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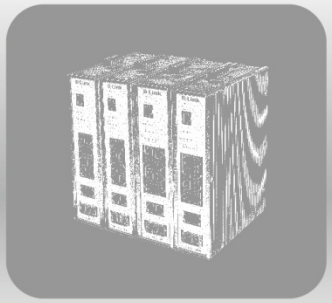

CLI Reference Guide

Product Model : DIS-200G Series
Industrial Gigabit Ethernet Switch
Release 1.10

August 2017

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1. Introduction

This manual's command descriptions are based on the software release 1.10 The commands listed here are the subset of commands that are supported by the DIS-200G Series Smart Switch.

Audience

This CLI Reference Guide is intended for network administrators and other IT networking professionals responsible for managing the switch by using the Command Line Interface (CLI). The CLI is the primary management interface to the DIS-200G Series Smart Switch, which will be generally be referred to simply as "the Switch" within this manual. This manual is written in a way that assumes that you already have the experience and knowledge of Ethernet and modern networking principles for Local Area Networks.

Other Documentation

The documents below are a further source of information in regards to configuring and troubleshooting the Switch. All the documents are available from the CD bundled with this switch, or from the D-Link website. Other documents related to the Switch are:

- *DIS-200G Series Industrial Gigabit Ethernet Smart Switch* Hardware Installation Guide
- *DIS-200G Series Industrial Gigabit Ethernet Smart Switch* Web UI Reference Guide

Conventions

Convention	Description
Boldface Font	Commands, command options and keywords are printed in boldface. Keywords, in the command line, are to be entered exactly as they are displayed.
UPPERCASE ITALICS Font	Parameters or values that must be specified are printed in UPPERCASE ITALICS. Parameters in the command line are to be replaced with the actual values that are desired to be used with the command.
Square Brackets [ ]	Square brackets enclose an optional value or set of optional arguments.
Braces { }	Braces enclose alternative keywords separated by vertical bars. Generally, one of the keywords in the separated list can be chosen.
Vertical Bar |	Optional values or arguments are enclosed in square brackets and separated by vertical bars. Generally, one or more of the vales or arguments in the separated list can be chosen.
`Blue Courier Font`	This convention is used to represent an example of a screen console display including example entries of CLI command input with the corresponding output. All examples used in this manual are based on the DIS-200G switch.

Notes, Notices, and Cautions

Below are examples of the three types of indicators used in this manual. When administering your switch using the information in this document, you should pay special attention to these indicators. Each example below provides an explanatory remark regarding each type of indicator.

NOTE: A note indicates important information that helps you make better use of your device.

NOTICE: A notice indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A caution indicates a potential for property damage, personal injury, or death.

Command Descriptions

The information pertaining to each command in this reference guide is presented using a number of template fields. The fields are:

- **Description -** This is a short and concise statement describing the commands functionality.
- **Syntax -** The precise form to use when entering and issuing the command.
- **Parameters -** A table where each row describes the optional or required parameters, and their use, that can be issued with the command.
- **Default -** If the command sets a configuration value or administrative state of the Switch then any default settings (i.e. without issuing the command) of the configuration is shown here.
- **Command Mode -** The mode in which the command can be issued. These modes are described in the section titled “Command Modes” below.
- **Command Default Level –** The user privilege level in which the command can be issued.
- **Usage Guideline -** If necessary, a detailed description of the command and its various utilization scenarios is given here.
- **Example(s) -** Each command is accompanied by a practical example of the command being issued in a suitable scenario.

Command Modes

There are severalcommand modes available in the command-line interface (CLI). The set of commands available to the user depends on both the mode the user is currently in and their privilege level. For each case, the user can see all the commands that are available in a particular command mode by entering a question mark (?) at the system prompt.

The command-line interface has two pre-defined privilege levels:

- **Basic User -** Privilege Level 1. This user account level has the lowest priority of the user accounts. The purpose of this type of user account level is for basic system checking.
- **Administrator -** Privilege Level 15. This administrator user account level can monitor all system information and change any of the system configuration settings expressed in this configuration guide.

The command-line interface has a number of command modes. There are three basic command modes:

- **User EXEC Mode**
- **Privileged EXEC Mode**
- **Global Configuration Mode**

All other sub-configuration modes can be accessed via the **Global Configuration Mode**.

When a user logs in to the Switch, the privilege level of the user determines the command mode the user will enter after initially logging in. The user will either log into **User EXEC Mode** or the **Privileged EXEC Mode**.

- Users with a **basic** user level will log into the Switch in the **User EXEC Mode**.
- Users with **administrator** level accounts will log into the Switch in the **Privileged EXEC Mode**.

Therefore, the User EXEC Mode can operate at a basic user level and the Privileged EXEC Mode can operate at the **administrator** levels. The user can only enter the Global Configuration Mode from the Privileged EXEC Mode. The Global Configuration Mode can be accessed by users who have administrator level user accounts.

As for sub-configuration modes, a subset of those can only be accessed by users who have the highest secure administrator level privileges.

The following table briefly lists the available command modes. Only the basic command modes and some of the sub-configuration modes are enumerated. The basic command modes and basic sub- configuration modes are further described in the following chapters. Descriptions for the rest of the sub-configuration modes are not provided in this section. For more information on the additional sub- configuration modes, the user should refer to the chapters relating to these functions.

The available command modes and privilege levels are described below:

Command Mode / Privilege Level	**Description**
User EXEC Mode / Basic User level	This level has the lowest priority of the user accounts. It is provided only to check basic system settings.
Privileged EXEC Mode / Administrator level	For changing both local and global terminal settings, monitoring, and performing certain system administration tasks. The system administration tasks that can be performed at this level include monitor and clear security related settings.
Global Configuration Mode / Administrator level	For applying global settings on the entire switch. In addition to applying global settings on the entire switch, the user can access other sub-configuration modes from global configuration mode.
Interface Configuration Mode / Administrator level	For applying interface related settings.
VLAN Interface Configuration Mode / Administrator level	For applying VLAN interface related settings.

User EXEC Mode at Basic User Level

This command mode is mainly designed for checking basic system settings. This command mode can be entered by logging in as a basic user.

Privileged EXEC Mode at Administrator Level

This command mode has a privilege level of 15. Users logged in with this command mode can monitor all system information and change any system configuration settings mentioned in this Configuration Guide. The method to enter privileged EXEC mode at administrator level is to login to the Switch with a user account that has a privilege level of 15.

Global Configuration Mode

The primary purpose of the global configuration mode is to apply global settings on the entire switch. Global configuration mode can be accessed at administrator level user accounts. In addition to applying glabal settings on the entire switch, the user can also access other sub-configuration modes.

In order to access the global configuration mode, the user must be logged in with the corresponding account level and use the **configure terminal** command in the privileged EXEC mode.

In the following example, the user is logged in as an Administrator in the Privileged EXEC Mode and uses the configure terminal command to access the Global Configuration Mode:

```
Switch# configure terminal
Switch(config)#
```

The **exit** command is used to exit the global configuration mode and return to the privileged EXEC mode.

```
Switch(config)# exit
Switch#
```

The procedures to enter the different sub-configuration modes can be found in the related chapters in this Configuration Guide. The command modes are used to configure the individual functions.

Interface Configuration Mode

Interface configuration mode is used to configure the parameters for an interface or a range of interfaces. An interface can be a physical port, VLAN, or other virtual interface. Thus, interface configuration mode is distinguished further according to the type of interface. The command prompt for each type of interface is slightly different.

VLAN Interface Configuration Mode

VLAN interface configuration mode is one of the available interface modes and is used to configure the parameters of a VLAN interface.

To access VLAN interface configuration mode, use the following command in global configuration mode:

```
Switch(config)# interface vlan 1
Switch(config-if)#
```

Creating a User Account

You can create different user account for various levels. This section will assist a user with creating a user a[illegible]y means of the Command Line Interface.

NOTE: By default, one user account is already configured on the Switch. Both the username and password for this account is admin, and the privilege level is 15.

Observe the following example.

```
Switch#configure terminal
Switch(config)#username user password pass1234
Switch(config)#
```

In the above example we had to navigate and access the username command.

- After starting in the Privileged EXEC Mode, we entered the command configure terminal to access the Global Configuration Mode. The username command can be used in the Global Configuration Mode.The command username **user password pass1234** creates a user account with the username

of user and a password of *pass1234*.

Save the running configuration to the start-up configuration. This means to save the changes made so that when the Switch is rebooted, the configuration will not be lost. The following example shows how to save the running configuration to the start-up configuration.

```
Switch# copy running-config startup-config
Building configuration...
% Saving 733 bytes to flash:startup-config
Switch#
```

After the Switch was rebooted, or when the users logs out and back in, the newly created username and password must be entered to access the CLI interface again, as seen below.

```
               DIS-200G-12PS/12PSW Gigabit Ethernet Switch


                        Command Line Interface
                       Firmware: Build 1.10.020
         Copyright(C) 2017 D-Link Corporation. All rights reserved.


User Access Verification


Username:user
Password:********


Switch>
```

Interface Notation

When configuration the physical ports available on this switch, a specific interface notation is used. The following will explain the layout, terminology and use of this notation.

In the following example, we will enter the Global Configuration Mode and then enter the Interface Configuration Mode, using the notation **1/0/1**. After entering the Interface Configuration Mode for port 1, we will change the speed to 1 Gbps, using the **speed 1000** command.

```
Switch#configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# speed 1000
Switch(config-if)#
```

In the above example the notation **1/0/1** was used. The terminology for each parameter is as follows:

- Interface Unit's ID / Open Slot's ID / Port's ID

The Interface Unit's ID is the ID of the stacking unit without the physical stack. If stacking is disabled or this unit is a stand-alone unit, then this parameter is irrelevant. The Open Slot's ID is the ID of the module plugged into the open module slot of the Switch. The DIS-200G Series doesn't support any open modules slots, thus this parameters will always by zero for this switch series. Lastly, the Port's ID is the physical port number of the port being configured.

In summary the above example will configure the stacked switch with the ID of 1, with the physical port number 1.

Error Messages

When the users issue a command that the Switch does not recognize, error messages will be generated to assist users with basic information about the mistake that was made. A list of possible error messages are found in the table below.

Error Message	Meaning
Ambiguous word detected at '^' marker	Not enough keywords were entered for the Switch to recognize the command.
Incomplete command	The command was not entered with all the required keyword.
Invalid word detected at '^' marker	The command was entered incorrectly.

The following example shows how an ambiguous command error message is generated.

```
Switch# show v
             ^
Ambiguous word detected at '^' marker.

Switch#
```

The following example shows how an incomplete command error message is generated.

```
Switch# show

Incomplete command.

Switch#
```

The following example shows how an invalid input error message is generated.

```
Switch# show verb
             ^
 Invalid word detected at '^' marker.

Switch#
```

Editing Features

The command line interface of this switch supports to following keyboard keystroke editing features.

Keystroke	Description
Delete	Deletes the character under the cursor and shifts the remainder of the line to the left.
Backspace	Deletes the character to the left of the cursor and shifts the remainder of the line to the left.

Left Arrow	Moves the cursor to the left.
Right Arrow	Moves the cursor to the right.
Return	Scrolls down to display the next line or used to issue a command.
Space	Scrolls down to display the next page.

Display Result Output Modifiers

Results displayed by **show** commands can be filtered using the following parameters:

- **begin** *FILTER-STRING* - This parameter is used to start the display with the first line that matches the filter string.
- **include** *FILTER-STRING* - This parameter is used to display all the lines that match the filter string.
- **exclude** *FILTER-STRING* - This parameter is used to exclude the lines that match the filter string from the display.

The example below shows how to use the **begin** *FILTER-STRING* parameter in a **show** command.

```
Switch# show running-config | begin interface
interface Ethernet 1/0/1
 switchport mode access
!
interface Ethernet 1/0/2
 switchport mode access
!
interface Ethernet 1/0/3
 switchport mode access
!
interface Ethernet 1/0/4
 switchport mode access
!
interface Ethernet 1/0/5
 switchport mode access
!
interface Ethernet 1/0/6
 switchport mode access
!
interface Ethernet 1/0/7
 switchport mode access
!
interface Ethernet 1/0/8
-- more --, next page: Space, continue: g, quit: ^C
```

The example below shows how to use the **include** *FILTER-STRING* parameter in a **show** command.

```
Switch# show running-config | include vlan
vlan 1
interface vlan 1
Switch#
```

The example below shows how to use the exclude FILTER-STRING parameter in a show command.

```
Switch# show running-config | exclude vlan

username user password user123
ddp
!
!
!
!
!
clock timezone + 0 0
!
!
interface Ethernet 1/0/1
 switchport mode access
!
interface Ethernet 1/0/2
 switchport mode access
!
interface Ethernet 1/0/3
 switchport mode access
!
interface Ethernet 1/0/4
 switchport mode access
-- more --, next page: Space, continue: g, quit: ^C
```

2. Basic CLI Commands

2-1 help

This command is used to display a brief description of the help system. Use the help command in any command modes

help

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

The help command provides a brief description for the help system, which includes the following functions:

- To list all commands available for a particular command mode, enter a question mark (?) at the system prompt.
- To obtain a list of commands that begin with a particular character string, enter the abbreviated command entry immediately followed by a question mark (?). This form of help is called **word** help, because it lists only the keywords or arguments that begin with the abbreviation entered.
- To list the keywords and arguments associated with a command, enter a question mark (?) in place of a keyword or argument on the command line. This form of help is called the **command syntax** help, because it lists the keywords or arguments that apply based on the command, keywords, and arguments already entered.

Example

This example shows how the help command is used to display a brief description of the help system.

```
Switch# help

 The switch CLI provides advanced help feature.
 1. Help is available when youe are ready to enter a command
    argument (e.g. 'show ?') and want to know each possible
    available options.
 2. Help is provided when an abbreviated argument is entered
    and you want to know what arguments match the input (e.g. 'show ve?'.).
    If nothing matched, the help list will be empty and tou must backup
    until entering a '?' shows the available options.
 3. For completing a partial command name could enter the abbreviated
    command name immediately followed by a <Tab> key.

 Note:
 Since the character '?' is used for help purpose, to enter
```

```
 the character '?' in a string argument, press ctrl+v immediately
 followed by the character '?'.

Switch#
```

The following example shows how to use the **word** help to display all the Privileged EXEC Mode commands that begin with the letters “re”. The letters entered before the question mark (?) are reprinted on the next command line to allow the user to continue entering the command.

```
Switch# re?
   reboot    Reboot system.
   reset     Reset the all configurations without rebooting.
Switch# re
```

The following example shows how to use the **command syntax** help to display the next argument of a partially complete IGMP snooping command. The characters entered before the question mark (?) is reprinted on the next command line to allow the user to continue entering the command.

```
Switch(config)# ip igmp ?
   snooping    Enable IGMP snooping
Switch(config)# ip igmp
```

2-2 configure terminal

This command is used to enter the Global Configuration Mode.

configure terminal

Parameters

None.

Default

None

Command Mode

Privilege EXEC Mode.

Command Default Level

Level: 15

Usage Guideline

This command is used to enter the Global Configuration Mode.

Example

This example shows how to enter into Global Configuration Mode.

```
Switch# configure terminal
Switch(config)#
```

2-3 logout

This command is used to close an active terminal session by logging off the Switch.

logout

Parameters

None.

Default

None.

Command Mode

User EXEC Mode.

Privilege EXEC Mode.

Command Default Level

Level:1.

Usage Guideline

Use this command to close an active terminal session by logging out of the device.

Example

This example shows how to logout

```
Switch# logout
```

2-4 end

This command is used to end the current configuration mode and return to the highest mode in the CLI mode hierarchy which is either the User EXEC Mode or the Privileged EXEC Mode.

end

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

E xecuting this command will return access to the highest mode in the CLI hierarchy regardless of what configuration mode or configuration sub-mode currently located at.

Example

This example shows how to end the Interface Configuration Mode and go back to the Privileged EXEC Mode.

```
Switch# configure terminal
Switch(config)# interface eth1/0/1
Switch(config-if)#end
```

```
Switch#
```

2-5 exit

This command is used to end the configuration mode and go back to the last mode. If the current mode is the User EXEC Mode or the Privilege EXEC Mode, executing the exit command logs you out of the current session.

exit

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to exit the current configuration mode and go back to the last mode. When the user is in the User EXEC Mode or the Privilege EXEC Mode, this command will logout the session.

Example

This example shows how to exit from the Interface Configuration Mode and return to the Global Configuration Mode.

```
Switch# configure terminal
Switch(config) interface eth1/0/1
Switch(config-if)#exit
Switch(config)#
```

2-6 show history

This command is used to list the commands entered in the current EXEC Mode session.

show history

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Commands entered are recorded by the system. A recorded command can be recalled by pressing CTRL+P or the Up Arrow key which will recall previous commands in sequence. The history buffer size is fixed at 32 commands.

The function key instructions, below, displays how to navigate the command in the history buffer.

- CTRL+P or the Up Arrow key - Recalls commands in the history buffer, beginning with the most recent command. Repeat the key sequence to recall successively older commands.
- Down Arrow key - Returns to more recent commands in the history buffer after recalling commands with Ctrl-P or the Up Arrow key. Repeat the key sequence to recall successively more recent commands.

Example

This example shows how to display the command buffer history.

```
Switch# show history

 help
 show history

Switch#
```

2-7 show cpu utilization

This command is used to display the CPU utilization information.

show cpu utilization

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays the system's CPU utilization information in 100 million seconds, 1 seconds and 10 seconds intervals.

Example

This example shows how to display the information about CPU utilization.

```
Switch# show cpu utilization

 100 million seconds - 2%       One seconds - 2%       Ten seconds - 2%

Switch#
```

2-8 show version

This command is used to display the Switch's software version information.

show version

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays version information about the Switch.

Example

This example shows how to displays version information about the Switch.

```
Switch# show version

 System MAC Address : 00-01-13-12-AB-00

 Unit ID   Module Name          Versions
 -------  ------------------  ---------------------
    1      DIS-200G            H/W:A1
                               Bootloader:1.10.001
                               Runtime:1.10.001

Switch#
```

3. Access Management Commands

3-1 ip http secure-server

This command is used to enable the HTTPS server. Use the **no** form of this command to disable the HTTPS server function.

ip http secure-server

no ip http secure-server

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15

Usage Guideline

This command enables the HTTPS server function.

Example

This example shows how to enable the HTTPS server function.

```
Switch# configure terminal
Switch(config)# ip http secure-server
Switch(config)#
```

3-2 show terminal

This command is used to obtain information about the terminal configuration parameter settings for the current terminal line. Use this command in any EXEC mode or any configuration mode.

show terminal

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display information about the terminal configuration parameters for the current terminal line.

Example

This example shows how to display information about the terminal configuration parameter settings for the current terminal line.

```
Switch# show terminal

 Terminal Settings :
  Length : 24 lines
  Width  : 80 columns
  Default length : 24 lines
  Default width  : 80 columns

Switch#
```

3-3 show ip http secure-server

This command is used to obtain information about the SSL status. Use this command in EXEC mode or any configuration mode.

show ip http secure-server

Parameters

None.

Default

By default, the state is disabled.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display information about the SSL status.

Example

This example shows how to display information about the SSL status.

```
Switch#show ip http secure-server

ip http secure-server state :  disable
Switch#
```

3-4 show users

This command is used to display information about the active lines on the Switch.

show users

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays information about the active lines on the Switch.

Example

This example shows how to display all session information.

```
Switch# show users

 ID   Type     User-Name      Privilege Login-Time        IP address
 ------------------------------------------------------------------------------
 0    * console admin         15        0D0H3M11S

 Total Entries  : 1

Switch#
```

3-5 terminal length

The command is used to configure the number of lines displayed on the screen. The **terminal length** command will only affect the current session. The newly created, saved session terminal length will use the default value. Use the no form of this command to revert to the default setting.

terminal length *NUMBER*

no terminal length

Parameters

NUMBER	Specifies the number of lines to display on the screen. This value must be between 0 and 512.When the terminal length is 0, the display will not stop until it reaches the end of the display.

Default

By default, this value is 24.

Command Mode

Use the EXEC Mode or Privilege EXEC Mode for the **terminal length** command.

Command Default Level

Level: 1 (for the **terminal length** command).

Usage Guideline

When the terminal length is 0, the display will not stop until it reaches the end of the display.

If the terminal length is specified to a value other than 0, for example 50, then the display will stop after every 50 lines. The terminal length is used to set the number of lines displayed on the current terminal screen. This command also applies to Telnet and SSH sessions. Valid entries are from 0 to 512. The default is 24 lines. A selection of 0's instructs the Switch to scroll continuously (no pausing).

Output from a single command that overflows a single display screen is followed by the **--More--** prompt. At the **--More--** prompt, press CTRL+C, q or Q to interrupt the output and return to the prompt. Press the Spacebar to display an additional screen of output, or press Return to display on more line of output. Setting the screen length to 0 turns off the scrolling feature and causes the entire output to display at once. Unless the default keyword is used, a change to the terminal length value applies only to the current session. When using the no form of this command, the number of lines in the terminal display screen is reset to 24.

Example

This example shows how to change the lines to be displayed on a screen to 60.

```
Switch# terminal length 60
Switch#
```

3-6 terminal width

The command is used to set the number of character columns on the terminal screen for the current session line. The terminal width command will only affect the current session.

terminal width *NUMBER*

no terminal width

Parameters

NUMBER	Specifies the number of characters to display on the screen. Valid values are from 40 to 255.

Default

By default, this value is 80 characters.

Command Mode

Use the EXEC Mode or Privilege EXEC Mode for the **terminal width** command.

Command Default Level

Level: 1 (for the **terminal width** command).

Usage Guideline

By default, the Switch's system terminal provides a screen display width of 80 characters. The **terminal width**

command changes the terminal width value which applies only to the current session. When changing the value in a session, the value applies only to that session. When the no form of this command is used, the number of lines in the terminal display screen is reset to the default, which is 80 characters.

However, for remote CLI session access such as Telnet, the auto-negotiation terminal width result will take precedence over the default setting if the negotiation is successful. Otherwise, the default settings take effect.

Example

This example shows how to adjust the current session terminal width to 120 characters.

```
Switch# show terminal

 Terminal Settings :
  Length : 24 lines
  Width  : 80 columns
  Default length : 24 lines
  Default width  : 80 columns

Switch# terminal width 120
Switch# show terminal

 Terminal Settings :
  Length : 24 lines
  Width  : 120 columns
  Default length : 24 lines
  Default width  : 80 columns

Switch#
```

3-7 username

This command is used to create a user account. Use the **no** form of this command to delete the user account.

username *NAME* **password** *PASSWORD*

no username *NAME*

Parameters

NAME	Specifies the user name with a maximum of 32 characters.
password	Specifies the password for the user.
PASSWORD	Specifies the password string based on the type.

Default

By default, the user name is *admin*, password is *admin*, and the privilege level is 15.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Ty default, the Switch's system terminal provides a screen display width of 80 characters. The terminal width command changes the terminal width value which applies only to the current session. When changing the value in a session, the value applies only to that session. When the **no** form of this command is used, the number of lines in the terminal display screen is reset to the default, which is 80 characters.

By default, the user account is empty. When the user account is empty, the user will be directly in the User EXEC Mode at Level 1. The user can further enter the Privileged EXEC Mode using the **enable** command.

Example

This example shows how to create an administrative username, called **user**, and a password, called "mypassword".

```
Switch# configure terminal
Switch(config)# username user password mypassword
Switch(config)#
```

This example shows how to remove the user account with the username **user**.

```
Switch# configure terminal
Switch(config)# no username user
Switch(config)#
```

4. Asymmetric VLAN Commands

4-1 asymmetric-vlan

his command is used to enable the asymmetric VLAN function. Use the **no** form of this command todisable the asymmetric VLAN function.

asymmetric-vlan

no asymmetric-vlan

Parameters

None.

Default

By default, this feature is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15

Usage Guideline

Use this command to enable or disable the asymmetric VLAN function.

Example

This example shows how to enable asymmetric VLAN.

```
Switch# configure terminal
Switch(config)# asymmetric-vlan
```

This example shows how to disable asymmetric VLAN.

```
Switch# configure terminal
Switch(config)# no asymmetric-vlan
```

5. Basic IPv4 Commands

5-1 ip address

This command is used to IPv4 address for an interface, or acquire an IP address on an interface from the DHCP. Use the **no** form of this command to remove the configuration of an IP address or disable DHCP on the interface.

ip address {*IP-ADDRESS SUBNET-MASK* **| dhcp}**

no ip address

Parameters

IP-ADDRESS	Specifies the IP address.
SUBNET-MASK	Specifies the subnet mask for the associated IP address.
dhcp	Specifies to acquire an IP address configuration on an interface from the DHCP protocol.

Default

None.

Command Mode

Time-range Configuration Mode.

Command Default Level

Level: 15

Usage Guideline

The IPv4 address of an interface can be either manually assigned by the user or dynamically assigned by the DHCP server. Use the no ip address command to delete the configured IP address entry.

Example

This example shows how to set 10.90.90.91 is the ip address for VLAN 1.

```
Switch# config terminal
Switch(config)# interface vlan 1
Switch(config-if-vlan)# ip address 10.90.90.91 255.255.255.0
Switch(config-if-vlan)#
```

5-2 ip route

This command is used to configure static route that destination is default gateway.

ip route *NETWORK-PREFIX NETWORK-MASK IP-ADDRESS*

no ip address *NETWORK-PREFIX NETWORK-MASK IP-ADDRESS*

Parameters

NETWORK-PREFIX	Specifies the network address.
NETWORK-MASK	Specifies the network mask
IP-ADDRESS	Specifies to an IP address.

Default

none.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15

Usage Guideline

Use this command to configure static route that destination is default gateway. The net-address and net-mask only allow to configure with 0.0.0.0.

Example

This example shows how to configure the static route that destination is to 10.90.90.254.

```
Switch# config terminal
Switch(config)# ip route 0.0.0.0 0.0.0.0 10.90.90.254
Switch(config)#
```

5-3 show ip interface

This command is used to display the IP interface information.

show ip interface brief

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display ip address information of the management interface.

Example

This example shows how to display the brief information of the IP interface.

```
Switch# show ip interface brief
```

```
 Interface         Address               Method    Status
 ----------------- --------------------- --------- ------
 VLAN 1           10.90.90.91/24         Manual    UP

Switch#
```

5-4 show ip route

This command is used to display ip address of default gateway.

show ip route

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the ip address of default gateway.

Example

This example shows how to display ip address of default gateway.

```
Switch(config-if-vlan)# show ip route

 Code: C - connected, S - static
       * - candidate default


 Gateway of last resort is 10.90.90.254 to network 0.0.0.0

 C    10.90.90.0/24 is directly connected, vlan1

 Total Entries: 1

Switch(config-if-vlan)#
```

6. Basic IPv6 Commands

6-1 ipv6 address

This command is used to manually configure an IPv6 addresses on the management VLAN . Use the no form of this command to disable IPv6 address for management VLAN.

ipv6 address *IPV6-ADDRESS*

no ipv6 address

Parameters

IPV6-ADDRESS	Specifies the IPv6 address and the length of prefix for the management VLAN.

Default

None.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure the IPv6 address of management VLAN. Use no form of this command to disable IPv6 address for management VLAN.

Example

This example shows how to configure an IPv6 address.

```
Switch# config terminal
Switch(config)# interface vlan 1
Switch(config-if-vlan)# ipv6 address 3ffe:22:33:44::55/64
Switch(config-if-vlan)#
```

This example shows how to disable IPv6 address for management VLAN.

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 address
```

6-2 show ipv6 interface

This command is used to display IPv6 interface information.

show ipv6 interface [*INTERFACE-ID*] **brief**

Parameters

INTERFACE-ID	Specifies the interface for display.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display IPv6 interface related configurations.

Example

This example shows how to display IPv6 interface information.

```
Switch# show ipv6 interface brief

 vlan1 is up, Link status is up
    Global unicast address: 3ffe:22:33:44::55
    Link-local address: fe80::201:19ff:fe11:20
    Static address is 3ffe:22:33:44::55/64

Switch#
```

7. Cable Diagnostics Commands

7-1 test cable-diagnostics

This command is used to start the cable diagnostics to test the status and length of copper cables.

test cable-diagnostics interface *INTERFACE-ID*

Parameters

interface INTERFACE-ID	Specifies the interface ID. The acceptable interface will be a physical port.

Default

None.

Command Mode

EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

The command is available for physical port configuration. Cable Diagnostics can help users to detect whether the copper Ethernet port has connectivity problems. Use the test cable-diagnostics command to start the test.

Example

This example shows how to start the cable diagnostics to test the status and length of copper cables.

```
Switch# test cable-diagnostics interface Ethernet 1/0/1-2
Switch#
```

7-2 show cable-diagnostics

This command is used to display the test results for the cable diagnostics.

show cable-diagnostics [interface *INTERFACE-ID***]**

Parameters

interface INTERFACE-ID	Specifies the interface's ID. The acceptable interface will be a physical port.

Default

None.

Command Mode

EXEC Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display the test results for the cable diagnostics.

Example

This example shows how to display the test results for the cable diagnostics.

```
Switch# show cable-diagnostics interface Ethernet 1/0/1-2

 Port       Type        Link Status    Test Result                Cable Length (M)
 ---------  ----------  -------------  -------------------------  -----------------
 eth1/0/1   1000BaseT    Link Down     Pair 1 Open     at   <7M    -
                                       Pair 2 Open     at   <7M    -
                                       Pair 3 Short    at   <7M    -
                                       Pair 4 OK       at   <7M    -
 eth1/0/2   1000BaseT    Link Down     Pair 1 Open     at   <7M    -
                                       Pair 2 Open     at   <7M    -
                                       Pair 3 Short    at   <7M    -
                                       Pair 4 OK       at   <7M    -
```

7-3 clear cable-diagnostics

This command is used to clear the test results for the cable diagnostics.

clear cable-diagnostics {all | interface *INTERFACE-ID***}**

Parameters

all	Specifies to clear cable diagnostics results for all interfaces.
interface INTERFACE-ID	Specifies the interface's ID. The acceptable interface will be a physical port.

Default

None.

Command Mode

EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to clear the test results for the cable diagnostics.

Example

This example shows how to clear the test results for the cable diagnostics.

```
Switch# clear cable-diagnostics interface Ethernet 1/0/2
Switch#
```

8. Digital Diagnostics Monitoring (DDM) Commands

8-1 show interfaces transceiver

This command is used to display the current SFP module operating parameters.

show interfaces [*INTERFACE-ID* **[,|-] transceiver [detail]**

Parameters

INTERFACE-ID [,|-]	(Optional) Specifies multiple interfaces for transceiver monitoring status display. If no interface ID is specified, transceiver monitoring statuses on all valid interfaces are displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the current SFP module operating transceiver monitoring parameters values for specified ports.

Example

This example shows how to display current operating parameters for all ports valid for transceiver monitoring.

```
Switch# show interfaces transceiver

++ : high alarm, +  :   high warning, -  : low warning, -- : low alarm
mA: milliamperes, mW:   milliwatts
Transceiver Monitoring  traps: None
Port    Temperature Voltage Bias Current    TX Power    RX Power
    (Celsius)   (V) (mA)    (mW)    (mW)
------- ------------ ------------ ------------ ------------ ------------
eth1/0/11   29.316  3.302   5.326   0.529   0.506
eth1/0/12   31.617  3.297   5.170   0.527   0.504

Total Entries: 2

Switch#
```

This example shows how to display detailed transceiver monitoring information for all ports which are valid for transceiver monitoring.

```
Switch# show interfaces transceiver detail
```

```
++ : high alarm, + : high warning, - : low warning, -- : low alarm mA: milliamperes,
mW: milliwatts

A: The threshold is administratively configured.

eth1/0/11
Transceiver Monitoring is enabled
Transceiver Monitoring shutdown action: Alarm

                 Current      High-Alarm    High-Warning    Low-Warning   Low-Alarm
Temperature(C)    30.090       75.000(A)    70.000          0.000         -5.000
Voltage (v)        3.353       3.630        3.465           3.135         2.970
Bias Current(mA)   16.794(++)  10.500       9.000           2.500         2.000
TX Power (mW)      0.258       1.413        0.708           0.186         0.074
RX Power (mW)      0.000(--)   1.585        0.794           0.102         0.041

Switch#
```

8-2 snmp-server enable traps transceiver-monitoring

This command is used to send all or the specified level of optical transceiver monitoring SNMP notifications. Use the **no** form of the command to stop sending the notifications.

snmp-server enable traps transceiver-monitoring [{alarm | warning}]

no snmp-server enable traps transceiver-monitoring [{alarm | warning}]

Parameters

alarm	(Optional) Specifies to send or stop sending alarm level notification.
warning	(Optional) Specifies to send or stop sending warning level notification.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to send all or the specified level of transceiver-monitoring SNMP notifications.

Example

This example shows how to start sending the SNMP notifications at the warning level.

```
Switch# configure terminal
```

```
Switch(config)# snmp-server enable traps transceiver-monitoring warning
Switch(config)#
```

8-3 transceiver-monitoring action shutdown

This command is used to shut down a port from an alarm or a warning of an abnormal status. Use the **no** form of the command to disable the shutdown action.

transceiver-monitoring action shutdown {alarm | warning }

no transceiver-monitoring action shutdown

Parameters

alarm	Specifies to shut down a port when alarm events occur.
warning	Specifies to shut down a port when warning events occur.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is available for physical port interface configuration.

The configuration can select to shut down a port on an alarm event or warning event or not to shut down on either of them. When the monitoring function is enabled, an alarm event occurs when the parameters, being monitored, go higher than the high alarm threshold or go lower than the low alarm threshold. A warning event occurs when the parameters being monitored go higher than the high warning threshold or go lower than the low warning threshold.

The port shutdown feature is controlled by the Error Disable module without a recover timer. Users can manually recover the port by using the shutdown command and then the no shutdown command.

Example

This example shows how to configure the shutdown interface eth1/0/11 when an alarm event is detected.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/11
Switch(config-if)# transceiver-monitoring action shutdown alarm
Switch(config-if)#
```

8-4 transceiver-monitoring bias-current

This command is used to configure the thresholds of the bias current for a specified port. Use the **no** form of the command to remove the configuration.

transceiver-monitoring bias-current *INTERFACE-ID* **{high | low} {alarm | warning}** *VALUE*

no transceiver-monitoring bias-current *INTERFACE-ID* **{high | low} {alarm | warning}**

Parameters

INTERFACE-ID	Specifies the interface to modify.
high	Specifies the high threshold, when the operating parameter rises above this value. It indicates an abnormal status.
low	Specifies the low threshold, when the operating parameter falls below this value. It indicates an abnormal status.
alarm	Specifies the threshold for high alarm or low alarm conditions.
warning	Specifies the threshold for high warning or low warning conditions.
VALUE	Specifies the value of the threshold. This value must be between 0 and 131 mA.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This configuration is only suitable for SFP/SFP+ port interfaces with optical modules with transceiver-monitoring.

The no form of this command has the effect to clear the configured threshold stored in the system.

Example

This example shows how to configure the bias current high warning threshold as 10.237 on interface eth1/0/11.

```
Switch# configure terminal
Switch(config)# transceiver-monitoring bias-current Ethernet 1/0/11 high warning
10.237
WARNING: A closest value 10.236 is chosen according to the transceiver-monitoring
precision definition.
Switch(config)#
```

8-5 transceiver-monitoring enable

This command is used to enable the optical transceiver monitoring function for an SFP port. Use the **no** form of the command to disable optical transceiver monitoring.

transceiver-monitoring enable

no transceiver-monitoring enable

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is available for the physical port interface configuration.

A user can use this command to enable or disable optical transceiver monitoring function for an SFP port. When the monitoring function is enabled, an alarm event occurs when the parameters being monitored go higher than the high alarm threshold or go lower than the low alarm threshold. A warning event occurs when the parameters being monitored go higher than the high warning threshold or go lower than the low warning threshold.

When an SFP with transceiver monitoring capability is plugged into a port but the transceiver monitoring function of the port is disabled, the system will not detect the SFP's abnormal status but the user can still check the current status by showing the interface transceiver command.

Example

This example shows how to enable transceiver monitoring on interface eth1/0/11.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/11
Switch(config-if)# transceiver-monitoring enable
Switch(config-if)#
```

8-6 transceiver-monitoring rx-power

This command is used to configure the thresholds of the input power for the specified port. Use the **no** form of the command to remove the configuration.

transceiver-monitoring rx-power *INTERFACE-ID* **{high | low} {alarm | warning} {mwatt** *VALUE* **| dbm** *VALUE***}**

no transceiver-monitoring rx-power *INTERFACE-ID* **{high | low} {alarm | warning}**

Parameters

INTERFACE ID	Specifies the interface to modify.
high	Specifies that when the operating parameter rises above the highest threshold, it indicates an abnormal status.
low	Specifies that when the operating parameter falls below the low threshold this value, it indicates an abnormal status.
alarm	Specifies to configure the high and low threshold value condition.
warning	Specifies to configure the high and low warning threshold conditions.
mwatt *VALUE*	Specifies the power threshold value in milliwatts. This value must be between 0 and 6.5535.
dbm *VALUE*	Specifies the power threshold value in dBm. This value must be between -40 and 8.1647.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Only SFP/SFP+ port interfaces with optical modules, with transceiver monitoring capability, are valid for this configuration.

The no form of this command has the effect to clear the configured threshold stored in system.

Example

This example shows how to configure the RX power low warning threshold as 0.135 mW on interface eth1/0/11.

```
Switch# configure terminal
Switch(config)# transceiver-monitoring rx-power Ethernet 1/0/11 low warning mwatt 0.135
Switch(config)#
```

8-7 transceiver-monitoring temperature

This command is used to configure the temperature thresholds for the specified port. Use the **no** form of the command to remove the configuration.

transceiver-monitoring temperature *INTERFACE-ID* **{high | low} {alarm | warning}** *VALUE*

no transceiver-monitoring temperature *INTERFACE-ID* **{high | low} {alarm | warning}**

Parameters

INTERFACE ID	Specifies the interface to modify.

high	Specifies that when the operating parameter rises above this high threshold value, it indicates an abnormal status.
low	Specifies that when the operating parameter falls below this low threshold value, it indicates an abnormal status.
alarm	Specifies to configure the high and low threshold value condition.
warning	Specifies to configure the high and low warning threshold conditions.
VALUE	Specifies the threshold value. This value must be between -128 and 127.996 °C.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Only SFP/SFP+ port interfaces with optical modules, with transceiver monitoring capability, are valid for this configuration.

The no form of this command has the effect to clear the configured threshold stored in system.

Example

This example shows how to configure the temperature high alarm threshold as 127.994 on interface eth1/0/11.

```
Switch# configure terminal
Switch(config)# transceiver-monitoring temperature Ethernet 1/0/11 high alarm 127.994

WARNING: A closest value 127.992 is chosen according to the transceiver-monitoring
precision definition.
Switch(config)#
```

8-8 transceiver-monitoring tx-power

This command is used to configure the output power threshold for the specified port. Use the **no** form of the command to remove the configuration.

transceiver-monitoring tx-power *INTERFACE-ID* **{high | low} {alarm | warning} {mwatt** *VALUE* **| dbm** *VALUE***}**

no transceiver-monitoring tx-power *INTERFACE-ID* **{high | low} {alarm | warning}**

Parameters

high	Specifies the interface to modify.

low	Specifies that when the operating parameter rises above this high threshold value, it indicates an abnormal status.
alarm	Specifies that when the operating parameter falls below this low threshold value, it indicates an abnormal status.
warning	Specifies to configure the high and low warning threshold conditions.
mwatt *VALUE*	Specifies the power threshold value in milliwatts. This value must be between 0 and 6.5535.
dbm *VALUE*	Specifies the power threshold value in dBm. This value must be between -40 and 8.1647.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Only SFP/SFP+ port interfaces with optical modules, with transceiver monitoring capability, are valid for this configuration.

The no form of this command has the effect to clear the configured threshold stored in system.

Example

This example shows how to configure the TX power low warning threshold to 0.181 mW on interface eth1/0/11.

```
Switch# configure terminal
Switch(config)# transceiver-monitoring tx-power Ethernet 1/0/11 low warning mwatt 0.181
Switch(config)#
```

8-9 transceiver-monitoring voltage

This command is used to configure the threshold voltage of the specified port. Use the **no** form of the command to remove the configuration.

transceiver-monitoring voltage *INTERFACE-ID* **{high | low} {alarm | warning}** *VALUE*

no transceiver-monitoring voltage *INTERFACE-ID* **{high | low} {alarm | warning}**

Parameters

INTERFACE ID	Specifies the interface to modify.
high	Specifies that when the operating parameter rises above the highest threshold, it indicates an abnormal status.
low	Specifies that when the operating parameter falls below this low threshold value, it indicates an abnormal status.

alarm	Specifies to configure the high and low threshold value condition.
warning	Specifies to configure the high and low warning threshold conditions.
VALUE	Specifies the threshold value. This value must be between 0 and 6.55 Volt.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Only SFP/SFP+ port interfaces with optical modules, with transceiver monitoring capability, are valid for this onfiguration.

The no form of this command has the effect to clear the configured threshold stored in system.

Example

This example shows how to configure the low alarm voltage threshold as 0.005 on interface eth1/0/11.

```
Switch# configure terminal
Switch(config)# transceiver-monitoring voltage Ethernet 1/0/11 low alarm 0.005
Switch(config)#
```

9. D-Link Discovery Protocol (DDP) ClientCommands

9-1 ddp

This command is used to enable DDP client function globally. Use the **no** form of this command to disable DDP client.

ddp

no ddp

Parameters

None.

Default

By default, this option is enabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enable or disable DDP client function globally.

Example

This example shows how to enable DDP globally.

```
Switch# configure terminal
Switch(config)# ddp
Switch(config)#
```

This example shows how to disable DDP.

```
Switch# configure terminal
Switch(config)# no ddp
Switch#
```

9-2 ddp report-timer

This command is used to configure interval between two consecutive DDP report messages. Use the **no** form of this command to revert to the default setting.

ddp report-timer {30| 60| 90|120 |Never}

no ddp report-timer

Parameters

30	Specifies the report interval to 30 seconds.
60	Specifies the report interval to 60 seconds.
90	Specifies the report interval to 90 seconds.
120	Specifies the report interval to 120 seconds.
Never	Specifies to stop sending report message.

Default

By default, this option is 30 seconds.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure interval between two consecutive DDP report messages.

Example

This example shows how to configure interval to 60 seconds.

```
Switch# configure terminal
Switch(config)# ddp report-timer 60
```

9-3 show ddp

This command is used to display the switch DDP configurations.

show ddp

Parameters

none

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the switch DDP configuration information.

Example

This example shows how to display DDP global information.

```
Switch# show ddp

D-Link Discovery Protocol state: disabled
Report timer: 60 seconds
```

10. DoS Prevention Commands

10-1 dos-prevention

This command is used to enable and configure the DoS prevention mechanism. Use the **no** form of this command to reset DoS prevention to the default setting.

dos-prevention *DOS-ATTACK-TYPE*

no dos-prevention *DOS-ATTACK-TYPE*

Parameters

DOS-ATTACK-TYPE	Specifies the string that identifies the DoS type to be configured.

Default

By default all supported DoS types are disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to enabled and configure the DoS prevention mechanism for a specific DoS attack type or for all supported types. The DoS prevention mechanisms (matching and taking action) are hardware-based features.

When DoS prevention is enabled, the Switch will log the event if any attack packet was received.

The command no dos-prevention with the all keyword is used to disable the DoS prevention mechanism for all supported types. All the related settings will be reverted back to the default for the specified attack types.

The following well-known DoS types which can be detected by most switches:

- **Blat:** This type of attack will send packets with TCP/UDP source port equals to destination port to the target device. It may cause the target device respond to itself.
- **Land:** A LAND attack involves with IP packets where the source and destination address are set to address of the target device. It may cause the target device reply to itself continuously.
- **TCP-NULL-scan:** Port scanning by using specific packets, which contain a sequence number of 0 and no flags.
- **TCP-SYN-fin:** Port scanning by using specific packets, which contain SYN and FIN flags.
- **TCP-SYN-SRCport-less-1024:** Port scanning by using specific packets, which contain source port 0-1023 and SYN flag.
- **TCP-xmas-scan:** Port scanning by using specific packets, which contain a sequence number of 0 and the Urgent (URG), Push (PSH), and FIN flags.
- **Ping-death:** A ping of death is a type of attack on a computer that involves sending a malformed or otherwise malicious ping to a computer. A ping is normally 64 bytes in size; many computers cannot handle a ping large than the maximum IP packet size, which is 65,535 bytes. Sending a ping of this size can crash the target computer. Traditionally, this bug has been relatively easy to exploit. Generally, sending a 65536 byte ping packet is illegal according to networking protocol, but a packet of such a size can be sent if it is fragmented; when the target computer reassembles the packet, a buffer overflow can occur, which often cause a system crash.

- **All:** All of above types.

Example

This example shows how to enable the DoS prevention mechanism for land attack.

```
Switch# configure terminal
Switch(config)# dos-prevention land
Switch(config)#
```

This example shows how to enable the DoS prevention mechanism on all supported types.

```
Switch# configure terminal
Switch(config)# dos-prevention all
Switch(config)#
```

This example shows how to disable the DoS prevention mechanism for all supported types.

```
Switch# configure terminal
Switch(config)# no dos-prevention all
Switch(config)#
```

10-2 show dos-prevention

This command is used to display the DoS prevention status and related drop counters.

show dos-prevention [*DOS-ATTACK-TYPE***]**

Parameters

DOS-ATTACK-TYPE	(Optional) Specifies the DoS type to be displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display information about DoS prevention.

Example

This example shows how to display the configuration information of the DoS prevention.

```
Switch# show dos-prevention

 DoS Prevention Information
```

```
 DoS Type                   State
 -------------------------- --------
 Land Attack                Enabled
 Blat Attack                Enabled
 TCP Null                   Enabled
 TCP Xmas                   Enabled
 TCP SYN-FIN                Enabled
 TCP SYN SrcPort Less 1024  Enabled
 Ping of Death Attack       Enabled
Switch#
```

This example shows how to display the specified type configuration information of the DoS prevention.

```
Switch# show dos-prevention lan

 DoS Type : Land Attack
 State    : Enabled

Switch#
```

11. Ethernet Ring Protection Switching (ERPS) Commands

11-1 description

This command is used to configure the description for Ethernet Ring Protection (ERP) instances.

description *DESCRIPTION*

Parameters

None.

Default

None.

Command Mode

ERP Instance Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to configure the description for the ERP instances.

Example

This example shows how to configure the description for the ERP instances.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 major-ring
Switch(config-erp)#instance 1
Switch(config-erp-instance)#description custom-description
Switch(config-erp-instance)#
```

11-2 ethernet ring g8032

This command is used to create or modify an ITU-T G.8032 ERP physical ring and enter the ERP configuration mode. Use the **no** form of this command to delete the specified ring.

ethernet ring g8032 *RING-NAME*

no ethernet ring g8032 *RING -NAME*

Parameters

RING-NAME	Specifies the name of the ERP ring with the maximum of 32 characters.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to create, modify or delete an ITU-T G.8032 ERP physical ring and enter the ERP configuration mode.

Example

This example shows how to create an ERP ring named “campus”.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 campus
Switch(config-erp)#
```

11-3 ethernet ring g8032 profile

This command is used to create or modify a G.8032 profile and enter the ERP profile configuration mode. Use the **no** form of this command to delete the specified profile.

ethernet ring g8032 profile *PROFILE-NAME*

no ethernet ring g8032 profile *PROFILE-NAME*

Parameters

PROFILE-NAME	Specifies the name of the G.8032 profile with the maximum of 32 characters.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to create, modify or delete a G.8032 profile and enter the ERP profile configuration mode.

Example

This example shows how to create a G.8032 profile named “campus”.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 profile campus
Switch(config-g8032-ring-profile)#
```

11-4 r-aps channel-vlan

This command is used to specify the APS channel VLAN for an ERP instance. Use the **no** form of this command to delete the configuration.

r-aps channel-vlan *VLAN-ID*

no r-aps channel-vlan

Parameters

VLAN-ID	Specifies the VLAN ID. The valid values are from 1 to 4094.

Default

None.

Command Mode

ERP Instance Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to assign the APS channel VLAN for an ERP instance. The APS channel VLAN needs to be assigned before an ERP instance can be set to the operation state.

The specified APS channel VLAN does not need to exist to configure the command. But it needs to exist before the instance can be set to the operation state.

If the APS channel VLAN is removed when the ERP instance is in operation, the ERP instance will enter the operational disabled state.

Each ERP instances should have distinct APS channel VLAN.

Example

This example shows how to configure the APS channel VLAN “2” for the ERP instance “1”.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 campus
Switch(config-erp)# instance 1
Switch(config-erp-instance)# r-aps channel-vlan 2
Switch(config-erp-instance)#
```

11-5 inclusion-list vlan-ids

This command is used to configure VLAN IDs protected by the ERP mechanism. Use the **no** form of this command to delete the VLAN IDs.

inclusion-list vlan-ids *VLAN-ID* **[, | -]**

no inclusion-list vlan-ids *VLAN-ID* **[, | -]**

Parameters

VLAN-ID	Specified the VLAN IDs protected by the ERP mechanism. The range is 1 to 4094.
,	(Optional) Specifies a series of VLANs, or separate a range of VLANs from a previous range. No spaces are required before and after the comma.
-	(Optional) Specifies a range of VLANs. No spaces are required before and after the hyphen.

Default

None.

Command Mode

ERP Instance Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to add or delete VLAN IDs protected by the ERP mechanism.

Example

This example shows how to configure service protected VLAN as 100-200 for ERP instance 1.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 ring2
Switch(config-erp)# instance 1
Switch(config-erp-instance)# inclusion-list vlan-ids 100-200
Switch(config-erp-instance)#
```

11-6 instance

This command is used to create an ERP instance and enter ERP instance configuration mode. Use the **no** form of this command to remove an ERP instance.

instance *INSTANCE-ID*

no instance *INSTANCE-ID*

Parameters

INSTANCE-ID	Specifies an ERP instance number. The valid values are from 1 to 32.

Default

None.

Command Mode

ERP Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to create or remove an ERP instance and enter ERP instance configuration mode.

Example

This example shows how to configure service protected VLAN as 100-200 for ERP instance 1.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 ring2
Switch(config-erp)# instance 1
Switch(config-erp-instance)#
```

11-7 level

This command is used to configure ring MEL value of an ERP instance. Use the **no** form of this command to revert to the default setting.

level *MEL-VALUE*

no level

Parameters

MEL-VALUE	Specifies an ERP instance number. The valid values are from 1 to 32.

Default

By default, the value is 1.

Command Mode

ERP Instance Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to configure ring MEL value of an ERP instance. The configured MEL value of all ring nodes participate in the same ERP instance should be identical.

Example

This example shows how to configure the ring MEL value of ERP instance 1 as 6.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 ring2
Switch(config-erp)# instance 1
Switch(config-erp-instance)# level 6
Switch(config-erp-instance)#
```

11-8 profile

This command is used to associate an ERP instance with a G.8032 profile. Use the **no** form of this command to remove the association.

profile *PROFILE-NAME*

no profile *PROFILE-NAME*

Parameters

PROFILE-NAME	Specifies the profile name to be associated with the ERP instance.

Default

None.

Command Mode

ERP Instance Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to associate an ERP instance with a G.8032 profile. Multiple ERP instances can be associated with the same G.8032 profile.

Example

This example shows how to associate the profile “campus” with instance 1.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 ring1
Switch(config-erp)# instance 1
Switch(config-erp-instance)# profile campus
Switch(config-erp-instance)#
```

11-9 port0

This command is used to specify the first ring port of a physical ring. Use the **no** form of this command to remove the settings.

port0 interface *INTERFACE-ID*

no port0

Parameters

PROFILE-NAME	Specifies the profile name to be associated with the ERP instance.

Default

None.

Command Mode

ERP Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to specify or remove the first ring port of a physical ring.

Example

This example shows how to configure the interface “eth1/0/1” as the first ring port of the G.8032 ring “ring1”.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 ring1
Switch(config-erp)# instance 1
Switch(config-erp-instance)# port0 interface eth1/0/1
Switch(config-erp-instance)#
```

11-10 port1

This command is used to specify the second ring port of a physical ring. Use the **no** form of this command to remove the settings.

port1 {interface *INTERFACE_ID* **| none}**

no port1

Parameters

INTERFACE-ID	Specifies the interface ID of the first ring port. The interface(s) can be a physical interface or a port-channel.
none	Specifies that the inter-connect node is a local node endpoint of an open ring.

Default

None.

Command Mode

ERP Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to specify or remove the first ring port of a physical ring. Use the port1 none command to indicate that the inter-connect node is a local node endpoint of an open ring.

Example

This example shows how to configure the inter-connect node as a local end node of the G.8032 ring “ring2”.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 ring2
```

```
Switch(config-erp)# instance 1
Switch(config-erp-instance)# port1 none
Switch(config-erp-instance)#
```

11-11 revertive

This command is used to revert back to the working transport entity, for example, when the RPL was blocked. Use the **no** form of this command to continue using the RPL, if it has not failed and if the 'switch link defect' condition was cleared.

revertive

no revertive

Parameters

None.

Default

By default, this option is **revertive**.

Command Mode

G.8032 Profile Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When a defect was cleared, the traffic channel will revert after the WTR timer has expired, which is used to avoid toggling protection states caused by intermitted defects.

n the non-revertive operation, the traffic channel continues to use the RPL if it did not fail after a 'switch link defect' condition was cleared. Since in Ethernet ring protection the working transport entity resources may be more optimized and in some cases it is more desirable to revert to this working transport entity once all ring links are available. This is performed at the expense of an additional traffic interruption. In some cases there may be no advantage to revert back to the working transport entity immediately and in some cases a second traffic interruption is even avoided by not reverting protect switching.

Example

This example shows how to configure rings in the profile "campus" to operate in non-revertive mode.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 profile campus
Switch(config-g8032-ring-profile)# no revertive
Switch(config-g8032-ring-profile)#
```

11-12 rpl

This command is used to configure the node as the RPL owner, or assign the port as the RPL port.

Use the **no** form of this command to remove the settings.

rpl {port0 | port1} [owner]

no rpl

Parameters

port0	Specified port0 as the RPL port.
port1	Specified port1 as the RPL port.
owner	(Optional) Specifies the ring node as the RPL owner node.

Default

None.

Command Mode

ERP Instance Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to configure the node as the RPL owner or RPL neighbor, or assign the port as the RPL port.

Example

This example shows how to configure port0 as the RPL port of the ERP instance “1”.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 ring1
Switch(config-erp)# instance 1
Switch(config-erp-instance)# rpl port0
Switch(config-erp-instance)#
```

11-13 show ethernet ring g8032

This command is used to display information of the ERP instances.

show ethernet ring g8032 {status | brief}

Parameters

status	Specifies to display the status of the ERP instances.
brief	Specifies to display the brief information of the ERP instances.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display information of the ERP instances.

Example

This example shows how to display the detailed information of the ERP instances.

```
Switch# show ethernet ring g8032 status

 Ethernet ring ring1, instance 1
----------------------------------------
    Description:
    MEL: 1
    R-APS Channel: invalid r-aps vlan,Protected VLAN:
    Profile:
    Guard timer: 500 milliseconds
    Hold-Off timer: 0 milliseconds
    WTR timer: 5 minutes
    Revertive
    Instance State: Deactivated
    Admin RPL: -
    Operational RPL: -
    Port0 State: Forwarding
    Port1 State: Forwarding
    Admin RPL Port: -
    Operational RPL Port: -

Total Entries : 1

Switch#
```

This example shows how to display the brief information of the ERP instances.

```
Switch# show ethernet ring g8032 brief

Profile                          Inst Status     Port-State
                                  .ID
-------------------------------- ---  ----------- ------------------
                                  1    Deactivated p0:-,Forwarding
                                                   p1:-,Forwarding

Total Entries : 1

Switch#
```

Display Parameters

MEL	Ring MEL value of ERP instance.
R-APS Channel	APS channel of ERP instance.
Protected VLANs	Service protected VLANs of ERP instance.
Profile	The profile associated with the ERP instance.
Guard timer	Time value for guard timer of the profile.
Hold-Off timer	Time value for hold-off timer of the profile.
WTR timer	Time value for WTR timer of the profile
Revertive / Non-Revertive	Ring instances is operated in revertively or non revertively in the profile.
Instance State	Current ring node status of ERP instance. Deactivated / Init / Idle / Protection.
Admin/Operational RPL	Current config/running config ring node role of ERPS instance. (Owner /None)
Admin/Operational Port0/port1	Current config/running config ring port role. (Interface_id /none)
Admin/Operational RPL Port	Current config/running RPL. (port0/port1 /none)
Ring port0/port1 state	State for ring ports of ERP instance. (- / Forwarding / Blocked l)
Profile	The profile associated with the ring instances.
Inst ID	Instance identifier of ERP instance.
RingType	Indicates either major ring or sub ring.
Node Type	RPL Owner.
Status	Current status of ERP instance. It can be one of the following values: **Deactivated**: The ERP instance is deactivated. **Init**: The instance is initializing. **Idle**: The instance is in normal state. The RPL port is blocked. **Protection**: The instance detects failure at some ring port. The RPL port is restored to protect the port.

Port-State	Current ring ports state. (- / Forwarding / Blocked)
status	Specifies to display the status of the ERP instances.
brief	Specifies to display the brief information of the ERP instances.

11-14 activate

This command is used to activate the specified ERP instance. Use the **no** form of this command to deactivate the specified ERP instance.

Activate

no activate

Parameters

None.

Default

By default, this option is no activate.

Command Mode

ERP Instance Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to activate or deactivate the specified ERP instance. The ring ports, APS channel, and ERP profile must be configured before activating the ERP instance.

The activated ERP instance will be in non-operational state, if the specified APS channel does not exist, or the specified ports are not the tagged member port of the APS channel VLAN.

Example

This example shows how to activate the instance 1.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 ring1
Switch(config-erp)# instance 1
Switch(config-erp-instance)# activate
Switch(config-erp-instance)#
```

11-15 timer

This command is used to configure timers for an ERP domain. Use the **no** form of this command to revert to the default settings.

timer {guard *MILLI-SECONDS* **| hold-off** *SECONDS* **| wtr** *MINUTES***}**

no timer {guard | hold-off | wtr}

Parameters

guard *MILLI-SECONDS*	(Optional) Specifies the guard timer in milliseconds. The value is range from 10 to 2000.
hold-off *SECONDS*	(Optional) Specifies the hold-off timer in seconds. The value is range from 0 to 10.
wtr *MINUTES*	(Optional) Specifies the WTR timer in minutes. The value is range from 1 to 12.
status	Specifies to display the status of the ERP instances.
brief	Specifies to display the brief information of the ERP instances.

Default

The default guard timer is 500 milliseconds.

The default hold-off timer is 0 second.

The default WTR timer is 5 minutes.

Command Mode

G.8032 Profile Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to configure timers for an ERP domain.

Example

This example shows how to configure guard timer to 700 for the profile campus.

```
Switch# configure terminal
Switch(config)# ethernet ring g8032 profile campus
Switch(config-g8032-ring-profile)# timer guard 700
Switch(config-g8032-ring-profile)#
```

12. File System Commands

12-1 delete

This command is used to delete a file.

delete *FILE-URL*

Parameters

FILE-URL	Specifies the name of the file in flash. Sytax: <flash:filename>.

Default

None.

Command Mode

Privileged EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

The firmware image or the default configuration file cannot be deleted.

Example

This example shows how to delete the file named “office.cfg” from file system on the local flash.

```
Switch# delete flash:office.cfg
```

12-2 dir

This command is used to display the information for files in the flash.

dir

Parameters

none

Default

None.

Command Mode

EXEC Mode.

Command Default Level

Level: 1.

Usage Guideline

Use to display all files information in the Flash.

Example

This example shows how to display all files information in the Flash.

```
Switch# dir

 Directory of flash:
 1   -r-     308 Jan 01 1970 00:00:00  default-config
 2   -rw     776 Mar 13 2017 13:28:51  startup-config
 3   -rw     776 Mar 15 2017 11:31:09  office.cfg
 4   -r-  3898396 Mar 14 2017 09:57:09  R1.10.B013.dat
 5   -r-  3893579 Mar 15 2017 11:28:57  R1.10.B014.dat

 7793835 bytes total
```

13. Filter Database (FDB) Commands

13-1 clear mac-address-table

This command is used to delete a specific dynamic MAC address, all dynamic MAC addresses on a particular interface, all dynamic MAC addresses on a particular VLAN, or all dynamic MAC addresses from the MAC address table.

clear mac-address-table dynamic {all | interface *INTERFACE-ID***}**

Parameters

all	Specifies to clear all dynamic MAC addresses.
interface INTERFACE-ID	Specifies the interface that the MAC address will be deleted from. The specified interface can be a physical port or a port-channel.

Default

None.

Command Mode

Privileged EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

Using this command only clears dynamic MAC address entries. Only the dynamic unicast address entry will be cleared.

Example

This example shows how to remove the address learnt from interface Ethernet 1/0/1.

```
Switch# clear mac-address-table dynamic interface Ethernet 1/0/1
```

13-2 mac-address-table aging-time

This command is used to configure the MAC address table aging time. Use the **no** form of this command to revert to the default setting.

mac-address-table aging-time *SECONDS*

no mac-address-table aging-time

Parameters

SECONDS	Specifies the aging time in seconds. The valid range is 0 or 10 to 1000000 seconds. Setting the aging time to 0 will disable the MAC address table aging out function.

Default

By default, this value is 300 seconds.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Setting the aging time to 0 will disable the MAC address table aging out function.

Example

This example shows how to set the aging time value to 200 seconds.

```
Switch# configure terminal
Switch(config)# mac-address-table aging-time 200
Switch(config)#
```

13-3 mac-address-table learning

This command is used to enable MAC address learning on the physical port. Use the **no** form of this command to disable learning.

mac-address-table learning interface *INTERFACE-ID* **[, | -]**

no mac-address-table learning interface *INTERFACE-ID* **[, | -]**

Parameters

INTERFACE-ID	(Optional) Specifies the physical port interface to be configured.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No spaces before and after the comma.
-	(Optional) Specifies a range of interfaces. No spaces before and after the hyphen.

Default

By default, this option is enabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this commands to enable or disable MAC address learning on a physical port.

Example

This example shows how to enable the MAC address learning option on Ethernet 1/0/1.

```
Switch# configure terminal
Switch(config)# mac-address-table learning interface Ethernet 1/0/1
Switch(config)#
```

13-4 mac-address-table static

This command is used to add a static address to the MAC address table. Use the **no** form of this command to remove a static MAC address entry from the table.

mac-address-table static *MAC-ADDR* **vlan** *VLAN-ID* **{interface** *INTERFACE-ID* **[, | -]}**

no mac-address-table static {all | *MAC-ADDR* **vlan** *VLAN-ID* **[interface** *INTERFACE-ID***] [, | -]}**

Parameters

MAC-ADDR	Specifies the MAC address of the entry. The address can be a unicast or a multicast entry. Packets with a destination address that match this MAC address received by the specified VLAN are forwarded to the specified interface.
vlan VLAN-ID	Specifies the VLAN of the entry. The range is 1 to 4094.
interface INTERFACE-ID	Specifies the forwarding ports.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No spaces are allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No spaces are allowed before and after the hyphen.
all	Specifies to remove all static MAC address entries.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

For a unicast MAC address entry, only one interface can be specified. For a multicast MAC address entry, multiple interfaces can be specified. To delete a unicast MAC address entry, there is no need to specify the interface ID. To delete a multicast MAC address entry, if an interface ID is specified, only this interface will be removed. Otherwise, the entire multicast MAC entry will be removed.

Example

This example shows how to add the static address C2:F3:22:0A:12:F4 to the MAC address table. It also specifies that when any packet received on VLAN 4 that has a destination MAC address of C2:F3:22:0A:12:F4 will be forwarded to the Ethernet interface 1/0/1.

```
Switch# configure terminal
Switch(config)# mac-address-table static C2:F3:22:0A:12:F4 vlan 4 interface
```

```
Ethernet 1/0/1
Switch(config)#
```

This example shows how to add the static address C2:F3:22:0A:22:33 to the MAC address table. It also specifies that when any packet received on VLAN 4 that has a destination MAC address of C2:F3:22:0A:22:33 will be forwarded to port-channel 2.

```
Switch# configure terminal
Switch(config)# interface range Ethernet 1/0/5-6
Switch(config-if-range)# channel-group 2 mode on
Switch(config-if-range)# exit
Switch(config)# mac-address-table static C2:F3:22:0A:22:33 vlan 4 interface port-
channel 2
Switch(config)#
```

13-5 multicast filtering-mode

This command is used to configure the handling method for IP multicast packets. Use the **no** form of this command to revert to the default setting.

multicast filtering-mode {forward-unregistered | filter-unregistered}

no multicast filtering-mode

Parameters

forward-unregistered	Specifies to forward registered IP multicast packets based on the forwarding table and flood all unregistered multicast packets based on the VLAN domain.
filter-unregistered	Specifies to forward registered IP multicast packets based on the forwarding table and filter all unregistered multicast packets.

Default

By default, the **forward-unregistered** option is enabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This filtering mode is only applied to IP multicast packets that are destined for addresses other than those reserved for multicast addresses.

Example

This example shows how to set the multicast filtering mode on switch to filter-unregistered.

```
Switch# configure terminal
Switch(config)# multicast filtering-mode filter-unregistered
```

```
Switch(config)#
```

13-6 show mac-address-table

This command is used to display a specific MAC address entry or the MAC address entries for a specific interface or VLAN.

show mac-address-table [dynamic | static] [address *MAC-ADDR* **| interface [***INTERFACE-ID* **| vlan** *VLAN-ID***]**

Parameters

dynamic	(Optional) Specifies to display dynamic MAC address table entries only.
static	(Optional) Specifies to display static MAC address table entries only.
address *MAC-ADDR*	(Optional) Specifies the 48-bit MAC address.
interface INTERFACE-ID	(Optional) Specifies to display information for a specific interface. Valid interfaces include physical ports and port-channels.
vlan VLAN-ID	(Optional) Specifies the VLAN ID. The valid values are from 1 to 4094.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

If the option **interface** is specified, the unicast entry that has the forwarding interface matches the specified interface will be displayed

Example

This example shows how to display all the MAC address table entries for the MAC address 00-02-4b- 28-c4-82.

```
Switch# show mac-address-table address 00:02:4B:28:C4:82

VLAN    MAC Address         Type    Ports
------ ------------------ -------- --------
1      00-02-4B-28-C4-82   Static  CPU

Total Entries: 1

Switch#
```

This example shows how to display all the static MAC address table entries.

```
Switch# show mac-address-table static

 VLAN  MAC Address        Type         Ports
 ----  -----------------  ----------  -------------------------
 1     00-19-11-00-A0-00  Static       CPU
 4     00-01-00-02-00-04  Static      eth1/0/2
 4     C2-F3-22-0A-12-F4  Static      port-channel2
 6     00-01-00-02-00-00  Static      eth1/0/1

Total Entries : 4

Switch#
```

This example shows how to display all the MAC address table entries for VLAN 1.

```
Switch# show mac-address-table vlan 1

 VLAN  MAC Address        Type         Ports
 ----  -----------------  ----------  -------------------------
 1     00-01-00-02-00-04  Dynamic     eth1/0/2
 1     C2-F3-22-0A-12-F4  Dynamic     port-channel2
 1     00-01-00-02-00-00  Dynamic     eth1/0/8

 Total Entries  : 3

Switch#
```

13-7 show mac-address-table aging-time

This command is used to display the MAC address table's aging time.

show mac-address-table aging-time

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display the MAC address table's aging time.

Example

This example shows how to display the MAC address table's aging time.

```
Switch# show mac-address-table aging-time

Aging Time is 300 seconds

Switch#
```

13-8 show mac-address-table learning

This command is used to display the MAC-address learning state.

show mac-address-table learning [interface *INTERFACE-ID* **[, | -]]**

Parameters

INTERFACE-ID	(Optional) Specifies the interface to be display.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No spaces before and after the comma.
-	(Optional) Specifies a range of interfaces. No spaces before and after the hyphen.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

If the interface is not specified, all existing interfaces will be displayed.

Example

This example shows how to display the MAC address learning status on all physical ports 1 to 3.

```
Switch# show mac-address-table learning interface Ethernet 1/0/1-3

 Port                      State
 ------------------------  --------
 eth1/0/1                  Enabled
 eth1/0/2                  Enabled
 eth1/0/3                  Enabled
```

```
Switch#
```

13-9 show multicast filtering-mode

This command is used to enable and configure the DoS prevention mechanism. Use the no form of this command to reset DoS prevention to the default setting.

show multicast filtering-mode

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

None.

Example

This example shows how to display the multicast filtering mode

```
Switch#show multicast filtering-mode

IP Multicast Filtering Mode : forward-unregistered

Switch#
```

14. GARP VLAN Registration Protocol (GVRP) Commands

14-1 gvrp global

This command is used to enable the GVRP function globally. Use the **no** form of this command to disable the GVRP function globally.

gvrp global

no gvrp global

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is available for both physical ports and port-channel interface configuration. This command only takes effect for hybrid mode and trunk mode.

Example

This example shows how to enable the GVRP function on interface eth1/0/1.

```
Switch# configure terminal
Switch(config)# gvrp global
Switch(config)#
```

14-2 gvrp enable

This command is used to enable the GVRP function on a port. Use the **no** form of this command to disable the GVRP function on a port.

gvrp enable

no gvrp enable

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Administrators can enable the global GVRP state and individual port's GVRP state to start GVRP on the port.

Example

This example shows how to enable the GVRP protocol global state.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# gvrp enable
Switch(config-if)#
```

14-3 gvrp advertise

This command is used to specify the VLAN that are allowed to be advertised by the GVRP protocol.

Use the **no** form of this command to disable the VLAN advertisement function.

gvrp advertise {all | [add | remove] *VLAN-ID* ***[,*** **| *-]}***

no gvrp advertise

Parameters

all	Specifies that all VLANs are advertised on the interface.
add	(Optional) Specifies a VLAN or a list VLANs to be added to advertise the VLAN list.
remove	(Optional) Specifies a VLAN or a list VLANs to be removed from the advertised VLAN list.
VLAN-ID **[,|-]**	(Optional) Specified the advertise VLAN list or the VLAN list to be added to or removed from the advertise VLAN list. If the **add** or **remove** parameter is not specified, the specified VLAN list overwrites the advertise VLAN list. The range is 1 to 4094.
,	(Optional) Specifies a series of VLANs, or separate a range of VLANs from a previous range. No spaces are required before and after the comma.
-	(Optional) Specifies a range of VLANs. No spaces are required before and after the hyphen.

Default

By default, no VLANs are advertised.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The command is available for both physical ports and port-channel interface configuration. Administrators can use the **gvrp advertise** command to enable the specified VLANs' GVRP advertise function on the specified interface. The command only takes effect when GVRP is enabled. The command only takes effect for hybrid mode and trunk mode.

Example

This example shows how to enable the advertise function of VLAN 1000 on interface eth1/0/1.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# gvrp advertise 1000
Switch(config-if)#
```

14-4 gvrp vlan create

This command is used to enable dynamic VLAN creation. Use the **no** form of this command to disable the dynamic VLAN creation function.

gvrp vlan create

no gvrp vlan create

Parameters

None.

Default

By default, this option is enabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When dynamic VLAN creation is enabled, if a port has learned a new VLAN membership and the VLAN does not exist, the VLAN will be created automatically. Otherwise, the newly learned VLAN will not be created.

Example

This example shows how to enable the creation of dynamic VLANs registered with the GVRP protocol.

```
Switch# configure terminal
Switch(config)# gvrp vlan create
Switch(config)#
```

14-5 gvrp forbidden

This command is used to specify a port as being a forbidden member of the specified VLAN. Use the **no** form of this command to remove the port as a forbidden member of all VLANs.

gvrp forbidden {all | [add | remove] *VLAN-ID* **[, | -]}**

no gvrp forbidden

Parameters

all	Specifies that all VLANs, except VLAN 1, are forbidden on the interface.
add	(Optional) Specifies a VLAN or a list VLANs to be added to forbidden the VLAN list.
remove	(Optional) Specifies a VLAN or a list VLANs to be removed from the forbidden VLAN list.
VLAN-ID **[,|-]**	(Optional) Specified the forbidden VLAN list. If the add or remove option is not specified, the specified VLAN list will overwrite the forbidden VLAN list. The range is 2 to 4094.
,	(Optional) Specifies a series of VLANs, or separate a range of VLANs from a previous range. No spaces are required before and after the comma.
-	(Optional) Specifies a range of VLANs. No spaces are required before and after the hyphen.

Default

No VLANs are forbidden.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The command is available for both physical ports and port-channel interface configuration. As a forbidden port of a VLAN, a port is forbidden from becoming a member port of the VLAN via the GVRP operation. The VLAN specified by the command does not need to exist.

This command only affects the GVRP operation. The setting only takes effect when GVRP is enabled.

The command only takes effect for hybrid mode and trunk mode.

Example

This example shows how to configure the interface eth1/0/1 as a forbidden port of VLAN 1000 via the GVRP operation.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# gvrp forbidden 1000
Switch(config-if)#
```

14-6 gvrp timer

This command is used to configure the GVRP timer value on a port. Use the **no** form of this command to revert the timer to the default setting.

gvrp timer [join *JOIN-TIMER-VALUE***] [leave** *LEAVE-TIMER-VALUE***] [leave-all** *LEAVE-ALL-TIMER-VALUE***]**

no gvrp timer [join] [leave] [leave-all]

Parameters

join	(Optional) Specifies to set the timer for joining a group. The unit is in a hundredth of a second.
leave	((Optional) Specifies to set the timer for leaving a group. The unit is in a hundredth of a second.
leave-all	((Optional) Specifies to set the timer for leaving all groups. The unit is in a hundredth of a second.
JOIN-TIMER-VALUE	(Optional) Specifies the timer value in a hundredth of a second. The valid range is 1 to 20.
LEAVE-TIMER-VALUE	(Optional) Specifies the timer value in a hundredth of a second. The valid range is 60 to 300.
LEAVE-ALL-TIMER-VALUE	(Optional) Specifies the timer value in a hundredth of a second. The valid range is 1000 to 5000.

Default

Join: 20.

Leave: 60.

Leave-all: 1000.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to configure the GVRP timer value.

Example

This example shows how to configure the leave-all timer to 5000 hundredths of a second.

```
Switch# configure terminal
Switch(config)# gvrp timer leave-all 5000
Switch(config)#
```

14-7 show gvrp configuration

This command is used to display the GVRP settings.

show gvrp configuration [interface [*INTERFACE-ID* **[,|-]]]**

Parameters

configuration	Specifies to display the GVRP configuration. If the interface is not specified, the GVRP global configuration is displayed.
interface	Specifies to display the GVRP interface configuration. If the interface ID is not specified, all interfaces are displayed.
INTERFACE-ID **[,|-]**	(Optional) Specifies the interfaces used to display the configuration. Specify a single interface or a range of interfaces, separated by a hyphen, or a series of interfaces separated by comma.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command only displays GVRP related configurations.

Example

This example shows how to display the GVRP configuration for the global configuration.

```
Switch# show gvrp configuration
 Global GVRP State     : Disabled
 Dynamic VLAN Creation : Enabled
 Join Time             : 20 centiseconds
 Leave Time            : 60 centiseconds
 Leave-All Time        : 1000 centiseconds
Switch#
```

This example shows how to display the GVRP configuration on interfaces eh1/0/5 to eth1/06.

```
Switch# show gvrp configuration interface Ethernet 1/0/5-6

eth1/0/5
   GVRP Status    : Enabled
   Advertise VLAN  : 1-4094
   Forbidden VLAN  : 3-5

 eth1/0/6
   GVRP Status    : Enabled
```

```
   Advertise VLAN  : 1-3
    Forbidden VLAN  : 5-8

Switch#
```

15. IGMP Snooping Commands

15-1 ip igmp snooping

This command is used to enable the IGMP snooping function on the Switch. Use the **no** form of this command to disable the IGMP snooping function.

ip igmp snooping

no ip igmp snooping

Parameters

None.

Default

IGMP snooping is disabled on all VLAN. The IGMP snooping global state is disabled by default.

Command Mode

VLAN Configuration Mode.

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

For a VLAN to operate with IGMP snooping, both the global state and per VLAN state must be enabled. On a VLAN, the setting of IGMP snooping and MLD snooping are independent. IGMP snooping and MLD snooping can be simultaneously enabled on the same VLAN.

Example

This example shows how to disable the IGMP snooping globally.

```
Switch# configure terminal
Switch(config)# no ip igmp snooping
Switch(config)#
```

This example shows how to enable the IGMP snooping globally.

```
Switch# configure terminal
Switch(config)# ip igmp snooping
Switch(config)#
```

This example shows how to disable IGMP snooping on VLAN1.

```
Switch# configure terminal
Switch(config)# vlan 1
Switch(config-vlan)# no ip igmp snooping
Switch(config-vlan)#
```

15-2 ip igmp snooping querier

This command is used to enable the capability of the entity as an IGMP querier. Use the **no** form of this command to disable the querier function.

ip igmp snooping querier

no ip igmp snooping querier

Parameters

None.

Default

By default, this option is disabled.

Command Mode

VLAN Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

If the system can play the querier role, the entity will listen for IGMP query packets sent by other devices. If IGMP query message is received, the device with lower value of IP address becomes the querie r.

Example

This example shows how to enable the IGMP snooping querier on VLAN 1.

```
Switch# configure terminal
Switch(config)# vlan 1
Switch(config-vlan)# ip igmp snooping querier
Switch(config-vlan)#
```

15-3 ip igmp snooping fast-leave

This command is used to configure IGMP Snooping fast-leave on the VLAN. Use the **no** form to disable the fast-leave option on the specified VLAN.

ip igmp snooping fast-leave

no ip igmp snooping fast-leave

Parameters

None.

Default

By default, this option is disabled.

Command Mode

VLAN Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The ip igmp snooping fast-leave command allows IGMP membership to be immediately removed from a port when receiving the leave message without using the group specific or group-source specific query mechanism.

Example

This example shows how to enable IGMP snooping fast-leave on VLAN 1

```
Switch# configure terminal
Switch(config)# vlan 1
Switch(config-vlan)# ip igmp snooping fast-leave
Switch(config-vlan)#
```

15-4 ip igmp snooping static-group

This command is used to configure an IGMP snooping static group. Use the **no** form of this command to delete a static group.

ip igmp snooping static-group *GROUP-ADDRESS* **interface** *INTERFACE-ID* **[,|-]**

no ip igmp snooping static-group *GROUP-ADDRESS* **[interface** *INTERFACE-ID* **[,|-]]**

Parameters

GROUP-ADDRESS	Specifies an IP multicast group address.
INTERFACE-ID	(Optional) Specifies an interface or an interface list. The interface should be the physical interface.
,	(Optional) Specifies a series of interfaces, or a separate a range of interfaces from a previous range. No space is allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No space is allowed before and after the hyphen.

Default

By default, no static-group is configured.

Command Mode

VLAN Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command applies to IGMP snooping on a VLAN to statically add group membership entries.

This command also allows the user to create an IGMP snooping staticgroup in case that the attached host does not support the IGMP protocol.

Example

This example shows how to statically add a group for IGMP snooping.

```
Switch# configure terminal
Switch(config)# vlan 1
Switch(config-vlan)# ip igmp snooping static-group 225.1.2.3 interface Ethernet 1/0/1
Switch(config-vlan)#
```

15-5 show ip igmp snooping

This command is used to display IGMP snooping information on the Switch.

show ip igmp snooping [vlan *VLAN-ID***]**

Parameters

vlan *VLAN-ID*	(Optional) Specifies the VLAN to be displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display IGMP snooping information for all VLANs where IGMP snooping is enabled.

Example

This example shows how to display IGMP snooping global state.

```
Switch#show ip igmp snooping

IGMP snooping global state: Enabled

Switch#
```

This example shows how to display IGMP snooping information on VLAN 2.

```
Switch#show ip igmp snooping vlan 2

IGMP snooping state    : Enabled
Querier state          : Enabled (Active)
Fast Leave state       : Enabled

Switch#
```

15-6 show ip igmp snooping groups

This command is used to display IGMP snooping group information learned on the Switch.

show ip igmp snooping groups [vlan *VLAN-ID* **|** *IP-ADDRESS***]**

Parameters

vlan *VLAN-ID*	(Optional) Specifies the VLAN interface to be displayed. If no VLAN is specified, IGMP snooping group information of all VLANs will be displayed, at which IGMP Snooping is enabled.
IP-ADDRESS	(Optional) Specifies the group IP address to be displayed. If no IP address is specified, all IGMP group information will be displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display IGMP snooping group information.

Example

This example shows how to display IGMP snooping group information.

```
Switch# show ip igmp snooping groups

IGMP Snooping Connected Group Membership:

VLAN ID Group address    Source address   FM  Exp(sec) Interface
------- ---------------- ---------------- -- -------- ---------
1       239.255.255.250         *         EX      260  eth1/0/1
1       239.255.255.251   192.168.1.1      IN      200  eth1/0/2
1       239.255.255.252   192.168.1.2      EX      200  eth1/0/3

Total Groups : 3,  Total SSM entries : 3

Switch#
```

15-7 show ip igmp snooping static-group

This command is used to display IGMP snooping statistics group information on the Switch.

show ip igmp snooping static-group [*GROUP-ADDRESS* **| vlan** *VLAN-ID***]**

Parameters

GROUP-ADDRESS	(Optional) Specifies the group IP address to be displayed.
vlan *VLAN-ID*	(Optional) Specifies the VLAN ID to be displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays the IGMP snooping static group information.

Example

This example shows how to display IGMP snooping static group information.

```
Switch#show ip igmp snooping static-group

VLAN ID  Group address    Interface
-------  ---------------  ------------------------
2        225.1.2.32       eth1/0/1

Total Entries: 1

Switch#
```

16. Interface Commands

16-1 clear counters

This command is used to clear counters for a physical port interface.

clear counters {all | interface *INTERFACE-ID* **[,|-]}**

Parameters

all	Specifies to clear counters for all interfaces.
INTERFACE-ID	Specifies the interface ID to clear the counter.

Default

None.

Command Mode

Privileged EXEC Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to clear counters for a physical port interface.

Example

This example shows how to clear the counters of interface eth1/0/1.

```
Switch# clear counters interface Ethernet 1/0/1
Switch#
```

16-2 description

This command is used to add a description to an interface.

description *STRING*

no description

Parameters

STRING	Specifies a description for an interface with a maximum of 64 characters.

Default

None.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The specified description corresponds to the MIB object “ifAlias” defined in the RFC 2233. Notice that space is not alllowed in the description.

Example

This example shows how to add the description “Port10” to interface Ethernet 1/0/10.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/10
Switch(config-if)# description Port10
```

16-3 interface

This command is used to enter the interface configuration mode for a single interface. Use the **no** form of this command to remove an interface.

interface *INTERFACE-ID*

no interface *INTERFACE-ID*

Parameters

INTERFACE-ID	Specifies the ID of the interface. The interface ID is formed by interface type and interface number. The interface types are as follows: ethernet - Ethernet switch port with all different media. vlan - VLAN interface. port-channel - Aggregated port channel interface. range - Enter the interface range configuration mode for multiple interfaces.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command enters the interface configuration mode for a specific interface. The format of the interface number is dependent on the interface type. For physical port interfaces, the user cannot enter the interface if the Switch’s port does not exist. The physical port interface cannot be removed by the no command.

Use the **interface vlan** command to create Layer 3 interfaces. Use the **vlan** command in the global configuration mode to create a VLAN before creating Layer 3 interfaces. Use the **no interface vlan** command to remove a Layer 3 interface.

The port channel interface is automatically created when the **channel-group** command is configured for the physical port interface. A port channel interface will be automatically removed when no

physical port interface has the **channel-group** command configured for it. Use the **no interface port-channel** command to remove a port-channel.

Example

This example shows how to enter the interface configuration mode for the interface Ethernet1/0/1.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)#
```

This example shows how to enter the interface configuration mode for VLAN 1.

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)#
```

This example shows how to enter interface configuration mode for port channel 3.

```
Switch# configure terminal
Switch(config)# interface port-channel 3
Switch(config-if)#
```

16-4 interface range

This command is used to enter the interface range configuration mode for multiple interfaces.

interface range *INTERFACE-ID* **[, | -]**

Parameters

INTERFACE-ID	Specifies the physical port interface.
,	(Optional) Specifies the interface range by delimiting a list of interface IDs with commas. No spaces are allowed before and after the comma.
-	(Optional) Specifies an interface range by delimiting the start and the ending interface numbers with a hyphen. No spaces are allowed before and after the hyphen.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command enters the interface configuration mode for the specified range of interfaces.

Commands configured in the interface range mode, applies to interfaces in the range.

Example

This example shows how to enter the interface configuration mode for the range of ports 1/0/1 to 1/0/10:

```
Switch# configure terminal
Switch(config)# interface range Ethernet 1/0/1-10
Switch(config-if-range)#
```

16-5 show counters

This command is used to display interface information.

show counters [interface *INTERFACE-ID***]**

Parameters

INTERFACE-ID	Specifies that the interface can be a physical port. If no interface is specified, counters of all interfaces will be displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the statistic counters for an interface.

Example

This example shows how to display the counters for interface Ethernet 1/0/1.

```
Switch# show counters interface Ethernet 1/0/1

 eth1/0/1 counters
 rxHCTotalPkts                  : 0
 txHCTotalPkts                  : 138
 rxHCUnicastPkts                : 0
 txHCUnicastPkts                : 0
 rxHCMulticastPkts              : 0
 txHCMulticastPkts              : 0
 rxHCBroadcastPkts              : 0
 txHCBroadcastPkts              : 138
 rxHCOctets                     : 0
 txHCOctets                     : 50094
```

```
rxHCPkt64Octets                : 0
rxHCPkt65to127Octets           : 0
rxHCPkt128to255Octets          : 0
rxHCPkt256to511Octets          : 0
rxHCPkt512to1023Octets         : 0
rxHCPkt1024to1518Octets        : 0
rxHCPkt1519to9216Octets        : 0
txHCPkt64Octets                : 0
txHCPkt65to127Octets           : 0
txHCPkt128to255Octets          : 0
txHCPkt256to511Octets          : 138
txHCPkt512to1023Octets         : 0
txHCPkt1024to1518Octets        : 0
txHCPkt1519to9126Octets        : 0


rxCRCAlignErrors               : 0
rxUndersizedPkts               : 0
rxOversizedPkts                : 0
rxFragmentPkts                 : 0
rxJabbers                      : 0
rxDropPkts                     : 0

txCollisions                   : 0
txDropPkts                     : 0
```

16-6 show interfaces

This command is used to display the interface information.

show interfaces [*INTERFACE-ID* **[- | ,]] [status]**

Parameters

INTERFACE-ID	(Optional) Specifies that the interface can be a physical port, VLAN or other.
status	(Optional) Specifies that display the connection status.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

If no interface is specified, all existing physical ports will be displayed.

Example

This example shows how to display the interface information for interface VLAN 1.

```
Switch# show interfaces vlan 1

VLAN1
  LINK: 00-01-c1-13-14-08 Mtu:1500 <UP BROADCAST RUNNING MULTICAST>
  IPv4: 192.168.1.2/24 192.168.1.255
  IPv6: fe80::201:c1ff:fe13:1408/64 <UP RUNNING>

Switch#
```

This example shows how to display the interface information for Ethernet 1/0/1.

```
Switch# show interfaces Ethernet 1/0/1

eth1/0/1 is enabled, link status is down
   Interface type: 1000BaseT
   Interface description:
   MAC Address: 00-01-C1-13-14-09
   Auto-duplex, auto-speed, auto-mdix
   Send flow-control: off, receive flow-control: off
   Down
   Maximum transmit unit: 1518 bytes
   RX bytes: 0, TX bytes: 54087
   RX packets: 0, TX packets: 149
   RX multicast: 0, RX broadcast: 0
   RX CRC error: 0, RX undersize: 0
   RX oversize: 0, RX fragment: 0
   RX jabber: 0, RX dropped Pkts: 0
   TX collision: 0

Switch#
```

16-7 show interfaces status

This command is used to display the Switch's port connection status.

show interfaces status

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays the Switch's port connection status.

Example

This example shows how to display the port status

```
Switch# show interfaces status

 Port           Status        VLAN          Duplex   Speed          Type
 -------------  ------------  ------------  -------  -------------  -------------
 eth1/0/1       not-connected  1            auto     auto           1000BASE-T
 eth1/0/2       not-connected  1            auto     auto           1000BASE-T
 eth1/0/3       not-connected  1            auto     auto           1000BASE-T
 eth1/0/4       not-connected  1            auto     auto           1000BASE-T
 eth1/0/5       connected      1            a-full   a-1000         1000BASE-T
 eth1/0/6       not-connected  1            auto     auto           1000BASE-T
 eth1/0/7       not-connected  1            auto     auto           1000BASE-T
 eth1/0/8       connected      1            a-full   a-1000         1000BASE-T
 eth1/0/9       not-connected  1            auto     auto           1000BASE-T
 eth1/0/10      not-connected  1            auto     auto           1000BASE-T
 eth1/0/11      not-connected  1            full     100            None
 eth1/0/12      not-connected  1            auto     auto           100BASE-FX
Total Entries: 12

Switch#
```

16-8 shutdown

This command is used to disable an interface. Use the **no** form of this command to enable an interface.

Shutdown

no shutdown

Parameters

None.

Default

By default, this option is no shutdown.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The physical port is valid for this configuration. This command is also configurable for port channel member ports.

The command will cause the port to enter the disabled state. Under the disabled state, the port will not be able to receive or transmit any packets. Using the **no shutdown** command will put the port back into the enabled state. When a port is shut down, the link status will also be turned off.

Example

This example shows how to disable the port state of interface Ethernet 1/0/1.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# shutdown
```

17. IP Utility Commands

17-1 ping

This command is used to diagnose basic network connectivity.

ping {[ip] *IP-ADDRESS* **} [count** *TIMES*] **[timeout** *SECONDS*]

Parameters

ip	(Optional) Specifies the destination IPv4 address.
IP-ADDRESS	Specifies the IPv4 address of the destination host.
count *TIMES*	(Optional) Specifies to stop after sending the specified number of echo request packets.
timeout *SECONDS*	(Optional) Specifies response timeout value, in seconds.

Default

If the **timeout** parameter is not specified, the timeout value will be 1 second.

Command Mode

EXEC Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to verify the reachability, reliability, and delay of the path to the destination host. If neither the count or timeout value is specified, the only way to stop the ping is by pressing Ctrl+C.

Example

This example shows how to ping the host with IP address 211.21.180.1 with count 4 times.

```
Switch#ping 211.21.180.1 count 4

Reply from 211.21.180.1, time=10ms
Reply from 211.21.180.1, time<10ms
Reply from 211.21.180.1, time<10ms
Reply from 211.21.180.1, time<10ms

Ping Statistics for 211.21.180.1
Packets: Sent =4, Received =4, Lost =0

Switch#
```

18. Jumbo Frame Commands

18-1 max-rcv-frame-size

This command is used to configure the maximum Ethernet frame size allowed. Use the **no** form of this command to revert to the default setting.

max-rcv-frame-size *BYTES*

no max-rcv-frame-size

Parameters

BYTES	Specifies the maximum Ethernet frame size allowed.

Default

By default, this value is 1518 bytes.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is available for physical ports configuration. Oversize frames will be dropped and checks are carried out on ingress ports. Use this command to transfer large frames or jumbo frames through the switch system to optimize server-to-server performance.

Example

This example shows how to configure the maximum received Ethernet frame size to be 6000 bytes on port 1/0/1.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# max-rcv-frame-size 6000
Switch(config-if)#
```

19. Link Aggregation Control Protocol (LACP)Commands

19-1 channel-group

This command is used to assign an interface to a channel group. Use the **no** form of this command to remove an interface from a channel-group.

channel-group *CHANNEL-NO* **mode {on | active | passive}**

no channel-group

Parameters

CHANNEL-NO	Specifies the channel group ID. The valid range is 1 to 6.
on	Specifies that the interface is a static member of the channel-group.
active	Specifies the interface to operate in LACP active mode.
passive	Specifies the interface to operate in LACP passive mode.

Default

None.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The command is available for physical port interface configuration. The system will automatically create the port-channel when a physical port first joins a channel group. An interface can only join one channel-group.

If the mode on is specified in the command, the channel group type is static. If the mode active or passive is specified in the command, the channel group type is LACP. A channel group can only consist of either static members or LACP members. Once the type of channel group has been determined, other types of interfaces cannot join the channel group.

Use the no form of this command to remove the interface from the channel group. If the channel group has no member ports left after a port is removed, the channel group will be deleted automatically. A port channel can also be removed by the **no interface port-channel** command.

Example

This example shows how to assign Ethernet interfaces 1/0/4 to 1/0/5 to a new LACP channel-group, with an ID of 3, and sets the LACP mode to active.

```
Switch# configure terminal
Switch(config)# interface range Ethernet 1/0/4-5
Switch(config-if-range)# channel-group 3 mode active
Switch(config-if-range)#
```

19-2 show channel-group

This command is used to display the channel group information.

show channel-group [channel [*CHANNEL-NO*] {detail | neighbor} | load-balance | sys-id]

Parameters

CHANNEL-NO	(Optional) Specifies the channel group ID.
channel	(Optional) Specifies to display information for the specified port-channels.
detail	(Optional) Specifies to display detailed channel group information.
neighbor	(Optional) Specifies to display neighbor information.
load-balance	(Optional) Specifies to display the load balance information.
sys-id	(Optional) Specifies to display the system identifier that is being used by LACP.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

If a port-channel number is not specified, all port-channels will be displayed. If the channel, load- balance and sys-id keywords are not specified with the show channel-group command, only summary channel-group information will be displayed.

Example

This example shows how to display the detailed information of all port-channels.

```
Switch# show channel-group channel detail

Flag:
S - Port is requesting Slow LACPDUs F - Port is requesting fast LACPDU
A - Port is in active mode  P - Port is in passive mode
LACP state:
bndl:   Port is attached to an aggregator and bundled with other ports.
hot-sby:  Port is in a hot-standby state.
indep:  Port is in an independent state(not bundled but able to switch data
traffic)
down:   Port is down
Channel Group 1
```

```
Member Ports: 2, Maxports = 8, Protocol: LACP
                    LACP    Port        Port
Port        Flags   State   Priority    Number
-------------------------------------------------
eth1/0/10   SA      bndl    32768       10
eth1/0/11   SA      bndl    32768       11

Channel Group 2
Member Ports: 2, Maxports = 8, Protocol: Static
                    LACP    Port        Port
Port        Flags   State   Priority    Number
-------------------------------------------------
eth1/0/8    N/A     bndl    N/A         N/A
eth1/0/9    N/A     down    N/A         N/A

Switch#
```

This example shows how to display the neighbor information for port-channel 3.

```
Switch# show channel-group channel 3 neighbor

Flag:
S - Port is requesting Slow LACPDUs, F - Port is requesting Fast LACPDUs,
A - Port is in Active mode, P - Port is in Passive mode,

Channel Group 3
Partner Partner Partner Partner
Port        System ID                 PortNo    Flags   Port_Pri.
-----------------------------------------------------------------------
eth1/0/1    32768,00-07-eb-49-5e-80   12         SP      32768
eth1/0/2    32768,00-07-eb-49-5e-80   13         SP      32768

Switch#
```

This example shows how to display the load balance information for all channel groups.

```
Switch# show channel-group load-balance

load-balance algorithm: src-mac

Switch#
```

This example shows how to display the system identifier information.

```
Switch# show channel-group sys-id

System-ID: 32765,00-02-4b-29-3a-00
```

```
Switch#
```

This example shows how to display the summary information for all port-channels.

```
Switch# show channel-group

load-balance algorithm: src-mac
system-ID: 32765,00-02-4b-29-3a-00

Group   Protocol
------------------------
1       LACP
2       Static

Switch#
```

20. Link Layer Discovery Protocol (LLDP)Commands

20-1 lldp run

This command is used to enable the Link Layer Discovery Protocol (LLDP) globally. Use the **no** form of this command to revert to the default setting.

lldp run

no lldp run

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to globally enable LLDP and then the Switch can start to transmit LLDP packets and receive and process the LLDP packets on all physical interfaces.

By advertising LLDP packets, the Switch announces the information to its neighbor through physical interfaces. On the other hand, the Switch will learn the connectivity and management information from the LLDP packets advertised from the neighbor(s).

Example

This example shows how to enable LLDP.

```
Switch# configure terminal
Switch(config)# lldp run
Switch(config)#
```

20-2 snmp-server enable traps lldp

This command is used to enable the LLDP trap state.

snmp-server enable traps lldp

no snmp-server enable traps lldp

Parameters

None.

Default

The LLDP states is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use the snmp-server enable traps lldp command to enable the sending of LLDP notifications.

Example

This example shows how to enable the LLDP trap.

```
Switch# configure terminal
Switch(config)# snmp-server enable traps lldp
Switch(config)#
```

20-3 show lldp

This command is used to display the Switch's general LLDP configuration.

show lldp

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display the LLDP system's global configurations.

Example

This example shows how to display the LLDP system's global configuration status.

```
Switch#show lldp

LLDP Configurations
LLDP State  : Disabled
```

20-4 show lldp neighbor interface

This command is used to display each physical interface's information currently learned from the neighbor.

show lldp neighbors interface *INTERFACE-ID* **[, | -] brief**

Parameters

INTERFACE-ID	Specifies the interface ID.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No spaces before and after the comma.
-	(Optional) Specifies a range of interfaces. No spaces before and after the hyphen.
brief	(Optional) Specifies to display the information in brief mode.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command display the information learned from the neighbor devices.

Example

This example shows how to display the neighbor information on Ethernet 1/0/1 to Ethernet 1/0/2 in brief mode.

```
Switch# show lldp neighbors interface Ethernet 1/0/1-2 brief


Port ID: eth1/0/1
------------------------------------------------------------
Remote Entities Count : 2
Entity 1
Chassis ID Subtype  : MAC Address
Chassis ID  : 00-01-02-03-04-01
Port ID Subtype : Local
Port ID : eth1/0/1
Port Description    : RMON Port 1 on Unit 3
Entity 2
Chassis ID Subtype  : MAC Address
Chassis ID  : 00-01-02-03-04-02
Port ID Subtype : Local
Port ID : eth1/0/1
```

```
Port Description    : RMON Port 1 on Unit 4

Port ID : eth1/0/2
------------------------------------------------------------------------
Remote Entities Count : 3
Entity 1
Chassis ID Subtype  : MAC Address
Chassis ID  : 00-01-02-03-04-03
Port ID Subtype : Local
Port ID : eth1/0/1
Port Description    : RMON Port 2 on Unit 1
Entity 2
Chassis ID Subtype  : MAC Address
Chassis ID  : 00-01-02-03-04-04
Port ID Subtype : Local
Port ID : eth1/0/2
Port Description    : RMON Port 2 on Unit 2
Entity 3
Chassis ID Subtype  : MAC Address
Chassis ID  : 00-01-02-03-04-05
Port ID Subtype : Local
Port ID : eth1/0/2
Port Description    : RMON Port 2 on Unit 3

Total Entries: 2

Switch#
```

21. Loopback Detection (LBD) Commands

21-1 loopback-detection (Global)

This command is used to enable the loopback detection function globally. Use the **no** form of this command to disable the function globally.

loopback-detection

no loopback-detection

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The LBD enabled port will send untagged port-based LBD packets out from the port to discover the loop. If there is a loop occurrence on the path, then the packet being transmitted will loop back to the same port or to another port located on the same device. When an LBD enabled port detects a loop condition, packet transmitting and receiving is disabled at the port.

If an LBD disabled port receives an LBD packet and detects that the packet is sent out by the system itself, the sending port will be blocked.

There are one way to recover an error disabled port. The user can manually recover the port by entering the shutdown command followed by the no shutdown command for the port.

Example

This example shows how to enable the loopback detection function globally and set the detection mode to port-based.

```
Switch# configure terminal
Switch(config)# loopback-detection
Switch(config)#
```

21-2 loopback-detection (Interface)

This command is used to enable the loopback detection function for an interface. Use the **no** form of this command to disable the function for an interface.

loopback-detection

no loopback-detection

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enable the loopback detection function on an interface. This command is available for port and port-channel interface configuration.

Example

This example shows how to enable the loopback detection function on interface Ethernet 1/0/1.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# loopback-detection
Switch(config-if)#
```

21-3 loopback-detection interval

This command is used to configure the timer interval. Use the no form of this command to revert to the default setting.

loopback-detection interval *SECONDS*

no loopback-detection interval

Parameters

interval *SECONDS*	Specifies the interval in seconds at which CPT packets are transmitted. The valid range is from 1 to 32767.

Default

By default, this value is 10 seconds.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure the interval at which LBD packets are sent to discover the loop occurrence.

Example

This example shows how to configure the time interval to 20 seconds.

```
Switch# configure terminal
Switch(config)# loopback-detection interval 20
Switch(config)#
```

21-4 loopback-detection recover-time

This command is used to configure the recover timer interval. Use the **no** form of this command to revert to the default setting.

loopback-detection recover-time *SECONDS*

no loopback-detection recover-time

Parameters

recover-time *SECONDS*	0 or 60-1000000. 0 will keep a port disabled until next device restart.

Default

By default, this value is 60 seconds.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure the recover time when the loop port will enable.

Example

This example shows how to configure the time interval to 100 seconds.

```
Switch# configure terminal
Switch(config)# loopback-detection recover-time 100
Switch(config)#
```

21-5 show loopback-detection

This command is used to display the current loopback detection control settings.

show loopback-detection [interface *INTERFACE-ID* **[, | -]]**

Parameters

interface *INTERFACE-ID*	(Optional) Specifies the interface's ID to be displayed.

,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No spaces are allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No spaces are allowed before and after the hyphen.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the loopback detection setting and status.

Example

This example shows how to displays the current loopback detection settings and status.

```
Switch# show loopback-detection

Loop Detection  : Enabled
Interval    : 20 seconds
Recover Time     : 60 seconds

Interface        State      Result             Time Left (sec)
---------------  --------   -----------------  ---------------
Ethernet1/0/1    Disabled   Normal             -
Ethernet1/0/2    Disabled   Normal             -
Ethernet1/0/3    Enabled    Loop               120
Ethernet1/0/4    Enabled    Loop               115
…
Port-channel1    Enabled     Loop               50
Port-channel2    Disabled    Normal             -

Switch#
```

This example shows how to displays the loopback detection status for port 1/0/1.

```
Switch# show loopback-detection interface Ethernet 1/0/1

Interface        State      Result             Time Left (sec)
---------------  --------   -----------------  ---------------
Ethernet1/0/1     Disabled   Normal             -

Switch#
```

This example shows how to displays the loopback detection status for port-channel 2.

```
Switch# show loopback-detection interface port-channel2

Interface        State      Result             Time Left (sec)
---------------  --------   -----------------  ---------------
Port-channel2    Disabled    Normal        -

Switch#
```

Display Parameters

Interface	Indicates the port that has loopback detection enabled.
State	Indicates the loopback detection state in each port.
Result	Indicates whether a loop is detected.
Time Left	The remaining time before being auto-recovered.

21-6 snmp-server enable traps loopback-detection

This command is used to enable the sending SNMP notifications of loopback detection. Use the no form of this command to revert to the default setting.

snmp-server enable traps loopback-detection

no snmp-server enable traps loopback-detection

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enable or disable the sending SNMP notifications of loopback detection.

Example

This example shows how to enable the sending SNMP notifications of loopback detection.

```
Switch# configure terminal
```

```
Switch(config)# snmp-server enable traps loopback-detection.
Switch(config)#
```

22. Mirror Commands

22-1 monitor session destination interface

This command is used to configure the destination interface for a port monitor session, allowing packets on source ports to be monitored via a destination port. Use the **no** form of this command to delete a port monitor session or remove the destination interface of the session.

monitor session *SESSION-NUMBER* **destination interface** *INTERFACE-ID*

no monitor session *SESSION-NUMBER* **destination interface** *INTERFACE-ID*

no monitor session *SESSION-NUMBER*

Parameters

session *SESSION-NUMBER*	Specifies the session number for the port monitor session. The valid range is 1.
interface *INTERFACE-ID*	Specifies the destination interface for the port monitor session.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure the destination interface for a local monitor session. For a monitor session, multiple source interfaces can be specified, but only one destination interface can be specified.

Example

This example shows how to create a port monitor session with the session number 1. It assigns a physical port ethernet 1/0/1 as the destination port and three physical ports (ethernet 1/0/2 to ethernet1/0/4) as monitor source ports.

```
Switch# configure terminal
Switch(config)# monitor session 1 destination interface Ethernet 1/0/1
Switch(config)# monitor session 1 source interface Ethernet 1/0/2-4
Switch(config)#
```

22-2 monitor session source interface

This command is used to configure the source port of a port monitor session. Use the **no** form of this command to remove a port monitor session or remove a source port from the port monitor session.

monitor session *SESSION-NUMBER* **source interface** *INTERFACE-ID* **[, | -] [both | rx | tx]**

no monitor session *SESSION-NUMBER* **source interface I***NTERFACE-ID* **[, | -]**

no monitor session *SESSION-NUMBER*

Parameters

session *SESSION-NUMBER*	Specifies the session number for the port monitor session. The valid range is 1.
interface *INTERFACE-ID*	Specifies the source interface for a port monitor session.
,	(Optional) Specifies the number of interfaces, or separate a range of interfaces from a previous range. No spaces before and after the comma.
-	(Optional) Specifies a range of interfaces. No spaces before and after the hyphen.
Both	(Optional) Specifies to monitor the packets transmitted and received on the port.
rx	(Optional) Specifies to monitor the packets received on the port.
tx	(Optional) Specifies to monitor the packets transmitted on the port

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Both physical ports and port channels are valid as source interfaces of monitor sessions.For a monitor session, multiple source interfaces can be specified, but only one destination interface can be specified. If the direction is not specified, both TX (transmitted)

and RX (received) traffic are monitored.

Example

This example shows how to create a port monitor session with the session number 1. It assigns a physical port ethernet 1/0/1 as the destination port and three physical ports (ethernet 1/0/2 to ethernet1/0/4) as monitor source ports.

```
Switch# configure terminal
Switch(config)# monitor session 1 destination interface Ethernet 1/0/1
Switch(config)# monitor session 1 source interface Ethernet 1/0/2-4
Switch(config)#
```

22-3 show monitor session

This command is used to display all or a specific port mirroring session.

show monitor session [*SESSION-NUMBER***]**

Parameters

session *SESSION-NUMBER*	(Optional) Specifies the session number which you want to display. The valid range is 1.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

If this command is used without specifying a session number, all monitor sessions are displayed.

Example

This example shows how to display a created port monitor session with the session number 1.

```
Switch# show monitor session 1

 Session 1
    Session Type    : local session
    Destination Port : Ethernet1/0/1
    Source Ports    :
       Both :
           Ethernet1/0/2
           Ethernet1/0/3
           Ethernet1/0/4

 Total Entries  : 1
```

23. MLD Snooping Commands

23-1 ipv6 mld snooping

This command is used to enable or disable MLD snooping.

ipv6 mld snooping

no ipv6 mld snooping

Parameters

None.

Default

MLD snooping is disabled on all VLAN interfaces. The MLD snooping global state is disabled by default.

Command Mode

VLAN Configuration Mode.

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

For a VLAN to operate with MLD snooping, both the global state and per interface state must be enabled. On a VLAN, the setting of IGMP snooping and MLD snooping are independent. That is, IGMP snooping and MLD snooping can be simultaneously enabled on the same VLAN.

Example

This example shows how to disable MLD snooping globally.

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping
Switch(config)#
```

This example shows how to enable MLD snooping globally.

```
Switch# config terminal
Switch(config)# ipv6 mld snooping
Switch(config)#
```

This example shows how to enable MLD snooping on VLAN 1.

```
Switch# config terminal
Switch(config)# vlan 1
Switch(config-vlan)# ipv6 mld snooping
Switch(config-vlan)#
```

23-2 ipv6 mld snooping querier

This command is used to enable the MLD snooping querier on the Switch. Use the **no** form of this command to disable the MLD snooping querier function.

ipv6 mld snooping querier

no ipv6 mld snooping querier

Parameters

None.

Default

By default, this option is disabled.

Command Mode

VLAN Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The command is only available for VLAN interface configuration.

Example

This example shows how to enable the MLD snooping querier state on VLAN 1.

```
Switch# configure terminal
Switch(config)# vlan 1
Switch(config-vlan)# ipv6 mld snooping querier
Switch(config-vlan)#
```

23-3 ipv6 mld snooping fast-leave

This command is used to configure MLD snooping fast-leave on the interface. Use the no form of this command to disable the fast-leave option on the specified interface.

ipv6 mld snooping fast-leave

no ipv6 mld snooping fast-leave

Parameters

None.

Default

No static-group is configured.

Command Mode

VLAN Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The ipv6 mld snooping fast-leave command allows MLD membership to be immediately removed from a port when receiving the leave message without using the group specific or group-source specific query mechanism.

Example

This example shows how to enable MLD snooping fast-leave on VLAN 1.

```
Switch# config terminal
Switch(config)# vlan 1
Switch(config-vlan)# ipv6 mld snooping fast-leave
Switch(config-vlan)#
```

23-4 ipv6 mld snooping static-group

This command is used to configure an MLD snooping static group. Use the **no** form of this command to delete a static group.

ipv6 mld snooping static-group *IPV6-ADDRESS* **interface** *INTERFACE-ID* **[,|-]**

no ipv6 mld snooping static-group *IPV6-ADDRESS* **[interface** *INTERFACE-ID* **[,|-]]**

Parameters

IPV6-ADDRESS	Specifies an IPv6 multicast group address.
INTERFACE-ID ***[,|-]***	Specifies an interface or an interface list. No space is allowed before and after the comma. The interface can be a physical interface or a port-channel.

Default

No static-group is configured.

Command Mode

VLAN Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The command is only available for VLAN interface configuration. This command applies to MLD snooping on a VLAN interface to statically add group membership entries. The ipv6 mld snooping static-group command allows the user to create an MLD snooping static group in case that the attached host does not support MLD protocol.

Example

This example shows how to statically add group records for MLD snooping on VLAN 1.

```
Switch# config terminal
Switch(config)# vlan 1
Switch(config-vlan)# ipv6 mld snooping static-group FF09::12:03 interface Ethernet
1/0/2,1/0/5
Switch(config-vlan)#
```

23-5 show ipv6 mld snooping

This command is used to display MLD snooping information on the Switch.

show ipv6 mld snooping [vlan *VLAN-ID***]**

Parameters

vlan *VLAN-ID*	(Optional) Specifies the VLAN to be displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display MLD snooping configurations.

.

Example

This example shows how to display MLD snooping configurations.

```
Switch# show ipv6 mld snooping

 MLD  snooping global state : Enabled

 VLAN #1 Configuration
    MLD  snooping state            : Enabled
    Querier state                  : Disabled
    Fast Leave state               : Enabled

Switch#
```

23-6 show ipv6 mld snooping groups

This command is used to display MLD snooping group-related information learned on the Switch.

show ipv6 mld snooping groups [*IPV6-ADDRESS* **| vlan** *VLAN-ID***]**

Parameters

IPV6-ADDRESS	(Optional) Specifies the group IPv6 address. If no IPv6 address is specified, all MLD group information will be displayed.

vlan *VLAN-ID*	(Optional) Specifies the VLAN interface. If no interface is specified, MLD group information about all interfaces will be displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display MLD group information by command.

Example

This example shows how to display MLD snooping group information.

```
Switch# show ipv6 mld snooping groups

 MLD Snooping Connected Group Membership:

VLAN ID Group address     Source address         FM Exp(sec) Interface
------- ----------------- ---------------------  -- -------- ---------
 1       ff09::2           2015:2016::2017:2018   IN      260  eth1/0/1
 1       ff09::c                  *               EX      200  eth1/0/2
 1       ff09::fb                 *               IN      245  eth1/0/3

 Total Groups : 3,  Total SSM entries : 3

Switch#
```

23-7 show ipv6 mld snooping static-group

This command is used to display MLD snooping static group information on the Switch.

show ipv6 mld snooping static-group [*GROUP-ADDRESS* **| vlan** *VLAN-ID***]**

Parameters

GROUP-ADDRESS	Specifies the group IPv6 address to be displayed.
vlan *VLAN-ID*	Specifies the VLAN ID to be displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays the MLD snooping static group information.

Example

This example shows how to display MLD snooping static group information .

```
Switch# show ipv6 mld snooping static-group

 VLAN ID  Group address          Interface
 -------  ---------------------  ---------
 1        ff09::12:3             eth1/0/2,5,7

 Total Entries : 1

Switch#
```

24. Multiple Spanning Tree Protocol (MSTP) Commands

24-1 instance

This command is used to map a VLAN or a set of VLANs to an MST instance. Use the **no** instance without VLANs specified to remove instances. Use the **no** instance with VLAN specified to return the VLANs to the default instance (CIST).

instance *INSTANCE-ID* **vlans** *VLANDID* **[, | -]**

no instance *INSTANCE-ID* **[vlans** *VLANDID* **[, | -]]**

Parameters

INSTANCE-ID	Specifies the MSTP instance identifier to which the specified VLANs are mapped. This value must be between 1 and 4094.
vlans *VLANDID*	Specifies the VLANs to be mapped to or removed from the specified instance. This value must be between 1 and 4094.
,	(Optional) Specifies a series of VLAN, or separate a range of interfaces from a previous range. No space is allowed before and after the comma.
-	(Optional) Specifies a range of VLAN. No space is allowed before and after the hyphen

Default

None.

Command Mode

MST Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Any unmapped VLAN is mapped to the CIST instance. When mapping the VLANs to an instance, if the instance doesn't exist, this instance will be created automatically. If all VLANs of an instance are removed, this instance will be destroyed automatically. In another way, users can remove the instance manually by using the **no instance** command without VLANs specified.

Example

This example shows how to map a range of VLANs to instance 2.

```
Switch# configure terminal
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# instance 2 vlans 1-100
Switch(config-mst)#
```

24-2 name

This command is used to configure the name of an MST region. Use the **no** form of this command to revert to the default setting.

name *NAME*

no name *NAME*

Parameters

NAME	Specifies the name given for a specified MST region. The name string has a maximum length of 32 characters and the type is a general string which allows spaces.

Default

The default name is the Switch's MAC address.

Command Mode

MST Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Two or more switches with the same VLAN mapping and configuration version number are considered to be in different MST regions if the region names are different.

Example

This example shows how to configure the MSTP configuration name to "MName".

```
Switch# configure terminal
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# name MName
Switch(config-mst)#
```

24-3 revision

This command is used to configure the revision number for the MST configuration. Use the **no** form of this command to revert to the default setting.

revision *VERSION*

no revision

Parameters

VERSION	Specifies the revision number for the MST configuration. The range is from 0 to 65535.

Default

By default, this value is 0.

Command Mode

MST Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Two Ethernet switches that have the same configuration but different revision numbers are considered to be part of two different regions.

Example

This example shows how to configure the revision level of the MSTP configuration to 2.

```
Switch# configure terminal
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# revision 2
Switch(config-mst)#
```

24-4 show spanning-tree mst

This command is used to display the information that used in the MSTP version.

show spanning-tree mst [configuration [digest]]

show spanning-tree mst [instance *INSTANCE-ID***]**

Parameters

configuration	Specifies to display the table for the mapping relationship between VLANs and MSTP Instances.
digest	Specifies to display the MD5 digest included in the current MST configuration identifier (MSTCI).
instance *INSTANCE-ID*	Specifies to display the MSTP information for the designated instance only.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the MSTP configuration and operation status. If a private VLAN is configured and the secondary VLAN does not map to the same primary VLAN, the **show spanning-tree mst configuration** command will display a message to indicate this condition.

Example

This example shows how to display MSTP summary information.

```
Switch# show spanning-tree mst

 Spanning tree: Disabled, protocol: RSTP
 BPDU Forward : Disabled
 Number of MST instances: 1

 >>>>MST00  vlans mapped : 1-4094
 Bridge Address: 00-01-02-03-04-00, Priority: 32768 (32768 sysid 0)
 Designated Root Address: 00-00-00-00-00-00, Priority: 0 (0 sysid 0)
 Regional Root Bridge Address: 00-00-00-00-00-00, Priority: 0 (0 sysid 0)
 Designated Bridge Address: 00-00-00-00-00-00, Priority: 0 (0 sysid 0)
 Topology Changes Count: 0

 Interface      Role       State      Cost      Priority  Edge
 --------------  ----       -----      ----      --------  ----
  eth1/0/1       nonStp     forwarding  200000    128       non-edge

Switch#
```

This example shows how to display MSTP instance mapping configuration.

```
Switch# show spanning-tree mst configuration

 Name    : MName
 Revision : 2, Instances configured : 3
 Instance   Vlans
 --------   ----------------------------------------------------------------
 0         21-4094
 1         1-10
 2         11-20

Switch#
```

24-5 spanning-tree mst configuration

This command is used to enter the MST Configuration Mode. Use the **no** form of this command to revert to the default setting.

spanning-tree mst configuration

no spanning-tree mst configuration

Parameters

None.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to enter the MST Configuration Mode.

Example

This example shows how to enter the MST Configuration Mode.

```
Switch# configure terminal
Switch(config)# spanning-tree mst configuration
Switch(config-mst)#
```

24-6 spanning-tree mst priority

This command is used to configure the bridge priority value for the selected MSTP instance. Use the **no** form of this command to revert to the default setting.

spanning-tree mst *INSTANCE-ID* **priority** *PRIORITY*

no spanning-tree mst *INSTANCE-ID* **priority**

Parameters

INSTANCE-ID	Specifies the MSTP instance identifier. Instance 0 represents the default instance, CIST.
PRIORITY	Specifies the bridge priority value that must be divisible by 4096. The range is from 0 to 61440.

Default

By default, this value is 32768.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The priority has same meaning with as the bridge priority in the STP command reference, but can specify a different priority for distinct MSTP instances.

Example

This example shows how to configure the bridge priority for the MSTP instance 2.

```
Switch# configure terminal
Switch(config)# spanning-tree mst 2 priority 0
Switch(config)#
```

25. Power over Ethernet (PoE) Commands

25-1 poe pd priority

This command is used to configure the priority for provisioning power to the port. Use the **no** form of this command to revert to the default setting.

poe pd priority {critical | high | low}

no poe pd priority

Parameters

critical	Specifies the PD connected to the port gains the highest priority.
high	Specifies the PD connected to the port gains the second high priority.
low	Specifies the PD connected to the port gains the lowest priority.

Default

By default, this option is set as low.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Since the power budget is limited, as more PDs are added to the system, the power source may not be sufficient to supply the power. The PoE system enters the power critical section when the remaining power source is not enough to serve the new added PD.

Example

This example shows how to configure the priority of ethernet 1/0/3 to the first priority.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# poe pd priority critical
Switch(config-if)#
```

25-2 poe power-inline

This command is used to configure the power management mode for the Power over Ethernet (PoE) ports. Use the **no** form of this command to remove the time range profile association or restore the mode to the default settings.

poe power-inline {auto [time-range *PROFILE-NAME***] | never}**

no poe power-inline [auto time-range]

Parameters

auto	Specifies to enable the auto-detection of PDs and provision power to the PD.
time-range *PROFILE-NAME*	(Optional) Specifies the name of the time-range profile to delineate the activation period.
never	Specifies to disable supplying power to PD connected to the port.

Default

By default, this option is set as auto.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When the port is set to auto mode, the port will automatically detect the PD and provision power to the PD.

Use this command to also specify a time range with a port. Once a PoE port is associated with a time-range profile, it will only be activated during the time frame specified in the profile. That is, the PD will not get powered during timeframe out of the specified time range.

When the command no poe power-inline is issued, the power management mode will be reset to default setting.

The specified time-range profile does not need to exist to configure the command. If the time-range profile does not exist, the command acts as if the time-range is not specified.

Example

This example shows how to enable PD detection and to automatically power PoE port, ethernet 1/0/3.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# poe power-inline auto
Switch(config-if)#
```

This example shows how to disable powered device detection and not to power a PoE port, ethernet 1/0/3.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# poe power-inline never
```

This example shows how to combine a time-range profile called “day-time” with the PoE port, ethernet 1/0/3.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# poe power-inline auto time-range day-time
Switch(config-if)#
```

25-3 poe usage-threshold

This command is used to configure the utilization threshold to record a log. Use the **no** form of this command to restore to the default setting.

poe usage-threshold *PERCENTAGE*

no poe usage-threshold

Parameters

PERCENTAGE	Specifies the usage threshold to generate a log. The valid range is from 1 to 99. The unit is percentage.

Default

By default, this value is 99.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When the usage threshold is configured, if the utilization of the PSE exceeds the configured threshold, then the EXCEED log will be recorded. Once the percentage decreases and become lower than the threshold, then the RECOVER log is recorded.

Example

This example shows how to configure the usage threshold to 50%.

```
Switch# configure terminal
Switch(config)# poe usage-threshold 50
Switch(config)#
```

25-4 snmp-server enable traps poe

This command is used to enable the sending of PoE notifications. Use the **no** form of this command to disable sending power over Ethernet notifications.

snmp-server enable traps poe

no snmp-server enable traps poe

Parameters

none

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enable sending PoE usage threshold exceeding traps.

Example

This example shows how to enable trap for PoE event.

```
Switch#configure terminal
Switch(config)#snmp-server enable traps poe
Switch(config)#
```

25-5 show poe power-inline

This command is used to display the Power over Ethernet (PoE) status for the specified PoE port, or for all PoE ports in the switch system.

show poe power-inline [*INTERFACE-ID* **[, | -]] {status | configuration}**

Parameters

INTERFACE-ID	(Optional) Specifies the interface to be displayed.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No spaces before and after the comma.
-	(Optional) Specifies a range of interfaces. No spaces before and after the hyphen.
status	Specifies to display the port PoE status.
configuration	Specifies to display the port configuration information.

Default

None

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display the PoE status of ports, power inline configuration status. If the interface ID is not specified with this command, then all PoE interfaces will be displayed. Only the PoE capable interfaces are displayed.

Example

This example shows how to display the PoE power inline status.

```
Switch# show poe power-inline status

 Interface   State     Class    Max(W)  Used(W)
 ------------------------------------------------
 eth1/0/1    Searching  Class-0  0.0     0.0
 eth1/0/2    Searching  Class-0  0.0     0.0
 eth1/0/3    Disabled   Class-0  0.0     0.0
 eth1/0/4    Searching  Class-0  0.0     0.0
 eth1/0/5    Searching  Class-0  0.0     0.0
 eth1/0/6    Searching  Class-0  0.0     0.0
 eth1/0/7    Searching  Class-0  0.0     0.0
 eth1/0/8    Searching  Class-0  0.0     0.0

 Faulty code
 [1] MPS (Maintain Power Signature) Absent
 [2] PD short
 [3] Overload
 [4] Power Denied
 [5] Thermal Shutdown
 [6] Startup Failure
 [7] Classification Failure

Switch#
```

Display Parameters

Interface	The PoE interface ID.
State	The port status can be of the following: **Disabled** - The PSE function is disabled. **Searching** - The remote PD is not connected. **Requesting** - The remote PD is inserted, but the PSE doesn't provide power yet. **Delivering** - The remote PD is now powering by PoE system. **Faulty[X]** - The device detection or a powered device is in a faulty state. X is the error code number. [1] - MPS (Maintain Power Signature) Absent. [2] - PD Short. [3] - Overload. [4] - Power Denied. [5] - Thermal Shutdown. [6] - Startup Failure. [7] - Classification Failure(IEEE 802.3at).
Class	The IEEE classification: N/A or a value from IEEE class 0 to 4.
Max(W)	The maximum amount of power could be allocated to the powered device in watts.
Used(W)	The amount of power is currently allocated to PoE ports in watts.

Example

This example shows how to display the PoE power inline configuration.

```
Switch# show poe power-inline configuration

 Interface   Admin    Priority  Time-Range
 ------------------------------------------------------
 eth1/0/1    auto     low
 eth1/0/2    auto     low
 eth1/0/3    auto     low       day-time
 eth1/0/4    auto     low
 eth1/0/5    auto     low
 eth1/0/6    auto     low
 eth1/0/7    auto     low
 eth1/0/8    auto     low
Switch#
```

Display Parameters

Interface	The PoE interface ID.
Admin	The user configured mode can be of the following: **Auto** - The powered device will be automatically detected and maximum power is based on the detection result. **Never** - The powered device will not be detected, and no power to the port.
Priority	The priority used to prioritize the service order when power constrain happens within at the power unit.
Time-Range	The time-range profile name which sets the activation time frame for a port.

25-6 show poe power module

This command is used to display the setting and actual values of the power modules.

show poe power module

Parameters

none

Default

None

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays the detailed power information and PoE chip parameters for PoE modules.

Example

This example shows how to display the PoE power system's power information.

```
Switch# show poe power module

 Unit  Delivered(W)  Power Budget(W)  Usage-Threshold(%)  Trap State
 ----------------------------------------------------------------
 1     0.0           40.0             50                  Disabled

Switch#
```

Display Parameters

Unit	The unit ID of stacking device.
Delivered	The actual amount of power delivered to the PD in watts.
Power budget	The total power can be provided by the device in watts.
Usage-Threshold	The utilization threshold to record a log.
Trap state	**enabled** - send trap if reach utilication threshold.

25-7 poe pd alive

This command is used to enable the PD alive check function for the PD connected to the PoE port. Use the **no** form of this command to disable the function.

poe pd alive [{ip *IP-ADDRESS* **| interval** *INTERVAL-TIME* **| retry** *RETRY-COUNT* **| waiting-time** *WAITING-TIME* **| action {reset | notify | both}}]**

no poe pd alive [{ip | interval | retry | waiting-time | action}]

Parameters

Ip *IP-ADDRESS*	(Optional) Specifies the IPv4 address of the target PD for the system executing the ping action. IP-ADDRESS - Specifies the IPv4 address of the target PD.
Interval *INTERVAL-TIME*	(Optional) Specifies the interval for the system to issue ping requests to detect the target PD. The valid range is from 10 to 300 seconds.
retry *RETRY-COUNT*	(Optional) Specifies the retry counts of ping requests when PD has no response. The valid range is from 0 to 5.
waiting-time *WAITING-TIME*	(Optional) Specifies the waiting time for PD to recover from rebooting. The valid range is from 30 to 300 seconds.
action	(Optional) Specifies the action of the system when PD does not

	reply the ping request. **reset** - Specifies to disable and then enable the PoE port state. **notify** - Specifies to send logs and traps to notify the administrator. **both** - Specifies to send log and trap first, and then reset the PoE port state.

Default

By default, this function is disabled.

The default IP address of the target PD is none.

The default interval for system to issue ping requests is 30 seconds.

The default retry counts for ping requests is 2 times.

The default waiting time for PD to recover from rebooting is 90 seconds.

The default action when PD does not reply the ping request is **both**.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This function only takes effect on PoE enabled ports with power feeding.

The PD alive check function provides the solution for the PD device that stops working or has no response via the ping mechanism.

Use this command without any optional parameter to enable or disable the PD alive check function.

By default, there is no IP address of the target PD for the system to execute the ping action. The IP address of the target PD must be configured by using the **poe pd alive ip** command before executing the PD alive check.

The system needs to periodically monitor the specific PD by using the ping function. When there is no response, the system takes one of the actions configured by the **poe pd alive action** command. The interval between retry attempts can be configured by the **poe pd alive interval** command.

The system implements the retry mechanism to check the PD status. The system will reset the PoE port power feeding after the retry by using Ping without any response from a PD. The retry count can be configured by the **poe pd alive retry** command.

If the action is **reset** or **both**, the system needs to wait for PD to recover from rebooting and then executes the Ping function again. The waiting time for PD to recover from rebooting can be configured by the poe pd alive waiting-time command.

If the PoE time range function is configured on the port that also enables the PD alive check function, the time range function has higher priority, and the PD alive check function will not work When the PoE time range function is still active.

NOTE: If the PD does not support ICMP, this function cannot work normally.

NOTE: It is required to setup IP settings properly that the PD can be reached via Ping, otherwise this function cannot work as expected.

NOTE: The **reset** action can only work on the direct-connected PD. If the PD is not connected directly, the reset action may not work as expected.

NOTE: If the direct-connected PD is also a PSE, all the next level PDs connect to this PSE will be power cycling whenever the PD alive check function takes effect on the **reset** or **both** action.

Example

This example shows how to enable the PoE PD alive check function on interface eth1/0/1-2.

```
Switch# configure terminal
Switch(config)# interface range Ethernet 1/0/1-2
Switch(config-if-range)#poe pd alive
Switch(config-if-range)#
```

This example shows how to configure the IP address of the target PD.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/2
Switch(config-if)# poe pd alive ip 192.168.1.150
Switch(config-if)#
```

This example shows how to configure the interval between ping requests.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/2
Switch(config-if)# poe pd alive interval 60
Switch(config-if)#
```

This example shows how to configure the retry counts of ping requests.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/2
Switch(config-if)# poe pd alive retry 4
Switch(config-if)#
```

This example shows how to configure the waiting time for PD to reboot.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/2
Switch(config-if)# poe pd alive waiting-time 120
Switch(config-if)#
```

This example shows how to configure the action to reset when PD does not reply.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/2
Switch(config-if)# poe pd alive action reset
Switch(config-if)#
```

25-8 show poe pd alive

This command is used to display the PD alive check settings.

show poe pd alive [interface *INTERFACE-ID* **[, | -]]**

Parameters

interface *INTERFACE-ID*	Specifies the interface ID to display.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No spaces before and after the comma.
-	(Optional) Specifies a range of interfaces. No spaces before and after the hyphen.

Default

None

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the PD alive check settings on the specified ports. When no optional parameter is specified, information of all PoE ports will be displayed.

Example

This example shows how to display the PD alive check settings on interface eth1/0/1-2.

```
Switch# show poe pd alive interface Ethernet 1/0/1-2

 Port ID: eth1/0/1
 ------------------------------------------------
    PD Alive State              : Enabled
    PD IP Address               : 0.0.0.0
    Poll Interval               : 30
    Retry Count                 : 2
    Waiting Time                : 90
    Action                      : both

 Port ID: eth1/0/2
 ------------------------------------------------
    PD Alive State              : Enabled
    PD IP Address               : 192.168.1.150
    Poll Interval               : 60
    Retry Count                 : 4
    Waiting Time                : 120
    Action                      : reset

Switch#
```

26. Power Saving Commands

26-1 dim led

This command is used to disable the port LED function. Use the **no** form of this command to restore the LED function.

dim led

no dim led

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to turn off the port LED function. Use the no form of this command to restore the LED function. When the port LED function is disabled, LEDs used to illustrate port status are all turned off to save power.

Example

This example shows how to disable the port LED function:

```
Switch# configure terminal
Switch(config)# dim led
Switch(config)#
```

26-2 power-saving

This command is used to enable individual power saving functions. Use the **no** form of this command to disable these functions.

power-saving {link-detection | port-shutdown | dim-led | hibernation}

no power-saving {link-detection | port-shutdown | dim-led | hibernation}

Parameters

link-detection	Specifies that power saving will be applied by link status.
dim-led	Specifies that power saving will be applied by scheduled dimming LEDs.

port-shutdown	Specifies that power saving will be applied by scheduled port shutdown.
hibernation	Specifies that power saving will be applied by scheduled system hibernation. This parameter can only be used when the stacking is disabled.

Default

By default, all the options are disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The user can enable or disable link detection, dimming LEDs, port shutdown, and hibernation using this command.

When link detection is enabled, the device can save power on the inactive ports. When dim LED is enabled, the device will turn off all the port's LEDs in the specified time range to save power.

When port shutdown is enabled, the device will shut off all ports in the specified time range to save power.

When hibernation is enabled, the device will enter the hibernation mode in the specified time range to save power.

Example

This example shows how to enable power saving by shutting off the Switch's ports and toggle the Switch into the hibernation mode.

```
Switch# configure terminal
Switch(config)# power-saving port-shutdown
Switch(config)# power-saving hibernation
Switch(config)#
```

26-3 power-saving eee

This command is used to enable the Energy-Efficient Ethernet (EEE) function on the specified port(s). Use the **no** form of this command to disable the EEE function.

power-saving eee

no power-saving eee

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enable or disable the specified port's EEE power saving function. The Energy-Efficient Ethernet (EEE) power-saving mode saves power consumption while a link is up when there s low utilization of packet traffic. The physical interface will enter into a Low Power Idle (LPI) mode when there is no data to be transmitted. In the EEE power-saving mode, power consumption is scalable to the actual bandwidth utilization.

Example

This example shows how to enable the EEE power saving function.

```
Switch(config-if)# end
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# power-saving eee
Switch(config-if)#
```

26-4 power-saving dim-led time-range

This command is used to configure the time range profile for the dim LED schedule. Use the **no** form of this command to delete the specified time range profile.

power-saving dim-led time-range *PROFILE-NAME*

no power-saving dim-led time-range *PROFILE-NAME*

Parameters

PROFILE-NAME	Specifies the name of the time range profile to be configured. The maximum length is 32 characters.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to add or delete a time range profile for the dim LED schedule. When the schedule is up, all port's LED will be turned off.

Example

This example shows how to add a time-range profile for the dim LED schedule.

```
Switch(config)# end
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# power-saving dim-led time-range day-time
```

```
Switch(config)#
```

26-5 power-saving hibernation time-range

This command is used to configure the time range profile for the system hibernation schedule. Use the **no** form of this command to delete the specified time range profile.

power-saving hibernation time-range *PROFILE-NAME*

no power-saving hibernation time-range *PROFILE-NAME*

Parameters

PROFILE-NAME	Specifies the name of the time range profile to be configured. The maximum length is 32 characters.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to add or delete a time range profile for the system hibernation schedule. When the system enters the hibernation mode, the Switch will go into a low power state and idle. It will shut down all the ports and LEDs, all network function will be disabled, and only the console connection will work via the RS232 port. If the Switch is an endpoint type Power Sourcing Equipment (PSE), the Switch will not provide power to the port.

Example

This example shows how to add a time range profile for the hibernation schedule.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config)# power-saving hibernation time-range day-time
```

26-6 power-saving shutdown time-range

This command is used to configure the time range profile for the port shutdown schedule. Use the **no** form of this command to delete the specified time range profile.

power-saving shutdown time-range *PROFILE-NAME*

no power-saving shutdown time-range *PROFILE-NAME*

Parameters

PROFILE-NAME	Specifies the name of the time range profile to be configured. The maximum length is 32 characters.

Default

None.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to add or delete a time range profile for the port shutdown schedule. When the schedule is up, the specific port will be disabled.

Example

This example shows how to add a time range profile for the port shutdown schedule.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# power-saving shutdown time-range day-time
Switch(config-if)#
```

26-7 show power-saving

This command is used to display the power saving configuration information.

show power-saving [link-detection] [dim-led] [port-shutdown] [hibernation] [eee]

Parameters

link-detection	(Optional) Specifies to display the link detection state.
dim-led	(Optional) Specifies to display the dim LED state.
port-shutdown	(Optional) Specifies to display the port shutdown state.
hibernation	(Optional) Specifies to display the hibernation state.
eee	(Optional) Specifies to display the EEE state.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

If no optional keywords were specified, all power saving configuration information will be displayed.

Example

This example shows how to display all power saving configuration information.

```
Switch# show power-saving

 Function Version: 3.00

 Link Detection Power Saving
   State : Disabled

 Scheduled Hibernation Power Saving
   State : Enabled

 Administrative Dim-LED
   State : Disabled

 Scheduled Dim-LED Power Saving
   State : Disabled
   Time Range : day-time

 Scheduled Port-shutdown Power Saving
   State : Enabled
   Port            Time Range
   ----------     -------------------
   Ethernet1/0/1    day-time

 EEE_Enabled Ports
   Ethernet1/0/1

Switch#
```

27. Port Security Commands

27-1 clear port-security

This command is used to delete the auto-learned secured MAC addresses.

clear port-security {all | {address *MAC-ADDR* **| interface** *INTERFACE-ID* **[, | -]} [vlan** *VLAN-ID***]}**

Parameters

all	Specifies to delete all auto-learned secured entries.
address *MAC-ADDR*	Specifies to delete the specified auto -learned secured entry based on the MAC address entered.
interface *INTERFACE-ID*	Specifies to delete all auto-learned secured entries on the specified physical interface.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space is allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No space is allowed before and after the hyphen.
vlan *VLAN-ID*	Specifies to delete the auto-learned secured entry learned with the specified VLAN.

Default

None.

Command Mode

Privileged EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

This command clears auto-learned secured entries, either dynamic or permanent.

Example

This example shows how to remove a specific secure address from the MAC address table.

```
Switch# clear port-security address 00:80:00:70:00:07
Switch#
```

27-2 show port-security

This command is used to display the current port security settings.

show port-security [[interface *INTERFACE-ID* **[, | -]] [address]**

Parameters

INTEFACE-ID	Specifies the ID of the interface to be displayed.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space is allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No space is allowed before and after the hyphen.
address	Specifies to display all the secure MAC addresses, including both configured and learned entries.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display the current port security settings.

Example

This example shows how to display the port security settings of interfaces eth1/0/1 to eth1/0/3.

```
Switch# show port-security interface eth 1/0/1-3

Interface    Max  Curr  Violation    Violation      Admin   Current
No.          No.  No.   Act.         Count          State   State
------------ ----- ----- -------- -------------------- -------- ------------
eth1/0/1     32   0     Protect  -                Disabled -
eth1/0/2     32   0     Protect  -                Disabled -
eth1/0/3     32   0     Protect  -                Disabled -
```

27-3 snmp-server enable traps port-security

This command is used to enable sending SNMP notifications for port security address violation. Use the no form of the command to disable sending SNMP notifications.

snmp-server enable traps port-security [trap-rate *TRAP-RATE***]**

no snmp-server enable traps port-security [trap-rate]

Parameters

trap-rate *TRAP-RATE*	(Optional) Specifies the number of traps per second. The range is from 0 to 1000. The default value ("0") indicates an SNMP trap to be generated for every security violation.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enable or disable SNMP notifications for port security address violation, and configure the number of traps per second.

Example

This example shows how to enable sending trap for port security address violation and set the number of traps per second to 3.

```
Switch# configure terminal
Switch(config)# snmp-server enable traps port-security
Switch(config)#
```

27-4 switchport port-security

This command is used to configure the port security settings to restrict the number of users that are allowed to gain access rights to a port. Use the no form of this command to disable port security or to delete a secure MAC address.

switchport port-security [aging time *MINUTES* **| maximum** *VALUE* **| violation {protect | restrict | shutdown}]**

no switchport port-security [aging time | maximum | violation]

Parameters

aging time MINUTES	(Optional) Specifies the aging time for the auto-learned dynamic secured address on this port. If not specified, the default value is 0.

	The valid range is from 0 to 1440 in minutes.
maximum *VALUE*	(Optional) Specifies to set the maximum number of secure MAC addresses allowed. If not specified, the default value is 32. The valid range is from 1 to 64.
protect	(Optional) Specifies to drop all packets from the insecure hosts at the port-security process level, but does not increment the security-violation count.
restrict	(Optional) Specifies to drop all packets from the insecure hosts at the port-security process level and increments the security-violation count and record the system log.
shutdown	(Optional) Specifies to shut down the port if there is a security violation and record the system log.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When port security is enabled, the port will automatically learn the dynamic secured entry which will be timed out. These entries will be aged out based on the setting specified by the **switchport port-security aging** command.

As the port mode-security state is changed, the violation counts will be cleared. As the port-security state is changed to disabled, the auto-learned secured entries and violation counts are cleared. When the maximum setting is changed, the auto-learned secured entries and violation counts are cleared.

A port-security enabled port has the following restrictions.

- If the port is a link aggregation member port, the port security function cannot be enabled.

When the maximum number of secured users is exceeded, one of the following actions can occur:

- **Protect** - When the number of port secure MAC addresses reaches the maximum number of users that is allowed on the port, the packets with the unknown source address is dropped until some secured entry is removed to release the space.
- **Restrict** - A port security violation restricts data and causes the security violation counter to increment.
- **Shutdown** - The interface is disabled, based on errors, when a security violation occurs.

Example

This example shows how to configure the port security maximum of 5 secure MAC addresses are allowed on the port.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# switchport port-security maximum 5
Switch(config-if)#
```

This example shows how to configure the Switch to drop all packets from the insecure hosts at the port-security process level and increment the security violation counter if a security violation is detected.

```
Switch# configure terminal
```

```
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# switchport port-security violation restrict
Switch(config-if)#
```

This example shows how to apply the aging time for automatically learned secure MAC addresses for interface eth1/0/1.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# switchport port-security aging time 1
Switch(config-if)#
```

28. Quality of Service (QoS) Commands

28-1 mls qos cos

This command is used to configure the default Class of Service (CoS) value of a port. Use the **no** form of this command to revert to the default settings.

mls qos cos {*COS-VALUE* **}**

no mls qos cos

Parameters

COS-VALUE	Specifies to assign a default CoS value to a port. This CoS will be applied to the incoming untagged packets received by the port.

Default

By default, this CoS value is 0.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

none

Example

This example shows how the default CoS of Ethernet port 1/0/1 set to 2

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# mls qos cos 2
Switch#
```

28-2 mls qos map dscp-cos

This command is used to define a Differentiated Services Code Point (DSCP)-to-class of service (CoS) map. Use the **no** form of this command to revert to the default setting.

mls qos map dscp-cos *DSCP-LIST* **to** *COS-VALUE*

no mls qos map dscp-cos *DSCP-LIST*

Parameters

dscp-cos *DSCP-LIST* **to** *COS-VALUE*	Specifies the list of DSCP code points to be mapped to a CoS value. The range is from 0 to 63. The series of DSCPs can be

	separated by commas (,) or hyphens (-) with no spaces or hyphens before and after.
DSCP-LIST	Specifies the range of DSCP values.

Default

CoS Value:	0	1	2	3	4	5	6	7
DSCP Value:	0-7	8-15	16-23	24-31	32-39	40-47	48-55	56-63

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The DSCP to CoS map is used by a DSCP trust port to map a DSCP value to an internal CoS value.

Example

This example shows how to configure the DSCP to CoS map for mapping DSCP 12, 16, and 18 to CoS 1.

```
Switch# configure terminal
Switch(config)# mls qos map dscp-cos 12,16,18 to 1
Switch(config)#
```

28-3 mls qos scheduler

This command is used to configure the scheduling mechanism. Use the **no** form of this command to reset the packet scheduling mechanism to the default.

mls qos scheduler {sp |wrr}

no mls qos scheduler

Parameters

sp	Specifies that all queues are in strict priority scheduling.
wrr	Specifies the queues in the frame count weighted round-robin scheduling.

Default

The default queue scheduling algorithm is WRR.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Specify schedule algorithms to WRR, SP for the output queue. By default, the output queue scheduling algorithm is WRR.

Example

This example shows how to configure the queue scheduling algorithm to the strict priority mode.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# mls qos scheduler sp
Switch(config-if)#
```

28-4 mls qos trust

This command is used to configure the trust state of a port to trust either the CoS field or the DSCP field of the arriving packet for subsequent QoS operation. Use the **no** form of this command to revert to the default setting.

mls qos trust {cos | dscp}

no mls qos trust

Parameters

cos	Specifies that the CoS bits of the arriving packets are trusted for subsequent QoS operations.
dscp	Specifies that the ToS/DSCP bits, if available in the arriving packets are trusted for subsequent operations. For non-IP packet, Layer 2 CoS information will be trusted for traffic classification.

Default

By default, CoS is trusted.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When the interface is set to trust DSCP, the DSCP of the arriving packet will be trusted for the subsequent QoS operations. First, the DSCP will be mapped to an internal CoS value, which will be subsequently used to determine the CoS queue. The DSCP to CoS map is configured by the **mls qos map dscp-cos** command. If the arriving packet is a non-IP packet, the CoS is trusted. The resulting CoS mapped from DSCP will also be the CoS in the transmitted packet.

When an interface is in the trust CoS state, the CoS of the arriving packet will be applied to the packet as the internal CoS and used to determine the CoS queue. The CoS queue is determined based on the CoS to Queue mapping table.

When a packet arrives at an 802.1Q VLAN tunnel port, the packet will be added with an outer VLAN tag in order to transmit through the VLAN tunnel. If the port is to trust CoS, then the inner tag CoS will be the internal CoS of the packet and the CoS value in the packet's outer VLAN tag. If the MLS QoS CoS override is configured, then the CoS specified by command **mls qos cos** will be the internal CoS of the packet and the CoS value in the packet's outer VLAN tag. If the port is to trust DSCP, then the CoS mapped from the DSCP code point will be the internal CoS of the packet and the CoS value in the packet's outer VLAN tag.

Example

This example shows how to configure port eth1/0/1 to trust the DSCP mode.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# mls qos trust dscp
Switch(config-if)#
```

28-5 rate-limit

This command is used to set the received bandwidth limit values for an interface. Use the **no** form of this command to disable the bandwidth limit.

rate-limit input NUMBER-KBPS

no rate-limit input

Parameters

NUMBER-KBPS	Specifies the number of kilobits per second as the maximum bandwidth limit. The valid range is 100-1048576.

Default

By default, there is no limitation.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The specified limitation cannot exceed the maximum speed of the specified interface. The input value will auto round up to next possible value such as 100, 200, …etc. .

Example

This example shows how the maximum bandwidth limits are configured on ethernet 1/0/3. The ingress bandwidth is limited to 1300Kbps..

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# rate-limit input 1300
Switch(config-if)#
```

28-6 show mls qos interface

This command is used to display port level QoS configurations.

show mls qos interface *INTERFACE-ID* **[, | -] {cos | scheduler| trust | rate-limit }**

Parameters

interface *INTERFACE-ID*	Specifies the interface ID to display.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space is allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No space is allowed before and after the hyphen.
cos	Specifies to displays the port default CoS.
scheduler	Specifies to displays the transmit queue scheduling settings.
trust	Specifies to displays the port trust State.
rate-limit	Specifies to displays the bandwidth limitation configured for the port.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display port level QoS configurations.

Example

This example shows how to display the default CoS for eth 1/0/1 to eth 1/0/5.

```
Switch# show mls qos interface Ethernet 1/0/1-5 cos

 Interface    CoS
 -----------  ----
 eth1/0/1      0
 eth1/0/2      3
 eth1/0/3      0
 eth1/0/4      3
 eth1/0/5      0
Switch#
```

This example shows how to display the port trust state for eth 1/0/2 to eth 1/0/5.

```
Switch# show mls qos interface eth1/0/2-1/0/5 trust

 Interface      Trust State
 -------------  -----------------
 eth1/0/2       trust DSCP
 eth1/0/3       trust CoS
 eth1/0/4       trust DSCP
 eth1/0/5       trust CoS

Switch#
```

This example shows how to display the scheduling configuration for eth1/0/2 to eth1/0/4.

```
 Switch# show mls qos interface Ethernet 1/0/2-4 scheduler

 Interface    Scheduler Method
 -----------  -----------------
 eth1/0/2      wrr
 eth1/0/3      sp
 eth1/0/4      wrr

Switch#
```

This example shows how to display the rate limit for eth 1/0/1 to eth 1/0/5.

```
Switch# show mls qos interface Ethernet 1/0/1-5 rate-limit

 Interface     Rx Rate
 -----------  -----------------
 eth1/0/1      No Limit
 eth1/0/2      No Limit
 eth1/0/3      1300 kbps
 eth1/0/4      No Limit
 eth1/0/5      No Limit

Switch#
```

28-7 show mls qos map dscp-cos

This command is used to display the DSCP to CoS map information.

show mls qos map dscp-cos

Parameters

none

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the DSCP to CoS map infomration on the switch

Example

This example shows how to display the DSCP to CoS map information.

```
Switch# show mls qos map dscp-cos

      0  1  2  3  4  5  6  7  8  9
    --------------------------------
  00  00 00 00 00 00 00 00 00 01 01
  10  01 01 01 01 01 01 01 02 01 02
  20  02 02 02 02 03 03 03 03 03 03
  30  03 03 04 04 04 04 04 04 04 04
  40  05 05 05 05 05 05 05 05 06 06
  50  06 06 06 06 06 06 07 07 07 07
  60  07 07 07 07

Switch#
```

28-8 show mls qos queueing

This command is used to display the QoS queuing information.

show mls qos queuing

Parameters

none

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the QoS queueing infomration on the switch

Example

This example shows how to display the QoS queuing information.

```
Switch# show mls qos queuing

 CoS-queue map:
   CoS    QID
   ---    ---
    0      1
    1      0
    2      0
    3      1
    4      2
    5      2
    6      3
    7      3

Switch#
```

29. RADIUS Server Commands

29-1 radius-server deadtime

This command is used to specify the default duration of the time to skip the unresponsive server. Use the **no** form of this command to revert to the default setting.

radius-server deadtime *MINUTES*

no radius-server deadtime

Parameters

MINUTES	Specifies the dead time. The valid range is 0 to 1440 (24 hours). When the setting is 0, the unresponsive server will not be marked as dead.

Default

By default, this value is 0.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command can be used to improve the authentication processing time by setting the dead time to skip the unresponsive server host entries.

When the system performs authentication with the authentication server, it attempts one server at a time. If the attempted server does not respond, the system will attempt the next server. When the system finds a server does not respond, it will mark the server as down, start a dead time timer, and skip them in authentication of the following requests until expiration of the dead time.

Example

This example shows how to set the dead time to ten minutes.

```
Switch# configure terminal
Switch(config)# radius-server deadtime 10
Switch(config)#
```

29-2 radius-server host

This command is used to create a RADIUS server host. Use the **no** form of this command to delete a server host.

radius-server host {*IP-ADDRESS* | *IPV6-ADDRESS***} [auth-port** *PORT***] [acct-port** *PORT***] [timeout** *SECONDS***] [retransmit** *COUNT***] key** *KEY-STRING*

no radius-server host {*IP-ADDRESS* | *IPV6-ADDRESS***}**

Parameters

IP-ADDRESS	Specifies the IP address of the RADIUS server.
IPV6-ADDRESS	Specifies the IPv6 address of the RADIUS server.
auth-port *PORT-NUMBER*	(Optional) Specifies the UDP destination port number for sending authentication packets. The range is 0 to 65535. Set the port number to zero if the server host is not for authentication purposes. The default value is 1812.
acct-port *PORT-NUMBER*	(Optional) Specifies the UDP destination port number for sending accounting packets. The range is 0 to 65535. Set the port number to zero if the server host is not for accounting purposes. The default value is 1813.
timeout *SECONDS*	Specifies the server time-out value. The range of timeout is between 1 and 255 seconds. If not specified, the default value is 5 seconds.
retransmit *COUNT*	(Optional) Specifies the retransmit times of requests to the server when no response is received. The value is from 0 to 20. Use 0 to disable the retransmission. If not specified, the default value is 2
key *KEY-STRING*	Specifies the key used to communicate with the server. The key can between 1 and 32 clear text characters.

Default

By default, no server is configured.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to create RADIUS server hosts before it can be associated with the RADIUS server group using the server command.

Example

This example shows how to create two RADIUS server hosts with the different IP address.

```
Switch# configure terminal
Switch(config)# radius-server host 172.19.10.100 auth-port 1500 acct-port 1501 timeout
8 retransmit 3 key ABCDE
Switch(config)# radius-server host 172.19.10.101 auth-port 1600 acct-port 1601 timeout
3 retransmit 1 key ABCDE
```

```
Switch(config)#
```

29-3 show radius statistics

This command is used to display RADIUS statistics for accounting and authentication packets.

show radius statistics

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display statistics counters related to servers.

Example

This example shows how to display the server related statistics counters.

```
Switch#show radius statistics

RADIUS Server: 172.19.192.80: Auth-Port 1645, Acct-Port 1646

State is UP Auth.   Acct.

Round Trip Time:        10  10
Access Requests:        4   NA
Access Accepts:         0   NA
Access Rejects:         4   NA
Access Challenges:      0   NA
Acct Request:           NA   3
Acct Response:          NA   3
Retransmissions:        0    0
Malformed Responses:    0    0
Bad Authenticators:     0    0
Pending Requests:       0    0
Timeouts:               0    0
Unknown Types:          0    0
Packets Dropped:        0    0
```

Display Parameters

Auth	Statistics for authentication packets.
Acct	Statistics for accounting packets.
Round Trip Time	The time interval (in hundredths of a second) between the most recent Response and the Request that matched it from this RADIUS server.
Access Requests	The number of RADIUS Access-Request packets sent to this server. This does not include retransmissions.
Access Accepts	The number of RADIUS Access-Accept packets (valid or invalid) received from this server.
Access Rejects	The number of RADIUS Access-Reject packets (valid or invalid) received from this server.
Access Challenges	The number of RADIUS Access-Challenge packets (valid or invalid) received from this server.
Acct Request	The number of RADIUS Accounting-Request packets sent. This does not include retransmissions.
Acct Response	The number of RADIUS packets received on the accounting port from this server.
Retransmissions	The number of RADIUS Request packets retransmitted to this RADIUS server. Retransmissions include retries where the Identifier and Acct-Delay have been updated, as well as those in which they remain the same.
Malformed Responses	The number of malformed RADIUS Response packets received from this server. Malformed packets include packets with an invalid length. Bad authenticators or Signature attributes or unknown types are not included as malformed responses.
Bad Authenticators	The number of RADIUS Response packets containing invalid authenticators or Signature attributes received from this server.
Pending Requests	The number of RADIUS Request packets destined for this server that have not yet timed out or received a response. This variable is incremented when a Request is sent and decremented due to receipt of a Response, a timeout or retransmission.
Timeouts	The number of timeouts to this server. After a timeout the client may retry to the same server, send to a different server, or give up. A retry to the same server is counted as a retransmit as well as a timeout. A send to a different server is counted as a Request as well as a timeout.
Unknown Types	The number of RADIUS packets of unknown type which were received from this server.
Packets Dropped	The number of RADIUS packets of which were received from this server and dropped for some other reason.

30. Remote Network MONitoring (RMON) Commands

30-1 rmon collection stats

This command is used to enable RMON statistics on the configured interface. Use the **no** form of this command to disable the RMON statistics.

rmon collection stats INDEX [owner NAME] no rmon collection stats INDEX

Parameters

INDEX	Specifies the Remote Network Monitoring (RMON) table index. The range is from 1 to 65535.
owner *NAME*	Specifies the owner string. The maximum length is 127.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The RMON statistics group entry number is dynamic. Only the interface that is enabled for RMON statistics will have a corresponding entry in the table.

Example

This example shows how to configure an RMON statistics entry with an index of 65 and the owner name “guest” on Ethernet interface Ethernet 1/0/1.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# rmon collection stats 65 owner guest
Switch(config-if)#
```

30-2 rmon collection history

This command is used to enable RMON MIB history statistics gathering on the configured interface. Use the **no** form of this command to disable history statistics gathering on the interface.

rmon collection history *INDEX* **[owner** *NAME***] [buckets** *NUM***] [interval** *SECONDS***]**

no rmon collection history *INDEX*

Parameters

INDEX	Specifies the history group table index. The range is from 1 to 65535.
owner *NAME*	Specifies the owner string. The maximum length is 127.
buckets *NUM*	Specifies the number of buckets specified for the RMON collection history group of statistics. If not specified, the default is 50. The range is from 1 to 65535.
interval *SECONDS*	Specifies the number of seconds in each polling cycle. The range is from 1 to 3600.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The RMON history group entry number is dynamic. Only the interface that is enabled for RMON history statistics gathering will have a corresponding entry in the table. The configured interface becomes the data source for the created entry.

Example

This example shows how to enable the RMON MIB history statistics group on Ethernet interface 1/0/1.

```
Switch# configure terminal Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# rmon collection history 101 owner it@domain.com interval 2000
Switch(config-if)#
```

30-3 rmon alarm

This command is used to configure an alarm entry to monitor an interface. To remove an alarm entry, use the **no** form of this command.

rmon alarm *INDEX VARIABLE INTERVAL* **{delta | absolute} rising-threshold** *VALUE* **[***RISING-EVENT-NUMBER***] falling-threshold** *VALUE* **[***FALLING-EVENT-NUMBER***] [owner** *STRING***]**

no rmon alarm *INDEX*

Parameters

INDEX	Specifies the alarm index. The range is from 1 to 65535.
VARIABLE	Specifies the object identifier of the variable to be sampled.
INTERVAL	Specifies the interval in seconds for the sampling of the variable and checking against the threshold. The valid range is from 1 to 2147483647.

delta	Specifies that the delta of two consecutive sampled values is monitored.
absolute	Specifies that the absolute sampled value is monitored.
rising-threshold *VALUE*	Specifies the rising threshold. The valid range is from 0 to 2147483647.
RISING-EVENT-NUMBER	(Optional) Specifies the index of the event entry that is used to notify the rising threshold crossing event. The valid range is from 1 to 65535. If not specified, no action is taken while crossing the ringing threshold.
falling-threshold *VALUE*	Specifies the falling threshold. The valid range is from 0 to 2147483647.
FALLING-EVENT-NUMBER	(Optional) Specifies the index of the event entry that is used to notify the falling threshold crossing event. The valid range is from 1 to 65535. If not specified, no action is taken while crossing the falling threshold.
owner *STRING*	Specifies the owner string. The maximum length is 127.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The RMON alarm facility periodically takes samples of the value of variables and compares them against the configured threshold.

Example

This example shows how to configure an alarm entry to monitor an interface.

```
Switch# configure terminal
Switch(config)# rmon alarm 783 1.3.6.1.2.1.2.2.1.12.6 30 delta rising-threshold 20 1
falling-threshold 10 1 owner Name
Switch(config)#
```

30-4 rmon event

This command is used to configure an event entry. To remove an event entry, use the **no** form of this command.

rmon event *INDEX* **[log] [[trap** *COMMUNITY***] [owner** *NAME***] [description** *STRING***]**

no rmon event INDEX

Parameters

INDEX	Specifies the index of the alarm entry. The valid range is from 1 to 65535.
log	(Optional) Specifies to generate log message for the notification.
trap *COMMUNITY*	(Optional) Specifies to generate SNMP trap messages for the notification. The maximum length is 127.
owner *NAME*	(Optional) Specifies the owner string. The maximum length is 127.
description STRING	(Optional) Specifies a description for the RMON event entry. Enter a text string with a maximum length of 127 characters.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

If the log and not the trap is specified, the created entry will cause a log entry to be generated on an event occurrence. If the trap and not the log is specified, the created entry will cause an SNMP notification to be generated on an event occurrence.

If both the log and trap options are specified, the created entry will cause both the log entry and the SNMP notification to be generated on event occurrence.

Example

This example shows how to configure an event with an index of 13 to generate a log on the occurrence of the event.

```
Switch# configure terminal
Switch(config)# rmon event 13 log owner it@domain.com description ifInNUcastPkts is too
much
Switch(config)#
```

30-5 show rmon alarm

This command is used to displays the alarm configuration.

show rmon alarm

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays the RMON alarm table.

Example

This example shows how to displays the RMON alarm table.

```
Switch# show rmon alarm

Alarm index 23, owned by IT
  Monitors OID: 1.3.6.1.2.1.2.2.1.10.1 every 120 second(s)
  Taking delta samples, last value was 2500
  Rising threshold is 2000, assigned to event 12
  Falling threshold is 1100, assigned to event 12
  On startup enable rising or falling alarm
Switch#
```

30-6 show rmon events

This command is used to display the RMON event table.

show rmon events

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays the RMON event table.

Example

This example shows how to displays the RMON event table.

```
Switch# show rmon events

Event 1, owned by manager1
  Description is Errors
  Event trigger action: log & trap sent to community
  manager Last triggered time: 13:12:15, 2014-03-12
```

```
Event 2, owned by manager2
  Description is Errors
  Event trigger action: log & trap
  Last triggered time:

Switch#
```

30-7 show rmon history

This command is used to display RMON history statistics information.

show rmon history

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command displays the history of the statistics for all of the configured entries.

Example

This example shows how to display RMON Ethernet history statistics.

```
Switch# show rmon history

Index 23, owned by Manager, Data source is eth4/0/2
  Interval: 30 seconds
  Requested buckets: 50, Granted buckets: 50
  Sample #1
    Received octets: 303595962, Received packets: 357568
    Broadcast packets: 3289, Multicast  packets: 7287
    Estimated utilization: 19
    Undersized packets: 213, Oversized  packets: 24
    Fragments: 2, Jabbers: 1
    CRC alignment errors: 0, Collisions: 0
  Drop events : 0
  Sample #2
    Received octets: 303596354, Received packets: 357898
    Broadcast packets: 3329, Multicast  packets: 7337
    Estimated utilization: 19
    Undersized packets: 213, Oversized  packets: 24
```

```
    Fragments: 2, Jabbers: 1
    CRC alignment errors: 0, Collisions: 0
  Drop events : 0

Switch#
```

30-8 show rmon statistics

This command is used to display RMON Ethernet statistics.

show rmon statistics

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Statistics for all of the configured entries are displayed.

Example

This example shows how to display the RMON statistics.

```
Switch# show rmon statistics

Index 32, owned by it@domain.com, Data Source is   eth4/0/3
  Received Octets : 234000, Received packets : 9706
  Broadcast packets: 2266, Multicast packets: 192
    Undersized packets: 213, Oversized  packets: 24
    Fragments: 2, Jabbers: 1
    CRC alignment errors: 0, Collisions: 0
  Drop events : 0
    Packets in 64 octets: 256, Packets in 65-127 octets : 236
    Packets in 128-255 octets : 129, Packets in 256-511 octets : 10
    Packets in 512-1023 octets : 38, Packets in 1024-1518 octets : 2200

Switch#
```

30-9 snmp-server enable traps rmon

This command is used to enable the RMON trap state.

snmp-server enable traps rmon [rising-alarm | falling-alarm]

no snmp-server enable traps rmon [rising-alarm | falling-alarm]

Parameters

rising-alarm	(Optional) Specifies to configure the rising alarm trap state.
falling-alarm	(Optional) Specifies to configure the falling alarm trap state.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 12.

Usage Guideline

This command enables RMON trap state.

Example

This example shows how to enable the sending of RMON traps for both the falling alarm and rising alarm.

```
Switch# configure terminal
Switch(config)# snmp-server enable traps rmon
Switch(config)#
```

31. Safeguard Engine Commands

31-1 cpu-protect safeguard

This command is used to enable the Safeguard Engine. Use the **no** form of this command to disable the Safeguard Engine.

cpu-protect safeguard

no cpu-protect safeguard

Parameters

None.

Default

By default, Safeguard Engine is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The Safeguard Engine can help the overall operability of the device by minimizing the workload of the Switch while the attack is ongoing, thus making it capable to forward essential packets over its network in a limited bandwidth.

Example

This example shows how to enable the Safeguard Engine.

```
Switch# configure terminal
Switch(config)# cpu-protect safeguard
Switch(config)#
```

31-2 show cpu-protect safeguard

This command is used to display the status of the Safeguard Engine.

show cpu-protect safeguard

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display the status of the Safeguard Engine.

Example

This example shows how to display the current status of the Safeguard Engine.

```
Switch# show cpu-protect safeguard

 Safeguard Enfine State   : Disabled
 Safeguard Enfine Status  : Normal

Switch#
```

32. Simple Network Management Protocol(SNMP) Commands

32-1 show snmp-server

This command is used to display the SNMP server's global state settings and trap related settings.

show snmp-server [traps]

Parameters

traps	(Optional) Specifies to display trap related settings.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use the show snmp-server command to display the SNMP server global state settings. Use the show snmp-server traps command to display trap related settings.

Example

This example shows how to display the SNMP server configuration.

```
Switch# show snmp-server

SNMP Server : Enabled
Name        : SiteA-Switch
Location    : HQ 15F
Contact     : MIS Department II

Switch#
```

This example shows how to display trap related settings.

```
Switch# show snmp-server traps

Global Trap State : Enabled
Individual Trap State:
   Authentication   : Enabled
   linkup       : Enabled
   linkdown     : Enabled
   coldstart    : Enabled
```

```
    warmstart    : Disabled


Switch#
```

32-2 snmp-server

This command is used to enable the SNMP agent. Use the **no** form of this command to disable the SNMP agent.

snmp-server

no snmp-server

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The SNMP manager manages a SNMP agent by sending SNMP requests to agents and receiving SNMP responses and notifications from agents. The SNMP server on the agent must be enabled before the agent can be managed.

Example

This example shows how to enable the SNMP server.

```
Switch# configure terminal
Switch(config)# snmp-server
Switch(config)#
```

32-3 snmp-server contact

This command is used to configure the system contact information for the device. Use the **no** form of this command to remove the setting.

snmp-server contact *TEXT*

no snmp-server contact

Parameters

contact *TEXT*	Specifies a string for describing the system contact information.

	The maximum length is 255 characters The syntax is a general string that allows spaces.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command configures the system contact information for management of the device.

Example

This example shows how to configure the system contact information with the string MIS Department.

```
Switch# configure terminal
Switch(config)# snmp-server contact MIS Department
Switch(config)#
```

32-4 snmp-server enable traps

This command is used to enable the sending of trap packets globally. Use the **no** form of this command to disable the sending of trap packets.

snmp-server enable traps

no snmp-server enable traps

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command enables the device to send the SNMP notification traps globally. To configure the router to send these SNMP notifications, enter the snmp-server enable traps command to enable the global setting.

Example

This example shows how to enable the SNMP traps global sending state.

```
Switch# configure terminal
Switch(config)# snmp-server enable traps
```

```
Switch(config)#
```

32-5 snmp-server enable traps snmp

This command is used to enable the sending of all or specific SNMP notifications. Use the **no** form of this command to disable sending of all or specific SNMP notifications.

snmp-server enable traps snmp [authentication] [linkup] [linkdown] [coldstart] [warmstart]

no snmp-server enable traps snmp [authentication] [linkup] [linkdown] [coldstart] [warmstart]

Parameters

authentication	(Optional) Specifies to control the sending of SNMP authentication failure notifications. An authentication Failure trap is generated when the device receives an SNMP message that is not properly authenticated. The authentication method depends on the version of SNMP being used. For SNMPv1 or SNMPv2c, authentication failure occurs if packets are formed with an incorrect community string. For SNMPv3, authentication failure occurs if packets are formed with an incorrect SHA/MD5 authentication key.
linkup	(Optional) Specifies to control the sending of SNMP linkup notifications. A linkup (3) trap is generated when the device recognizes that one of the communication links has come up.
linkdown	(Optional) Specifies to control the sending of SNMP linkDown notifications. A linkDown (2) trap is generated when the device recognizes a failure in one of the communication links.
coldstart	(Optional) Specifies to control the sending of SNMP coldStart notifications.
warmstart	(Optional) Specifies to control the sending of SNMP warmStart notifications.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command controls the sending of SNMP standard notification traps. To enable the sending of notification traps, the global setting must be enabled too.

Example

This example shows how to enable the switch to send all SNMP traps to the host 10.9.18.100 using the community string defined as public.

```
Switch# configure terminal
Switch(config)# snmp-server enable traps
Switch(config)# snmp-server enable traps snmp
```

```
Switch(config)# snmp-server host 10.9.18.100 version 2c public
Switch(config)#
```

This example shows how to enable the SNMP authentication traps.

```
Switch# configure terminal
Switch(config)# snmp-server enable traps snmp authentication
Switch(config)#
```

32-6 snmp-server location

This command is used to configure the system's location information. Use the **no** form of this command to remove the setting.

snmp-server location *TEXT*

no snmp-server location

Parameters

location *TEXT*	Specifies the string that describes the system location information. The maximum length is 255 characters. The syntax is a general string that allows spaces.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure the system's location information on the Switch.

Example

This example shows how to configure the system's location information with the string "HQ 15F".

```
Switch# configure terminal
Switch(config)# snmp-server location HQ 15F
Switch(config)#
```

32-7 snmp-server name

This command is used to configure the system's name information. Use the **no** form of this command to remove the setting.

snmp-server name *NAME*

no snmp-server name

Parameters

NAME	Specifies the string that describes the SNMP server name information. Spaces are not allowed here.

Default

By default, this name is "Switch".

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure the system's name information on the Switch.

Example

This example shows how to configure the system's name to "SiteA-switch".

```
Switch#configure terminal
Switch(config)#snmp-server name SiteA-switch
SiteA-switch(config)#
```

32-8 show snmp

This command is used to display the SNMP settings.

show snmp {community | host | view | group | engineID }

Parameters

community	Specifies to display SNMP community information.
host	Specifies to display SNMP trap recipient information.
view	Specifies to display SNMP view information.
group	Specifies to display SNMP group information.
engineID	Specifies to display SNMP local engine ID information.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command displays the SNMP information.

Example

This example shows how to display SNMP community information.

```
Switch# show snmp community

Codes: ro - read only, rw - Read Write
Community                       access    view
------------------------------  ------   ------
public                           ro      CommunityView
private                          rw      CommunityView

Total Entries : 2
Switch#
```

This example shows how to display the SNMP server host setting.

```
Switch# show snmp host

Host IP Address :   10.20.30.40
SNMP Version    :   V1
Community Name  :   public
UDP Port    :   162

Host IP Address :   10.10.10.1
SNMP Version    :   V3 noauthnopriv
SNMPv3 User Name :  user1
UDP Port    :   162

Total Entries: 2

Switch#
```

This example shows how to display the MIB view setting.

```
Switch# show snmp view

View Name                     Subtree                   View Type
------------------------------------------------------------
restricted                    1.3.6.1.2.1.1             Included
restricted                    1.3.6.1.2.1.11            Included
restricted                    1.3.6.1.2.1.10.2.1        Included
restricted                    1.3.6.1.2.1.11.2.1        Included
restricted                    1.3.6.1.2.1.15.1.1        Included
CommunityView                 1                         Included
CommunityView                 1.3.6.1.6.3               Excluded
CommunityView                 1.3.6.1.6.3.1             Included
Total Entries: 8

Switch#
```

This example shows how to display the SNMP group setting.

```
Switch# show snmp group

 GroupName: initial                          SecurityModel: v3/noauth
   ReadView     : restricted                 WriteView    :
   NotifyView   : restricted

 GroupName: ReadGroup                        SecurityModel: v1
   ReadView     : CommunityView              WriteView    :
   NotifyView   : CommunityView

 GroupName: ReadGroup                        SecurityModel: v2c
   ReadView     : CommunityView              WriteView    :
   NotifyView   : CommunityView

 GroupName: WriteGroup                       SecurityModel: v1
   ReadView     : CommunityView              WriteView    : CommunityView
   NotifyView   : CommunityView

 GroupName: WriteGroup                       SecurityModel: v2c
   ReadView     : CommunityView              WriteView    : CommunityView
   NotifyView   : CommunityView

 GroupName: private                          SecurityModel: v1
   ReadView     : CommunityView              WriteView    : CommunityView
   NotifyView   : CommunityView

 GroupName: private                          SecurityModel: v2c
   ReadView     : CommunityView              WriteView    : CommunityView
   NotifyView   : CommunityView

 GroupName: public                           SecurityModel: v1
   ReadView     : CommunityView              WriteView    :
   NotifyView   : CommunityView

 GroupName: public                           SecurityModel: v2c
   ReadView     : CommunityView              WriteView    :
   NotifyView   : CommunityView


 Total Entries : 9

Switch#
```

This example shows how to display the SNMP engine ID.

```
Switch# show snmp engineID

 Local SNMP engineID : 800000ab03000102183401

Switch#
```

32-9 show snmp user

This command is used to display information about the configured SNMP user.

show snmp user [*USER-NAME***]**

Parameters

USER-NAME	(Optional) Specifies the name of a specific user to display SNMP information.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

When the username argument is not specified, all configured users will be displayed. The community string created will not displayed by this command.

Example

This example shows how SNMP users are displayed.

```
Switch# show snmp user authuser
User name: authuser
Security Model: v2c
Group Name: VacmGroupName
IP access control list: HB5
User name: authuser
Security Model: v3 priv
Group Name: VacmGroupName
Authentication Protocol: MD5
Privacy Protocol: DES
Engine ID: 0000000902000000C025808
IP access control list:
Total Entries: 2
Switch#
```

32-10 snmp-server community

This command is used to configure the community string to access the SNMP. Use the **no** form of this command to remove the community string,

snmp-server community *COMMUNITY-STRING* **[ro | rw] [view** *VIEW-NAME***]**

no snmp-server community *COMMUNITY-STRING*

Parameters

COMMUNITY-STRING	Specifies the community string with a maximum of 32 characters. Spaces are not allowed here.
ro	(Optional) Specifies read-only access.
rw	(Optional) Specifies read-write access.
view *VIEW-NAME*	(Optional) Specifies a view name of a previously defined view. It defines the view accessible by the SNMP community.

Default

Community	View Name	Access right
private	CommunityView	Read/Write
public	CommunityView	Read Only

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command provides an easy way to create a community string for SNMPv1 and SNMPv2c management. When creating a community with the snmp-server community command, two SNMP group entries, one for SNMPv1 and one for SNMPv2c, which has the community name as their group names are created. If the view is not specified, it is permitted to access all objects.

Example

This example shows how to create a new community named “comaccess” with read-only access right.

```
Switch# configure terminal
Switch(config)# snmp-server view interfacesMibView 1.3.6.1.2.1.1.2 included
Switch(config)# snmp-server community comaccess view interfacesMibView ro

Switch(config)#
```

32-11 snmp-server engineID local

This command is used to specify the SNMP engine ID on the local device. Use the **no** command to revert the SNMP engine ID to the default.

snmp-server engineID local *ENGINEID-STRING*

no snmp-server engineID local

Parameters

ENGINEID-STRING	Specifies the engine ID string of a maximum of 24 characters.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

An SNMP engine ID is not displayed or stored in the running configuration. The SNMP engine ID is a unique string to identify the device. A string is generated by default. If you configure a string less than 24 characters, it will be filled with trailing zeros up to 24 characters.

Example

This example shows how to configure the SNMP engine ID to 332200000000000000000000.

```
Switch# configure terminal
Switch(config)# snmp-server engineID local 332200000000000000000000
Switch(config)#
```

32-12 snmp-server group

This command is used to configure an SNMP group. Use the no command to remove a SNMP group or remove a group from using a specific security model.

snmp-server group *GROUP-NAME* **{v1 | v2c | v3 {auth | noauth | priv}} [read** *READ-VIEW***] [write** *WRITE-VIEW***] [notify** *NOTIFY-VIEW***]**

no snmp-server group *GROUP-NAME* **{v1 | v2c | v3 {auth | noauth | priv}}**

Parameters

GROUP-NAME	Specifies the group name of a maximum of 32 characters. The syntax is general string that does not allow space.
v1	Specifies that the group user can use the SNMPv1 security model.

v2c	Specifies that the group user can use the SNMPv2c security model.
v3	Specifies that the group user can use the SNMPv3 security model.
auth	Specifies to authenticate the packet but not encrypt it.
noauth	Specifies not to authenticate and not to encrypt the packet.
priv	Specifies to authenticate and encrypt the packet.
read *READ-VIEW*	(Optional) Specifies a read-view that the group user can access.
write *WRITE-VIEW*	(Optional) Specifies a write-view that the group user can access.
notify *NOTIFY-VIEW*	(Optional) Specifies a write-view that the group user can access. The notify view describes the object that can be reported its status via trap packets to the group user.

Default

Group Name	Version	Security Level	Read View Name	Write View Name	Notify View Name
Initial	SNMPv3	noauth	Restricted	None	Restricted
ReadGroup	SNMPv1	noauth	CommunityView	None	CommunityView
ReadGroup	SNMPv2c	noauth	CommunityView	None	CommunityView
WriteGroup	SNMPv1	noauth	CommunityView	CommunityView	CommunityView
WriteGroup	SNMPv2c	noauth	CommunityView	CommunityView	CommunityView

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

An SNMP group defines a user group by specifying the allowed security model, the read-view, the write-view, and the notification view. The security model defines that the group user is allowed to use the specified version of SNMP to access the SNMP agent,

The same group name can be created with security models SNMPv1, SNMPv2c, and SNMPv3 at the same time. For SNMPv3, it can be created for SNMPv3 auth and SNMPv3 priv at the same time.

To update the view profile for a group for a specific security model, delete and create the group with the new view profile.

The read-view defines the MIB objects that the group user is allowed to read. If read-view is not specified, then Internet OID space 1.3.6.1 can be read.

The write-view defines the MIB objects that the group user is allowed to write. If write-view is not specified, then no MIB objects can be written.

The notification view defines the MIB objects that the system can report its status in the notification packets to the trap managers that are identified by the specified group user (act as community string). If notify-view is not specified, then no MIB objects can be reported.

Example

This example shows how to create the SNMP server group “guestgroup” for SNMPv3 access and SNMPv2c.

```
Switch# configure terminal
Switch(config)# snmp-server view interfacesMibView 1.3.6.1.2.1.2 included
Switch(config)# snmp-server group guestgroup v3 auth read interfacesMibView
Switch(config)# snmp-server group guestgroup v2c read CommunityView write CommunityView
Switch(config)#
```

32-13 snmp-server host

This command is used to specify the recipient of the SNMP notification. Use the **no** form of this command to remove the recipient.

snmp-server host {*IP-ADDRESS***} [version {1 | 2c | 3 {auth | noauth | priv}}]** *COMMUNITY-STRING* ***[port*** *PORT-NUMBER]*

no snmp-server host {*IP-ADDRESS* **}**

Parameters

IP-ADDRESS	Specifies the IPv4 address of the SNMP notification host.
version	(Optional) Specifies the version of the SNMP used to send the traps. If not specified, the default is SNMPv1 1 - SNMPv1. 2c - SNMPv2c. 3 - SNMPv3.
auth	Specifies to authenticate the packet but not to encrypt it.
noauth	Specifies not to authenticate and to encrypt the packet.
priv	Specifies to both authenticate and to encrypt the packet.
COMMUNITY-STRING	Specifies the community string to be sent with the notification packet. If the version is 3, the community string is used as the username as defined in the snmp-sever user command.
PORT-NUMBER	Specifies the UDP port number. The default trap UDP port number is 162. The range of UDP port numbers is from 0 to 65535. Some port numbers may conflict with other protocols.

Default

By default, the version used is 1.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

SNMP notifications are sent as trap packets. The user should create at least one recipient of a SNMP notification by using the snmp-server host command in order for the Switch to send the SNMP notifications. Specify the version of the n otification packet for the created user. For SNMPv1 and SNMPv2c, the notification will be sent in the trap protocol data unit (PDU). For SNMPv3, the notification will be sent in the

SNMPv2-TRAP-PDU with the SNMPv3 header.

When specifying to send the trap packets in SNMPv1 or SNMPv2c to a specific host, the specified community string acts as the community string in the trap packets.

When specifying to send the trap packets in SNMPv3 to a specific host, whether to do authentication and encryption in the sending of the packet should be specified. The specified community string acts as the username in the SNMPv3 packet. The user must be created first using the snmp-server user command or snmp-server user v3 command.

In the sending of the trap packet, the system will check the notification view associated with the specified user (or community name). If the binding variables to be sent with the trap packet are not in the notification view, the notification will not be sent to this host.

Example

This example shows how to configure the trap recipient 163.10.50.126 with version 1 with community string “comaccess”.

```
Switch# configure terminal
Switch(config)# snmp-server community comaccess rw
Switch(config)# snmp-server host 163.10.50.126 version 1 comaccess
Switch(config)#
```

This example shows how to configure the trap recipient 163.10.50.126 with version 3 authentication security level and with the username “useraccess”.

```
Switch# configure terminal
Switch(config)# snmp-server group groupaccess v3 auth read CommunityView write
CommunityView
Switch(config)# snmp-server user useraccess groupaccess v3 auth md5 12345678
Switch(config)# snmp-server host 163.10.50.126 version 3 auth useraccess
Switch(config)#
```

This example shows how to configure the trap recipient 163.10.50.126 with version 1 with the community string “comaccess”. The UDP port number is configured to 50001.

```
Switch# configure terminal
Switch(config)# snmp-server community comaccess rw
Switch(config)# snmp-server host 163.10.50.126 version 1 comaccess port 50001
Switch(config)#
```

32-14 snmp-server user

This command is used to create an SNMP user. Use the no form of this command to remove an SNMP user.

snmp-server user *USER-NAME GROUP-NAME* **{v1 | v2c | v3 [auth {md5 | sha}** *AUTH-PASSWORD* **[priv** *PRIV-PASSWORD*]]}

no snmp-server user *USER-NAME GROUP-NAME* **{v1 | v2c | v3}**

Parameters

USER-NAME	Specifies a username of a maximum of 32 characters. The syntax is general string that does not allow spaces.
GROUP-NAME	Specifies the name of the group to which the user belongs. The syntax is general string that does not allow spaces.
v1	Specifies that the user uses the SNMPv1 security model.
v2c	Specifies that the user uses the SNMPv2c security model.
v3	Specifies that the user uses the SNMPv3 security model.
auth	(Optional) Specifies the authentication level.
md5	Specifies to use HMAC-MD5-96 authentication.
sha	Specifies to use HMAC-SHA-96 authentication.
AUTH-PASSWORD	Specifies the authentication password in the plain-text form. This password is 8 to 16 octets for MD5 and 8 to 20 octets for SHA. If the keyword encrypted is specified, the length is 32 for MD5 and 40 for SHA. The format is a hexadecimal value.
PRIV-PASSWORD	Specifies a privacy key used by DES. In the plain-text form, this password is 8 to 16 octets. If the keyword encrypted is specified, the length is fixed to 32 octets.

Default

By default, there is one user.

User Name: initial.

Group Name: initial.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

To create a SMNP user, specify the security model that the user uses and the group that the user is created for. To create an SNMPv3 user, the password used for authentication and encryption needs to be specified. An SNMP user is unable to be deleted if it has been associated with a SNMP server host.

Example

This example shows how the plain-text password is configured for the user “user1” in the SNMPv3 group public.

```
Switch# configure terminal
Switch(config)# snmp-server user user1 public v3 auth md5 authpassword priv privpassword
Switch(config)#
```

This example shows how the MD5 digest string is used instead of the plain text password.

```
Switch# configure terminal
Switch(config)# snmp-server user user1 public v3 auth md5 112233445566778899AABBCCDDEE
Switch(config)#
```

32-15 snmp-server view

This command is used to create or modify a view entry. Use the **no** form of this command to remove a specified SNMP view entry.

snmp-server view *VIEW-NAME OID-TREE* **{included | excluded}**

no snmp-server view *VIEW-NAME*

Parameters

VIEW-NAME	Specifies the name of the view entry. The valid length is 1 to 32 characters. The syntax is general string that does not allow spaces.
OID-TREE	Specifies the object identifier of the ASN.1 sub-tree to be included or excluded from the view. To identify the sub-tree, specify a text string consisting of numbers, such as 1.3.6.2.4, or a word, such as system. Use the asterisk (*) wildcard in a single sub-identifier to specify a sub-tree family.
included	Specifies the sub-tree to be included in the SNMP view.
excluded	Specifies the sub-tree to be excluded from the SNMP view.

Default

VIEW-NAME	OID-TREE	View Type
Restricted	1.3.6.1.2.1.1	Included
Restricted	1.3.6.1.2.1.11	Included
Restricted	1.3.6.1.6.3.10.2.1	Included
Restricted	1.3.6.1.6.3.11.2.1	Included
Restricted	1.3.6.1.6.3.15.1.1	Included
CommunityView	1	Included
CommunityView	1.3.6.1.6.3	Excluded
CommunityView	1.3.6.1.6.3.1	Included

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to create a view of MIB objects.

Example

This example shows how to create a MIB view called “interfacesMibView” and define an SNMP group “guestgroup” with “InterfaceMIBView” as the read view.

```
Switch# configure terminal
Switch(config)# snmp-server view interfacesMibView 1.3.6.1.2.1.2 included
Switch(config)# snmp-server group guestgroup v3 auth read interfacesMibView
Switch(config)#
```

33. Spanning Tree Protocol (STP) Commands

33-1 show spanning-tree

This command is used to display the information of spanning tree protocol operation. This command is only for STP and RSTP.

show spanning-tree [interface [*INTERFACE-ID* **[, | -]]**

Parameters

interface *INTERFACE-ID*	Specifies the interface ID to display.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space before and after the comma.
-	(Optional) Specifies a range of interfaces. No space before and after the hyphen.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the Spanning Tree configuration for the single spanning tree when in the RSTP or STP-compatible mode.

Example

This example shows how to display the spanning tree information when STP is enabled.

```
Switch# show spanning-tree

Spanning Tree : Enabled
BPDU Forward  : Disabled
 Protocol Mode : RSTP
 Root ID Priority : 32768
         Address  : 00-01-C1-13-14-08
         Max Age  : 20 sec, Forward Delay : 15 sec

Interface      Role       State      Cost      Priority  Edge
  -------------  ----       -----      ----      --------  ----
  eth1/0/1       designated  discarding  200000    128      non-edge
  eth1/0/2       designated  discarding  200000    128      non-edge

Switch#
```

33-2 show spanning-tree configuration interface

This command is used to display the information about STP interface related configuration.

show spanning-tree configuration interface [*INTERFACE-ID* **[, | -]]**

Parameters

interface *INTERFACE-ID*	Specifies the interface ID to display.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space before and after the comma.
-	(Optional) Specifies a range of interfaces. No space before and after the hyphen.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display Spanning Tree interface level configuration. The command can be used for all STP versions.

Example

This example shows how to display spanning tree configuration information for interface Ethernet 1/0/1.

```
Switch#show spanning-tree configuration interface Ethernet 1/0/1


eth1/0/1
Port fast: edge


Switch#
```

33-3 snmp-server enable traps stp

This command is used to enable the spanning tree to send SNMP notifications for STP. Use the **no** form of this command to disable the sending of notifications for STP.

snmp-server enable traps stp [new-root] [topology-chg]

no snmp-server enable traps stp [new-root] [topology-chg]

Parameters

new-root	(Optional) Specifies the sending of STP new root notification.
topology-chg	(Optional) Specifies the sending of STP topology change notification.

Default

By default, these options are disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enable the sending of notification traps. When using this command with no parameters specified, both STP notification types are enabled or disabled.

Example

This example shows how to enable the switch to send all STP traps to the host 10.9.18.100 using the community string defined as public.

```
Switch# configure terminal
Switch(config)# snmp-server enable traps
Switch(config)# snmp-server enable traps stp
Switch(config)# snmp-server host 10.9.18.100 version 2c public
Switch(config)#
```

33-4 spanning-tree global state

This command is used to enable or disable the STP's global state. Use the **no** form to disable the STP's global state.

spanning-tree global state {enable | disable}

no spanning-tree global state

Parameters

enable	Specifies to enable the STP's global state.
disable	Specifies to disable the STP's global state.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command in the global configuration mode to enable the global spanning-tree function.

Example

This example shows how to enable the spanning-tree function.

```
Switch# configure terminal
Switch(config)# spanning-tree global state enable
Switch(config)#
```

33-5 spanning-tree mode

This command is used to configure the STP mode. Use the **no** form of this command to revert to the default setting.

spanning-tree mode {mstp | rstp |stp}

no spanning-tree mode

Parameters

mstp	Specifies the Multiple Spanning Tree Protocol (MSTP).
rstp	Specifies the Rapid Spanning Tree Protocol (RSTP).
stp	Specifies the Spanning Tree Protocol (IEEE 802.1D Compatible)

Default

By default, this mode is rstp.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

If the mode is configured as STP or RSTP, all currently running MSTP instances will be cancelled automatically. If the newly configured mode is changed from the previous one, the spanning- tree state machine will restart again, therefore all of the stable spanning-tree port states will transit into discarding states.

Example

This example shows how to configure the running version of the RSTP module to STP.

```
Switch# configure terminal
Switch(config)# spanning-tree mode stp
Switch(config)#
```

33-6 spanning-tree portfast

This command is used to specify the port's fast mode. Use the **no** form of this command to revert to the default setting.

spanning-tree portfast {disable | edge| network}

no spanning-tree portfast

Parameters

disable	Specifies to set the port to the port fast disabled mode.
edge	Specifies to set the port to the port fast edge mode.
network	Specifies to set the port to the port fast network mode.

Default

By default, this option is edge.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

A port can be in one of the following three port fast modes:

- **Edge mode -** The port will directly change to the spanning-tree forwarding state when a link-up occurs without waiting for the forward-time delay. If the interface receives a BPDU later, its operation state changes to the non-port-fast state.
- **Disable mode -** The port will always be in the non-port-fast state. It will always wait for the forward-time delay to change to forwarding state.
- **Network mode -** The port will remain in the non-port-fast state for three seconds. The port will change to the port-fast state if no BPDU is received and changes to the forwarding state. If the port received the BPDU later, it will change to the non-port-fast state

This command should be used with caution. Otherwise, an accidental topology loop and data-packet loop may be generated and disrupt the network operation.

Example

This example shows how to configure port Ethernet 1/0/1 to the port-fast network mode.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# spanning-tree portfast network
Switch(config-if)#
```

33-7 spanning-tree priority

This command is used to configure the bridge priority. It is only used for RSTP and STP versions. Use the **no** form of this command to restore to the default setting.

spanning-tree priority *PRIORITY*

no spanning-tree priority

Parameters

PRIORITY	Specifies that the bridge priority and bridge MAC address together forms the Spanning-Tree Bridge-ID, which is an important factor in the Spanning-Tree topology. The range is from 0 to 61440.

Default

By default, this value is 32768.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The bridge priority value is one of the two parameters used to select the Root Bridge. The other parameter is system's MAC address. The bridge's priority value must be divisible by 4096 and a smaller number represents a better priority.

This configuration will take effect on STP version and RSTP mode. In the MSTP mode, use the command **spanning-tree mst priority** to configure the priority for an MSTP instance.

Example

This example shows how to configure the STP bridge priority value to 4096.

```
Switch# configure terminal
Switch(config)# spanning-tree priority 4096
Switch(config)#
```

33-8 spanning-tree forward-bpdu

This command is used to enable the forwarding of the spanning tree BPDU. Use the **no** form of this command to disable the forwarding of the spanning tree BPDU.

spanning-tree forward-bpdu

no spanning-tree forward-bpdu

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

If enabled, the received STP BPDU will be forwarded to all VLAN member ports in the untagged form. The command does not take effect if the Layer 2 protocol tunnel is enabled for STP.

Example

This example shows how to enable the forwarding of STP BPDUs.

```
Switch# configure terminal
Switch(config)# spanning-tree forward-bpdu
Switch(config)#
```

34. Storm Control Commands

34-1 storm-control

This command is used to configure the device to protect the device from broadcast, multicast, and DA unknown packet storm attacks. Use the **no** form of this command to restore the function to its default settings.

storm-control {broadcast | multicast | unicast} level pps <*threshold*>

no storm-control {broadcast | multicast | unicast | action}

Parameters

broadcast	Specifies to set the broadcast rate limit.
multicast	Specifies to set the multicast rate limit.
unicast	Specifies to set the unicast rate limit.
threshold	Threshold of packets per second.

Default

By default, the broadcast, multicast, and unicast (DLF) storm controls are disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use the storm control function to protect the network from the storm of broadcast packets, multicast packets, or unknown DA flooding packets. Enter the storm-control command to enable storm control for a specific traffic type on the switch.

Example

This example shows how to enable broadcast storm control on switch. It sets the threshold to 512 pps.

```
Switch# configure terminal
Switch(config)# storm-control broadcast level pps 512
Switch(config)#
```

34-2 show storm-control

This command is used to display the current storm control settings.

show storm-control

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

None.

Example

This example shows how to display the current storm control settings.

```
Switch# show storm-control

Storm       Status    Threshold
 ---------- --------- ------------
 Unicast    Disabled   1 pps
 Multicast   Enabled    512 pps
 Broadcast   Disabled   1 pps

Switch#
```

34-3 spanning-tree priority

This command is used to configure the bridge priority. It is only used for RSTP and STP versions. Use the **no** form of this command to restore to the default setting.

spanning-tree priority *PRIORITY*

no spanning-tree priority

Parameters

PRIORITY	Specifies that the bridge priority and bridge MAC address together forms the Spanning-Tree Bridge-ID, which is an important factor in the Spanning-Tree topology. The range is from 0 to 61440.

Default

By default, this value is 32768.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The bridge priority value is one of the two parameters used to select the Root Bridge. The other parameter is system's MAC address. The bridge's priority value must be divisible by 4096 and a smaller number represents a better priority.

This configuration will take effect on STP version and RSTP mode. In the MSTP mode, use the command **spanning-tree mst priority** to configure the priority for an MSTP instance.

Example

This example shows how to configure the STP bridge priority value to 4096.

```
Switch# configure terminal
Switch(config)# spanning-tree priority 4096
Switch(config)#
```

35. Surveillance VLAN Commands

35-1 surveillance vlan

This command is used to enable the global surveillance VLAN state and configure the surveillance VLAN. Use the **no** form of this command to disable the surveillance VLAN state.

surveillance vlan *VLAN-ID*

no surveillance vlan

Parameters

VLAN-ID	Specifies the ID of the surveillance VLAN. The range is from 2 to 4094.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to enable the global surveillance VLAN function and to specify the surveillance VLAN on the Switch. The Switch has only one Surveillance VLAN. This surveillance VLAN also supports to recognize the surveillance devices, like IP Cameras (IPC) and Network Video Recorders (NVR), using the ONVIF protocol.

Both the **surveillance vlan** command in the Global Configuration Mode and the **surveillance vlan enable** command in the Interface Configuration Mode need to be enabled for a port to start the surveillance VLAN function.

When surveillance VLAN is enabled for a port, the port will automatically be learned as a surveillance VLAN untagged member. Received untagged surveillance packets will be forwarded in surveillance VLAN. Received packets are determined as surveillance packets if the source MAC addresses of packets comply with the OUI addresses configured by the **surveillance vlan mac-address** command.

An auto-surveillance VLAN can also be used to carry video traffic from an IP camera and its related components like Video Management Servers (VMS), VMS clients, and video encoders. These devices can be recognized by an OUI address and the ONVIF protocol. If the IPC is recognized by the ONVIF protocol, the Switch will learn the IPC on a port by snooping Hello/ProbeMatch packets and then insert the port into the surveillance VLAN. The Switch regards a host as an NVR once it connects to the IPC via HTTP, HTTPS or RTSP. The Switch will learn the NVR on this port and insert it into the surveillance VLAN.

If the IPC is recognized by OUI address, the Switch will determine whether a received packet is a video packet or not by checking its IPC MAC address. If the source MAC addresses of the untagged packets has the same MAC address as the IPC. These packets are determined as video packets and transmitted in surveillance VLANs. If the incoming video packet is tagged, and its VLAN ID is equal to the surveillance VLAN, the priority of the packet will be remarked with video traffic priority.

When the IPC is recognized by its OUI address and ONVIF protocol at the same time, this IPC will be recognized by the ONVIF protocol and take action. If the resource supported ONVIF device is depleted, the IPC will be recognized by OUI address.

The VLAN to be specified as a surveillance VLAN needs to pre-exist to use this command.

If the surveillance VLAN is configured, then the surveillance VLAN by the **vlan** command cannot be removed.

Example

This example shows how to enable the surveillance VLAN function and configure VLAN 1001 as a Surveillance VLAN.

```
Switch# config terminal
Switch(config)# surveillance vlan 1001
Switch(config)#
```

35-2 surveillance vlan aging

This command is used to configure the aging time for aging out the surveillance VLAN dynamic member ports. Use the **no** form of this command to revert to the default setting.

surveillance vlan aging *MINUTES*

no surveillance vlan aging

Parameters

MINUTES	Specifies the aging time of surveillance VLAN. The range is from 1 to 65535 minutes.

Default

By default, this aging time is 720 minutes.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure the aging time for aging out the surveillance device and the surveillance VLAN automatically learned member ports.

When the last surveillance device connected to the port stops sending traffic, and the MAC address of this surveillance device is aged out, the surveillance VLAN aging timer will be started. The port will be removed from the surveillance VLAN after expiration of surveillance VLAN aging timer.

If the surveillance traffic resumes during the aging time, the aging timer will be cancelled.

Example

This example shows how to configure the aging time of surveillance VLAN to 30 minutes.

```
Switch# config terminal
Switch(config)# surveillance vlan aging 30
Switch(config)#
```

35-3 surveillance vlan enable

This command is used to enable the surveillance VLAN state of ports. Use the **no** form of this command to disable the surveillance VLAN state of ports.

surveillance vlan enable

no surveillance vlan enable

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The command is available for physical port and port-channel interface configuration.

The command takes effect for access ports or hybrid ports.

Use this command to enable the surveillance VLAN function for ports.

Both the **surveillance vlan** command in Global Configuration Mode and the **surveillance vlan enable** command in Interface Configuration Mode need to be enabled for a port to start the surveillance VLAN function.

When surveillance VLAN is enabled for a port, the port will be automatically learned as surveillance VLAN untagged member, the received untagged surveillance packets will be forwarded to surveillance VLAN. The received packets are determined as surveillance packets if the source MAC addresses of packets comply with the OUI addresses configured by the **surveillance vlan mac-address** command.

Example

This example shows how to enable surveillance VLAN function on physical port eth1/0/1.

```
Switch# config terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)#surveillance vlan enable
Switch(config-if)#
```

35-4 surveillance vlan mac-address

This command is used to add the user-defined surveillance device OUI. Use the **no** form of this command to delete the user-defined surveillance device OUI.

surveillance vlan mac-address *MAC-ADDRESS MASK* **[component-type {vms | vms-client | video-encoder | network-storage | other} description** *TEXT***]**

no surveillance vlan mac-address *MAC-ADDRESS MASK*

Parameters

MAC-ADDRESS	Specifies the OUI MAC address.
MASK	Specifies the OUI MAC address matching bitmask.

component-type	(Optional) Specifies surveillance components that could be auto-detected by surveillance VLAN.
vms	(Optional) Specifies the surveillance components type as Video Management Server (VMS).
vms-client	(Optional) Specifies the surveillance components type as VMS client.
video-encoder	(Optional) Specifies the surveillance components type as Video Encoder.
network-storage	(Optional) Specifies the surveillance components type as Network Storage.
other	(Optional) Specifies the surveillance components type as other IP Surveillance Devices.
description *TEXT*	(Optional) Specifies the description for the user-defined OUI with a maximum of 32 characters.

Default

OUI Address	Mask	Component Type	Description
28-10-7B-00-00-00	FF-FF-FF-E0-00-00	D-Link Device	IP Surveillance Device
28-10-7B-20-00-00	FF-FF-FF-F0-00-00	D-Link Device	IP Surveillance Device
B0-C5-54-00-00-00	FF-FF-FF-80-00-00	D-Link Device	IP Surveillance Device
F0-7D-68-00-00-00	FF-FF-FF-F0-00-00	D-Link Device	IP Surveillance Device

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to add user-defined OUI(s) for the surveillance VLAN. The OUI for surveillance VLAN are used to identify the surveillance traffic by the surveillance VLAN function.

If the source MAC addresses of the received packet matches any of the OUI pattern, the received packet is determined as a surveillance packet.

The user-defined OUI cannot be the same as the default OUI.

The default OUI cannot be deleted.

Example

This example shows how to add a user-defined OUI for surveillance devices.

```
Switch# config terminal
Switch(config)# surveillance vlan mac-address 00-01-02-03-00-00 FF-FF-FF-FF-00-00
component-type vms description user1
Switch(config)#
```

35-5 surveillance vlan onvif-discover-port

This command is used to configure the TCP/UDP port number for RTSP stream snooping. Use the **no** form of this command to revert to the default setting.

surveillance vlan onvif-discover-port *VALUE*

no surveillance vlan onvif-discover-port

Parameters

VALUE	Enter the TCP/UDP port number here. The range is either 554, or from 1025 to 65535.

Default

By default, this value is 554.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to configure the TCP/UDP port number for RTSP stream snooping. ONVIF-capable IPC and ONVIF-capable NVR utilize WS- Discovery to find other devices. Once IPCs are discovered, the Switch can further discover NVRs by snooping RTSP, HTTP, and HTTPS packets between NVRs and IPCs. These packets cannot be snooped if the TCP/UDP port is not equal to the RTSP port number.

Example

This example shows how to configure the TCP/UDP port number to 2000 for RTSP stream snooping.

```
Switch# config terminal
Switch(config)# surveillance vlan onvif-discover-port 2000
Switch(config)#
```

35-6 surveillance vlan onvif-ipc state

This command is used to configure the ONVIF recognition IPC state. Use the **no** form of this command to revert to the default setting.

surveillance vlan onvif-ipc *IP-ADDRESS* **[mac-address** *MAC-ADDRESS***] state {enable | disable}**

no surveillance vlan onvif-ipc *IP-ADDRESS* **[mac-address** *MAC-ADDRESS***] state**

Parameters

IP-ADDRESS	Enter the IP address of the IPC here.
MAC-ADDRESS	(Optional) Enter the MAC address of the IPC that is recognized with ONVIF.

enable	Specifies that the ONVIF recognition IPC state will be enabled.
disable	Specifies that the ONVIF recognition IPC state will be disabled.

Default

By default, this feature is enabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to configure the ONVIF recognition IPC state with only the IP address of the IPC, or both the IP and MAC address of the IPC. When the ONVIF IPC is recognized, the state can be configured for the specified device. If there is more than one IPC with the same IP address and the MAC addresses of those IPCs are not specified, the state of those IPCs will be affected.

This feature is used to block IPC traffic or not. If the IPC state on the port is disabled, the traffic from the IPC will be blocked.

Example

This example shows how to enable the state of IPC with the IP address 172.18.60.1.

```
Switch# config terminal
Switch(config)# surveillance vlan onvif-ipc 172.18.60.1 state enable
Switch(config)#
```

35-7 surveillance vlan onvif-ipc description

This command is used to configure the description of the ONVIF recognized IPC. Use the **no** command to remove the description.

surveillance vlan onvif-ipc *IP-ADDRESS* **[mac-address** *MAC-ADDRESS***] description** *TEXT*

no surveillance vlan onvif-ipc *IP-ADDRESS* **[mac-address** *MAC-ADDRESS***] description**

Parameters

IP-ADDRESS	Enter the IP address of the ONVIF recognized IPC here.
MAC-ADDRESS	(Optional) Enter the MAC address of the IPC that is recognized with ONVIF.
TEXT	Enter the description of the ONVIF recognized IPC here. This can be up to 32 characters long.

Default

By default, there is no description defined for an ONVIF recognized IPC.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to configure the description of the ONVIF recognized IPC with only the IP address of the IPC, or both the IP and MAC address of the IPC. If there is more than one IPC with the same IP address and the MAC addresses of those IPCs are not specified, the description of those IPCs will be configured.

Example

This example shows how to define the description of the IPC with an IP address of 172.18.60.1 to 'ipc1'.

```
Switch# config terminal
Switch(config)# surveillance vlan onvif-ipc 172.18.60.1 description ipc1
Switch(config)#
```

35-8 surveillance vlan onvif-nvr description

This command is used to configure the description of an ONVIF recognized NVR. Use the **no** command to remove this description.

surveillance vlan onvif-nvr *IP-ADDRESS* **[mac-address** *MAC-ADDRESS***] description** *TEXT*

no surveillance vlan onvif-nvr *IP-ADDRESS* **[mac-address** *MAC-ADDRESS***] description**

Parameters

IP-ADDRESS	Enter the IP address of the ONVIF recognized NVR here.
MAC-ADDRESS	(Optional) Enter the MAC address of the NVR that is recognized with ONVIF.
TEXT	Enter the description of the ONVIF recognized NVR here. This can be up to 32 characters long.

Default

By default, there is no description defined for an ONVIF recognized NVR.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When an ONVIF NVR is recognized, the description for specified device can be configured.

This command is used to configure the description of the ONVIF recognized NVR with only the IP address of the NVR, or both the IP and MAC address of the NVR. If there is more than one NVR with the same IP address and the MAC addresses of those NVRs are not specified, the description of those NVRs will be configured.

Example

This example shows how to define the description of the NVR with an IP address of 172.18.60.2 to 'nvr1'.

```
Switch# config terminal
Switch(config)# surveillance vlan onvif-nvr 172.18.60.2 description nvr1
Switch(config)#
```

35-9 surveillance vlan qos

This command is used to configure the CoS priority for the incoming surveillance VLAN traffic. Use the **no** form of this command to revert to the default settings.

surveillance vlan qos *COS-VALUE*

no surveillance vlan qos

Parameters

COS-VALUE	Specifies the priority of surveillance VLAN. The available value is from 0 to 7.

Default

The default value 5.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The surveillance packets arriving at the surveillance VLAN enabled port are marked to the COS specified by the command.

The remarking of COS allows the surveillance VLAN traffic to be distinguished from data traffic in quality of service.

Example

This example shows how to configure the priority of the surveillance VLAN to be 7.

```
Switch# config terminal
Switch(config)# surveillance vlan qos 7
Switch(config)#
```

35-10 show surveillance vlan

This command is used to display the surveillance VLAN configurations.

show surveillance vlan [interface [*INTERFACE-ID* **[, | -]]]**

show surveillance vlan device [interface [*INTERFACE-ID* **[, | -]]]**

Parameters

device	Specifies to display the learned surveillance devices information.
interface	(Optional) Specifies to display surveillance VLAN information of ports.
INTERFACE-ID	(Optional) Specifies the port to be displayed.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space is allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No space is allowed before and after the hyphen.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the surveillance VLAN configurations.

The **show surveillance vlan** command is used to display the surveillance VLAN global configurations.

The **show surveillance vlan interface** command is used to display the surveillance vlan configurations on the interfaces.

The **show surveillance vlan device** command is used to display the surveillance device discovered by its OUI.

Example

This example shows how to display the surveillance VLAN global settings.

```
Switch# show surveillance vlan

Surveillance VLAN ID   : 100
 Surveillance VLAN CoS  : 5
 Aging Time             : 30 minutes
 ONVIF Discover Port    : 554
 Log State              : Enabled
Member Ports              :
Dynamic Member Ports    :

 Surveillance VLAN OUI  :

 OUI Address       Mask            Component Type   Description
 ----------------  ----------------  --------------  --------------
 28-10-7B-00-00-00  FF-FF-FF-E0-00-00  D-Link Device    IP Surveillance Device
 28-10-7B-20-00-00  FF-FF-FF-F0-00-00  D-Link Device    IP Surveillance Device
 B0-C5-54-00-00-00  FF-FF-FF-80-00-00  D-Link Device    IP Surveillance Device
 F0-7D-68-00-00-00  FF-FF-FF-F0-00-00  D-Link Device    IP Surveillance Device
```

```
Total OUI : 4

Switch#
```

35-11 show surveillance vlan onvif-ipc interface

This command is used to display ONVIF-based IPC information.

show surveillance vlan onvif-ipc interface [*INTERFACE-ID* **[,|-]] {brief | detail}**

Parameters

INTERFACE-ID	(Optional) Specifies the port to be displayed.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space is allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No space is allowed before and after the hyphen.
brief	Specifies to display brief ONVIF-based IP camera information.
detail	Specifies to display detailed ONVIF-based IP camera information.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display brief or detailed ONVIF-based IPC information.

Example

This example shows how to display brief ONVIF-based IP camera information.

```
Switch# show surveillance vlan onvif-ipc interface Ethernet 1/0/1 brief

 Interface    : eth1/0/1
 IP Address   : 10.90.90.1
 MAC Address  : 00-01-02-03-04-05
 Model          : P3384-VE
 Manufacturer : D-Link
 Traffic       : Enabled
 Description   : P3384-VE
```

```
Total Entries: 1

Switch#
```

This example shows how to display detailed ONVIF-based IP camera information.

```
Switch# show surveillance vlan onvif-ipc interface Ethernet 1/0/1 detail

Interface          : eth1/0/1
IP Address       : 10.90.90.1
MAC Address      : 00-01-02-03-04-05
Model              : P3384-VE
Manufacturer     : D-Link
State            : Enabled
Description      : P3384-VE
Protocol         : ONVIF
Power Consumption: 1.9W/15W
PoE              : 802.3af
PoE Status       : Enable

Total Entries: 1

Switch#
```

35-12 show surveillance vlan onvif-nvr interface

This command is used to display ONVIF-based NVR and group information.

show surveillance vlan onvif-nvr interface [*INTERFACE-ID* **[,|-]] [ipc-list]**

Parameters

INTERFACE-ID	(Optional) Specifies the port to be displayed.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space is allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No space is allowed before and after the hyphen.
ipc-list	(Optional) Specifies to display NVR group information.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display ONVIF-based NVR and group information. The group ID is the group ID of the IPCs that belong to the NVR group. NVRs and IPCs, managed by it, must have the same group ID.

Example

This example shows how to display ONVIF-based NVR information.

```
Switch# show surveillance vlan onvif-nvr interface Ethernet 1/0/1

 Interface    : eth1/0/1
 IP Address   : 111.111.111.111
 MAC Address  : 00-01-02-03-04-08
 IPC Number    : 2
 Manufacturer : D-Link
 Group        : Group 1
 Description   : D-Link-NVR

 Total Entries: 1

Switch#
```

This example shows how to display ONVIF-based NVR information associated with the group ID 'ipc-list'.

```
Switch# show surveillance vlan onvif- nvr interface Ethernet 1/0/1 ipc-list

 Interface       IP address         MAC address          Group     Description
-------------- ----------------- -------------------- -------- ------------------
 1               10.90.90.90        00-01-02-03-04-05    1         D-Link-IPC-1
 1               10.90.90.100       00-01-02-03-04-06    1         D-Link-IPC-2

 Total Entries : 2

Switch#
```

36. Switch Port Commands

36-1 duplex

This command is used to configure the physical port interface's duplex setting. Use the **no** form of command to revert to the default setting.

duplex {full | half | auto}

no duplex

Parameters

full	Specifies that the port operates in the full-duplex mode.
half	Specifies that the port operates in the half-duplex mode.
auto	Specifies that the port's duplex mode will be determined by auto-negotiation.

Default

The duplex mode will be set as auto.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

If the speed is set to 1000, then the duplex mode cannot be set to half-duplex. The half-duplex only allow to be configured if speed is configured as 10 or 100.

Example

This example shows how to configure the interface eth1/0/3 to operate at a forced speed of 1000Mbits and specifies that the duplex mode should be set to full-duplex mode.

```
Switch# config terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# speed 1000
Switch(config-if)# duplex full
Switch(config-if)#
```

36-2 flowcontrol

This command is used to configure the flow control capability of the port interface. Use the **no** form of command to revert to the default setting.

flowcontrol {on | off}

no flowcontrol

Parameters

on	Specifies to enable a port to send PAUSE frames or process PAUSE frames from remote ports.
off	Specifies to disable the ability for a port to send or receive PAUSE frames.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command can only assure that the flow control capability has been configured in the Switch software and not guarantee the actual hardware operation. The actual hardware operation may be different to the settings that have been configured on the Switch because the flow control capability is determined by both the local port/device and the device connected at the other end of the link, not just by the local device.

If the speed is set to the forced mode, the final flow control setting will be determined by the configured flow control setting. If the speed is set to the auto mode, the final flow control setting will be based on the negotiated result between the local side setting and the partner side setting. The configured flow control setting here is the local side setting.

Example

This example shows how to enable the flow control on interface eth1/0/3.

```
Switch# config terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# flowcontrol on
Switch(config-if)#
```

36-3 mdix

This command is used to configure the port Media-Dependent Interface Crossover (MDIX) state. Use the **no** form of command to revert to the default setting.

mdix {auto | normal | cross}

no mdix

Parameters

auto	Specifies to set the port interface's MDIX state to the auto-MDIX mode.
normal	Specifies to force the port interface's MDIX state to the normal

	mode.
cross	Specifies to force the port interface's MDIX state to the cross mode.

Default

By default, this option is set as auto.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command cannot be applied to a port when the medium of the port interface is fiber.

Example

This example shows how to configure the MDIX state of interface eth1/0/3 to auto:

```
Switch# config terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# mdix auto
Switch(config-if)#
```

36-4 speed

This command is used to configure the physical port interface's speed settings. Use the **no** form of command to revert to the default setting.

speed {10 | 100 | 1000 | auto }

no speed

Parameters

10	Specifies to force the speed to 10 Mbps.
100	Specifies to force the speed to 100 Mbps.
1000	Specifies that for copper ports, it forces the speed to 1000 Mbps and the user must manually set that the port operates as master or slave. Specifies that for fiber ports (1000BASE-SX/LX), the port will disable the auto-negotiation.
auto	Specifies that for copper ports, it specifies to determine the speed and flow control via auto-negotiation with its link partner. Specifies that for fiber ports (1000BASE-SX/LX), it enables the auto-negotiation option. Auto-negotiation will start to negotiate the clock and flow control with its link partner.

Default

The speed will be set as auto.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command is to configure the physical port interface's speed settings.

Example

This example shows how to configure eth1/0/3 to 1000 Mbps.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/3
Switch(config-if)# speed 1000
Switch(config-if)#
```

37. System File Management Commands

37-1 boot image

This command is used to specify image that will be used as the image file for the next boot.

boot image {image1 | image2}

Parameters

Image1	Specifies the image1 for the next boot.
Image2	Specifies the image2 for the next boot.

Default

By default, there is an image file as the boot image.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When using the boot image command, the associated specified boot image file will be the startup boot image file for the next reboot. Use show boot command to display information of boot images.

Example

This example shows how to specify that the Switch should use the image2 as the boot image file for the next startup.

```
Switch# configure terminal
Switch(config)# boot image image2
```

37-2 copy

This command is used to copy a file to another file.

copy *SOURCE-URL DESTINATION-URL*

Parameters

SOURCE-URL	Specifies the source URL for the source file to be copied. One special form of the URL is represented by the following keywords. If **startup-config** is specified as the *SOURCE-URL*, the purpose is to upload the startup configuration, save the startup configuration as the file in the file system, or to execute the startup configuration as the running configuration. If **running-config** is specified as the *SOURCE-URL*, the purpose

	is to upload the running configuration or save the running configuration as the startup configuration or to save it as the file in the file system. If **flash**: [*PATH-FILE-NAME*] is specified as the *SOURCE-URL*, the purpose is to specify the source file to be copied in the file system. If **log** is specified as the *SOURCE-URL*, the system log can be retrieved to the TFTP server. If **image1/image2** is specified as the *SOURCE-URL*, the purpose is to upload boot up image to tftp server.
DESTINATION-URL	Specifies the destination URL for the copied file. One special form of the URL is represented by the following keywords. If **running-config** is specified as the *DESTINATION-URL*, the purpose is to apply a configuration to the running configuration. If **startup-config** is specified as the *DESTINATION-URL*, the purpose is to save a configuration to the next-boot configuration. If **flash**: [*PATH-FILE-NAME*] is specified as the *DESTINATION-URL*, the purpose is to specify the copied file in the file system. If **image1/image2** is specified as the *DESTINATION- URL*, the purpose is to store the file as boot up image1/image2.

Default

None.

Command Mode

Privileged EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to copy a file to another file in the file system. Use this command to download or upload the configuration file or the image file. Use this command to upload the system log to the TFTP server. To upload the running configuration or save the running configuration to the startup configuration, specify **running-config** as the *SOURCE-URL*. To save the running configuration to the startup configuration, specify **startup-config** as the *DESTINATION-URL*.

To apply a configuration file to the running configuration, specify **running-config** as the *DESTINATION-URL* for the **copy** command and the configuration file will be executed immediately. That means the running configuration will be cleared before applying of the specified configuration.

As the specified source is the system log and the specified destination is a URL, the current system log will be copied to the specified URL.

To represent a file in the remote TFTP server, the URL must be prefixed with “tftp: //”.

To download the firmware image, the user should use the **copy tftp:** // command to download the file from the TFTP server to a file(image1 or image2) in the file system. Then, use the boot image command to specify it as the **boot image** file.

Example

This example shows how to configure the Switch’s running configuration by using the configuration called “office.cfg” that is download from the TFTP server 10.10.1.141.

```
Switch# copy tftp://10.10.1.141/office.cfg running-config
% Loading /office.cfg from TFTP server 10.10.1.141
Switch#
```

This example shows how to upload the running configuration to the TFTP server for storage.

```
Switch# copy running-config tftp://10.10.1.141/office.cfg
Building configuration...
% Saving 1072 bytes to TFTP server 10.10.1.141: /office.cfg
Switch#
```

This example shows how to save the system's running configuration into the FLASH memory and uses it as the next boot configuration.

```
Switch# copy running-config startup-config
Building configuration...
% Saving 1072 bytes to flash:startup-config
Switch#
```

37-3 clear running-config

This command is used to clear the system's running configuration.

clear running-config

Parameters

None.

Default

None.

Command Mode

Privilege EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to clear the system's configuration retained in DRAM. The configuration data will revert to the default settings. Before using this command, save a backup of the configuration using the **copy** command or upload the configuration profile to the TFTP server.

This command will clear the system's configuration settings, including IP parameters. Thus, all the existing remote connections will be disconnected. After this command was applied, the user needs to setup the IP address via the local console.

Example

This example shows how to clear the system's running configuration.

```
Switch# clear running-config

 This command will clear all of system configuration
 as factory default setting including IP parameters.
 Clear running configuration? (y/n) [n]  y

Switch#
```

37-4 reset system

This command is used to reset the system, clear the system's configuration.

reset system

Parameters

None.

Default

None.

Command Mode

Privilege EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to clear the system's configuration. The configuration data will revert to the default settings.Before using this command, save a backup of the configuration using the **copy** command or upload the configuration profile to the TFTP server.

Example

This example shows how to reset the system to the factory default settings.

```
Switch# reset system

 This command will clear all of system configuration as factory
 default setting including IP parameters.
 Clear system configuration, save, reboot? (y/n) [n]  y

Switch#
```

37-5 show boot

This command is used to display the boot image setting.

show boot

Parameters

none

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display the boot image setting.

Example

This example shows how to display system boot information.

Switch# show boot

```
Unit 1
 Boot image: flash:/R1.10.B014.dat
 Image info (* : Next bootup image) :
   * R1.10.B014.dat (Image1)
     R1.10.B014.dat (Image2)

Switch#
```

37-6 show running-config

This command is used to display the commands in the running configuration file.

show running-config

Parameters

None.

Default

None.

Command Mode

Privileged EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

This command displays the current running system configuration.

Example

This example shows how to display the content of the running configuration file.

```
Switch# show running-config

ddp
!
vlan 1
!
!
!
!
```

```
multicast filtering-mode filter-unregistered
clock timezone + 0 0
ip http secure-server
ip http timeout-policy idle 60
snmp-server enable traps
storm-control multicast level pps 8
cpu-protect safeguard threshold 60 40
!
!
interface Ethernet 1/0/1
 switchport mode access
!
interface Ethernet 1/0/2
 switchport mode access
 mls qos cos 3
!
interface Ethernet 1/0/3
 switchport mode access
 rate-limit input 1300
 mls qos scheduler sp
 speed 1000
 flowcontrol on
 duplex full
!
interface Ethernet 1/0/4
 switchport mode access
 mls qos cos 3
!
interface Ethernet 1/0/5
 switchport mode access
!
interface Ethernet 1/0/6
 switchport mode access
!
interface Ethernet 1/0/7
 switchport mode access
!
interface Ethernet 1/0/8
 switchport mode access
!
interface Ethernet 1/0/9
 switchport mode access
!
interface Ethernet 1/0/10
 switchport mode access
!
interface Ethernet 1/0/11
 switchport mode access
```

```
!
interface Ethernet 1/0/12
 switchport mode access
!
interface vlan 1
 ip address 10.10.1.19 255.255.248.0
!
!
end
Switch#
```

37-7 show startup-config

This command is used to display the content of the startup configuration file.

show startup-config

Parameters

None.

Default

None.

Command Mode

Privileged EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

This command displays the configuration settings that the system will be initialized with.

Example

This example shows how to display the content of the startup configuration file.

```
Switch# show startup-config

ddp
!
vlan 1
!
!
!
!
multicast filtering-mode filter-unregistered
clock timezone + 0 0
ip http secure-server
ip http timeout-policy idle 60
snmp-server enable traps
storm-control multicast level pps 8
cpu-protect safeguard threshold 60 40
!
!
interface Ethernet 1/0/1
 switchport mode access
!
interface Ethernet 1/0/2
 switchport mode access
```

38. System Log Commands

38-1 clear logging

This command is used to delete log messages.

clear logging

Parameters

None.

Default

None.

Command Mode

Privilege EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

This command deletes all the log messages in the system.

Example

This example shows how to delete all the log messages in the system.

```
Switch# clear logging
Switch#
```

38-2 logging buffered

This command is used to enable logging of system messages. Use the **no** form of this command to disable the logging of messages.

logging buffered

Parameters

none

Default

By default, the logging buffered is enabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The content of the logging messages will be saved to the FLASH immediately such that the message can be restored on reboot.

The content of the logged messages in the FLASH will be reloaded into the logging buffer on reboot.

Example

This example shows how to enable the logging of messages .

```
Switch# config terminal
Switch(config)# logging buffered
Switch(config)#
```

38-3 logging server

This command is used to create a SYSLOG server host to log the system messages or debug output. Use the **no** form of this command to remove a SYSLOG server host.

logging server {*IP-ADDRESS***} [severity {***SEVERITY-LEVEL* | *SEVERITY-NAME***}] [facility** *FACILITY-TYPE***] [port** *UDP-PORT***]**

no logging server {*IP-ADDRESS* **}**

Parameters

IP-ADDRESS	Specifies the IP address of the SYSLOG server host.
SEVERITY-LEVEL	(Optional) Specifies the severity level of system messages. The messages at that severity level or a more severe level will be logged to the log server. This value must be between 3 and 6. 0 is the most severe level. If not specified, the default severity level is informational (6).
SEVERITY-NAME	(Optional) Specifies the severity level of system messages by one of the following names: errors, warnings, notifications, informational.
facility *FACILITY-TYPE*	(Optional) Specifies the facility type as a decimal value from 16 to 23. If not specified, the default facility is local7 (23).
port *UDP-PORT*	(Optional) Specifies the UDP port number to be used for the SYSLOG server. Valid values are 514 (the IANA well-known port) or any value from 1024 to 65535. If not specified, the default UDP port is 514.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

System messages can be logged to the local message buffer or remote hosts. Messages must enter the local message buffer first before it can be further dispatched to logging server.

The following is a table for the facility.

Numerical code	Facility
16	Local use 0 (local0).
17	Local use 1 (local1).
18	Local use 2 (local2).
19	Local use 3 (local3).
20	Local use 4 (local4).
21	Local use 5 (local5).
22	Local use 6 (local6).
23	Local use 7 (local7).

Example

This example shows how to enable the logging of system messages with a severity higher than warnings to the remote host 10.10.1.141.

```
Switch# configure terminal
Switch(config)# logging server 10.10.1.141 severity warnings
Switch(config)#
```

38-4 logging source-interface

This command is used to specify the interface whose IP address will be used as the source address for sending the SYSLOG packet. Use the **no** form of this command to disabled sending the packet.

logging source-interface *INTERFACE-ID*

no logging source-interface

Parameters

source-interface *INTERFACE-ID*	Specifies the interface whose IP address will be used as the source address of the SYSLOG packet.

Default

By default, sending the SYSLOG packet is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to specify the interface whose IP address will be used as the source address of the SYSLOG packet. The interface MUST be management vlan interface.

Example

This example shows how to configure VLAN 100 as the source interface for SYSLOG packets.

```
Switch# config t
Switch(config)# logging source-interface vlan 100

 ERROR : Syslog source interface only support on management vlan interface

Switch(config)#
```

38-5 show logging

This command is used to display the system messages logged in the local message buffer.

show logging

Parameters

none

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

Use this command to display the system messages logged in the system.

Example

This example shows how to display the messages in the system.

```
Switch# show logging

 Total number of buffered messages : 100

 #286 10:45:28, 2017-06-23 INFO(6) Successful login through telnet (Username: admin, IP:
10.10.1.141)
 #285 18:16:25, 2017-06-22 INFO(6) Port Ethernet1/0/2 link down
 #284 17:30:41, 2017-06-22 INFO(6) Port Ethernet1/0/2 link up, 1Gb/s
 #283 17:30:38, 2017-06-22 INFO(6) Port Ethernet1/0/2 link down
 #282 17:18:27, 2017-06-22 INFO(6) Port Ethernet1/0/2 link up, 1Gb/s
 #281 17:18:23, 2017-06-22 INFO(6) Port Ethernet1/0/2 link down
```

39. Time and SNTP Commands

39-1 clock set

This command is used to manually set the system's clock.

clock set *HH:MM:SS DAY MONTH YEAR*

Parameters

HH:MM:SS	Specifies the current time in hours (24-hour format), minutes and seconds.
DAY	Specifies the current day (by date) in the month.
MONTH	Specifies the current month (by name, January, Jan, February, Feb, and so on).
YEAR	Specifies the current year (no abbreviation).

Default

None.

Command Mode

Privilege EXEC Mode.

Command Default Level

Level: 15.

Usage Guideline

Generally, if the system is synchronized by a valid outside timing mechanism, such as SNTP, there is mp need to set the software clock. Use this command if no other time sources are available. The time specified in this command is assumed to be in the time zone specified by the configuration of the **clock timezone** command. The clock configured by this command will be applied to RTC if it is available. The configured clock will not be stored in the configuration file.

If the clock is manually set and the SNTP server is configured, the system will still try to sync the clock with the server. If the clock is manually set, but a new clock time is obtained by the SNTP server, the clock will be replaced by the new synced clock.

Example

This example shows how to manually set the software clock to 3:45 p.m. on Mar 16, 2017.

```
Switch# clock set 15:45:00 16 mar 2017
Switch#
```

39-2 clock summer-time

This command is used to configure the system to automatically switch to summer time (daylight saving time). Use the **no** form of this command to configure the Switch to not automatically switch over to summer time.

clock summer-time date *DATE MONTH YEAR HH:MM DATE MONTH YEAR HH:MM* **[***OFFSET***]**

no clock summer-time

Parameters

date	Specifies that summer time should start and end on the specified date of the specified month.
DATE	Specifies the date of the month (1 to 31).
MONTH	Specifies the month (1 to 12).
YEAR	Specifies the start and end years for the summer time data.
HH:MM	Specifies the time (24 hours format) in hours and minutes.
OFFSET	(Optional) Specifies the number of minutes to add during summer time. The default value is 60. The range of this offset is 30, 60, 90 and 120.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to automatically switch over to summer time. .

Example

This example shows how to specify that summer time starts on 2:00 a.m. on Jun 16, 2017 and ends on 2:00 a.m. on Dec 31, 2017.

```
Switch# configure terminal
Switch(config)# clock summer-time date 1 6 2017 2:00 31 12 2017 2:00
Switch(config)#
```

39-3 clock timezone

This command is used to set the time zone for display purposes. Use the **no** form of this command to revert to the default setting.

clock timezone {+ | -} *HOURS-OFFSET* **[***MINUTES-OFFSET***]**

no clock timezone

Parameters

+|-	+: Specifies that time to be added to the UTC. - : Specifies that time to be subtracted from the UTC.

HOURS-OFFSET	Specifies the hours difference from UTC.
MINUTES-OFFSET	(Optional) Specifies the minutes difference from UTC.

Default

By default, this option is set to UTC.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The time obtained by the SNTP server refers to the UTC time. The local time will be calculated based on UTC time, time zone, and the daylight saving configuration.

Example

This example shows how to set the time zone to the Pacific Standard Time (PST), which is 8 hours ahead of UTC.

```
Switch# config terminal
Switch(config)# clock timezone - 8
Switch(config)#
```

39-4 show clock

This command is used to display the time and date information.

show clock

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command also indicates the clock's source. The clock source can be "No Time Source" or "SNTP".

Example

This example shows how to display the current time.

```
Switch# show clock
```

```
Current Time Source    : System Clock
Current Time           : 08:05:01, 2017-03-16
Time Zone              : UTC -08:00
Daylight Saving Time   : Date
Offset In Minutes      : 60
    Date        From :  1 Jun 2017 02:00
                 To  : 31 Dec 2017 21:00

Switch#
```

39-5 show sntp

This command is used to display information about the SNTP server.

show sntp

Parameters

None.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display information about the SNTP server.

Example

This example shows how to display SNTP information.

```
Switch# show sntp

SNTP Status             : Enabled
SNTP Poll Interval       : 720 sec

SNTP Server Status:

SNTP Server                                Stratum Version Last Receive
------------------------------------------ ------- ------- ---------------
10.10.1.112                                0       4       -
------------------------------------------ ------- ------- ---------------

Total Entries  : 1
```

```
Switch#
```

39-6 sntp server

This command is used to allow the system clock to be synchronized with an SNTP time server. Use the **no** form of this command to remove the configuration.

sntp server {*IP-ADDRESS***}**

no sntp server

Parameters

IP-ADDRESS	Specifies the IP address of the time server which provides the clock synchronization.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

SNTP is a compact, client-only version of the NTP. Unlike NTP, SNTP can only receive the time from NTP servers; it cannot be used to provide time services to other systems. SNTP typically provides time within 100 milliseconds of the accurate time, but it does not provide the complex filtering and statistical mechanisms of NTP.

Use the **no** form of this command to delete the SNTP server configuration. The time obtained from the SNTP server refers to the UTC time.

Example

This example shows how to configure a switch to allow its software clock to be synchronized with the clock by the SNTP server at IP address 10.10.1.143.

```
Switch# config terminal
Switch(config)# sntp server 10.10.1.143
Switch(config)#
```

39-7 sntp enable

This command is used to enable the SNTP function. Use the **no** form of this command to disable the SNTP function.

sntp enable

no sntp enable

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to enable or disable the SNTP function.

Example

This example shows how to enable the SNTP function.

```
Switch# configure terminal
Switch(config)# sntp enable
Switch(config)#
```

39-8 sntp interval

This command is used to set the interval for the SNTP client to synchronize its clock with the server.

sntp interval *SECONDS*

no sntp interval

Parameters

SECONDS	Specifies the synchronization interval from 30 to 99999 seconds.

Default

By default, this value is 720 seconds.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to set the polling interval.

Example

This example shows how to configure the interval to 100 seconds.

```
Switch# configure terminal
Switch(config)# sntp interval 100
Switch(config)#
```

40. Time Range Commands

40-1 periodic

This command is used to specify the period of time for a time range profile. This command is used in the time-range configuration mode.

periodic {daily *HH:MM* **to** *HH:MM* **| weekly** *WEEKLY-DAY HH:MM* **to [***WEEKLY-DAY***]** *HH:MM***}**

no periodic {daily *HH:MM* **to** *HH:MM* **| weekly** *WEEKLY-DAY HH:MM* **to [***WEEKLY-DAY***]** *HH:MM***}**

Parameters

daily *HH:MM* to *HH:MM*	Specifies the time of the day, using the format *HH:MM* (for example, 18:30).
weekly WEEK-DAY HH:MM to [WEEK-DAY] HH:MM	Specifies the day of the week and the time of day in the format day *HH:MM*, where the day of the week is spelled out (monday, tuesday, wednesday, thursday, friday, saturday, and sunday). If the ending day of the week is the same as the starting day of the week, it can be omitted.

Default

None.

Command Mode

Time-range Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

A new period can be partially overlapped with an older one. If a new period's starting and ending time is respectively the same as a previous period, an error message will be displayed and the new period will not be allowed. When specifying a period to remove, it must be the same period originally added and cannot be a partial range of a period or multiple periods configured. Otherwise, an error message will be displayed.

Example

This example shows how to create a time-range that include daily 09:00 to 12:00, 00:00 Saturday to 0:00 Monday and delete the period for daily 09:00 to 12:00.

```
Switch# configure terminal
Switch(config)# time-range rdtime
Switch(config-time-range)# periodic daily 9:00 to 12:00
Switch(config-time-range)# no periodic daily 9:00 to 12:00
Switch(config-time-range)#
```

40-2 show time-range

This command is used to display the time range profile configuration.

show time-range [*NAME*]

Parameters

NAME	(Optional) Specifies the name of the time-range profile to be displayed.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

If the name is not specified, all configured time-range profiles will be displayed.

Example

This example shows how to display all the configured time ranges.

```
Switch#show time-range

Time Range Profile: rdtime
Daily 09:00 to 12:00
Weekly Saturday 00:00 to Monday 00:00

Time Range Profile: lunchtime
Daily 12:00 to 13:00

Total Entries: 2

Switch#
```

40-3 time-range

This command is used to enter the time range configuration mode to define a time range. Use the **no** command to delete a time range.

time-range *NAME*

no time-range *NAME*

Parameters

NAME	Specifies the name of the time-range profile to be configured. The maximum length is 32 characters.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enter the time range configuration mode before using the periodic command to specify a time period. When a time-range is created without any time interval (periodic) setting, it implies that there is not any active period for the time-range.

Example

This example shows how to enter the time range configuration mode for the time-range profile, named“rdtime”.

```
Switch# configure terminal
Switch(config)# time-range rdtime
Switch(config-time-range)#
```

41. Traffic Segmentation Commands

41-1 show traffic-segmentation forward

This command is used to display the traffic segmentation for some ports or all ports.

show traffic-segmentation forward [interface *INTERFACE-ID* **[, | -]]**

Parameters

interface INTERFACE-ID	(Optional) Specifies ID of an interface. The acceptable interface will be physical port or port channel.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space before and after the comma.
-	(Optional) Specifies a range of interfaces. No space before and after the hyphen.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

While entering this command without any other keywords, the traffic segmentation configuration for all ports is displayed. Otherwise, only the specified interface's traffic segmentation is displayed.

Example

This example shows how to display the configuration of traffic segmentation for eth1/0/3

Switch# show traffic-segmentation forward interface Ethernet 1/0/3

```
Interface   Forwarding Domain
----------- ----------------------------------------
eth1/0/3    eth1/0/4-6

Total Entries: 1

Switch#
```

41-2 traffic-segmentation forward

This command is used to restrict the Layer 2 packet forwarding domain of packets received by the configured port. Use the **no** form of this command to remove the specification of forwarding domain.

traffic-segmentation forward interface *INTERFACE-ID* **[, | -]**

no traffic-segmentation forward interface *INTERFACE-ID* **[, | -]**

Parameters

interface *INTERFACE-ID*	Specifies the ID of an interface allowed. The allowed interfaces include physical port.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space before and after the comma.
-	(Optional) Specifies a range of interfaces. No space before and after the hyphen.

Default

None.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When traffic segmentation forwarding domain is specified, packets received by the port will be restricted in Layer 2 packet forwarding to interfaces within the domain. When the forwarding domain of a port is empty, Layer 2 forwarding for packets received by the port is not restricted.

The traffic-segmentation forward command can be entered multiple times. The following interfaces will be appended into the forwarding domain. Use the no form command will remove the specified interface from the traffic segmentation forward member list.

The traffic segmentation member list can be comprised of different interface types, for example port and port-channel in the same forwarding domain. If the interfaces specified by the command include a port-channel, all the member ports of this port-channel will be included in the forwarding domain.

If the forwarding domain of an interface is empty, then there is no restriction on Layer 2 forwarding of packets received by the port.

Example

This example shows how to configure traffic segmentation. It restricts the flooding domain of eth1/0/1 to a set of ports, which are eth1/0/2 – eth1/0/6.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# traffic-segmentation forward interface range eth1/0/2-6
Switch(config-if)#
```

42. Virtual LAN (VLAN) Commands

42-1 acceptable-frame

This command is used to set the acceptable types of frames by a port. Use the **no** form of this command to revert to the default settings.

acceptable-frame {tagged-only | untagged-only | admit-all}

no acceptable-frame

Parameters

tagged-only	Specifies that only tagged frames are admitted.
untagged-only	Specifies that only untagged frames are admitted.
admit-all	Specifies that all frames are admitted.

Default

For the access VLAN mode, the default option is untagged-only.

For the other VLAN mode, the default option is admit-all.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to set the acceptable types of frames by a port.

Example

This example shows how to set the acceptable frame type to tagged-only for port eth1/0/2.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/2
Switch(config-if)# acceptable-frame tagged-only
Switch(config-if)#
```

42-2 ingress-checking

This command is used to enable ingress checking for frames received by a port. Use the **no** command to disable the ingress check.

ingress-checking

no ingress-checking

Parameters

None.

Default

By default, this option is enabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enable ingress checking for packets received by the interface. If ingress checking is enabled, the packet will be dropped if the received port is not a member port of the VLAN classified for the received packet.

Example

This example shows how to set ingress checking to enabled port eth1/0/2.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/2
Switch(config-if)# ingress-checking
Switch(config-if)#
```

42-3 show vlan

This command is used to display the parameters for all configured VLANs or one VLAN on the Switch.

show vlan [*VLAN-ID* **[, | -] | interface [***INTERFACE-ID* **[, | -]]]**

Parameters

VLAN-ID	(Optional) Specifies a list of VLANs to display the member port information. If the VLAN is not specified, all VLANs are displayed. The valid range is from 1 to 4094.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space before and after the comma.
-	(Optional) Specifies a range of interfaces. No space before and after the hyphen.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display the parameters for all configured VLANs or one VLAN on the Switch.

Example

This example shows how to display all the current VLAN entries.

```
Switch#show vlan

VLAN 1
Name : default
Tagged Member Ports :
Untagged Member Ports : 1/0/1-1/0/14

Total Entries : 1

Switch#
```

This example shows how to display the PVID, ingress checking, and acceptable frame type information for ports eth1/0/1-1/0/4.

```
Switch# show vlan interface Ethernet 1/0/1-4

 Ethernet1/0/1
   VLAN mode           : Access
   Access VLAN         : 1
   Ingress checking     : Disabled
   Acceptable frame type : Admit-All

 Ethernet1/0/2
   VLAN mode           : Access
   Access VLAN         : 1
   Ingress checking     : Disabled
   Acceptable frame type : Tagged-Only

 Ethernet1/0/3
   VLAN mode           : Access
   Access VLAN         : 1
   Ingress checking     : Disabled
   Acceptable frame type : Admit-All

 Ethernet1/0/4
```

```
  VLAN mode           : Access
  Access VLAN         : 1
  Ingress checking     : Disabled
  Acceptable frame type : Admit-All

Switch#
```

42-4 switchport access vlan

This command is used to specify the access VLAN for an interface. Use the no form of this command to revert to the default setting.

switchport access vlan *VLAN-ID*

no switchport access vlan

Parameters

access vlan *VLAN-ID*	Specifies the access VLAN of the interface.

Default

By default, this access VLAN is VLAN 1.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The command takes effect when the interface is set to access mode. The VLAN specified as the access VLAN does not need to exist to configure the command.

Only one access VLAN can be specified. The succeeding command overwrites the previous command.

Example

This example shows how to configure the interface 1/0/1 to access mode with access VLAN 1000.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 1000
Switch(config-if)#
```

42-5 switchport hybrid allowed vlan

This command is used to specify the tagged or untagged VLANs for a hybrid port. Use the **no** form of this command to revert to the default setting.

switchport hybrid allowed vlan {[add] {tagged | untagged} | remove} *VLAN-ID* **[, | -]**

no switchport hybrid allowed vlan

Parameters

add	Specifies the port will be added into the specified VLAN(s).
remove	Specifies the port will be removed from the specified VLAN(s).
tagged	Specifies the port as a tagged member of the specified VLAN(s).
untagged	Specifies the port as an untagged member of the specified VLAN(s).
VLAN-ID	Specified the allowed VLAN list or the VLAN list to be added to or removed from the allow VLAN list. If no option is specified, the specified VLAN list will overwrite the allowed VLAN list.
,	(Optional) Specifies a series of VLANs, or separate a range of VLANs from a previous range. No space is required before and after the comma.
-	(Optional) Specifies a range of VLANs. No space is required before and after the hyphen.

Default

By default, a hybrid port is an untagged member port of VLAN 1.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

By setting the hybrid VLAN command multiple times with different VLAN IDs, a port can be a tagged member port or an untagged member port of multiple VLANs.

When the allowed VLAN is only specified as the VLAN ID, the succeeding command will overwrites the previous command. If the new untagged allowed VLAN list is overlap with the current tagged allowed VLAN list, the overlap part will change to the untagged allowed VLAN. On the other hand, if the new tagged allowed VLAN list is overlap with current untagged allowed VLAN list, the overlap part will change to the tagged allowed VLAN. The last command will take effect. The VLAN does not need to exist to configure the command.

Example

This example shows how to configure interface eth1/0/1 to be a tagged member of VLAN 1000 and an untagged member of VLAN 2000 and 3000.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# switchport mode hybrid
Switch(config-if)# switchport hybrid allowed vlan add tagged 1000
Switch(config-if)# switchport hybrid allowed vlan add untagged 2000,3000
Switch(config-if)#
```

42-6 switchport hybrid native vlan

This command is used to specify the native VLAN ID of a hybrid port. Use the **no** form of this command to reset the native VLAN to the default setting.

switchport hybrid native vlan *VLAN-ID*

no switchport hybrid native vlan

Parameters

vlan *VLAN-ID*	Specifies the native VLAN of a hybrid port.

Default

By default, the native VLAN of a hybrid port is VLAN 1.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When configuring the hybrid port join to its native VLAN, use the switchport hybrid allowed vlan command to add the native VLAN into its allowed VLAN. The specified VLAN does not need to exist to apply the command. The command takes effect when the interface is set to hybrid mode.

Example

This example shows how to configure interface eth1/0/1 to become a hybrid interface and configure the PVID to 20.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# switchport mode hybrid
Switch(config-if)# switchport hybrid allowed vlan add untagged 1000,20
Switch(config-if)# switchport hybrid native vlan 20
Switch(config-if)#
```

42-7 switchport mode

This command is used to specify the VLAN mode for the port. Use the **no** form of this command to revert to the default setting.

switchport mode {access | hybrid | trunk}

no switchport mode

Parameters

access	Specifies the port as an access port.

hybrid	Specifies the port as a hybrid port.
trunk	Specifies the port as a trunk port.

Default

By default, this option is hybrid.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

When a port is set to access mode, this port will be an untagged member of the access VLAN configured for the port. When a port is set to hybrid mode, the port can be an untagged or tagged member of any VLAN configured.

When a port is set to trunk mode, this port is either a tagged or untagged member port of its native VLAN and can be a tagged member of other VLANs configured. The purpose of a trunk port is to support the switch-to-switch connection.

When the switch-port mode is changed, the VLAN related setting associated with previous mode will be lost.

Example

This example shows how to set the interface eth1/0/1 as a trunk port.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# switchport mode trunk
Switch(config-if)#
```

42-8 switchport trunk allowed vlan

This command is used to configure the VLANs that are allowed to receive and send traffic on the specified interface in a tagged format. Use the **no** form of this command to revert to the default setting.

switchport trunk allowed vlan {all | [add | remove | except] *VLAN-ID* **[, | -]}**

no switchport trunk allowed vlan

Parameters

all	Specifies that all VLANs are allowed on the interface.
add	Specifies to add the specified VLAN list to the allowed VLAN list.
remove	Specifies to remove the specified VLAN list from the allowed VLAN list.
except	Specifies that all VLANs except the VLANs in the exception list are allowed.
VLAN-ID	Specifies the allow VLAN list or the VLAN list to be added to or removed from the allow VLAN list.

,	(Optional) Specifies a series of VLANs, or separate a range of VLANs from a previous range. No space is required before and after the comma.
-	(Optional) Specifies a range of VLANs. No space is required before and after the hyphen.

Default

By default, all VLANs are allowed.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command only takes effect when the interface is set to trunk mode. If a VLAN is allowed on a trunk port, the port will become the tagged member of the VLAN. When the allowed VLAN option is set to all, the port will be automatically added to all the VLAN created by the system.

Example

This example shows how to configure interface eth1/0/1 as a tagged member of VLAN 1000.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk allowed vlan add 1000
Switch(config-if)#
```

42-9 switchport trunk native vlan

This command is used to specify the native VLAN ID of a trunk mode interface. Use the **no** interface command to reset to the native VLAN ID to the default setting.

switchport trunk native vlan {*VLAN-ID* **| tag}**

no switchport trunk native vlan [tag]

Parameters

VLAN-ID	Specifies the native VLAN for a trunk port.
tag	Specifies to enable the tagging mode of the native VLAN.

Default

By default, the native VLAN is 1, untagged mode.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The command only takes effect when the interface is set to trunk mode. When a trunk port native VLAN is set to tagged mode, normally the acceptable frame type of the port should be set to “tagged- only” to only accept tagged frames. When a trunk port works in the untagged mode for a native VLAN, transmitting untagged packet for a native VLAN and tagged packets for all other VLANs and the acceptable frame types of the port has to be set to “admit-all” in order to function correctly.

The specified VLAN does not need to exist to apply the command.

Example

This example shows how to configure interface port1 as a trunk interface and configures the native VLAN to 20.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk native vlan 20
Switch(config-if)#
```

42-10 vlan

This command is used to add VLANs and enter the VLAN configuration mode. Use the **no** form of this command to remove VLANs.

vlan *VLAN-ID* **[, | -]**

no vlan *VLAN-ID* **[, | -]**

Parameters

VLAN-ID	Specifies the ID of the VLAN to be added, removed or configured. The valid VLAN ID range is from 1 to 4094. VLAN ID 1 cannot be removed.
,	Specifies a series of VLANs, or separate a range of VLANs from a previous range. No space is required before and after the comma.
-	(Optional) Specifies a range of VLANs. No space is required before and after the hyphen.

Default

The VLAN ID 1 exists in the system as the default VLAN.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use the vlan global configuration command to create VLANs. Entering the vlan command with a VLAN ID enters the VLAN configuration mode. Entering the VLAN ID of an existing VLAN does not create a new VLAN, but allows the user to modify the VLAN parameters for the specified VLAN. When the user enters the VLAN ID of a new VLAN, the VLAN will be automatically created.

Use the no vlan command to remove a VLAN. The default VLAN cannot be removed. If the removed VLAN is a port's access VLAN, the port's access VLAN will be reset to VLAN 1.

Example

This example shows how to add new VLANs, assigning the new VLANs with the VLAN IDs 1000 to 1005.

```
Switch# configure terminal
Switch(config)# vlan 1000-1005
Switch(config-vlan)#
```

42-11 name

This command is used to specify the name of a VLAN. Use the **no** form of this command to reset the VLAN name to the default VLAN name.

name *VLAN-NAME*

no name

Parameters

VLAN-NAME	Specifies the VLAN name, with a maximum of 32 characters. The VLAN name must be unique within the administrative domain.

Default

The default VLAN name is VLANx, where x represents four numeric digits (including the leading zeros) that are equal to the VLAN ID.

Command Mode

VLAN Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to specify the name of a VLAN. The VLAN name must be unique within the administrative domain.

Example

This example shows how to configure the VLAN name of VLAN 1000 to be "admin-vlan".

```
Switch# configure terminal
Switch(config)# vlan 1000
Switch(config-vlan)# name admin-vlan
Switch(config-vlan)#
```

43. Voice VLAN Commands

43-1 voice vlan

This command is used to enable the global voice VLAN state and configure the voice VLAN. Use the **no** form of this command to disable the voice VLAN state.

voice vlan *VLAN-ID*

no voice vlan

Parameters

VLAN-ID	Specifies the ID of the voice VLAN. The valid range is from 2 to 4094.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command is used to enable the global voice VLAN function and to specify the voice VLAN on a switch. The switch has only one voice VLAN.

Both the voice vlan command in the global configuration and the voice vlan enable command in the interface configuration mode need to be enabled for a port to start the voice VLAN function.

When the voice VLAN is enabled for a port, the received voice packets will be forwarded in the voice VLAN. The received packets are determined as voice packets if the source MAC addresses of packets comply with the organizationally unique identifier (OUI) addresses configured by the voice vlan mac-address command.

The VLAN to be specified as the voice VLAN needs to pre-exist before configuration. If the voice VLAN is configured, then the voice VLAN cannot be removed with the no vlan command.

Example

This example shows how to enable the voice VLAN function and configure VLAN 1000 as the voice VLAN.

```
Switch# configure terminal
Switch(config)# voice vlan 1000
Switch(config)#
```

43-2 voice vlan aging

This command is used to configure the aging time for aging out the voice VLAN's dynamic member ports. Use the **no** form of this command to revert to the default setting.

voice vlan aging *MINUTES*

no voice vlan aging

Parameters

MINUTES	Specifies the aging time of the voice VLAN. The valid range is from 1 to 65535 minutes.

Default

By default, this value is 720 minutes.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure the aging time for aging out the voice device and the voice VLAN automatically learned member ports. When the last voice device connected to the port stops sending traffic and the MAC address of this voice device is aged out from FDB, the voice VLAN aging timer will be started. The port will be removed from the voice VLAN after the expiration of the voice VLAN aging timer. If voice traffic resumes during the aging time, the aging timer will be cancelled.

Example

This example shows how to configure the aging time of the voice VLAN to 30 minutes.

```
Switch# configure terminal
Switch(config)# voice vlan aging 30
Switch(config)#
```

43-3 voice vlan enable

This command is used to enable the voice VLAN state of ports. Use the **no** form of this command to disable the voice VLAN's port state.

voice vlan enable

no voice vlan enable

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The command takes effect for access ports or hybrid ports. Use the voice vlan enable command to enable the voice VLAN function for ports. Both the voice vlan command in the global configuration and the voice vlan enable command in the interface configuration mode need to be enabled for a port to start the voice VLAN

function.

Example

This example shows how to enable the voice VLAN function on the physical port eth1/0/1.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# voice vlan enable
Switch(config-if)#
```

43-4 voice vlan mac-address

This command is used to add the user-defined voice device OUI. Use the **no** form of this command to delete the user-defined voice device OUI.

voice vlan mac-address *MAC-ADDRESS MASK* **[description** *TEXT***]**

no voice vlan mac-address *MAC-ADDRESS MASK*

Parameters

MAC-ADDRES	Specifies the OUI MAC address.
MASK	Specifies the OUI MAC address matching bitmask.
description *TEXT*	(Optional) Specifies the description for the user defined OUI with a maximum of 32 characters.

Default

The default OUI is listed in the following table:

OUI	Vendor
00:E0:BB	3COM
00:03:6B	Cisco
00:E0:75	Veritel
00:D0:1E	Pingtel
00:01:E3	Siemens
00:60:B9	NEC/Philips
00:0F:E2	Huawei-3COM
00:09:6E	Avaya

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to add a user-defined OUI for the voice VLAN. The OUI for the voice VLAN is used to identify the voice traffic by using the voice VLAN function. If the source MAC addresses of the received packet matches any of the OUI patterns, the received packet is determined as a voice packet.

The user-defined OUI cannot be the same as the default OUI. The default OUI cannot be deleted.

Example

This example shows how to add a user-defined OUI for voice devices.

```
Switch# configure terminal
Switch(config)# voice vlan mac-address 00-02-03-00-00-00 FF-FF-FF-00-00-00
description User1
Switch(config)#
```

43-5 voice vlan mode

This command is used to enable the automatic learning of the port as voice VLAN member ports. Use the **no** form of this command to disable the automatic learning.

voice vlan mode {manual | auto {tag | untag}}

no voice vlan mode

Parameters

manual	Specifies that voice VLAN membership will be manually configured.
auto	Specifies that voice VLAN membership will be automatically learned.
tag	Specifies to learn voice VLAN tagged members.
untag	Specifies to learn voice VLAN untagged members.

Default

By default, this option is set to untag and auto.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to configure automatic learning or manual configuration of voice VLAN member ports.

If auto-learning is enabled, the port will automatically be learned as a voice VLAN member. This membership will be automatically be aged out. When the port is working in the auto tagged mode and the port captures a voice device through the device's OUI, it will join the voice VLAN as a tagged member automatically. When the voice device sends tagged packets, the switch will change its priority. When the voice device sends untagged packets, it will forward them in port's PVID VLAN.

When the port is working in auto untagged mode, and the port captures a voice device through the device's OUI,

it will join the voice VLAN as an untagged member automatically. When the voice device sends tagged packets, the switch will change its priority. When the voice device sends untagged packets, it will forward them in voice VLAN.

When the switch receives LLDP-MED packets, it checks the VLAN ID, tagged flag, and priority flag. The switch should follow the tagged flag and priority setting.

If auto learning is disabled, the user should use the switchport hybrid vlan command to configure the port as a voice VLAN tagged or untagged member port.

Example

This example shows how to configure physical port eth1/0/1 to be in the auto tag mode.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# voice vlan mode auto tag
Switch(config-if)#
```

43-6 voice vlan qos

This command is used to configure the CoS priority for the incoming voice VLAN traffic. Use the **no** form of this command to revert to the default setting.

voice vlan qos *COS-VALUE*

no voice vlan qos

Parameters

COS-VALUE	Specifies the priority of the voice VLAN. This value must be between 0 and 7.

Default

By default, this value is 5.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

The voice packets arriving at the voice VLAN enabled port are marked to the CoS specified by the command. The remarking of CoS allows the voice VLAN traffic to be distinguished from data traffic in quality of service.

Example

This example shows how to configure the priority of the voice VLAN to be 7.

```
Switch# configure terminal
Switch(config)# voice vlan qos 7
Switch(config)#
```

43-7 show voice vlan

This command is used to display the voice VLAN configurations.

show voice vlan [interface [*INTERFACE-ID* **[, | -]]]**

show voice vlan {device | lldp-med device} [interface *INTERFACE-ID* **[, | -]]**

Parameters

interface	(Optional) Specifies to display voice VLAN information of ports.
INTERFACE-ID	(Optional) Specifies the interface to display.
,	(Optional) Specifies a series of interfaces, or separate a range of interfaces from a previous range. No space is allowed before and after the comma.
-	(Optional) Specifies a range of interfaces. No space is allowed before and after the hyphen.
device	(Optional) Specifies to display the voice devices learned by OUI.
lldp-med device	(Optional) Specifies to display the voice devices learned by LLDP-MED.

Default

None.

Command Mode

EXEC Mode or Any Configuration Mode.

Command Default Level

Level: 1.

Usage Guideline

This command is used to display the voice VLAN configurations.

Example

This example shows how to display the voice VLAN global settings.

```
Switch# show voice vlan

Voice VLAN ID   : 1000
Voice VLAN CoS  : 7
Aging Time  : 30 minutes
Member Ports    : eth1/0/1-1/0/5
Dynamic Member Ports : eth1/0/1-1/0/3
Voice VLAN OUI:

OUI Address Mask    Description
----------------    -----------------   -------------
00-01-E3-00-00-00  FF-FF-FF-00-00-00    Siemens
00-03-6B-00-00-00  FF-FF-FF-00-00-00    Cisco
00-09-6E-00-00-00  FF-FF-FF-00-00-00    Avaya
```

```
00-0F-E2-00-00-00  FF-FF-FF-00-00-00    Huawei&3COM
00-60-B9-00-00-00  FF-FF-FF-00-00-00    NEC&Philips
00-D0-1E-00-00-00  FF-FF-FF-00-00-00    Pingtel
00-E0-75-00-00-00  FF-FF-FF-00-00-00    Veritel
00-E0-BB-00-00-00  FF-FF-FF-00-00-00    3COM
00-02-03-00-00-00  FF-FF-FF-00-00-00    User1

Total OUI: 9

Switch#
```

This example shows how to display the voice VLAN information of ports.

```
Switch# show voice vlan interface eth1/0/1-5
Interface State Mode
------------ ---------- ------------
eth1/0/1 Enabled Auto/Tag
eth1/0/2 Enabled Manual
eth1/0/3 Enabled Manual
eth1/0/4 Enabled Auto/Untag
eth1/0/5 Disabled Manual
Switch#
```

This example shows how to display the learned voice devices on ports eth1/0/1-1/0/2.

```
Switch# show voice vlan device interface eth1/0/1-2
Interface Device Address Start Time Status
--------- ----------------- ----------------- -------
eth1/0/1 00-03-6B-00-00-01 2012-03-19 09:00 Active
eth1/0/1 00-03-6B-00-00-02 2012-03-20 10:09 Aging
eth1/0/1 00-03-6B-00-00-05 2012-03-20 12:04 Active
eth1/0/2 00-03-6B-00-00-0a 2012-03-19 08:11 Aging
eth1/0/2 33-00-61-10-00-11 2012-03-20 06:45 Aging
Total Entries: 5
Switch#
```

This example shows how to display the learned LLDP-MED voice devices on ports eth1/0/1-1/0/2.

```
Switch# show voice vlan lldp-med device interface eth1/0/1-2
Index : 1
Interface : eth1/0/1
Chassis ID Subtype : MAC Address
Chassis ID : 00-E0-BB-00-00-11
Port ID Subtype : Network Address
Port ID : 172.18.1.1
Create Time : 2012-03-19 10:00
Remain Time : 108 Seconds
```

```
Index : 2
Interface : eth1/0/2
Chassis ID Subtype : MAC Address
Chassis ID : 00-E0-BB-00-00-12
Port ID Subtype : Network Address
Port ID : 172.18.1.2
Create Time : 2012-03-20 11:00
Remain Time : 105 Seconds
Total Entries: 2
Switch#
```

44. Web Authentication Commands

44-1 web-auth enable

This command is used to enable the Web authentication function on the port. Use the **no** form of this command to disable the Web authentication function.

web-auth enable

no web-auth enable

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Interface Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

This command allows hosts connected to the port to do authentication via the Web browser.

Example

This example shows how to enable the Web authentication function on interface eth1/0/1.

```
Switch# configure terminal
Switch(config)# interface Ethernet 1/0/1
Switch(config-if)# web-auth enable
Switch(config-if)#
```

44-2 web-auth page-element

This command is used to customize the Web authentication page elements. Use the no form of this command to revert to the default setting.

web-auth page-element {page-title *STRING* **| login-window-title** *STRING* **| username-title** *STRING* **| password-title** *STRING* **| logout-window-title** *STRING* **| copyright-line** *LINE-NUMBER* **title** *STRING***}**

no web-auth page-element {page-title | login-window-title | username-title | password-title | logout-window-title | copyright-line}

Parameters

page-title *STRING*	Specifies the title of the Web authentication page. The maximum number can be up to 128 characters.
login-window-title *STRING*	Specifies the title of the Web authentication login window. The maximum number can be up to 64 characters.
username-title *STRING*	Specifies the user name title of Web authentication login window. The maximum number can be up to 32 characters.
password-title *STRING*	Specifies the password title of Web authentication login window. The maximum number can be up to 32 characters.
logout-window-title *STRING*	Specifies the title of the Web authentication logout window. The maximum number can be up to 64 characters.
copyright-line *LINE-NUMBER* **title** *STRING*	Specifies the copyright information by lines in Web authentication pages. The total copyright information can be up to 5 lines and 128 characters for each line.

Default

By default, the page title is not set.

By default, the login window title is “Authentication Login”.

By default, the username title is “User Name”.

By default, the password title is “Password”.

By default, the logout window title is “Logout From The Network”.

By default, the copyright information is not set.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Administrators can customize Web authentication page elements. There are two Web authentication pages, (1) the authentication login page and (2) the authentication logout page.

The Web authentication login page will be displayed to the user to get the username and password when the system doing Web authentication for the user.

Users can logout from the network by clicking the Logout button on the authentication login page after success login to the network.

Example

This example shows how to modify two lines of the copyright information at the bottom of the authentication page with:

Line 1: Copyright @ 2018 All Rights Reserved

Line 2: Site: http://support.website.com

```
Switch# configure terminal
Switch(config)# web-auth page-element copyright-line 1 title Copyright @ 2018 All Rights
Reserved
Switch(config)# web-auth page-element copyright-line 2 title Site:
http://support.website.com
Switch(config)#
```

44-3 web-auth success redirect-path

This command is used to configure the default URL the client Web browser will be redirected to after successful authentication. Use the no form of this command to remove the specification.

web-auth success redirect-path *STRING*

no web-auth success redirect-path

Parameters

STRING	Specifies the default URL the client Web browser will be redirected to after successful authentication. If no default redirect URL is specified, the Web authentication logout page will be displayed. The default redirect path can be up to 128 characters.

Default

By default, the Web authentication logout page is displayed.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to specify the Web page to display to the hosts who passes the Web authentication.

Example

This example shows how to configure the default redirect path to be “http://www.website.com” after passing Web authentication.

```
Switch# configure terminal
Switch(config)# web-auth success redirect-path http://www.website.com
Switch(config)#
```

44-4 web-auth system-auth-control

This command is used to enable the Web authentication function globally on the Switch. Use the no form of this command to disable the Web authentication function globally on the Switch.

web-auth system-auth-control

no web-auth system-auth-control

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Web authentication is a feature designed to authenticate a user by using the Web browser when the user is trying to access the Internet via the Switch. The Switch itself can be the authentication server and do the authentication via RADIUS protocol with remote RADIUS server. The authentication process uses either the HTTP or HTTPS protocol.

Example

This example shows how to enable the Web authentication function globally on the Switch.

```
Switch# configure terminal
Switch(config)# web-auth system-auth-control
Switch(config)#
```

44-5 web-auth virtual-ip

This command is used to configure the Web authentication virtual IP address which is used to accept authentication requests from host. Use the no form of this command to revert to the default setting.

web-auth virtual-ip {ipv4 *IP-ADDRESS* **|** *ipv6 IPV6-ADDRESS* **}**

no web-auth virtual-ip {ipv4 | ipv6 }

Parameters

ipv4 *IP-ADDRESS*	Specifies the Web authentication virtual IPv4 address.
ipv6 *IPV6-ADDRESS*	Specifies the Web authentication virtual IPv6 address.

Default

None.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 12.

Usage Guideline

The virtual IP of Web authentication is just the characterization of the Web authentication function on the Switch. All Web authentication processes communicate with this IP address, however, the virtual IP does not respond to any ICMP packet or ARP request. So it's not allowed to configure virtual IP in the same subnet as the Switch's IP interface or the same subnet as the host PCs' subnet, otherwise the Web authentication cannot operate correctly.

If the IPv4 virtual IP is not configured, the IPv4 access cannot start a Web authentication. If the IPv6 virtual IP is not configured, the IPv6 access cannot start a Web authentication.

Example

This example shows how to configure the Web authentication virtual IPv4 to be "1.1.1.1" and virtual IPV6 to be "2018::1".

```
Switch# configure terminal
Switch(config)# web-auth virtual-ip ipv4 1.1.1.1
Switch(config)# web-auth virtual-ip ipv6 2018::1
Switch(config)#
```

44-6 snmp-server enable traps web-auth

This command is used to enable sending SNMP notifications for Web-Authentication. Use the no form of this command to disable sending SNMP notifications.

snmp-server enable traps web-auth
no snmp-server enable traps web-auth

Parameters

None.

Default

By default, this option is disabled.

Command Mode

Global Configuration Mode.

Command Default Level

Level: 15.

Usage Guideline

Use this command to enable or disable sending SNMP notifications for Web-Authentication.

Example

This example shows how to enable sending SNMP notifications for Web-Authentication

```
Switch# configure terminal
Switch(config)# snmp-server enable traps web-auth
Switch(config)#
```

Appendix A - System Log Entries

The following table lists all possible entries and their corresponding meanings that will appear in the System Log of this switch.

Auto Surveillance VLAN

Log Description	Severity
Event description: When a new surveillance device is detected on an interface. Log Message: New surveillance device detected (<interface-id>, MAC: <mac-address>) Parameters description: interface-id: Interface name. mac-address: Surveillance device MAC address.	Informational
Event description: When an interface which is enabled surveillance VLAN joins the surveillance VLAN automatically. Log Message: <interface-id> add into surveillance VLAN <vid> Parameters description: interface-id: Interface name. vid:VLAN ID.	Informational
Event description: When an interface leaves the surveillance VLAN and at the same time, no surveillance device is detected in the aging interval for that interface, the log message will be sent. Log Message: <interface-id> remove from surveillance VLAN <vid> Parameters description: interface-id: Interface name. vid:VLAN ID.	Informational
Event description: When an IPC is added in the surveillance VLAN, the log message will be sent. Log Message: ASV: Add IPC (IP:<ipaddr> MAC:< mac-address >) Parameters description: ipaddr: Represent the IP address of the IPC mac-address: Represent the MAC address of the IPC	Informational
Event description: When an IPC is removed from the surveillance VLAN, the log message will be sent. Log Message: ASV: Remove IPC (IP:<ipaddr> MAC:< mac-address >) Parameters description: ipaddr: Represent the IP address of the IPC mac-address: Represent the MAC address of the IPC	Informational
Event description: When an NVR is added in the surveillance VLAN, the log message will be sent. Log Message: ASV: Add NVR (IP:<ipaddr> MAC:< mac-address >) Parameters description: ipaddr: Represent the IP address of the NVR mac-address: Represent the MAC address of the NVR	Informational
Event description: When an NVR is removed from the surveillance VLAN, the log message will be sent. Log Message: ASV: Remove NVR (IP:<ipaddr> MAC:< mac-address >) Parameters description: ipaddr: Represent the IP address of the NVR mac-address: Represent the MAC address of the NVR	Informational
Event description: When the mode of ASV 2.0 is changed by Web GUI, the log message will be sent. Log Message: ASV: Mode change from <mode> to <mode> Parameters description:	Informational

mode: Represent the mode of ASV 2.0. And the mode can be standard or surveillance.

DDM

Log Description	Severity
Event description: when the any of SFP parameters exceeds from the warning threshold. Log Message: Optical transceiver <interface-id> <component> <high-low> warning threshold exceeded Parameters description: interface-id: port interface ID. component: DDM threshold type. It can be one of the following types: temperature supply voltage bias current TX power RX power high-low: High or low threshold.	Warning
Event description: when the any of SFP parameters exceeds from the alarm threshold. Log Message: Optical transceiver <interface-id> <component> <high-low> alarm threshold exceeded Parameters description: interface-id: port interface ID. component: DDM threshold type. It can be one of the following types: temperature supply voltage bias current TX power RX power high-low: High or low threshold.	Warning
Event description: when the any of SFP parameters recovers from the warning threshold. Log Message: Optical transceiver <interface-id> <component> back to normal Parameters description: interface-id: port interface ID. component: DDM threshold type. It can be one of the following types: temperature supply voltage bias current TX power RX power	Warning

Interface

Log Description	Severity
Event description: When port is down Log Message: Port < interface-id> link down Parameters description: interface-id: Interface name	Informational
Event description: When port is up Log Message: Port < interface-id> link up, <link-speed> Parameters description: interface-id: Interface name link-speed: port link speed.	Informational

LBD

Log Description	Severity
Event description: Record the event when an interface detect loop. Log Message: <interface-id> LBD loop occurred. Parameters description: interface-id: Interface on which loop is detected.	Critical
Event description: Record the event when an interface loop recovered Log Message: <interface-id> LBD loop recovered. Parameters description: interface-id: Interface on which loop is detected.	Critical

Login/Logout CLI

Log Description	Severity
Event description: Login through console successfully. Log Message: Successful login through Console (Username: <username>) Parameters description: username: Represent current login user.	Informational
vent description: Login through console unsuccessfully. Log Message: Login failed through Console (Username: <username>) Parameters description: username: Represent current login user.	Warning
Event description: Console session timed out. Log Message: Console session timed out (Username: <username>) Parameters description: username: Represent current login user.	Informational
Event description: Logout through console. Log Message: Logout through Console (Username: <username>) Parameters description: username: Represent current login user.	Informational
Event description: Login through telnet successfully. Log Message: Successful login through Telnet (Username: <username>, IP: <ipaddr>) Parameters description: username: Represent current login user. ipaddr: Represent client IP address.	Informational

Event description: Login through telnet unsuccessfully. Log Message: Login failed through Telnet (Username: <username>, IP: <ipaddr>) Parameters description: username: Represent current login user. ipaddr: Represent client IP address.	Warning
Event description: Telnet session timed out. Log Message: Telnet session timed out (Username: <username>, IP: <ipaddr>) Parameters description: username: Represent current login user. ipaddr: Represent client IP address.	Informational
Event description: Logout through telnet. Log Message: Logout through Telnet (Username: <username>, IP: <ipaddr>) Parameters description: username: Represent current login user. ipaddr: Represent client IP address.	Informational

PoE

Log Description	Severity
Event description: Total power usage threshold is exceeded Log Message: Unit <unit-id> usage threshold <percentage> is exceeded Parameters description: unit-id : box id percentage : usage threshold	Warning
Event description: Total power usage threshold is recovered. Log Message: Unit <unit-id> usage threshold <percentage> is recovered Parameters description: unit-id : box id percentage : usage threshold	Warning
Event description: PD alive check fail. Log Message: ASV: PD alive check failed. (Port: <interface-id>, PD: <ipaddr>) Parameters description: interface-id : Interface name ipaddr: Represent PD IP address	Warning

Port Security

Log Description	**Severity**
Event description: Address full on a port. Log Message: MAC address <macaddr> causes port security violation on <interface-id> Parameters description: macaddr: The violation MAC address. interface-id: The interface name.	Warning
Event description: Address full on system. Log Message: Limit on system entry number has been exceeded	Warning

Safeguard

Log Description	Severity
Event description: the host enters the mode of exhausted. Log Message: Unit <unit-id>, Safeguard Engine enters EXHAUSTED mode. Parameters description: unit-id: The Unit ID	Warning
Event description: the host enters the mode of normal. Log Message: Unit <unit-id>, Safeguard Engine enters NORMAL mode. Parameters description: unit-id: The Unit ID	Informational

SNMP

Log Description	Severity
Event Description: SNMP request received with invalid community string Log Message: SNMP request received from <ipaddr> with invalid community string. Parameters Description: ipaddr: The IP address.	Informational

Telnet

Log Description	Severity
Event description: Successful login through Telnet. Log Message: Successful login through Telnet (Username: <username>, IP: <ipaddr>) Parameters description: ipaddr: The IP address of telnet client. username: the user name that used to login telnet server.	Informational
Event description: Login failed through Telnet. Log Message: Login failed through Telnet (Username: <username>, IP: <ipaddr>) Parameters description: ipaddr: The IP address of telnet client. username: the user name that used to login telnet server.	Warning
Event description: Logout through Telnet. Log Message: Logout through Telnet (Username: <username>, IP: <ipaddr>) Parameters description: ipaddr: The IP address of telnet client. username: the user name that used to login telnet server.	Informational
Event description: Telnet session timed out. Log Message: Telnet session timed out (Username: <username>, IP: <ipaddr>). Parameters description: ipaddr: The IP address of telnet client. username: the user name that used to login telnet server.	Informational

Voice-VLAN

Log Description	Severity
Event description: When a new voice device is detected on an interface. Log Message: New voice device detected (<interface-id>, MAC: < mac-address >)	Informational

Parameters description: interface-id: Interface name. mac-address: Voice device MAC address	
Event description: When an interface which is in auto voice VLAN mode joins the voice VLAN Log Message: < interface-id > add into voice VLAN <vid > Parameters description: interface-id: Interface name. vid:VLAN ID	Informational
Event description: When an interface leaves the voice VLAN and at the same time, no voice device is detected in the aging interval for that interface, the log message will be sent. Log Message: < interface-id > remove from voice VLAN <vid > Parameters description: interface-id: Interface name. vid:VLAN ID	Informational

Web

Log Description	Severity
Event description: Successful login through Web. Log Message: Successful login through Web (Username: <username>, IP: <ipaddr>). Parameters description: username: The use name that used to login HTTP server. ipaddr: The IP address of HTTP client.	Informational
Event description: Login failed through Web. Log Message: Login failed through Web (Username: <username>, IP: <ipaddr>). Parameters description: username: The use name that used to login HTTP server. ipaddr: The IP address of HTTP client.	Warning
Event description: Web session timed out. Log Message: Web session timed out (Username: <usrname>, IP: <ipaddr>). Parameters description: username: The use name that used to login HTTP server. ipaddr: The IP address of HTTP client.	Informational
Event description: Logout through Web. Log Message: Logout through Web (Username: %S, IP: %S). Parameters description: username: The use name that used to login HTTP server. ipaddr: The IP address of HTTP client.	Informational

Web-Authentication

Log Description	**Severity**
Event description: When a host has passed the authentication. Log Message: Web-Authentication host login success (Username: <string>, IP: <ipaddr | ipv6address>, MAC: <mac-address>, <interface-id>, VID: <vlan-id>) Parameters description: Username: The host username. IP: The host IP address mac-address: The host MAC addresses. interface-id: The interface on which the host is authenticated. vlan-id: The VLAN ID on which the host exists.	Informational

Event description: When a host fail to pass the authentication. Message: Web-Authentication host login fail (Username: <string>, IP: <ipaddr | ipv6address>, MAC: <mac-address>, <interface-id>, VID: <vlan-id>) Parameters description: Username: The host username. IP: The host IP address mac-address: The host MAC addresses. interface-id: The interface on which the host is authenticated. vlan-id: The VLAN ID on which the host exists.	Error

Appendix B - Trap Entries

The following table lists all possible trap log entries and their corresponding meanings that will appear in the switch.

Authentication Fail

Trap Name	Description	OID
authenticationFailure	An authenticationFailure trap signifies that the SNMPv2 entity, acting in an agent role, has received a protocol message that is not properly authenticated. While all implementations of the SNMPv2 must be capable of generating this trap, the snmpEnableAuthenTraps object indicates whether this trap will be generated.	1.3.6.1.6.3.1.1.5 .5

DDM

Trap Name	Description	OID
dDdmAlarmTrap	A notification is generated when an abnormal alarm situation occurs or recovers from an abnormal alarm situation to normal status. Only when the current value> low warning or current value <high warning will send recover trap. Binding objects: (1) dDdmNotifyInfoIfIndex (2) dDdmNotifyInfoComponent (3) dDdmNotifyInfoAbnormalLevel (4) dDdmNotifyInfoThresholdExceedOrRecover	1.3.6.1.4.1.171. 11.155.1000.72. 0.1
dDdmWarningTrap	A notification is generated when an abnormal warning situation occurs, or recovers from an abnormal warning situation to normal status. Binding objects: (1) dDdmNotifyInfoIfIndex (2) dDdmNotifyInfoComponent (3) dDdmNotifyInfoAbnormalLevel (4) dDdmNotifyInfoThresholdExceedOrRecover	1.3.6.1.4.1.171. 11.155.1000.72. 0.2

LBD

Trap Name	Description	OID
isLbdLoopOccurred	his trap is sent when an interface loop occurs. Binding objects: (1) isLbdNotifyInfoIfIndex	1.3.6.1.4.1.171. 11.155.1000.46. 0.1
isLbdLoopRestart	This trap is sent when an interface loop restarts after the interval time. Binding objects: (1) isLbdNotifyInfoIfIndex	1.3.6.1.4.1.171. 11.155.1000.46. 0.2

LLDP

Trap Name	Description	OID
lldpRemTablesChange	A lldpRemTablesChange notification is sent when the value of lldpStatsRemTableLastChangeTime changes. It can be utilized by an NMS to trigger LLDP remote systems table maintenance polls. Binding objects: (1) lldpStatsRemTablesInserts (2) lldpStatsRemTablesDeletes (3) lldpStatsRemTablesDrops (4) lldpStatsRemTablesAgeouts	1.0.8802.1.1.2.0.0.1

STP

Trap Name	Description	OID
newRoot	The newRoot trap indicates that the sending agent has become the new root of the Spanning Tree; the trap is sent by a bridge soon after its election as the new root, e.g., upon expiration of the Topology Change Timer, immediately subsequent to its election. Implementation of this trap is optional.	1.3.6.1.2.1.17.0.1
topologyChange	A topologyChange trap is sent by a bridge when any of its configured ports transitions from the Learning state to the Forwarding state, or from the Forwarding state to the Blocking state. The trap is not sent if a newRoot trap is sent for the same transition. Implementation of this trap is optional	1.3.6.1.2.1.17.0.2

PoE

Trap Name	Description	OID
pethMainPowerUsageOnNotification	This trap indicates PSE Threshold usage indication is on, the usage power is above the threshold. At least 500 msec must elapse between notifications being emitted by the same object instance. Binding objects: (1) pethMainPseConsumptionPower	1.3.6.1.2.1.105.0.2
pethMainPowerUsageOffNotification	This trap indicates PSE Threshold usage indication is off, the usage power is below the threshold. At least 500 msec must elapse between notifications being emitted by the same object instance. Binding objects: (1) pethMainPseConsumptionPower	1.3.6.1.2.1.105.0.3
isPoeIfPdAliveFailOccurNotification	This Notification indicates if the PD device has the stop working or no response problem.	1.3.6.1.4.1.171.11.155.1000.24.0.4

Port

Trap Name	Description	OID

linkUp	A notification is generated when port linkup. Binding objects: (1) ifIndex (2) ifAdminStatus (3) ifOperStatu	1.3.6.1.6.3.1.1.5 .4
linkDown	A notification is generated when port linkdown. Binding objects: (1) ifIndex (2) ifAdminStatus (3) ifOperStatu	1.3.6.1.6.3.1.1.5 .3

Port Security

Trap Name	Description	OID
dPortSecMacAddrViolation	When the port security trap is enabled, new MAC addresses that violate the pre-defined port security 1.14.8.0.1 configuration will trigger trap messages to be sent out. Binding objects: (1) ifIndex (2) dPortSecIfCurrentStatus (3) dPortSecIfViolationMacAddress	1.3.6.1.4.1.171. 11.155.1000.8.0 .1

Start

Trap Name	Description	OID
coldStart	A coldStart trap signifies that the SNMPv2 entity, acting in an agent role, is reinitializing itself and that its configuration may have been altered.	1.3.6.1.6.3.1.1.5 .1
warmStart	A warmStart trap signifies that the SNMPv2 entity, acting in an agent role, is reinitializing itself such that its configuration is unaltered.	1.3.6.1.6.3.1.1.5 .2

Web-Authentication

Trap Name	Description	OID
isWebAuthLoggedSuccess	The trap is sent when a host has successfully logged in (passed Web-Authentication). Binding objects: (1) ifIndex (2) isSessionAuthVlan (3) isnaSessionClientMacAddress (4) isnaSessionClientAddrType (5) isnaSessionClientAddress (6) isnaSessionAuthUserName	1.3.6.1.4.1.17.1 1.155.1000.154. 0.1
isWebAuthLoggedFail	The trap is sent when a host has failed to pass Web-Authentication (login failed). Binding objects: (1) ifIndex	1.3.6.1.4.1.17.1 1.155.1000.154. 0.2

(2) isnaSessionAuthVlan
(3) isnaSessionClientMacAddress
(4) isnaSessionClientAddrType
(5) isnaSessionClientAddress
(6) isnaSessionAuthUserName

Appendix C - IETF RADIUS Attributes Support

Remote Authentication Dial-In User Service (RADIUS) attributes carry specific authentication, authorization, information and configuration details for the request and reply. This appendix lists the RADIUS attributes currently supported by the switch.

RADIUS attributes are supported by the IETF standard and Vendor-Specific Attribute (VSA). VSA allows the vendor to create an additionally owned RADIUS attribute.

IETF standard RADIUS attributes are defined in the RFC 2865 Remote Authentication Dial-In User Service (RADIUS), RFC 2866 RADIUS Accounting, RFC 2868 RADIUS Attributes for Tunnel Protocol Support, and RFC 2869 RADIUS Extensions.

The following table lists the IETF RADIUS attributes supported by the D-Link switch.

RADIUS Authentication Attributes:

Trap Name	Description
1	User-Name
2	User-Password