CLI Reference Guide

Managed Switches

1900000380 REV1.0.0

May 2025

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Preface

This Guide is intended for network administrator to provide referenced information about CLI (Command Line Interface). The device mentioned in this Guide stands for Managed Switch without any explanation. Some models featured in this guide may be unavailable in your country or region. For local sales information, visit https://www.omadanetworks.com/

Overview of this Guide

Chapter 1: Using the CLI

Provide information about how to use the CLI, CLI Command Modes, Security Levels and some Conventions.

Chapter 2: Line Commands (Only for Certain Devices)

Provide information about the commands used to make related configurations for the desired users and set the priority of the console media type.

Chapter 3: User Interface

Provide information about the commands used to switch between five CLI Command Modes.

Chapter 4: User Management Commands

Provide information about the commands used for user management.

Chapter 5: System Configuration Commands

Provide information about the commands used for configuring the System information and System IP, reboot and reset the switch, upgrade the switch system and commands used for cable test.

Chapter 6: PTP Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring the PTP (Precision Time Protocol).

Chapter 7: File System Configuration Commands

Provide information about the commands used for configuring the File System.

Chapter 8: Management Port Configuration Commands

Provide information about the commands used for configuring the Management Port.

Chapter 9: EEE Configuration Commands

Provide information about the commands used for configuring EEE (Energy Efficient Ethernet).

Chapter 10: SDM Template Commands

Provide information about the commands used for configuring the SDM templates.

Chapter 11: Time Range Commands

Provide information about the commands used for configuring the time range.

Chapter 12: Interface Configuration Commands

Provide information about the commands used for configuring the Speed, Negotiation Mode, and Flow Control for Ethernet ports.

Chapter 13: Port Isolation Commands

Provide information about the commands used for configuring Port Isolation function.

Chapter 14: Loopback Detection Commands

Provide information about the commands used for configuring the Loopback Detection function.

Chapter 15: Stack Commands

Provide information about the commands used for configuring the Stack function.

Chapter 16: DDM Commands (Only for Certain Devices)

Provide information about the commands used for DDM (Digital Diagnostic Monitoring) function.

Chapter 17: Etherchannel Commands

Provide information about the commands used for configuring LAG (Link Aggregation Group) and LACP (Link Aggregation Control Protocol).

Chapter 18: MLAG Commands

Provide information about the commands used for configuring MLAG (Multichassis Link Aggregation Group).

Chapter 19: MAC Address Commands

Provide information about the commands used for Address configuration.

Chapter 20: IEEE 802.1Q VLAN Commands

Provide information about the commands used for configuring IEEE 802.1Q VLAN.

Chapter 21: MAC-based VLAN Commands

Provide information about the commands used for configuring MAC-based VLAN.

Chapter 22: Protocol-based VLAN Commands

Provide information about the commands used for configuring Protocol VLAN.

Chapter 23: Private VLAN Commands (Only for Certain Devices)

Provide information about the commands used for configuring Private VLAN.

Chapter 24: VLAN-VPN Commands (Only for Certain Devices)

Provide information about the commands used for configuring VLAN-VPN (Virtual Private Network) function.

Chapter 25: ERPS Commands

Provide information about the commands used for configuring ERPS (Ethernet Ring Protection Switching) function.

Chapter 26: GVRP Commands

Provide information about the commands used for configuring GVRP (GARP VLAN registration protocol).

Chapter 27: IGMP Snooping Commands

Provide information about the commands used for configuring the IGMP Snooping (Internet Group Management Protocol Snooping).

Chapter 28: Layer 3 IGMP Commands (Only for Certain Devices)

Provide information about the commands used for configuring the layer 3 IGMP Snooping (Internet Group Management Protocol Snooping).

Chapter 29: PIM Commands (Only for Certain Devices)

Provide information about the commands used for configuring the PIM (Protocol Independent Multicast) function.

Chapter 30: Static Multicast Routing Commands (Only for Certain Devices)

Provide information about the commands used for configuring the Static Multicast Routing function.

Chapter 31: VRF Commands (Only for Certain Devices)

Provide information about the commands used for configuring the VRF (Virtual Routing and Forwarding) function.

Chapter 32: MLD Snooping Commands

Provide information about the commands used for configuring the MLD Snooping (Multicast Listener Discovery Snooping).

Chapter 33: MVR Commands

Provide information about the commands used for configuring the MVR.

Chapter 34: MSTP Commands

Provide information about the commands used for configuring the MSTP (Multiple Spanning Tree Protocol).

Chapter 35: Debug Commands

Provide information about the commands used for configuring the debug funtion.

Chapter 36: LLDP Commands

Provide information about the commands used for configuring LLDP function.

Chapter 37: L2PT Commands (Only for Certain Devices)

Provide information about the commands used for configuring L2PT (Layer 2 Protocol Tunneling).

Chapter 38: PPPoE ID-Insertion Commands (Only for Certain Devices)

Provide information about the commands used for configuring PPPoE ID-Insertion.

Chapter 39: Static Routes Commands

Provide information about the commands used for configuring the Static Route function.

Chapter 40: RIP Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring the RIP (Routing Information Protocol).

Chapter 41: RIPng Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring the RIP (RIP next generation).

Chapter 42: OSPF Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring the OSPF (Open Shortest Path First).

Chapter 43: OSPFv3 Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring the OSPFv3 (Open Shortest Path First version 3).

Chapter 44: BFD Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring BFD (Bidirectional Forwarding Detection).

Chapter 45: BGP Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring BGP (Border Gateway Protocol).

Chapter 46: IS-IS Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring IS-IS (Intermediate System to Intermediate System).

Chapter 47: URPF Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring URPF (Unicast Reverse Path Forwarding).

Chapter 48: Tunnel Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring IPv6 over IPv4/GRE Tunnel.

Chapter 49: IPv6 Address Configuration Commands

Provide information about the commands used for configuring the System IPv6 addresses.

Chapter 50: ARP Configuration Commands

Provide information about the commands used for configuring the ARP (Address Resolution Protocol) functions.

Chapter 51: VRRP Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring VRRP (Virtual Router Redundancy Protocol).

Chapter 52: DHCP Server Configuration Commands

Provide information about the commands used for configuring the DHCP Server function.

Chapter 53: DHCP Relay Configuration Commands

Provide information about the commands used for configuring the DHCP Relay function.

Chapter 54: DHCPV6 Relay Configuration Commands

Provide information about the commands used for configuring the DHCPV6 Relay function.

Chapter 55: DHCP L2 Relay Configuration Commands

Provide information about the commands used for configuring the DHCP L2 Relay function.

Chapter 56: DHCPV6 L2 Relay Configuration Commands

Provide information about the commands used for configuring the DHCPV6 L2 Relay function.

Chapter 57: QoS Configuration Commands

Provide information about the commands used for configuring the QoS function.

Chapter 58: Bandwidth Control Configuration Commands

Provide information about the commands used for configuring the Bandwidth Control.

Chapter 59: OUI-Based VLAN Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring OUI-Based VLAN (Organizationally Unique Identifier-Based Virtual Local Area Network).

Chapter 60: Voice VLAN Configuration Commands

Provide information about the commands used for configuring Voice VLAN.

Chapter 61 Auto VoIP Configuration Commands

Provide information about the commands used for configuring Auto VoIP.

Chapter 62: Access Control Configuration Commands

Provide information about the commands used for configuring Access Control.

Chapter 63: HTTP and HTTPS Configuration Commands

Provide information about the commands used for configuring the HTTP and HTTPS logon.

Chapter 64: SSH Configuration Commands

Provide information about the commands used for configuring and managing SSH (Security Shell).

Chapter 65: Telnet Configuration Commands

Provide information about the commands used for configuring and managing SSH (Security Shell).

Chapter 66: Serial Port Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring and managing SSH (Security Shell).

Chapter 67: AAA Configuration Commands

Provide information about the commands used for configuring AAA (authentication, authorization and accounting).

Chapter 68: IEEE 802.1X Configuration Commands

Provide information about the commands used for configuring IEEE 802.1X function.

Chapter 69: Port Security Configuration Commands

Provide information about the commands used for configuring Port Security.

Chapter 70: MACsec Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring the MACsec (Media Access Control Security).

Chapter 71: Port Mirroring Configuration Commands

Provide information about the commands used for configuring the Port Mirror function.

Chapter 72: ACL Configuration Commands

Provide information about the commands used for configuring the ACL (Access Control List).

Chapter 73: IPv4 IMPB Configuration Commands

Provide information about the commands used for binding the IP address, MAC address, VLAN and the connected Port number of the Host together.

Chapter 74: IPv6 IMPB Configuration Commands

Provide information about the commands used for binding the IPv6 address, MAC address, VLAN and the connected Port number of the Host together.

Chapter 75: IP Verify Source Configuration Commands

Provide information about the commands used for guarding the IP Source by filtering the IP packets based on the IP-MAC Binding entries.

Chapter 76: IPv6 Verify Source Configuration Commands

Provide information about the commands used for guarding the IPv6 Source by filtering the IP packets based on the IP-MAC Binding entries.

Chapter 77: DHCPv4 Filter Configuration Commands

Provide information about the commands used for configuring the DHCPv4 Filter.

Chapter 78: DHCPv6 Filter Configuration Commands

Provide information about the commands used for configuring the DHCPv6 Filter.

Chapter 79: DoS Defend Configuration Command

Provide information about the commands used for DoS defend and detecting the DoS attack.

Chapter 80: sFlow Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring the Sampled Flow function.

Chapter 81: Ethernet OAM Configuration Commands (Only for Certain Devices)

Provide information about the commands used for configuring the Ethernet OAM (Operation, Administration, and Maintenance) function.

Chapter 82: DLDP Commands Configuration (Only for Certain Devices)

Provide information about the commands used for configuring the DLDP (Device Link Detection Protocol).

Chapter 83: SNMP Configuration Commands

Provide information about the commands used for configuring the SNMP (Simple Network Management Protocol) functions.

Chapter 84: NETCONF Commands Configuration (Only for Certain Devices)

Provide information about the commands used for configuring the NETCONF (Network Configuration Protocol).

Chapter 85: PoE Commands Configuration (Only for Certain Devices)

Provide information about the commands used for configuring PoE function.

Chapter 86: ARP Inspection Configuration Commands

Provide information about the commands used for protecting the switch from the ARP cheating or ARP Attack.

Chapter 87: ND Detection Configuration Commands

Provide information about the commands used for configuring ND detection.

Chapter 88: System Log Configuration Commands

Provide information about the commands used for configuring system log.

Chapter 1 Using the CLI

1.1 Accessing the CLI

You can log on to the switch and access the CLI by the following three methods:

1. Log on to the switch by the console port on the switch.
2. Log on to the switch remotely by a Telnet connection through an Ethernet port.
3. Log on to the switch remotely by an SSH connection through an Ethernet port.

1.1.1 Logon by a console port

Note: Console port is only available on certain devices.

- Console Port

The switch has two console ports: an RJ-45 console port and a Micro-USB console port. Console output is active on devices connected to both console ports, but console input is only active on one console port at a time.

The Micro-USB connector takes precedence over the RJ-45 connector. When the switch detects a valid connection on the Micro-USB console port, input from the RJ-45 console port is immediately disabled, and input from the Micro-USB console port is enabled. Removing the Micro-USB connection immediately reenables input from the RJ-45 console connection.

- USB Console Driver

If you are using the USB port on the MAC OS X or Linux OS for console connection, there is no need to run a USB driver.

If you are using the switch's Micro-USB console port with the USB port of a Windows PC, a driver for the USB port is required. The USB driver is provided on the resource CD. Follow the InstallSheild Wizard to accomplish the installation.

The TP-Link USB Console Driver supports the following Windows operating systems:

- 32-bit Windows XP SP3
- 64-bit Windows XP
- 32-bit Windows Vista
- 64-bit Windows Vista
- 32-bit Windows 7

- 64-bit Windows 7
- 32-bit Windows 8
- 64-bit Windows 8
- 32-bit Windows 8.1
- 64-bit Windows 8.1
- 32-bit Windows 10
- 64-bit Windows 10

After the TP-Link USB Console Driver is installed, the PC's USB port will act as RS-232 serial port when the PC's USB port is connected to the switch's Micro-USB console port. And the PC's USB port will act as standard USB port when the PC's USB port is unplugged from the switch.

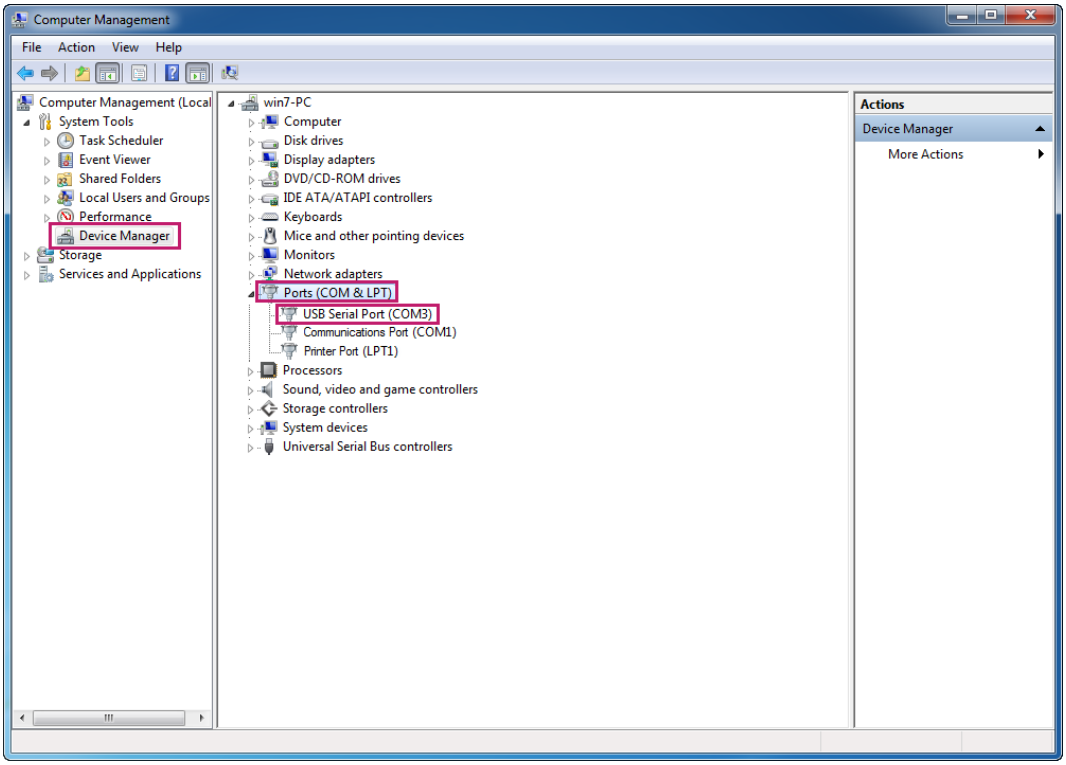
- Logon

Take the following steps to log on to the switch by the console port.

1. Connect the PCs or Terminals to the console port on the switch by the provided cable.
2. Start the terminal emulation program (such as the HyperTerminal, PuTTY, Tera Term) on the PC.
3. Specify the connection COM port in the terminal emulation program. If the Micro-USB Console port is used, you can view which port is assigned to the USB serial port in the following path:

   Control Panel -> Hardware and Sound -> Device Manager -> Ports ->USB Serial Port.

Figure 1-1 USB Serial Port Number

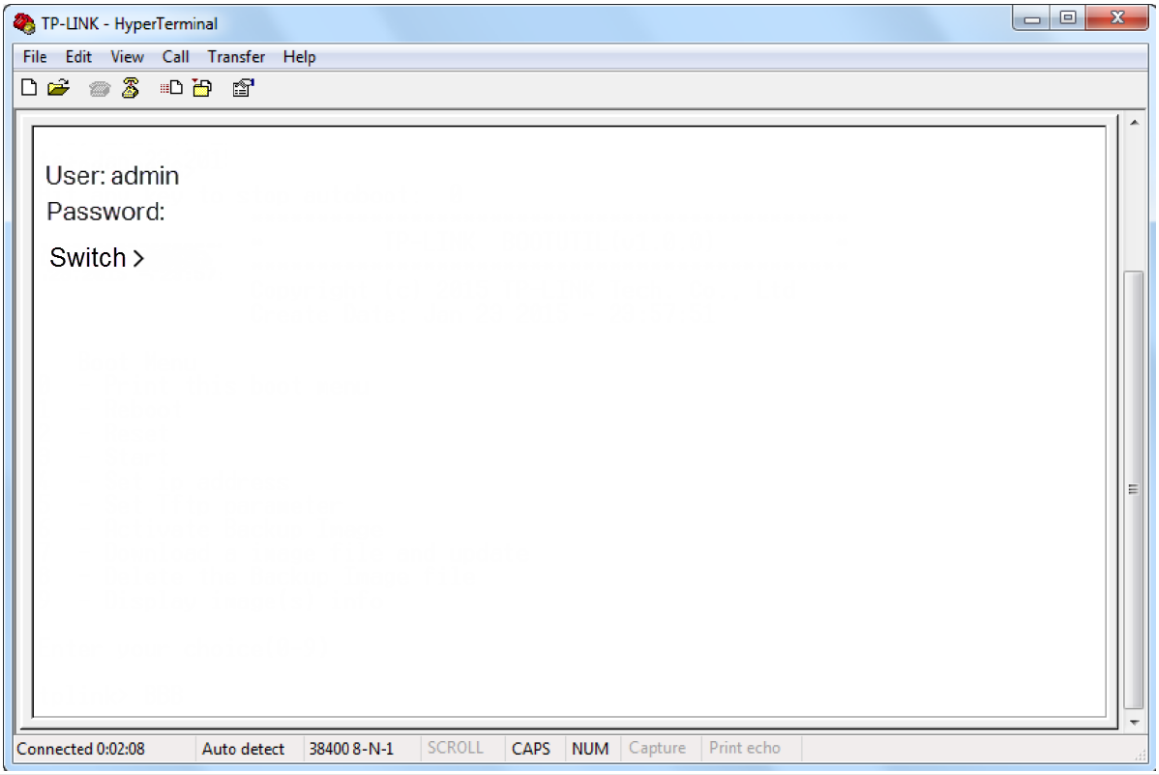


4. Configure the terminal emulation program or the terminal to use the following settings:

   - Baud rate: 38400 bps
   - Data bits: 8
   - Parity: none
   - Stop bits: 1
   - Flow control: none

5. Type the Username and Password in the Hyper Terminal window. The default value for both of them are **admin**. Press **Enter** in the main window and "Switch>" will appear indicating that you have successfully logged in to the switch and you can use the CLI now.

Figure 1-2 Log in to the Switch



Note: The first time you log in, change the password to better protect your network and devices.

1.1.2 Logon by Telnet

To log on to the switch by a Telnet connection, please take the following steps:

1. Click **Start** and type in **cmd** in the Search programs and files window and press the **Enter** button.

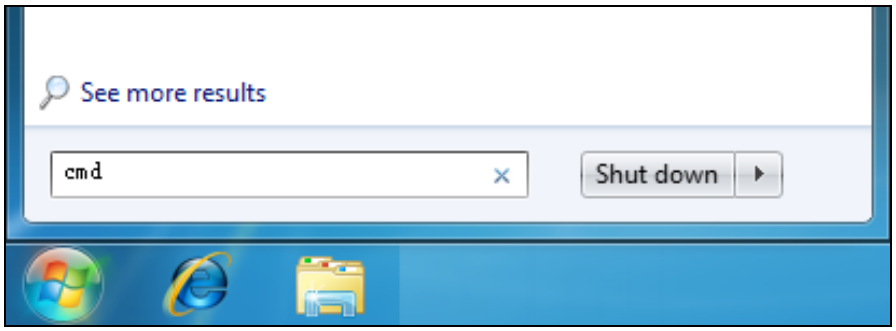


Figure 1-1 Run Window

2. Type in telnet 192.168.0.1 in the cmd window and press **Enter**.

Figure 1-2 Type in the telnet command

3. Type in the login username and password (both **admin** by default). Press **Enter** and you will enter User EXEC Mode.

Figure 1-2 Log in the Switch

Note: The first time you log in, change the password to better protect your network and devices.

4. Type in **enable** command and you will enter Privileged EXEC Mode. By default, no password is needed. Later you can set a password for users who want to access the Privileged EXEC Mode.

Figure 1-3 Enter into Priviledged EXEC Mode

1.1.3 Logon by SSH

To log on by SSH, a Putty client software is recommended. There are two authentication modes to set up an SSH connection:

Password Authentication Mode: It requires username and password, which are both **admin** by default.

Key Authentication Mode: It requires a public key for the switch and a private key for the SSH client software. You can generate the public key and the private key through Putty Key Generator.

Note:

1. Before SSH login, please follow the steps shown in Figure 1-4 to enable the SSH function through Telnet connection, which is enabled by default for some models.
2. The first time you log in, change the password to better protect your network and devices.

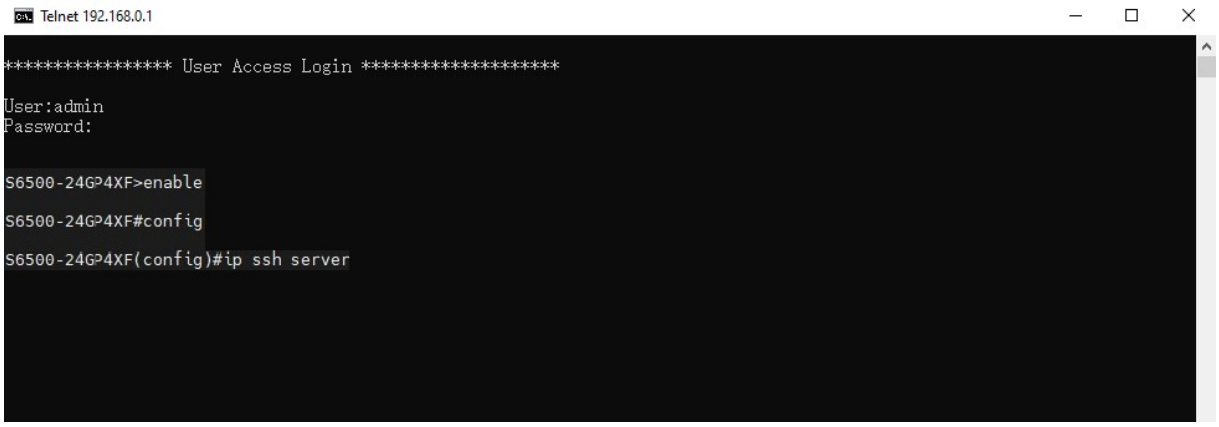


Figure 1-4 Enable SSH function

- **Password Authentication Mode**

1. Open the software to log on to the interface of PuTTY. Enter the IP address of the switch into **Host Name** field; keep the default value 22 in the **Port** field; select **SSH** as the Connection type.

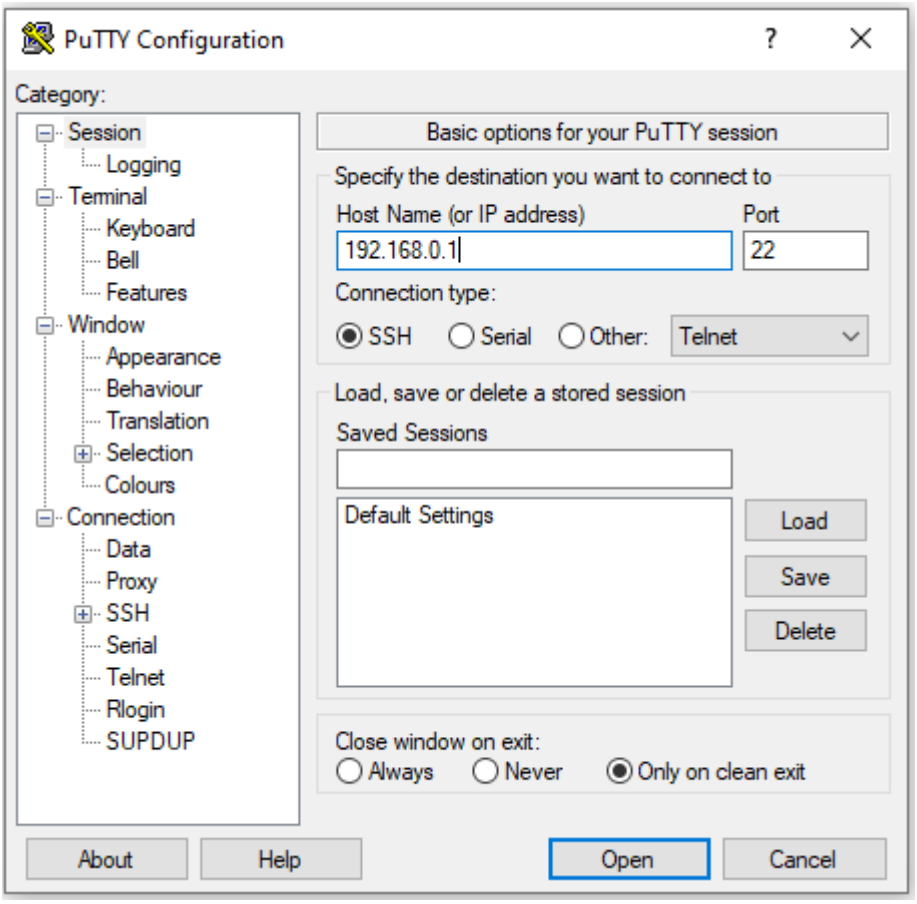


Figure 1-5 SSH Connection Config

2. Click the **Open** button in the above figure to log on to the switch. Enter the login user name and password to log on the switch, and then enter enable to enter Privileged EXEC Mode, so you can continue to configure the switch.

Figure 1-6 Log on the Switch

■ **Key Authentication Mode**

2. Select the key type and key length, and generate SSH key.

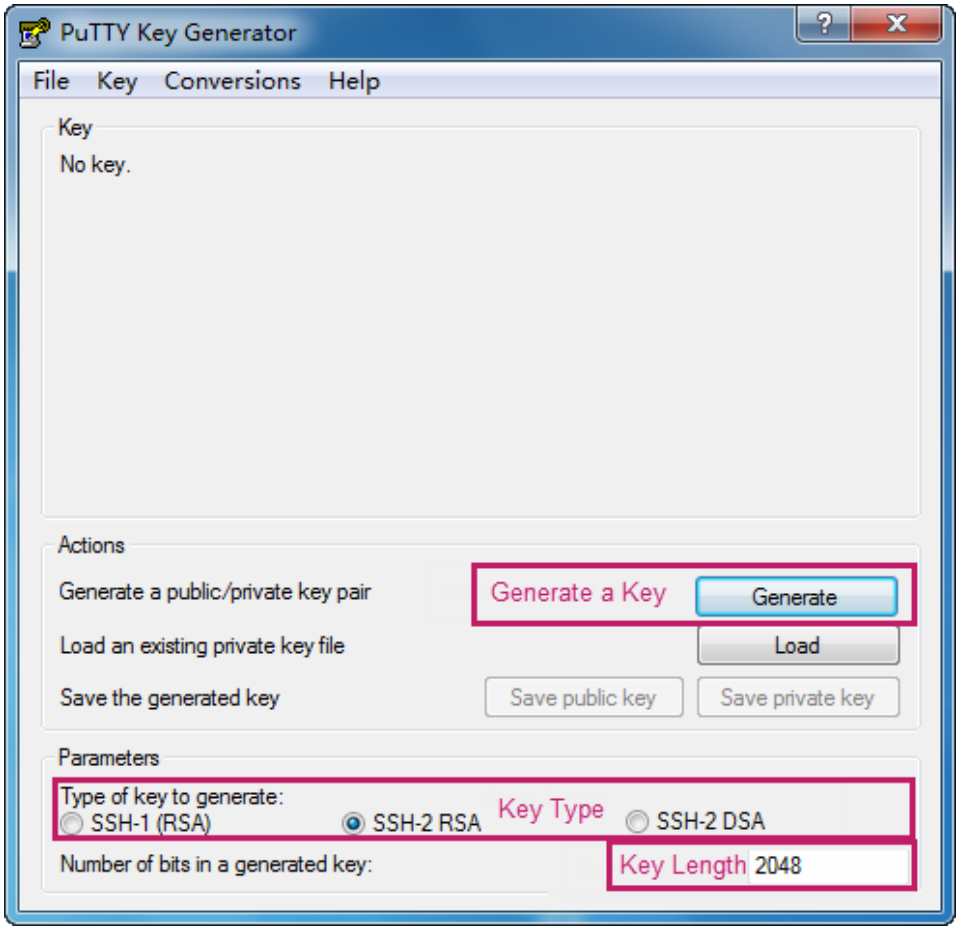


Figure 1-7 Generate SSH Key

Note:

1. The key length is in the range of 512 to 3072 bits.
2. During the key generation, randomly moving the mouse quickly can accelerate the key generation.

3. After the key is successfully generated, please save the public key and private key to a TFTP server.

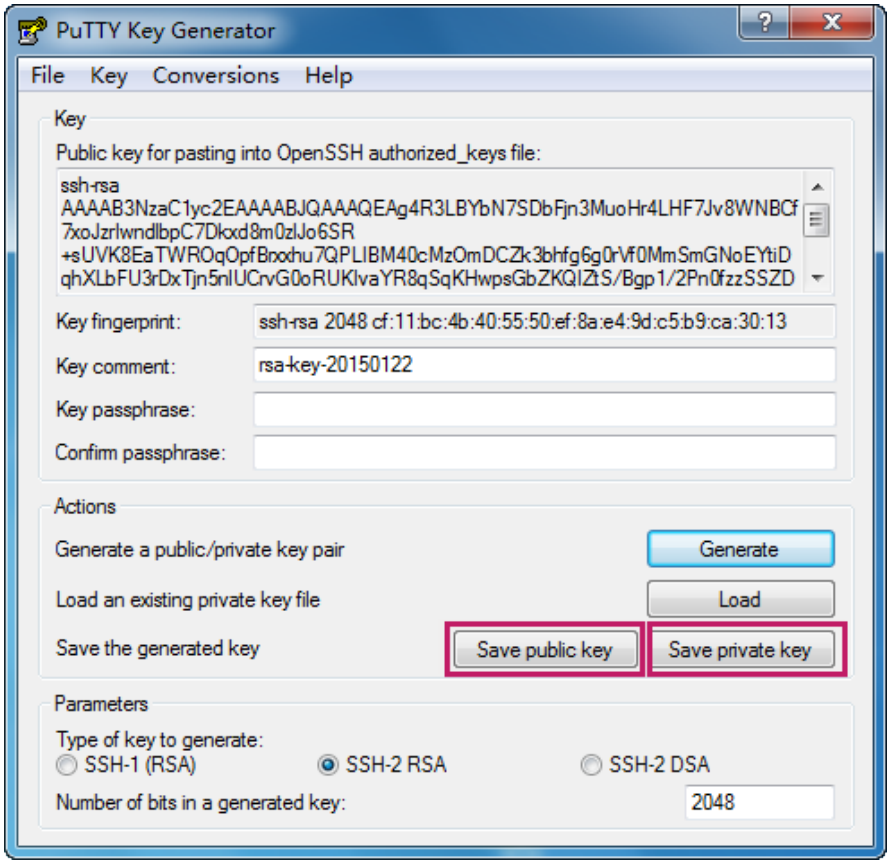


Figure 1-8 Save the Generated Key

4. Log on to the switch by Telnet and download the public key file from the TFTP server to the switch, as the following figure shows:

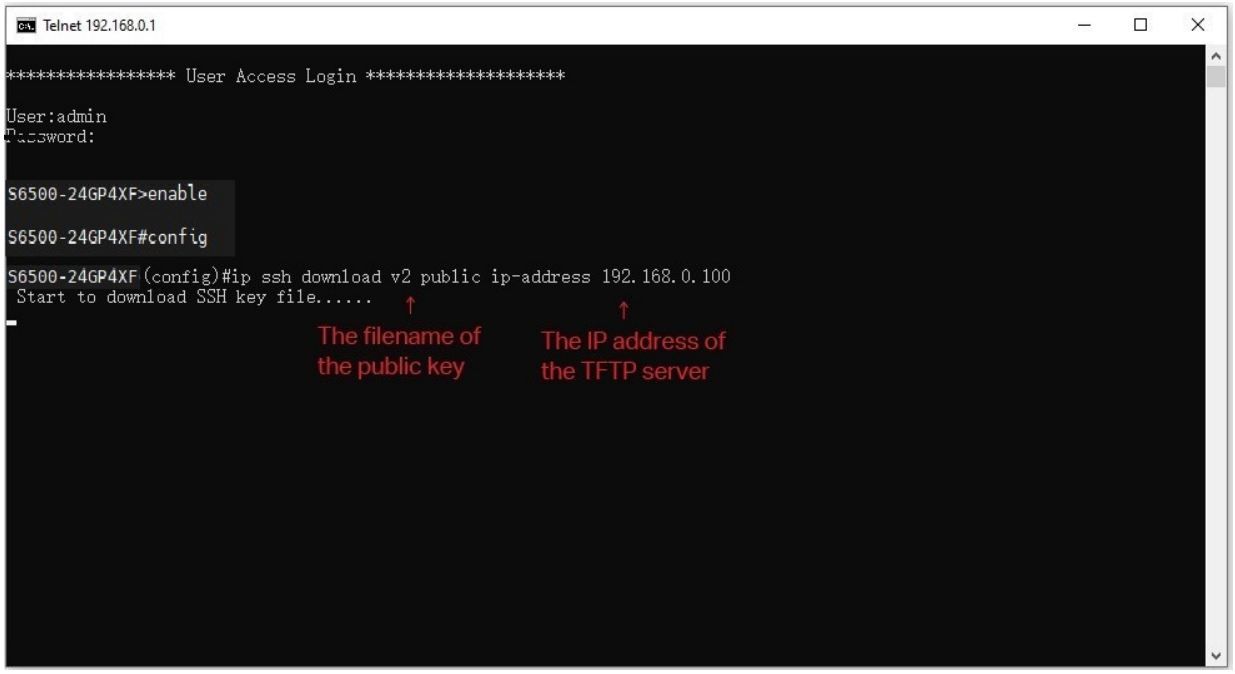


Figure 1-9 Download the Public Key

Note:

1. The key type should accord with the type of the key file.
2. The SSH key downloading cannot be interrupted.

5. After the public key is downloaded, please log on to the interface of PuTTY and enter the IP address for login.

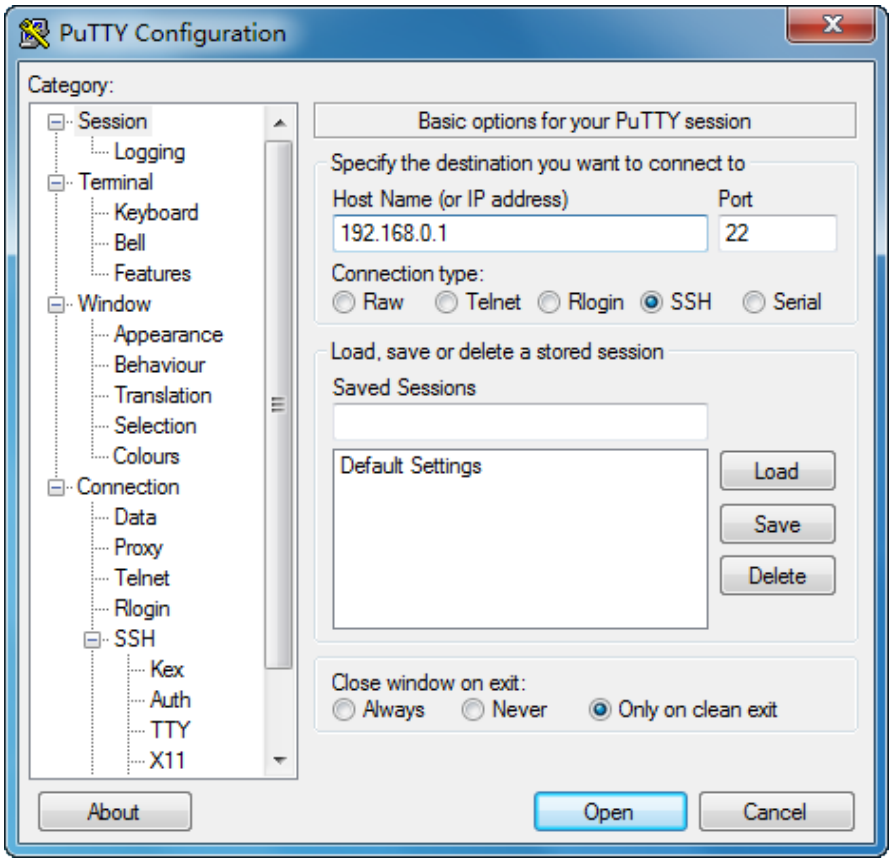


Figure 1-10 SSH Connection Config

6. Click **Browse** to download the private key file to SSH client software and click **Open**.

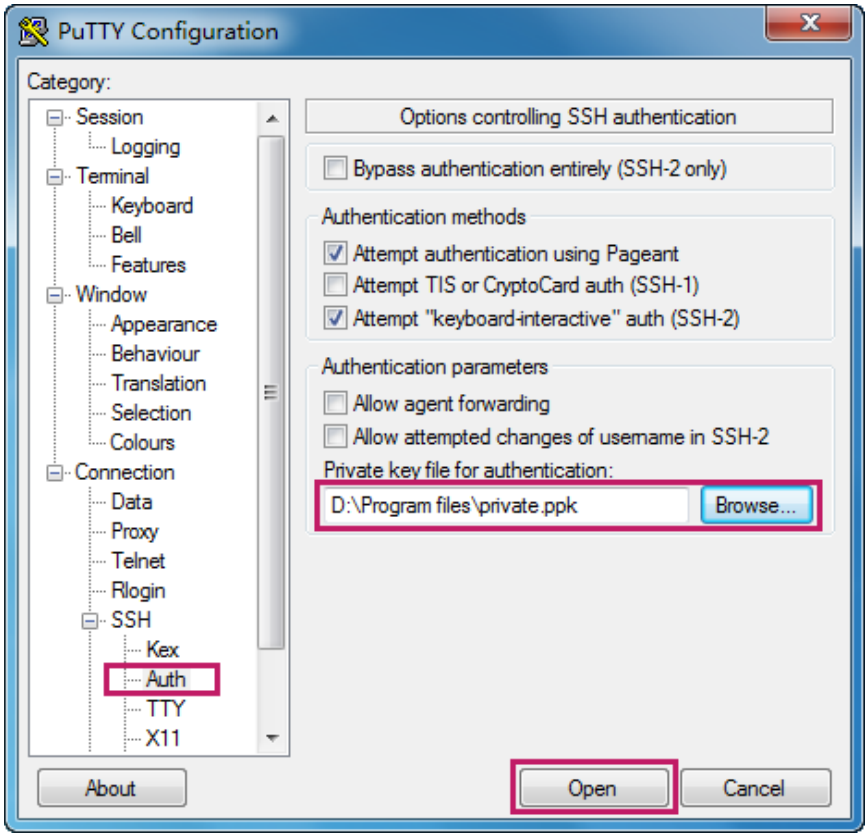


Figure 1-11 Download the Private Key

7. After successful authentication, please enter the login user name. If you log on to the switch without entering password, it indicates that the key has been successfully downloaded.

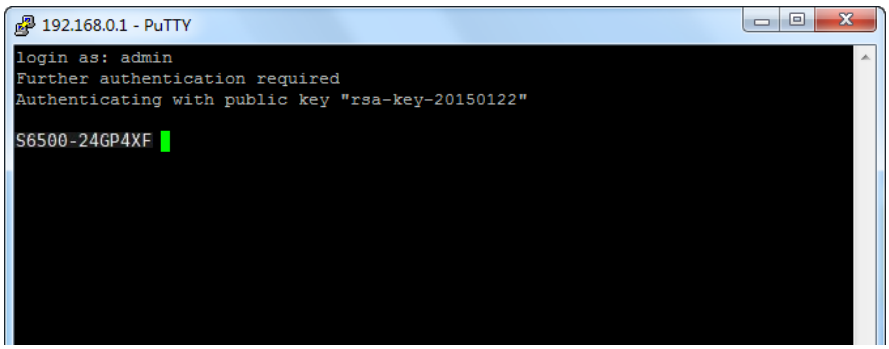


Figure 1-12 Log on the Switch

1.2 CLI Command Modes

The CLI is divided into different command modes: User EXEC Mode, Privileged EXEC Mode, Global Configuration Mode, Interface Configuration Mode and VLAN Configuration Mode.

Interface Configuration Mode can also be divided into Interface Ethernet, Interface link-aggregation and some other modes, which is shown as the following diagram.

The following table gives detailed information about the Accessing path, Prompt of each mode and how to exit the current mode and access the next mode.

Mode	Accessing Path	Prompt	Logout or Access the next mode
User EXEC Mode	Primary mode once it is connected with the switch.	**Switch>**	Use the **exit** command to disconnect the switch. Use the **enable** command to access Privileged EXEC mode.
Privileged EXEC Mode	Use the **enable** command to enter this mode from User EXEC mode.	**Switch#**	Enter the **disable** or the **exit** command to return to User EXEC mode. Enter **configure** command to access Global Configuration mode.
Global Configuration Mode	Use the **configure** command to enter this mode from Privileged EXEC mode.	**Switch(config)#**	Use the **exit** or the **end** command or press **Ctrl+Z** to return to Privileged EXEC mode. Use the **interface gigabitEthernet** *port* or **interface range gigabitEthernet** *port-list* command to access interface Configuration mode. Use the **vlan** *vlan-list* to access VLAN Configuration mode.
Interface Configuration Mode	Layer 2 Interface: Use the **interface gigabitEthernet** *port,* **interface port-channel** *port-channel-id* or **interface range gigabitEthernet** *port-list* command to enter this mode from Global Configuration mode.	**Switch(config-if)#** or **Switch(config-if-range)#**	Use the **end** command or press **Ctrl+Z** to return to Privileged EXEC mode. Enter the **exit** or the **#** command to return to Global Configuration mode. A port number must be specified in the **interface** command.

Mode	Accessing Path	Prompt	Logout or Access the next mode
Interface Configuration Mode	Layer 3 Interface: Use the **no switchport** command to enter Routed Port mode from Interface Configuration mode. Use the **interface vlan** *vlan-id* command to enter VLAN Interface mode from Global Configuration mode. Use the **interface loopback** *id* command to enter Loopback Interface mode from Global Configuration mode.	**Switch (config-if)#** or **Switch(config-if-range)#**	Use the **switchport** command to switch to the Layer 2 interface mode. Use the **end** command or press **Ctrl+Z** to return to Privileged EXEC mode. Enter the **exit** or the **#** command to return to Global Configuration mode.
Router Configuration Mode	Layer 3 Interface: Use the **router rip** or **router ripng** command to enter this mode from Global Configuration mode.	**Switch (config-router)**	Use the **end** command or press **Ctrl+Z** to return to Privileged EXEC mode. Enter the **exit** command or the # command to return to Global configuration mode.
VLAN Configuration Mode	Use the **vlan** *vlan-list* command to enter this mode from Global Configuration mode.	**Switch (config-vlan)#**	Use the **end** command or press **Ctrl+Z** to return to Privileged EXEC mode. Enter the **exit** command or the # command to return to Global configuration mode.

Note:

1. The user is automatically in User EXEC Mode after the connection between the PC and the switch is established by a Telnet/SSH connection.
2. Global Configuration Mode/Interface Configuration Mode/VLAN Configuration Mode is only available in standalone mode.
3. Each command mode has its own set of specific commands. To configure some

commands, you should access the corresponding command mode firstly.

- **Global Configuration Mode**: In this mode, global commands are provided, such as the Spanning Tree, Schedule Mode and so on.
- **Interface Configuration Mode**: In this mode, users can configure one or several ports, different ports corresponds to different commands

  a). Interface fastEthernet/gigabitEthernet/two-gigabitEthernet/ten-gigabitEthernet: Configure parameters for a fastEthernet/gigabitEthernet/two-gigabitEthernet/ten-gigabitEthernet port, such as Duplex-mode, flow control status.

  b). Interface range fastEthernet/gigabitEthernet/two-gigabitEthernet/ten-gigabitEthernet: Configure parameters for several fastEthernet/gigabitEthernet/two-gigabitEthernet/ten-gigabitEthernet ports.

  c). Interface link-aggregation: Configure parameters for a link-aggregation, such as broadcast storm.

  d). Interface range link-aggregation: Configure parameters for multi-trunks.

  e). Interface vlan: Configure parameters for the vlan-port.
- **VLAN Configuration Mode**: In this mode, users can create a VLAN and add a specified port to the VLAN.

4. Some commands are global, that means they can be performed in all modes:
   - **show**: Display all information of switch, for example: statistic information, port information, VLAN information.
   - **history**: Display the commands history.

1.3 Privilege Restrictions

This switch's security is divided into four privilege levels: User level, Power User level, Operator level and Admin level. You can define username and password pairs, and assign a specific privilege level to each pair. Different privilege levels have access to specified commands, which is illustrated in the **Privilege Requirement** in each command. For details about how to configure usename and password pairs, please refer to user name (password) and user name (secret).

Users can enter Privileged EXEC mode from User EXEC mode by using the **enable** command. In default case, no password is needed. In Global Configuration Mode, you can configure password for Admin level by **enable password** command. Once password is configured, you are required to enter it to access Privileged EXEC mode.

1.4 Conventions

1.4.1 PoE Disclaimer

PoE budget calculations are based on laboratory testing. Actual PoE power budget is not guaranteed and will vary as a result of client limitations and environmental factors.

1.4.2 Format Conventions

The following conventions are used in this Guide:

- Items in square brackets [ ] are optional
- Items in braces { } are required
- Alternative items are grouped in braces and separated by vertical bars. For example: **speed** {10 | 100 | 1000 }
- Bold indicates an unalterable keyword. For example: **show logging**
- Normal Font indicates a constant (several options are enumerated and only one can be selected). For example: **mode** {dynamic | static | permanent}
- Italic Font indicates a variable (an actual value must be assigned). For example: **bridge aging-time** *aging-time*

1.4.3 Special Characters

You should pay attentions to the description below if the variable is a character string:

- These six characters " < > , \ & cannot be input.

- If a blank is contained in a character string, single or double quotation marks should be used, for example 'hello world', "hello world", and the words in the quotation marks will be identified as a string. Otherwise, the words will be identified as several strings.

1.4.4 Parameter Format

Some parameters must be entered in special formats which are shown as follows:

- MAC address must be enter in the format of xx:xx:xx:xx:xx:xx.
- One or several values can be typed for a port-list or a vlan-list using comma to separate. Use a hyphen to designate a range of values, for instance, 1/0/1, 1/0/3-5, 1/0/7 indicates choosing port 1/0/1, 1/0/3, 1/0/4, 1/0/5, 1/0/7.

Chapter 2 Line Commands (Only for Certain Devices)

Note: Line Commands are only available on certain devices.

2.1 line

Description

The line command is used to enter the Line Configuration Mode and make related configurations for the desired user(s).

Syntax

line { console linenum | vty startlinenum endlinenum }

Parameter

linenum —— The number of users allowed to login through console port. Its value is 0 in general, for the reason that console input is only active on one console port at a time.

startlinenum ——The start serial number of the login user selected to configure the login mode and password, ranging from 0 to 15. 0 means the first login user number, 1 means the second, and the rest can be done on the same manner.

endlinenum —— The end serial number of the login user selected to configure the login mode and password, ranging from 0 to 15. 0 means the first login user number, 1 means the second, and the rest can be done on the same manner.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enter the Console port configuration mode and configure the console port 0:

```
Switch(config)#line console 0
```

Enter the Virtual Terminal configuration mode so as to prepare further configurations such as password and login mode for virtual terminal 0 to 5:

```
Switch(config)#line vty 0 5
```

2.2 media-type rj45

Description

The media-type rj45 command is used to configure the console media type as RJ-45 for input. The switch has two console ports available —— an RJ-45 console port and a micro-USB console port. Console input is active on only one console port at a time. By default, the micro-USB connector takes precedence over the RJ-45 connector, which means that, when both the RJ-45 console connection and micro-USB console connection are valid, input from the RJ-45 console is disabled, and input from the micro-USB console is enabled. To return to the default configuration, please use no media-type rj45 command.

Syntax

media-type rj45

no media-type rj45

Command Mode

Line Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable the RJ-45 console input:

```
Switch(config)# line console 0
Switch(config-line)# media-type rj45
```

Receive the micro-USB console input prior to the RJ-45 console input:

```
Switch(config)# line console 0
Switch(config-line)# no media-type rj45
```

Chapter 3 User Interface

3.1 enable

Description

The **enable** command is used to access Privileged EXEC Mode from User EXEC Mode.

Syntax

enable

Command Mode

User EXEC Mode

Privilege Requirement

None.

Example

If you have set the password to access Privileged EXEC Mode from User EXEC Mode:

```
Switch>enable
Enter password:
Switch#
```

3.2 service password-encryption

Description

The **service password-encryption** command is used to encrypt the password when the password is defined or when the configuration is written, using the symmetric encryption algorithm. Encryption prevents the password from being readable in the configuration file. To disable the global encryption function, please use **no service password-encryption** command.

Syntax

service password-encryption

no service password-encryption

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable the global encryption function:

```
Switch(config)# service password-encryption
```

3.3 enable password

Description

The **enable password** command is used to set or change the password for users to access Privileged EXEC Mode from User EXEC Mode. To remove the password, please use **no enable password** command. This command uses the symmetric encryption.

Syntax

enable password { [0] *password* | 7 *encrypted-password*}

no enable password

Parameter

0 —— Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

password —— A string with 31 characters at most, which can contain only English letters (case-sensitive), digits and 17 kinds of special characters. The special characters are **!$%'()*,-./[]_{|}**. By default, it is empty.

7 —— Indicates a symmetric encrypted password with fixed length will follow.

encrypted-password —— A symmetric encrypted password with fixed length, which you can copy from another switch's configuration file. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in service password-encryption, the password in the configuration file will be displayed in the symmetric encrypted form.

If both the **enable password** and **enable secret** are defined, only the latest configured password will take effect.

Example

Set the super password as "admin" and unencrypted to access Privileged EXEC Mode from User EXEC Mode:

Switch(config)#enable password 0 admin

3.4 enable secret

Description

The **enable secret** command is used to set a secret password, which is using an MD5 encryption algorithm, for users to access Privileged EXEC Mode from User EXEC Mode. To return to the default configuration, please use **no enable secret** command. This command uses the MD5 encryption.

Syntax

enable secret { [0] *password*| 5 *encrypted-password*| 8 *encrypted-password*| 9 *encrypted-password*}

no enable secret

Parameter

0 ——Specify the encryption type. 0 indicates that an unencrypted password will follow. the password will be encrypted by MD5. By default, the encryption type is 0.

password ——A string with 31 characters at most, which can contain only English letters (case-sensitive), digits and 17 kinds of special characters. The special characters are !$%'()*,-./[]_{|}. By default, it is empty.

5 ——Indicates an MD5 encrypted password with fixed length will follow.

8 ——Indicates an PBKDF2 encrypted password with fixed length will follow.

9 ——Indicates a SCRYPT encrypted password with fixed length will follow.

encrypted-password ——An/A MD5/SCRYPT/PBKDF2 encrypted password with fixed length, which you can copy from another switch's configuration file.

After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

If both the **enable password** and **enable secret** are defined, only the latest configured password will take effect.

Example

Set the secret password as “admin” and unencrypted to access Privileged EXEC Mode from User EXEC Mode. The password will be displayed in the encrypted form.

```
Switch(config)#enable secret 0 admin
```

3.5 configure

Description

The **configure** command is used to access Global Configuration Mode from Privileged EXEC Mode.

Syntax

configure

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Access Global Configuration Mode from Privileged EXEC Mode:

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

3.6 exit

Description

The **exit** command is used to return to the previous Mode from the current Mode.

Syntax

exit

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Return to Global Configuration Mode from Interface Configuration Mode, and then return to Privileged EXEC Mode:

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

3.7 end

Description

The **end** command is used to return to Privileged EXEC Mode.

Syntax

end

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Return to Privileged EXEC Mode from Interface Configuration Mode:

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

3.8 clipaging

Description

The **clipaging** command is used to enable the pause function for the screen display. If you want to display all the related information of the switch at once when using the show command, please use **no clipaging** command.

Syntax

clipaging

no clipaging

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Disable the pause function for the screen display:

```
Switch (config)#no clipaging
```

3.9 history

Description

The **history** command is used to show the latest 20 commands you entered in the current mode since the switch is powered.

Syntax

history

Command Mode

Privileged EXEC Mode and any Configuration Mode

Privilege Requirement

None.

Example

Show the commands you have entered in the current mode:

```
Switch (config)# history

    1 history
```

3.10 history clear

Description

The **history clear** command is used to clear the commands you have entered in the current mode; therefore, these commands will not be shown next time you use the **history** command.

Syntax

history clear

Command Mode

Privileged EXEC Mode and any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear the commands you have entered in the current mode:

```
Switch (config)#history clear
```

Chapter 4 User Management Commands

User Management commands are used to manage the user's logging information by Web, Telnet or SSH, so as to protect the settings of the switch from being randomly changed.

4.1 user name (password)

Description

The **user name** command is used to add a new user or modify the existed users' information. To delete the existed users, please use **no user name** command. This command uses the symmetric encryption.

Syntax

user name *name* [**privilege** admin | operator | power_user | user] **password** { [0] *password* | 7 *encrypted-password* }

no user name *name*

Parameter

name ——Type a name for users' login. It contains 16 characters at most, composed of digits, English letters and symbols. No spaces, question marks and double quotation marks are allowed.

admin | operator | power_user | user —— Access level. "admin" means that you can edit, modify and view all the settings of different functions. "operator" means that you can edit, modify and view most of the settings of different functions. "power-user" means that you can edit, modify and view some of the settings of different functions. "user" means that you can only view some of the settings of different functions without the right to edit or modify. It is "admin" by default. For more details about privilege restrictions, please refer to the **Privilege Requirement** part in each command.

0 —— Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

password —— Users' login password, a string with 6–31 alphanumeric characters (case-sensitive) and symbols. No spaces are allowed.

7 —— Indicates a symmetric encrypted password with fixed length will follow.

encrypted-password —— A symmetric encrypted password with fixed length, which you can copy from another switch's configuration file. After the

encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in service password-encryption, the password in the configuration file will be displayed in the symmetric encrypted form.

If both the **user name (password)** and **user name (secret)** are defined, only the latest configured password will take effect.

Example

Add and enable a new admin user named "tplink", of which the password is "admin" and unencrypted:

```
Switch(config)#user name tplink privilege admin password 0 admin
```

4.2 user name (algorithm-type)

Description

The **user name** command is used to add a new user or modify the existed users' information. To delete the existed users, please use **no user name** command. This command uses the symmetric encryption.

Syntax

user name *name* [**privilege** *admin* | *operator* | *power_user* | *user*] **algorithm-type** { **md5** | **sha256** | **scrypt** } **secret** *password*

no user name *name*

Parameter

name——Type a name for users' login. It contains 16 characters at most, composed of digits, English letters and symbols. No spaces, question marks and double quotation marks are allowed.

admin / *operator* / *power_user* / *user* ——Access level. "admin" means that you can edit, modify and view all the settings of different functions. "operator"

means that you can edit, modify and view most of the settings of different functions. “power-user” means that you can edit, modify and view some of the settings of different functions. “user” means that you can only view some of the settings of different functions without the right to edit or modify. It is “admin” by default.

md5 | *scrypt* | *sha256* —— algorithm-type. Specifies the algorithm to use for hashing the plaintext secret for the user. md5: Encodes the password using the MD5 algorithm; sha256: Encodes the password using the PBKDF2 hashing algorithm; scrypt: Encodes the password using the SCRYPT hashing algorithm.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in service password-encryption, the password in the configuration file will be displayed in the symmetric encrypted form.

If both the **user name (password)** and **user name (secret)** are defined, only the latest configured password will take effect.

Example

Create an admin user named tplink and set the password to dsaoM#3210, which is encrypted in SCRYPT mode:

Switch (config)# user name *tplink* **privilege admin algorithm-type** scrypt **secret** *dsaoM#3210*

4.3 user name (secret)

Description

The **user name** command is used to add a new user or modify the existed users’ information. To delete the existed users, please use **no user name** command. This command uses the MD5 encryption.

Syntax

user name *name* [**privilege** *admin* | *operator* | *power_user* | *user*] **secret** { [0] *password* | 5 *encrypted-password* | 8 *encrypted-password* | 9 *encrypted-password*}

no user name *name*

Parameter

name ——Type a name for users' login. It contains 16 characters at most, composed of digits, English letters and symbols. No spaces, question marks and double quotation marks are allowed.

admin | operator | power_user | user —— Access level. “admin” means that you can edit, modify and view all the settings of different functions. “operator” means that you can edit, modify and view most of the settings of different functions. “power-user” means that you can edit, modify and view some of the settings of different functions. “user” means that you can only view some of the settings of different functions without the right to edit or modify. It is “admin” by default.

0 —— Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

password ——Users’ login password, a string with 6–31 alphanumeric characters (case-sensitive) and symbols. No spaces are allowed.

5 —— Indicates an MD5 encrypted password with fixed length will follow.

encrypted-password —— An MD5 encrypted password with fixed length, which you can copy from another switch’s configuration file.

8 ——Indicates an PBKDF2 encrypted password with fixed length will follow.

9 ——Indicates a SCRYPT encrypted password with fixed length will follow.

encrypted-password ——An/A MD5/SCRYPT/PBKDF2 encrypted password with fixed length, which you can copy from another switch’s configuration file.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

If both the **user name (password)** and **user name (secret)** are defined, only the latest configured password will take effect.

Example

Add and enable a new admin user named “tplink”, of which the password is “admin”. The password will be displayed in the encrypted form.

Switch (config)#user name tplink **privilege** admin **secret** 0 admin

4.4 service password-recovery

Note: This command is only available on certain devices.

Description

The **service password-recovery** command is used to enable the password-recovery feature. To disable the password-recovery feature, please use **no service password-recovery** command.

With password-recovery enabled, you can connect to the switch’s console port and delete all your previous set accounts. You can use the default username and password (which are both admin) to login the switch after its startup.

Syntax

service password-recovery

no service password-recovery

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable the switch’s password-recovery feature:

Switch(config)# service password-recovery

4.5 service passwd-complexity

Note: This command is only available on certain devices.

Description

The **service passwd-complexity** command is used to enable the global switch of password complexity, which is enabled by default. If the switch is disabled, when the user sets the password, only the password length entered by the user is checked to see if it is between 6 and 64 characters. Other complexity parameters are invalid, and the function of limiting the number of login attempts is disabled. If the switch is enabled, when the user sets the password, the password will be checked according to the parameters set by the user. For specific user settings, see the subsequent command description. At the same time, the login limit will take effect according to the user configuration. To disable this function, please use **no service passwd-complexity** command.

Syntax

service passwd-complexity

no service passwd-complexity

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable global password complexity:

```
Switch(config)# service passwd-complexity
```

4.6 service passwd-complexity min-length

Note: This command is only available on certain devices.

Description

The **service passwd-complexity min-length** command is used to configure the minimum password length, which is 10 by default.

Syntax

service passwd-complexity min-length *min-length*

Parameter

min-length —— minimum password length, the value range is 9~64, the default value is 10.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Set minimum length to 12:

Switch(config)#service passwd-complexity min-length 12

4.7 service passwd-complexity min-class-number

Note: This command is only available on certain devices.

Description

The **service passwd-complexity min-class-number** command is used to configure the minimum number of character classes (digits, lowercase, uppercase, special characters) required in passwords.

Syntax

service passwd-complexity min-class-number *min-class-number*

Parameter

min-class-number —— The minimum character class contained in the password, the value range is 0~4, the default value is 3; if it is set to 0, it means no restriction.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Require all 4 character classes:

Switch(config)# service passwd-complexity min-class-number 4

4.8 service passwd-complexity max-repeat-number

Note: This command is only available on certain devices.

Description

The **service passwd-complexity max-repeat-number** command is used to configure the maximum allowed consecutive identical characters.

Syntax

service passwd-complexity max-repeat-number *max-repeat-number*

Parameter

max-repeat-number —— The maximum number of times the same character can be repeated in a password. The value range is 0 to 16. The default value is 1, which means that the password is not allowed to contain consecutive repeated characters. If it is set to 0, it means there is no limit.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Allow up to 2 consecutive repeats:

Switch(config)# service passwd-complexity max-repeat-number 2

4.9 service passwd-complexity max-keyboard-consecutive-num

Note: This command is only available on certain devices.

Description

The **service passwd-complexity max-keyboard-consecutive-num** command is used to configure the maximum consecutive keyboard-aligned characters (case-insensitive, excludes special characters).

Syntax

service passwd-complexity max-keyboard-consecutive-num *max-keyboard-consecutive-num*

Parameter

max-keyboard-consecutive-num —— The maximum number of characters that cannot be included in the password from left to right in the main keyboard area (excluding special characters). Letters are not case sensitive. The value range is 0 to 10. The default value is 4, which means that the password is not allowed to contain consecutive characters such as aSdf and 1234 in the main keyboard area. If it is set to 0, it means there is no limit.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Block sequences longer than 3 characters (e.g., 123, Asd):

Switch(config)#service passwd-complexity

max-keyboard-consecutive-num 3

4.10 service passwd-complexity not-current

Note: This command is only available on certain devices.

Description

The **service passwd-complexity not-current** command is used to configure that a new password cannot be set as the currently active password. When enabled, users cannot configure a new password identical to their current active password. When disabled, users are allowed to set a new password that matches their currently active password. To disable the restriction that prevents newly set passwords from being the same as the current password, use the **no service passwd-complexity not-current** command.

Syntax

service passwd-complexity not-current

no service passwd-complexity not-current

Parameter

None

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable check to block reuse of current password:

```
Switch(config)# service passwd-complexity not-current
```

4.11 service passwd-complexity not-username

Note: This command is only available on certain devices.

Description

The **service passwd-complexity not-username** command is used to configure the policy that newly set passwords cannot be the username or its variants (including reversed or case-changed versions). When enabled, newly configured user passwords cannot match the username or its variants; when disabled, users may configure passwords identical to the username or its variants. To disable the restriction preventing new passwords from being username variants, use the **no service passwd-complexity not-username** command.

Syntax

service passwd-complexity not-username

no service passwd-complexity not-username

Parameter

None

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Block passwords matching username variants (e.g., Admin@123 → ADMIN@123):

```
Switch(config)# service passwd-complexity not-username
```

4.12 service passwd-complexity not-manufacturer-name

Note: This command is only available on certain devices.

Description

The **service passwd-complexity not-manufacturer-name** command is used to configure that new passwords cannot be set as the manufacturer name or its variants (including reversed or case-altered forms, where manufacturer names include tplink and tp-link). When enabled, users cannot configure new

passwords using manufacturer names or their variants; when disabled, users are permitted to use manufacturer names and their variants as new passwords. To disable the restriction on using manufacturer names and their variants as new passwords, use the **no service passwd-complexity not-manufacturer-name** command.

Syntax

service passwd-complexity not-manufacturer-name

no service passwd-complexity not-manufacturer-name

Parameter

None

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Block manufacturer name variants:

```
Switch(config)# service passwd-complexity not-manufacturer-name
```

4.13 service passwd-cycle

Note: This command is only available on certain devices.

Description

The **service passwd-cycle** command is used to set the time period during which previously used old passwords cannot be reused, determining the cycle before a password becomes available for reuse. If the switch is reset, this configuration will revert to default settings and previous configurations will become invalid.

Syntax

service passwd-cycle *days*

Parameter

days —— The time that a used password can be used again, in days, with a value range of 0-356, and a default value of 90, which means that if an old

password is used and a new password is set, the old password cannot be used again within 90 days. 0 means no limit.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Set reuse cooldown to 120 days:

```
Switch(config)# service passwd-cycle 120
```

4.14 show user account-list

Description

The **show user account-list** command is used to display the information of the current users.

Syntax

show user account-list

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the information of the current users:

```
Switch (config)# show user account-list
```

4.15 show user configuration

Description

The **show user configuration** command is used to display the security configuration information of the users, including access-control, max-number and the idle-timeout, etc.

Syntax

show user configuration

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the security configuration information of the users:

```
Switch (config)# show user configuration
```

4.16 show client all

Description

The **show client all** command is used to display the detailed information about all clients.

Syntax

show client

Parameter

all —— Displays more detailed information, such as client type, hardware model, vendor, port traffic data, etc.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the detailed information about all clients:

```
Switch (config)# show client all
```

Chapter 5 System Configuration Commands

System Commands can be used to configure the System information and System IP, reboot and reset the switch, upgrade the switch system and other operations.

5.1 system-time manual

Description

The **system-time manual** command is used to configure the system time manually.

Syntax

system-time manual *time*

Parameter

time —— Set the date and time manually, MM/DD/YYYY-HH:MM:SS. The valid value of the year ranges from 2000 to 2037.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the system mode as manual, and the time is 12/20/2010 17:30:35

Switch (config)# system-time manual 12/20/2010-17:30:35

5.2 system-time ntp

Description

The **system-time ntp** command is used to configure the time zone and the IP address or hostname for the NTP Server. The switch will get UTC automatically if it has connected to an NTP Server.

Syntax

system-time ntp { *timezone* } { *ntp-server* } { *backup-ntp-server* } { *fetching-rate* }

system-time ntp vrf *vrf-name*

Parameter

timezone —— Your local time-zone, and it ranges from UTC-12:00 to UTC+13:00.

The detailed information that each time-zone means are displayed as follow:

UTC-12:00 —— TimeZone for International Date Line West.

UTC-11:00 —— TimeZone for Coordinated Universal Time-11.

UTC-10:00 —— TimeZone for Hawaii.

UTC-09:00 —— TimeZone for Alaska.

UTC-08:00 —— TimeZone for Pacific Time(US Canada).

UTC-07:00 —— TimeZone for Mountain Time(US Canada).

UTC-06:00 —— TimeZone for Central Time(US Canada).

UTC-05:00 —— TimeZone for Eastern Time(US Canada).

UTC-04:30 —— TimeZone for Caracas.

UTC-04:00 —— TimeZone for Atlantic Time(Canada).

UTC-03:30 —— TimeZone for Newfoundland.

UTC-03:00 —— TimeZone for Buenos Aires, Salvador, Brasilia.

UTC-02:00 —— TimeZone for Mid-Atlantic.

UTC-01:00 —— TimeZone for Azores, Cape Verde Is.

UTC —— TimeZone for Dublin, Edinburgh, Lisbon, London.

UTC+01:00 —— TimeZone for Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna.

UTC+02:00 —— TimeZone for Cairo, Athens, Bucharest, Amman, Beirut, Jerusalem.

UTC+03:00 —— TimeZone for Kuwait, Riyadh, Baghdad.

UTC+03:30 —— TimeZone for Tehran.

UTC+04:00—— TimeZone for Moscow, St.Petersburg, Volgograd, Tbilisi, Port Louis.

UTC+04:30 —— TimeZone for Kabul.

UTC+05:00 —— TimeZone for Islamabad, Karachi, Tashkent.

UTC+05:30 —— TimeZone for Chennai, Kolkata, Mumbai, New Delhi.

UTC+05:45 —— TimeZone for Kathmandu.

UTC+06:00 —— TimeZone for Dhaka,Astana, Ekaterinburg.

UTC+06:30 —— TimeZone for Yangon (Rangoon).

UTC+07:00 —— TimeZone for Novosibrisk, Bangkok, Hanoi, Jakarta.

UTC+08:00—— TimeZone for Beijing, Chongqing, Hong Kong, Urumqi, Singapore.

UTC+09:00 —— TimeZone for Seoul, Irkutsk, Osaka, Sapporo, Tokyo.

UTC+09:30 —— TimeZone for Darwin, Adelaide.

UTC+10:00 —— TimeZone for Canberra, Melbourne, Sydney, Brisbane.

UTC+11:00 —— TimeZone for Solomon Is., New Caledonia, Vladivostok.

UTC+12:00 —— TimeZone for Fiji, Magadan, Auckland, Welington.

UTC+13:00 —— TimeZone for Nuku'alofa, Samoa.

ntp-server —— The IP address or domain name for the Primary NTP Server.

backup-ntp-server —— The IP address or domain name for the Secondary NTP Server.

fetching-rate —— Specify the rate fetching time from NTP server.

vrf-name —— VRF instance name (1–15 characters).

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the system time mode as NTP, the time zone is UTC-12:00, the primary NTP server is 133.100.9.2 and the secondary NTP server is 139.78.100.163, the fetching-rate is 11 hours, and specify the VRF instance named vrf1:

Switch(config)# system-time ntp UTC-12:00 133.100.9.2 139.79.100.163 11

Switch (config)# system-time ntp vrf *vrf1*

5.3 system-time dst predefined

Description

The **system-time dst predefined** command is used to select a daylight saving time configuration from the predefined mode. The configuration can be used recurrently. To disable DST function, please use **no system-time dst** command.

Syntax

system-time dst predefined [USA /Australia | Europe | New-Zealand]

no system-time dst

Parameter

USA /Australia | Europe | New-Zealand —— The mode of daylight saving time. There are 4 options which are USA, Australia, Europe and New-Zealand respectively. The default value is Europe.

Following are the time ranges of each option:

USA —— Second Sunday in March, 02:00 – First Sunday in November, 02:00.

Australia —— First Sunday in October, 02:00 – First Sunday in April, 03:00.
Europe —— Last Sunday in March, 01:00 – Last Sunday in October, 01:00.
New Zealand —— Last Sunday in September, 02:00 – First Sunday in April, 03:00.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the daylight saving time as USA standard:

Switch(config)#system-time dst predefined USA

5.4 system-time dst date

Description

The **system-time dst date** command is used to configure the one-off daylight saving time. The start date is in the current year by default. The time range of the daylight saving time must shorter than one year, but you can configure it spanning years. To disable DST function, please use **no system-time dst** command.

Syntax

system-time dst date {*smonth*} {*sday*} {*stime*} {*syear*} {*emonth*} {*eday*} {*etime*} {*eyear*}[*offset*]

no system-time dst

Parameter

smonth——The start month of the daylight saving time. There are 12 values showing as follows: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

sday—— The start day of the daylight saving time, ranging from 1 to 31. Here you should show special attention to February and the differences between a solar month and a lunar month.

stime—— The start moment of the daylight saving time, HH:MM.

syear—— The start year of the daylight saving time.

emonth—— The end month of the daylight saving time. There are 12 values showing as follows: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

eday —— The end day of the daylight saving time, ranging from q to 31. Here you should show special attention to February and the differences between a solar month and a lunar month.

etime —— The end moment of the daylight saving time, HH:MM.

eyear —— The end year of the daylight saving time.

offset —— The number of minutes to add during the daylight saving time. It is 60 minutes by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the daylight saving time from zero clock, Apr 1st to zero clock Oct 1st and the offset is 30 minutes in 2015:

Switch(config)# system-time dst date Apr 1 00:00 2015 Oct 1 00:00 2015 30

5.5 system-time dst recurring

Description

The **system-time dst recurring** command is used to configure the recurring daylight saving time. It can be configured spanning years. To disable DST function, please use **no system-time dst** command.

Syntax

system-time dst recurring {*sweek*} {*sday*} {*smonth*} {*stime*} {*eweek*} {*eday*} {*emonth*} {*etime*} [*offset*]

no system-time dst

Parameter

sweek——The start week of the daylight saving time. There are 5 values showing as follows: first, second, third, fourth, last.

sday —— The start day of the daylight saving time. There are 7 values showing as follows: Sun, Mon, Tue, Wed, Thu, Fri, Sat.

smonth —— The start month of the daylight saving time. There are 12 values showing as follows: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

stime —— The start moment of the daylight saving time, HH:MM.

eweek——The end week of the daylight saving time. There are 5 values showing as follows: first, second, third, fourth, last.

eday—— The end day of the daylight saving time. There are 5 values showing as follows: Sun, Mon, Tue, Wed, Thu, Fri, Sat.

emonth—— The end month of the daylight saving time. There are 12 values showing as following: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec.

etime—— The end moment of the daylight saving time, HH:MM.

offset—— The number of minutes to add during the daylight saving time. It is 60 minutes by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the daylight saving time from 2:00am, the first Sunday of May to 2:00am, the last Sunday of Oct and the offset is 45 minutes:

Switch(config)# system-time dst recurring first Sun May 02:00 last Sun Oct 02:00 45

5.6 hostname

Description

The **hostname** command is used to configure the system name. To clear the system name information, please use **no hostname** command.

Syntax

hostname [*hostname*]

no hostname

Parameter

hostname—— System Name. The length of the name ranges from 1 to 32 characters. By default, it is the device name, for example "SG6654XHP".

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the system name as TP-Link

```
Switch(config)# hostname TP-Link
```

5.7 location

Description

The **location** command is used to configure the system location. To clear the system location information, please use **no location** command.

Syntax

location [*location*]

no location

Parameter

location —— Device Location. It consists of 32 characters at most. It is "Hong Kong" by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the system location as Hong Kong:

```
Switch(config)# location Hong Kong
```

5.8 contact-info

Description

The **contact-info** command is used to configure the system contact information. To clear the system contact information, please use **no contact-info** command.

Syntax

contact-info [*contact_info*]

no contact-info

Parameter

contact_info —— Contact Information. It consists of 32 characters at most. It is "www.tp-link.com" by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the system contact information as www.tp-link.com:

Switch(config)# contact-info www.tp-link.com

5.9 led

Note: This command is only available on certain devices.

Description

The **led** command is used to control the LEDs.

Syntax

led {on | off}

Parameter

on | off—— The LEDs are configured as on or off. By default, they are on.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the LED as off:

Switch(config)# led off

5.10 ip management-vlan

Description

The **ip management-vlan** command is used to switch the management VLAN in standalone mode (non-Controller adoption mode). By default, the management VLAN is VLAN 1. After switching the management VLAN, the Controller retains the device-side configurations related to this VLAN, and subsequent communication between the device and the Controller also uses this VLAN (requires Controller version support). Before switching the management VLAN, ensure proper configuration of the VLAN, ports, VLAN interface (VLAN IF), etc., to guarantee normal Controller adoption and management of the device. To restore the management VLAN to the default, please use the **no ip management-vlan** command.

Syntax

ip management-vlan *vlan-id*

no ip management-vlan

Parameter

vlan-id—— The VLAN ID of the management VLAN, ranging from 1 to 4090 (since the Controller only supports VLAN IDs 1–4090).

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the switch's management VLAN as VLAN 100 via CLI commands.

(1) Create VLAN 100:

```
switch(config)# vlan 100
switch(config-vlan)# name mgmt-vlan
switch(config-vlan)# exit
```

(2) Add the port to the management VLAN:

```
switch(config)# interface gigabitEthernet 1/0/1
switch(config-if)# switchport general allowed vlan 100 untagged
```

```
switch(config-if)# switchport pvid 100
switch(config-if)# exit
```

(3) Configure the VLAN 100 interface:

```
switch(config)# interface vlan 100
```

Configure a static IP:

```
switch(config-if)# ip address 192.168.0.1 255.255.255.0
```

Or obtain an IP address via DHCP:

```
switch(config-if)# ip address-alloc dhcp
switch(config-if)# exit
```

(4) Switch the management VLAN to VLAN 100:

```
switch(config)# ip management-vlan 100
```

(5) Verify the configuration using show running-config.

5.11 ip address

Description

The **ip address** command is used to configure the IP address and IP subnet mask for the specified interface manually. The interface type includes: routed port, port-channel interface, loopback interface and VLAN interface.

Syntax

ip address { *ip-addr* } { *mask* } [**secondary**]

no ip address [*ip-addr*] [*mask*]

Parameter

ip-addr —— The IP address of the Layer 3 interface.

mask —— The subnet mask of the Layer 3 interface.

secondary —— Specify the interface's secondary IP address. If this parameter is omitted here, the configured IP address is the interface's primary address.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create the VLAN interface 2 with the primary IP address as 192.168.1.1/24 and secondary IP address as 192.168.2.1/24:

Switch (config)# interface vlan 2
Switch (config-if)# ip address 192.168.1.1 255.255.255.0
Switch (config-if)# ip address 192.168.2.1 255.255.255.0 **secondary**

5.12 ip address-alloc

Description

The **IP address-alloc** command is used to enable the DHCP Client function or the BOOTP Protocol. When this function is enabled, the specified interface will obtain IP from DHCP Server or BOOTP server. To disable the IP obtaining function on the specified interface, please use the **no ip address** command. This command applies to the routed port, the port-channel interface and the VLAN interface.

Syntax

ip address-alloc { dhcp | bootp }

no ip address

Parameter

dhcp —— Specify the Layer 3 interface to obtain IP address from the DHCP Server.

bootp —— Specify the Layer 3 interface to obtain IP address from the BOOTP Server.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCP Client function on the Lay 3 routed port 1/0/1:

Switch (config)# interface gigabitEthernet 1/0/1

Switch (config-if)# no switchport

Switch (config-if)# ip address-alloc dhcp

Disable the IP address obtaining function on the VLAN interface 2:

Switch (config)# interface vlan 2

Switch (config-if)# no ip address

5.13 controller cloud-based (Only for Certain Devices)

Note: This command is only available on certain devices

Description

The **controller cloud-based** command is used to enable Cloud-Based Controller managment. When this feature is enabled, you can further add your devices to your Omada Cloud-Based Controller. To disable the feature, use the **no controller cloud-based** command.

Syntax

controller cloud-based

no controller cloud-based

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

5.14 controller inform-url (Only for Certain Devices)

Note: This command is only available on certain devices

Description

If your switch and Omada SDN Controller are not located on the same subnet, the **controller inform-url** command is used to inform the switch of the controller's URL/IP address. To disable the feature, use the **no controller inform-url** command.

Syntax

controller inform-url { controller-url | controller-ip }

no controller inform-url

Parameter

controller-url —— Specify the URL of Omada SDN Controller.

controller-ip —— Specify the IP address of Omada SDN Controller.

Command Mode

Gloabal Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Inform the switch of the controller whose IP address is 192.168.1.1:

Switch (config)# controller inform-url 192.168.1.1

5.1 controller discover (Only for Certain Devices)

Note: This command is only available on certain devices

Description

The **controller discover** command is used to control whether the device sends out controller discovery broadcast packets. By default, the device sends controller discovery broadcast packets. When the switch is turned off, the device will no longer periodically send broadcast discovery packets, and controllers will be unable to discover the device. However, this setting does not affect the sending of unicast discovery packets. If a controller's address is explicitly specified, that controller can still discover the device. To remove this configuration, please use the **no controller discover** command.

Syntax

controller discover

no controller discover

Parameter

None.

Command Mode

Gloabal Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable the device from sending broadcast discovery packets to controllers:

```
Switch (config)# no controller discover
```

5.2 reset

Description

The **reset** command is used to reset the switch's software. After resetting, all configuration of the switch will restore to the factory defaults and your current settings will be lost.

Syntax

reset [**except-ip**]

Parameter

except-ip ——Maintain the IP address when resetting the switch.

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Reset all settings of the switch except its IP address:

```
Switch # reset except-ip
```

5.3 service reset-disable

Description

The **service reset-disable** command is used to disable the reset function of the console port or reset button. To enable the reset function, use **no service reset-disable** command. By default, the reset function is enabled.

Syntax

service reset-disable

no service reset-disable

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Disable the reset function of console port or reset button:

```
Switch (config)# service reset-disable
```

5.4 reboot

Description

The **reboot** command is used to reboot the Switch. To avoid damage, please don't turn off the device while rebooting.

Syntax

reboot

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Reboot the switch:

```
Switch # reboot
```

5.5 reboot-schedule

Description

This **reboot-schedule** command is used to configure the switch to reboot at a certain time point. To delete the reboot schedule settings, please use the **reboot-schedule cancel** command.

Syntax

reboot-schedule at *time* [*date*] [**save_before_reboot**]

reboot-schedule in *interval* [**save_before_reboot**]

reboot-schedule cancel

Parameter

time —— Specify the time point for the switch to reboot, in the format of hh:mm.

date —— Specify the date for the switch to reboot, in the format of DD:MM:YYYY. The date should be within 30 days.

save_before_reboot —— Save the configuration file before the switch reboots.

interval —— Specify a time period after which the switch reboots. It ranges from 1 to 43200 minutes.

cancel —— Delete the reboot schedule settings.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

In the command **reboot-schedule at** *time* [*date*] [**save_before_reboot**], if no date is specified and the time you set here is later than the time that this command is executed, the switch will reboot later that day; otherwise the switch will reboot at the time point the next day.

Example

Specify the switch to save the configuration files and reboot in 200 minutes:

Switch (config)# reboot-schedule in 200 **save_before_reboot**

5.6 copy running-config startup-config

Description

The **copy running-config startup-config** command is used to save the current settings.

Syntax

copy running-config startup-config

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Save current settings:

```
Switch # copy running-config startup-config
```

5.7 copy startup-config tftp

Description

The **copy startup-config tftp** command is used to backup the configuration file to TFTP server.

Syntax

copy startup-config tftp ip-address *ip-addr* **filename** *name* **[vrf** *vrf-name***]**

Parameter

ip-addr —— IP Address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

name —— Specify the name for the configuration file which would be backup.

vrf-name —— VRF instance name (1–15 characters).

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Backup the configuration files to TFTP server with the IP 192.168.0.148, name this file config.cfg and specify the VRF instance named vrf1:

Switch # copy startup-config tftp ip-address 192.168.0.148 **filename** config **vrf** *vrf1*

Backup the configuration files to TFTP server with the IP fe80::1234 and name this file config.cfg:

Switch # copy startup-config tftp ip-address fe80::1234 **filename** config

5.8 copy tftp startup-config

Description

The **copy tftp startup-config** command is used to download the configuration file to the switch from TFTP server.

Syntax

copy tftp startup-config ip-address *ip-addr* **filename** *name* **[vrf** *vrf-name***]**

Parameter

ip-addr —— IP Address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

name —— Specify the name for the configuration file which would be downloaded.

vrf-name —— VRF instance name (1–15 characters).

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Download the configuration file named as config.cfg to the switch from TFTP server with the IP 192.168.0.148 and specify the VRF instance named vrf1:

Switch # copy tftp startup-config ip-address 192.168.0.148 **filename** config **vrf** *vrf1*

Download the configuration file named as config.cfg to the switch from TFTP server with the IP fe80::1234

Switch # copy tftp startup-config ip-address fe80::1234 **filename** config

5.9 copy backup-config tftp

Description

The **copy backup-config tftp** command is used to export the backup configuration file of the switch to TFTP server.

Syntax

copy backup-config tftp ip-address *ip-addr* **filename** *name* **[vrf** *vrf-name***]**

Parameter

ip-addr —— IP Address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

name —— Specify the name for the configuration file which would be exported.

vrf-name —— VRF instance name (1–15 characters).

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Export the backup configuration file of the switch to the TFTP server with the IP 192.168.0.148, name the file config.cfg, and specify the VRF instance named vrf1:

Switch # copy backup-config tftp ip-address 192.168.0.148 **filename** config **vrf** *vrf1*

5.10 copy backup-config startup-config

Description

The **copy backup-config startup-config** command is used to replace the startup configuration file using the backup configuration file.

Syntax

copy backup-config startup-config

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Replace the startup configuration file using the backup configuration file.:

```
Switch # copy backup-config startup-config
```

5.11 copy running-config backup-config

Description

The **copy running-config backup-config tftp** command is used to save the current running configuration as the backup configuration file.

Syntax

copy running-config backup-config

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Save the current running configuration as the backup configuration file.

```
Switch # copy running-config backup-config
```

5.12 copy tftp backup-config

Description

The **copy tftp backup-config** command is used to download the backup configuration file from a TFTP server.

Syntax

Copy tftp backup-config ip-address *ip-addr* **filename** *name* **[vrf** *vrf-name***]**

Parameter

ip-addr —— IP Address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

name —— Specify the name for the configuration file which would be downloaded.

vrf-name —— VRF instance name (1–15 characters).

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Download the configuration file named config.cfg from the TFTP server with the IP 192.168.0.148 and specify the VRF instance named vrf1:

Switch # copy tftp backup-config ip-address 192.168.0.148 **filename** config **vrf** *vrf1*

5.13 ftp open

Note: This command is only available on certain devices

Description

The **ftp open** command is used to connect to an FTP server.

Syntax

ftp open *ip-addr* **[vrf** *vrf-name***]**

ftp open ipv6 *ip-addr* **[vrf** *vrf-name***]**

Parameter

ip-addr—— IPv4 or IPv6 address.

vrf-name—— VRF instance name (1-15 characters).

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Connect to an FTP server at IP 192.168.0.2 with VRF instance vrf1:

Switch (config)# ftp open *192.168.0.2* **vrf** *vrf1*

5.14 scp get

Note: This command is only available on certain devices

Description

The **scp get** command is used to download a file to the device via SCP.

Syntax

scp get *username ip-addr source-filename dest-filename* **[vrf** *vrf-name***]**

scp ipv6 get *username ipv6-addr source-filename dest-filename* **[vrf** *vrf-name***]**

Parameter

username —— SCP login username.

ip-addr —— IPv4 address.

source-filename —— Source filename (allowed characters: alphanumeric, -_@:/.[]()).

dest-filename —— Destination filename (allowed characters: same as above).

vrf-name —— VRF instance name (1-15 characters).

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Download test from server 192.168.0.2 (user admin) to local file test with VRF vrf1:

Switch (config)# scp get *admin 192.168.0.2 test test* **vrf** *vrf1*

5.15 scp put

Note: This command is only available on certain devices

Description

The **scp put** command is used to upload a file from the device to a server via SCP.

Syntax

scp put *username ip-addr source-filename dest-filename* **[vrf** *vrf-name***]**

scp ipv6 put *username ipv6-addr source-filename dest-filename* **[vrf** *vrf-name***]**

Parameter

username —— SCP login username.

ip-addr —— IPv4 address.

source-filename —— Source filename (allowed characters: alphanumeric, -_@:/.[]()).

dest-filename —— Destination filename (allowed characters: same as above).

vrf-name —— VRF instance name (1-15 characters).

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Upload local file test to server 192.168.0.2 (user admin) as test with VRF vrf1:

Switch (config)# scp put *admin 192.168.0.2 test test* **vrf** *vrf1*

5.16 sftp open

Note: This command is only available on certain devices

Description

The **sftp open** command is used to connect to an SFTP server.

Syntax

sftp open *ip-addr username* **[vrf** *vrf-name***]**

sftp open ipv6 *ipv6-addr username* **[vrf** *vrf-name***]**

Parameter

ip-addr —— IPv4 address.

ipv6-addr—— IPv6 address.

username —— SFTP login username.

vrf-name —— VRF instance name (1-15 characters).

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Connect to SFTP server 192.168.0.2 (user admin) with VRF vrf1:

Switch (config)# sftp open *admin 192.168.0.2* **vrf** *vrf1*

5.17 copy logging

Description

The **copy logging** command command is used to export system log information to the user file system.

Syntax

copy logging { flash | usbflash1 | usbflash2 } *filename*

Parameter

flash | usbflash1 | usbflash2—— The location of the exported file.

filename —— The name of the exported log file.

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Export the log information to flash and name it syslog.log:

Switch # copy logging flash *syslog.log*

5.18 copy logging tftp

Description

The **copy logging tftp** command command is used to export system log information to a remote end.

Syntax

copy logging tftp *ip-address filename*

Parameter

ip-address —— The destination IP address of the exported file.

filename —— The name of the exported log file.

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Export the log information to 192.168.1.255 and name it syslog.log:

Switch # copy logging tftp *192.168.1.255 syslog.log.*

5.19 boot application

Description

The **boot application** command is used to configure the image file as startup image or backup image.

Syntax

boot application filename { image1 | image 2 } { startup | backup }

no boot application

Parameter

image1 | image2 —— Specify the image file to be configured. By default, the image1.bin is the startup image and the image2.bin is the backup image.

startup | backup —— Specify the property of the image, either startup image or backup image.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the image2.bin as the startup image:

Switch (config)# boot application filename image2 startup

5.20 boot config

Description

The **boot config** command is used to configure the configuration file as startup configuration or backup configuration.

Syntax

boot config filename { config1 | config 2 } { startup | backup }

no boot application

Parameter

config1 | config2 —— Specify the configuration file to be configured. By default, the config1.cfg is the startup image and the config2.cfg is the backup image.

startup | backup—— Specify the property of the configuration.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the config2.cfg as the startup image:

Switch (config)# boot config filename config2 startup

5.21 remove backup-image

Description

The **remove backup-image** command is used to delete the backup-image.

Syntax

remove backup-image

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Delete the backup image file:

```
Switch # remove backup-image
```

5.22 firmware upgrade

Description

The **firmware upgrade** command is used to upgrade the switch's backup image file via the TFTP server. The uploaded firmware file will take place of the Backup Image, and user can choose whether to reboot the switch with the Backup Image.

Syntax

firmware upgrade tftp **ip-address** *ip-addr* **filename** *name* [**vrf** *vrf-name*]

Parameter

ip-addr —— IP Address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

name —— Specify the name of the desired firmware file.

vrf-name —— VRF instance name (1-15 characters).

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Upgrade the switch's backup image file with the file firmware.bin in the TFTP server with the IP address 192.168.0.148, and reboot the switch with this firmware:

Switch # firmware upgrade tftp ip-address 192.168.0.148 **filename** firmware.bin

It will only upgrade the backup image. Continue? (Y/N):y

Operation OK!

Reboot with the backup image? (Y/N): y

Upgrade the switch's backup image file with the file firmware.bin in the TFTP server with the IP address fe80::1234, but do not reboot the switch:

Switch # firmware upgrade tftp ip-address fe80::1234 **filename** firmware.bin

It will only upgrade the backup image. Continue? (Y/N):y

Operation OK!

Reboot with the backup image? (Y/N): n

5.23 patch load (Only for Certain Devices)

Description

This command is used to load a patch file from a TFTP server into the patch area of the system. The patch is in the deactivated state and has not taken effect.

Syntax

patch load ip-address *ip-addr* **filename** *filename* **[vrf** *vrf-name***]**

Parameter

ipaddr: IP address of the TFTP server.

filename: Name of the patch file.

vrf-name: VRF instance name (1-15 characters).

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Download the patch file named patch.bin from the TFTP server address with IP address 192.168.0.2 and specify the VRF instance named vrf1:

```
Switch# patch load ip-address 192.168.0.146 filename patch.bin vrf vrf1
```

5.24 patch active (Only for Certain Devices)

Description

This command is used to temporarily run a deactivated patch loaded into the system patch area. When a deactivated patch is temporarily run, the patch is activated and takes effect. When the device is restarted, the patch that was activated before the restart will be deactivated. Users can perform the following three operations on the activated patch.

Syntax

patch avtive

Parameter

patch run: Change the patch status to running.

patch deactive: Change the patch status to deactivated.

patch delete: Invalidate the patch and delete it from the patch area.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Activate all deactivated patches loaded into the system patch area:

```
Switch# patch active
```

5.25 patch run (Only for Certain Devices)

Description

This command is used to permanently run an activated patch. When an activated patch is permanently run, the patch is in the running state. When the device is restarted, the patch that was in the running state before the restart will remain in the running state and take effect. Users can perform the following two operations on the running patch:

Syntax

patch run

Parameter

patch uninstall: Return the patch from the running state to the activated state.

patch delete: Invalidate the patch and delete it from the patch area.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Permanently run an activated patch:

```
Switch# patch run
```

5.26 patch deactive (Only for Certain Devices)

Description

This command is used to deactivate an activated patch:

Syntax

patch deactive

Parameter

patch uninstall: Return the patch from the running state to the activated state.

patch delete: Invalidate the patch and delete it from the patch area.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Deactivate an activated patch:

```
Switch# patch deactive
```

5.27 patch uninstall (Only for Certain Devices)

Description

This command is used to uninstall a running patch and activate it:

Syntax

patch uninstall

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Uninstall a running patch and activate it:

```
Switch# patch uninstall
```

5.28 patch delete (Only for Certain Devices)

Description

This command is used to delete a patch in the deactivated, activated, or running state, invalidating the patch and deleting the patch file from the system patch area:

Syntax

patch delete

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Delete a patch:

```
Switch# patch delete
```

5.29 show patch information (Only for Certain Devices)

Description

This command is used to view the patch information of the current system:

Syntax

show patch information

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the patch information of the current system:

```
Switch# show patch information
```

5.30 mcu-firmware unit upgrade (Only for Certain Devices)

Description

The **mcu-firmware unit upgrade** command is used to upgrade the switch's MCU-firmware online.

Syntax

mcu-firmware unit {*unit id***} type** {*mcu-type*} **upgrade**

Parameter

unit id—— Stack unit ID, ranging from 1 to 4.

mcu-type—— MCU device type, which can be pse, crps, fan, monitor.

Command Mode

None

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Upgrade the switch's MCU-firmware online:

```
Switch#mcu-firmware unit 1 type pse upgrade
```

5.31 mcu-firmware type (Only for Certain Devices)

Description

The **mcu-firmware type** command is used to display the MCU version information.

Syntax

mcu-firmware type {*mcu-type*} **version**

Parameter

mcu-type—— MCU device type, which can be pse, crps, fan, monitor.

Command Mode

None

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Upgrade the switch's MCU-firmware online:

```
Switch#mcu-firmware unit 1 type pse upgrade
```

5.32 checkpoint file (Only for Certain Devices)

Description

The **checkpoint file** command is used to create a checkpoint file. When creating a checkpoint file, it snapshots the current configuration. When deleting a checkpoint file, specify the filename for deletion. Note that after performing a device reset operation, all checkpoint files will be cleared. To delete a checkpoint file, please use the **no checkpoint file** command.

Syntax

checkpoint file *filename*

no checkpoint file *fileName*

Parameter

fileName: Checkpoint file name, in the format of letters, numbers, underscores, hyphens and dots, and the length is limited to 1 to 32 characters. For example: hello_2024-01.cfg

Command Mode

Privileged EXEC Mode

Privilege Requirement

Privileged EXEC Mode and Any Configuration Mode

Example

Create a checkpoint file named "hello2024" for the current configuration:

```
Switch#checkpoint file hello2024
```

5.33 show checkpoint (Only for Certain Devices)

Description

The **show checkpoint** command is used to view the names of all existing checkpoint files, or view all configuration information in a specific checkpoint file.

Syntax

show checkpoint

show checkpoint file *fileName*

Parameter

fileName: Checkpoint file name, in the format of letters, numbers, underscores, hyphens and dots, and the length is limited to 1 to 32 characters. fileName must be the name of an existing file in the show checkpoint command execution result.

Command Mode

Privileged EXEC Mode

Privilege Requirement

Privileged EXEC Mode and Any Configuration Mode

Example

View the configuration information in the checkpoint file named "hello2024":

```
Switch#show checkpoint file hello2024
```

5.34 rollback running-config file (Only for Certain Devices)

Description

The **rollback running-config file** command is used to roll back the configuration of the switch to the configuration in an existing checkpoint file.

Syntax

rollback running-config file *fileName*

Parameter

fileName: Checkpoint file name, in the format of letters, numbers, underscores, hyphens and dots, and the length is limited to 1 to 32

characters. fileName must be the name of an existing file in the show checkpoint command execution result.

Command Mode

Privileged EXEC Mode

Privilege Requirement

Privileged EXEC Mode and Any Configuration Mode

Example

Roll back the configuration of the switch to the configuration in the checkpoint file named “hello2024”:

```
Switch# rollback running-config file hello2024
```

5.35 boot autoinstall start

Note: This command is only available on certain devices.

Description

The **boot autoinstall start** command is used to start Auto Install function. To stop the Auto Install function, use **no boot autoinstall start**.

Syntax

boot autoinstall start

no boot autoinstall start

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Start Auto Install function:

```
Switch(config)# boot autoinstall start
```

5.36 boot autoinstall persistent-mode

Note: This command is only available on certain devices.

Description

The **boot autoinstall persistent-mode** command is used to start Auto Install function to next reboot cycle. To disable persistent mode, use **no boot autoinstall persistent-mode**.

Syntax

boot autoinstall persistent-mode

no boot autoinstall persistent-mode

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Start Auto Install function:

```
Switch(config)# boot autoinstall persistent-mode
```

5.37 boot autoinstall auto-save

Note: This command is only available on certain devices.

Description

The **boot autoinstall auto-save** command is used to automatically save the new configuration file that was downloaded by Auto Install function to start-up configuration file Auto Install. To disable auto-save configuration feature use **no boot autoinstall auto-save**.

Syntax

boot autoinstall auto-save

no boot autoinstall auto-save

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure Auto Install function to auto-save new configuration file to start-up configuration file:

```
Switch(config)# boot autoinstall auto-save
```

5.38 boot autoinstall auto-reboot

Note: This command is only available on certain devices.

Description

The **boot autoinstall auto-reboot** command is used to automatically reboot the switch after Auto Install function is completed successfully. To disable auto-reboot feature use **no boot autoinstall auto-reboot**.

Syntax

boot autoinstall auto-reboot

no boot autoinstall auto-reboot

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the switch to auto reboot after Auto Install function completed successfully:

```
Switch(config)# boot autoinstall auto-reboot
```

5.39 boot autoinstall retry-count

Note: This command is only available on certain devices.

Description

The **boot autoinstall retry-count** command is used to configure retry count when Auto Install function uses TFTP to download configuration files in a cycle of Auto Install process. To set retry count to default value use **no boot autoinstall retry-count**.

Syntax

boot autoinstall retry-count *count*

no boot autoinstall retry-count

Parameter

count—— The count of retrying auto install. The value ranges from 1 to 3.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure TFTP retry 2 times when download files failed:

```
Switch(config)# boot autoinstall retry-count 2
```

5.40 show boot autoinstall

Note: This command is only available on certain devices.

Description

The **show boot autoinstall** command is used to display the configuration of Auto Install function.

Syntax

show boot autoinstall

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of Auto Install function:

```
Switch# show boot autoinstall
```

5.41 show boot autoinstall downloaded-config

Note: This command is only available on certain devices.

Description

The **show boot autoinstall downloaded-config** command is used to display the configuration file which downloaded by Auto Install.

Syntax

show boot autoinstall downloaded-config

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration file which downloaded by Auto Install:

```
Switch# show boot autoinstall downloaded-config
```

5.42 ping

Description

The **ping** command is used to test the connectivity between the switch and one node of the network.

Syntax

ping [ip | ipv6] { ip_addr } [**-n** count] [**-l** size] [**-i** interval] [**-vrf** vrf-name]

Parameter

ip —— The type of the IP address for ping test should be IPv4.

ipv6 —— The type of the IP address for ping test should be IPv6.

ip_addr —— The IP address of the destination node for ping test. If the parameter ip/ipv6 is not selected, both IPv4 and IPv6 addresses are supported, for example 192.168.0.100 or fe80::1234.

-n *count* —— The amount of times to send test data during Ping testing. It ranges from 1 to 10. By default, this value is 4.

-l *size* —— The size of the sending data during ping testing. It ranges from 1 to 1500 bytes. By default, this value is 64.

-i *interval* —— The interval to send ICMP request packets. It ranges from 100 to 1000 milliseconds. By default, this value is 1000.

vrf-name —— VRF instance name (1-15 characters).

Command Mode

Privileged EXEC Mode

Privilege Requirement

None.

Example

To test the connectivity between the switch and the network device with the IP 192.168.0.131, please specify the *count* (-l) as 512 bytes and *count* (-i) as 1000 milliseconds. If there is not any response after 8 times' Ping test, the connection between the switch and the network device is failed to establish:

Switch # ping 192.168.0.131 **–n** 8 **–l** 512

To test the connectivity between the switch and the network device with the IP fe80::1234, please specify the *count* (-l) as 512 bytes and *count* (-i) as 1000 milliseconds. If there is not any response after 8 times' Ping test, the connection between the switch and the network device is failed to establish:

Switch # ping fe80::1234 **–n** 8 **–l** 512

5.43 tracert

Description

The **tracert** command is used to test the connectivity of the gateways during its journey from the source to destination of the test data.

Syntax

tracert [ip | ipv6] *ip_addr* [*maxHops*] [**-vrf** vrf-name]

Parameter

ip —— The type of the IP address for tracert test should be IPv4.

ipv6 —— The type of the IP address for tracert test should be IPv6.

ip_addr —— The IP address of the destination device. If the parameter ip/ipv6 is not selected, both IPv4 and IPv6 addresses are supported, for example 192.168.0.100 or fe80::1234.

maxHops —— The maximum number of the route hops the test data can pass though. It ranges from 1 to 30. By default, this value is 4.

vrf-name —— VRF instance name (1-15 characters).

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Test the connectivity between the switch and the network device with the IP 192.168.0.131. If the destination device has not been found after 20 *maxHops*, the connection between the switch and the destination device is failed to establish:

Switch # tracert 192.168.0.131 20

Test the connectivity between the switch and the network device with the IP fe80::1234. If the destination device has not been found after 20 *maxHops*, the connection between the switch and the destination device is failed to establish:

Switch # tracert fe80::1234 20

5.44 show system-info

Description

The **show system-info** command is used to display System Description, Device Name, Device Location, System Contact, Hardware Version, Firmware Version, System Time, Run Time and so on.

Syntax

show system-info

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the system information:

Switch # show system-info

5.45 show image-info

Description

The **show image-info** command is used to display the information of image files in the system.

Syntax

show image-info

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the system image files' information:

```
Switch# show image-info
```

5.46 show boot

Description

The **show boot** command is used to display the boot configuration of the system.

Syntax

show boot

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the system boot configuration information:

```
Switch# show boot
```

5.47 show running-config

Description

The **show running-config** command is used to display the current operating configurations of the whole system, a specified unit, or a specified port.

Syntax

show running-config [*unit* {**all** | **|** [**exclude** *keyword*] [**include** *keyword*] | **interface** {**fastEthernet** |**gigabitEthernet** | **ten-gigabitEthernet**} *port*}]

show running-config [**all** | **|** [**exclude** *keyword*] [**include** *keyword*] | **interface** {**fastEthernet** |**gigabitEthernet** | **ten-gigabitEthernet**} *port*]

Parameter

unit—— Specify the unit number of a switch to show the unit's operating configurations. By default, it is 1.

all—— Display all the operating configurations of the whole system or a specified unit.

|—— Enable filter to filtrate the configurations. You can use **exclude** and **include** to set the filter rule.

keyword—— The filter conditions, such as interface, vlan, and user.

port—— Specify the number of the port to show the port's operating configurations.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the current operating configurations only related to the user:

Switch# show running-config | include user

5.48 show startup-config

Description

The **show startup-config** command is used to display the current configuration saved in the switch. These configuration settings will not be lost the next time you reboot the switch.

Syntax

show startup-config

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the saved configuration:

```
Switch# show startup-config
```

5.49 show system-time

Description

The **show system-time** command is used to display the time information of the switch.

Syntax

show system-time

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the time information of the switch

```
Switch# show system-time
```

5.50 show system-time dst

Description

The **show system-time dst** command is used to display the DST information of the switch.

Syntax

show system-time dst

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DST information of the switch

```
Switch# show system-time dst
```

5.51 show system-time ntp

Description

The **show system-time ntp** command is used to display the NTP mode configuration information.

Syntax

show system-time ntp

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the NTP mode configuration information of the switch:

```
Switch# show system-time ntp
```

5.52 show cable-diagnostics interface

Description

The **show cable-diagnostics interface** command is used to display the cable diagnostics of the connected Ethernet Port., which facilitates you to check the connection status of the cable connected to the switch, locate and diagnose the trouble spot of the network.

Syntax

show cable-diagnostics interface { **fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* }

Parameter

port—— The number of the port which is selected for Cable test.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Show the cable-diagnostics of port 3:

```
Switch# show cable-diagnostics interface gigabitEthernet 1/0/3
```

5.53 show cpu-utilization

Description

The **show cpu-utilization** command is used to display the system's CPU utilization in the last 5 seconds/1minute/5minutes.

Syntax

show cpu-utilization

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the CPU utilization information of the switch:

```
Switch# show cpu-utilization
```

5.54 show memory-utilization

Description

The **show memory-utilization** command is used to display the current system's memory utilization in the last 5 seconds/1minute/5minutes.

Syntax

show memory-utilization

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the memory utilization information of the switch:

```
Switch# show memory-utilization
```

5.55 show controller

Note: This command is only available on certain devices.

Description

The **show controller** command is used to display the current controller settings and status.

Syntax

show controller

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the current controller settings and status:

```
Switch# show controller
```

5.56 show temperature

Note: This command is only available on certain devices.

Description

The **show temperature** command is used to display the temperature of switch.

Syntax

show temperature

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the temperature information of the switch:

```
Switch-DC# show temperature
```

5.57 show voltage

Note: This command is only available on certain devices.

Description

The **show voltage** command is used to display the voltage of DC power board.

Syntax

show voltage

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the voltage information of the switch:

```
Switch # show voltage
```

5.58 clear config interace

Description

The **clear config interace** command is used to clear all configurations of a specified port.

Syntax

clear config interace [**fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet | port-channel**] *port*

Parameter

port —— The port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Clear all configurations of gigabitEthernet port 1/0/3:

```
Switch(config)# clear config interace gigabitEthernet 1/0/3
```

5.59 power backup unit (Only for Certain Devices)

Description

The **power backup unit** command is used to configure the power backup mode.

Syntax

power backup unit {*unit id*} {*power*} **mode** {*mode*}

Parameter

unit id —— Stack unit ID, ranging from 1-4.

power—— power supply module number.

mode —— Power backup mode

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the power backup mode of stack unit 1:

```
Switch(config)#power backup unit 1 pwr1 mode enable
```

5.60 show power (Only for Certain Devices)

Description

The **show power** command is used to display the power details.

Syntax

show power [detail**]**

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the power details:

```
Switch#show power
```

Chapter 6 PTP Configuration Commands (Only for Certain Devices)

The Precision Time Protocol (PTP) in network measurement and control systems is a protocol for synchronizing time (phase) and frequency across standard Ethernet devices. It is also known as IEEE 1588 (defined by IEEE) or 1588 for short. Its primary goal is to achieve high-precision clock synchronization within Local Area Networks (LAN) or Wide Area Networks (WAN) to meet the requirements of applications such as communication networks, industrial control, financial trading, and audio/video transmission.

PTP defines the basic paradigm for network clock synchronization and imposes no strict requirements on the network environment, ensuring broad adaptability. Based on PTP, derived protocols such as 802.1as (also known as gPTP), G.8265.1, G.8275.1, G.8275.2, SMPTE, and AES67 have been developed. These protocols impose restrictions on network environments and PTP parameters for specific domains and can be seen as functional subsets of PTP (achievable through PTP's profile mechanism).

6.1 ptp enable (Global View)

Description

The **ptp enable** command is used to enable the PTP function globally. To disable this function globally, use the **no ptp enable** command. By default, PTP is disabled.

Syntax

ptp enable

no ptp enable

Parameter

None

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the PTP function globally:

```
Switch(config)# ptp enable
```

6.2 ptp profile

Description

The **ptp profile** command is used to specify the PTP protocol standard. To restore the default protocol standard (1588v2), use the **no ptp profile** command.

Syntax

ptp profile *{ 1588v2 | 8021as}*

no ptp profile

Parameter

1588v2 | 8021as—— Specify the protocol standard (default: 1588v2).

Note

Changing the protocol standard will clear all existing configurations under the previous standard and reset PTP parameters to their default values for the new standard. The global ptp enable state is retained.

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the protocol to 802.1as:

```
Switch(config)# ptp profile 8021as
```

6.3 ptp clock-type

Description

The **ptp clock-type** command is used to configure the PTP node type. To remove the configuration, use the **no ptp clock-type** command. No node type is set by default.

Syntax

ptp clock-type *{bc | oc | e2etc | p2ptc }*

no ptp clock-type

Parameter

Node types vary by protocol:

1588v2: *bc, oc, e2etc, p2ptc*

802.1as: *bc, oc, p2ptc*

Note

Ensure compatibility with the configured protocol standard.

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the node type to bc under 1588v2:

```
Switch(config)# ptp clock-type bc
```

6.4 ptp domain

Description

The **ptp domain** command is used to specify the PTP clock domain. To restore the default domain for the current protocol, use the **no ptp domain** command. Only devices in the same domain can synchronize.

Syntax

ptp domain *domain*

no ptp domain

Parameter

domain —— Domain ID (integer). Default varies by protocol.

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the domain to 1:

```
Switch(config)# ptp domain 1
```

6.5 ptp clock-class

Description

The **ptp clock-class** command is used to set the clock quality class (lower values indicate higher priority in master election). Default: 248.

Syntax

ptp clock-class *clock-class*

no ptp clock-class

Parameter

clock-class —— Integer (smaller values = higher priority).

Note

If <clock-class> < 128, the device cannot act as a slave. Configure carefully to avoid synchronization issues.

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set clock class to 200:

```
Switch(config)# ptp clock-class 200
```

6.6 ptp priority1

Description

The **ptp priority1** command is used to set Priority1 for master election (lower values = higher priority). Defaults vary by protocol.

Syntax

ptp priority1 *priority1*

no ptp priority1

Parameter

priority1—— Integer (specific range depends on protocol).

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set Priority1 to 129:

```
Switch(config)# ptp priority1 129
```

6.7 ptp priority2

Description

The **ptp priority2** command is used to set Priority2 for master election (lower values = higher priority). Defaults vary by protocol.

Syntax

ptp priority2 *priority1*

no ptp priority2

Parameter

priority2—— Integer (specific range depends on protocol).

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set Priority2 to 129:

```
Switch(config)# ptp priority2 129
```

6.8 ptp slave-only

Description

The **ptp slave-only** command is used to OC-type ports to operate as slave-only. To restore the default behavior (master/member allowed), use the **no ptp slave-only** command.

Syntax

ptp slave-only

no ptp slave-only

Parameter

None

Note

Only applicable to OC node types.

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure slave-only mode for OC under 1588v2:

```
Switch (config)# ptp profile 1588v2
Switch (config)# ptp clock-type oc
Switch (config)# ptp slave-only
```

6.9 ptp utc-offset

Description

The **ptp utc-offset** command is used to correct the deviation between UTC time and TAI time. Its no command is used to restore utc-offset to the default value. By default, the value of utc-offset is 37 seconds.

Syntax

ptp utc-offset *utc-offset*

no ptp utc-offset

Parameter

utc-offset —— Specify the offset between UTC time and TAI time, in integer form, in seconds, with a default value of 37 seconds.

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the offset to 40 seconds:

```
Switch (config)# ptp utc-offset 40
```

6.10 ptp virtual-id

Description

The **ptp virtual-id** command is used to configure the virtual clock ID of the ptp device. Its no command is used to restore the default clock ID. The clock ID is unique and is used to distinguish other clock devices in the domain. By default, the clock ID is composed of the mac address of the device and 0xfffe.

Syntax

ptp virtual-id *xxxxxx.xxxx.xxxxxx*

no ptp virtual-id

Parameter

xxxxxx.xxxx.xxxxxx —— Hexadecimal ID.

Command Mode

Global Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set virtual ID to 112233.4455.aabbcc:

```
Switch (config)# ptp virtual-id 112233.4455.aabbcc
```

6.11 ptp enable (Interface View)

Description

The **ptp enable** command is used to PTP functionality on a port, turning it into a PTP port. The no form disables PTP on the port. By default, PTP is disabled on ports.

Syntax

ptp enable

no ptp enable

Parameter

None

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable PTP on Ten-GigabitEthernet 1/0/1:

```
Switch (config)# interface ten-gigabitEthernet 1/0/1
Switch (config-if)# ptp enable
```

6.12 ptp announce-interval

Description

The **ptp announce-interval** command is used to configure the announce message transmission rate on a port. The no form restores the protocol-standard default. The default is protocol-specific.

Syntax

ptp announce-interval *announce-interval*

no ptp announce-interval

Parameter

announce-interval—— Transmission interval in seconds, calculated as 2 times the announce-interval in seconds.

Notes

Announce messages are used for clock source election and master-slave synchronization. Excessive rates may consume bandwidth and degrade synchronization. Configure this value carefully.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set announce messages to 1 per second on Ten-GigabitEthernet 1/0/1:

Switch (config)# interface ten-gigabitEthernet 1/0/1

Switch (config-if)# ptp announce-interval 0

6.13 ptp announce-timeout

Description

The **ptp announce-interval** command is used to configure the maximum allowed missed announce messages before triggering clock source re-election. The no form restores the default value 3.

Syntax

ptp announce-timeout *announce-timeout*

no ptp announce-timeout

Parameter

announce-timeout —— Timeout threshold (number of intervals).

Notes

Ensure compatibility between announce-timeout and announce-interval. Overly frequent intervals or low timeout values may cause instability.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set timeout to 4 on Ten-GigabitEthernet 1/0/1:

Switch (config)# interface ten-gigabitEthernet 1/0/1

Switch (config-if)# ptp announce-timeout 4

6.14 ptp sync-interval

Description

The **ptp sync-interval** command is used to configure the sync message transmission rate. The no form restores the protocol-standard default.

Syntax

ptp sync-interval *sync-interval*

no ptp sync-interval

Parameter

sync-interval—— Specify the sync message sending rate on this port. The sending interval is 2 times the sync-interval in seconds.

Notes

Sync messages affect synchronization accuracy. Balance precision and bandwidth usage.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set sync messages to 2 per second on Ten-GigabitEthernet 1/0/1:

Switch (config)# interface ten-gigabitEthernet 1/0/1

Switch (config-if)# ptp sync-interval -1

6.15 ptp delay-req-interval

Description

The **ptp delay-req-interval** command is used to configure the minimum interval for sending delay_req packets on a port. The no command is used to restore the default value of the current protocol standard. By default, the default value is used.

Syntax

ptp delay-req-interval *delay-req-interval*

no ptp delay-req-interval

Parameter

delay-req-interval—— Specify the minimum interval for sending delay-req packets on this port. The interval is 2 times the delay-req-interval in seconds.

Notes

Used in request-response mode for path delay calculation. Balance accuracy and bandwidth.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set delay_req rate to 2 per second on Ten-GigabitEthernet 1/0/1:

```
Switch (config)# interface ten-gigabitEthernet 1/0/1
Switch (config-if)# ptp delay-req-interval -1
```

6.16 ptp pdelay-req-interval

Description

The **ptp pdelay-req-interval** command is used to configure the minimum interval for sending pdelay_req packets on a port. The no command is used to restore the default value of the current protocol standard. By default, the default value is used.

Syntax

ptp delay-req-interval *pdelay-req-interval*

no ptp delay-req-interval

Parameter

pdelay-req-interval—— Specify the minimum interval for sending pdelay-req packets on this port. The interval is 2 times the pdelay-req-interval in seconds.

Notes

Used in peer-to-peer delay mechanism. Balance accuracy and bandwidth.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set pdelay_req rate to 2 per second on Ten-GigabitEthernet 1/0/1:

```
Switch (config)# interface ten-gigabitEthernet 1/0/1
Switch (config-if)# ptp pdelay-req-interval-1
```

6.17 ptp clock-step

Description

The **ptp clock-step** command is used to configure the timestamp carrying mode of the message on the port. The no command is used to restore the default value under the current protocol standard.

Syntax

ptp clock-step {*one-step* | *two-step***}**

no ptp clock-step

Parameter

None

Notes

Not applicable for E2ETC/P2PTC node types.

Unavailable under IEEE 802.1AS.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set timestamp mode to two-step on Ten-GigabitEthernet 1/0/1:

Switch (config)# interface ten-gigabitEthernet 1/0/1

Switch (config-if)# ptp clock-step two-step

6.18 ptp delay-mechanism

Description

The **ptp delay-mechanism** command is used to configure the delay measurement mechanism used by the port. The no command is used to restore the default value under the current protocol standard.

Syntax

ptp delay-mechanism {*e2e* / *p2p***}**

no ptp delay-mechanism

Parameter

None

Notes

Not applicable for E2ETC/P2PTC node types.

Unavailable under IEEE 802.1AS.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set delay mechanism to P2P on Ten-GigabitEthernet 1/0/1:

Switch (config)# interface ten-gigabitEthernet 1/0/1

Switch (config-if)# ptp delay-mechanism p2p

6.19 ptp asymmetry-correction

Description

The **ptp asymmetry-correction** command is used to configure the asymmetric delay correction time for the port to send ptp messages. The no command is used to cancel the asymmetric delay correction time for the port to send ptp messages. By default, it is not configured.

Syntax

ptp asymmetry-correction *asymmetry-correction*

no ptp asymmetry-correction

Parameter

asymmetry-correction —— Specify the correction time in nanoseconds.

Notes

Corrects synchronization errors caused by unequal transmit/receive path delays.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set correction to 200 ns on Ten-GigabitEthernet 1/0/1:

```
Switch (config)# interface ten-gigabitEthernet 1/0/1
Switch (config-if)# ptp asymmetry-correction 200
```

6.20 ptp eth-egress

Description

The **ptp eth-egress** command is used to configure the layer 2 encapsulation for PTP messages. The no command is used to reset settings.

Syntax

ptp mac-egress {**destination-mac** *destination-mac* /**vlan** *vlan-id* [**priority** *priority*]}

no ptp mac-egress { destination-mac /vlan }

Parameter

destination-mac —— Destination MAC address of the packet in Layer 2 encapsulation.

vlan-id —— VLAN ID of the packet in Layer 2 encapsulation.

priority —— 802.1p priority of the VLAN.

Notes

Invalid MACs (e.g., multicast) are rejected.

Disable UDP encapsulation first if configured.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set destination MAC to aa:bb:cc:11:22:33:

```
Switch (config)# interface ten-gigabitEthernet 1/0/1
Switch (config-if)# ptp mac-egress aa:bb:cc:11:22:33
```

6.21 ptp udp-egress

Description

The **ptp udp-egress** command is used to configure Layer 3 UDP encapsulation for PTP messages. The no command is used to reset settings.

Syntax

ptp udp-egress {source-ip *ip-address* **/destination-ip** *ip-address* **| destination-mac** *destination-mac* **/vlan** *vlan-id* [**priority** *priority*] **}**

no ptp udp-egress {source-ip /destination-ip | destination-mac /vlan }

Parameter

source-ip —— Source IP address of the Layer 3 packet encapsulation

destination-ip —— Destination IP address of the Layer 3 packet encapsulation

destination-mac —— Destination MAC address of the Layer 3 packet encapsulation.

vlan-id —— VLAN ID of the Layer 3 packet encapsulation.

priority —— 802.1p priority of the VLAN.

Notes

When configuring UDP encapsulation, you need to configure the source IP address first.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the source IP address of UDP encapsulation to 192.168.1.5 on Ten-GigabitEthernet 1/0/1:

```
Switch (config)# interface ten-gigabitEthernet 1/0/1
Switch (config-if)# ptp udp-egress source-ip 192.168.1.5
```

6.22 ptp reset-statistics

Description

The **ptp reset-statistics** command is used to clear the statistics of the port's message transmission and reception.

Syntax

ptp reset-statistics

Parameter

None

Notes

Once the message transmission and reception statistics are cleared, they cannot be restored.

Command Mode

Interface Configuration Mode.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear message statistics on Ten-GigabitEthernet 1/0/1:

```
Switch (config)# interface ten-gigabitEthernet 1/0/1
Switch (config-if)# ptp reset-statistics
```

6.23 show ptp all

Description

The **show ptp all** command is used to view the running status of the PTP protocol.

Syntax

show ptp all

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

View the the running status of the PTP protocol:

```
Switch (config)# show ptp all
```

6.24 show ptp interface

Description

The **show ptp interface** command is used to view the running status and statistics of the PTP port.

Syntax

show ptp all

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

View the running status and statistics of the PTP port on Ten-GigabitEthernet 1/0/1:

```
Switch (config)# show ptp interface ten-gigabitEthernet 1/0/1
```

Chapter 7 File System Configuration Commands

(Only for Certain Devices)

File System Commands can be used to configure the File System.

7.1 copy

Description

The **copy** command is used to copy the specified file.

Syntax

copy {flash|usbflash1|usbflash2} {filename} {destination}

Parameter

flash|usbflash1|usbflash2 —— The flash type of the source file.

filename —— File name.

destination —— Copied file path.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Copy the specified file:

```
Switch#copy flash test.txt usbflash1
```

7.2 cd

Description

The **cd** command is used to change the current file path.

Syntax

cd {filename|flash|usbflash1|usbflash2} [filename]

Parameter

filename|flash|usbflash1|usbflash2 —— The path that needs to be switched. If you enter filename, the file will be found in the current path by default.

filename —— Specify the file in the corresponding flash.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Change the current file path:

```
Switch# cd usbflash1 test
```

7.3 dir

Description

The **dir** command is used to list files and subdirectories contained in the specified working directory.

Syntax

dir [flash|usbflash1|usbflash2] [filename]

Parameter

flash|usbflash1|usbflash2 —— Specify path.

filename —— Specify the file in the corresponding flash.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

List files and subdirectories contained in the specified working directory:

```
Switch#dir flash
```

7.4 pwd

Description

The **pwd** command is used to display the absolute path name of the current working directory.

Syntax

pwd

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Display the absolute path name of the current working directory:

```
Switch#pwd
```

7.5 rename

Description

The **rename** command is used to rename a file.

Syntax

rename {srcFilename} {dstFilename}

Parameter

srcFilename —— Source file name.

dstFilename —— Renamed file name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Rename a file:

```
Switch#rename test1 test2
```

7.6 delete

Description

The **delete** command is used to delete a file.

Syntax

delete {filename|flash|usbflash1|usbflash2} [filename]

Parameter

filename|flash|usbflash1|usbflash2 —— The file that needs to be deleted. If you enter filename, the file will be found in the current working path by default.

filename —— Specify the file in the corresponding flash.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Delete a file:

```
Switch# delete text.txt
```

7.7 ftp

Description

The **ftp** command is used to enter the FTP (File Transfer Protocol) view.

Syntax

ftp

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enter the FTP view:

```
Switch#ftp
```

7.8 open

Description

The **open** command is used to connect to FTP server.

Syntax

open [ipv6] {hostIp}

Parameter

ipv6—— Specify the FTP server type as IPv6.

hostIp —— FTP server IP.

Command Mode

FTP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Connect to FTP server:

```
Switch(ftp)#open 192.168.0.146
```

7.9 put

Description

The **put** command is used to upload files to FTP server.

Syntax

put {srcFilename} {dstFilename}

Parameter

srcFilename —— Source file name.

dstFilename —— Destination file name.

Command Mode

FTP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Upload files to FTP server:

```
Switch(ftp)#put src.c dst.c
```

7.10 get

Description

The **get** command is used to download files from FTP server.

Syntax

get {srcFilename} {dstFilename}

Parameter

srcFilename —— Source file name.

dstFilename —— Destination file name.

Command Mode

FTP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Download files from FTP server:

```
Switch(ftp)#get src.c dst.c
```

7.11 close

Description

The **close** command is used to close current FTP connection.

Syntax

close

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Close current FTP connection:

```
Switch#close
```

Chapter 8 Management Port Configuration Commands (Only for Certain Devices)

8.1 management-port protocol

Description

The **management-port protocol** command is used to enable or disable the IPv4 DHCP funtion on the management port.

Syntax

management-port protocol {*dhcp*|*none*}

Parameter

dhcp ——Enable the DHCP function

none—— Disable the DHCP function

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IPv4 DHCP funtion on the management port:

```
Switch(config)#management-port protocol dhcp
```

8.2 management-port ip

Description

The **management-port ip** command is used to configure the IPv4 address of the management port. To delete the address, please use the **no management-port ip** command.

Syntax

management-port ip {*ip-addr*}{*mask*}

no management-port ip

Parameter

ip-addr —— IPv4 address

mask—— IP mask

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the IPv4 address of the management port:

```
Switch(config)#management-port ip 192.168.10.1 255.255.255.0
```

8.3 management-port ipv6 enable

Description

The **management-port ipv6 enable** command is used to enable the management-port ipv6 funtion. To disable the function, please use the **no management-port ipv6 enable** command.

Syntax

management-port ipv6 enable

no management-port ipv6 enable

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the management-port ipv6 funtion:

```
Switch(config)#management-port ipv6 enable
```

8.4 management-port ipv6 address

Description

The **management-port ipv6 address** command is used to configure the IPv6 address of the management port. To delete the address, please use the **no management-port ipv6 address** command.

Syntax

management-port ipv6 address {*ipv6-addr*} [*eui64*]

no management-port ipv6 address {*ipv6-addr*} [*eui64*]

Parameter

ipv6-addr —— IPv6 address, you need to specify the prefix length.

eui64—— Create the address in eui64 mode.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the IPv6 address of the management port:

```
Switch(config)#management-port ipv6 address 2001::1/64 eui64
```

8.5 show management-port

Description

The **show management-port** command is used to display the configuration information of the management port.

Syntax

show management-port

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration information of the management port:

```
Switch# show management-port
```

Chapter 9 EEE Configuration Commands

EEE (Energy Efficient Ethernet) is used to save power consumption of the switch during periods of low data activity. You can simply enable this feature on ports to allow power reduction.

9.1 eee

Description

The **eee** command is used to enable EEE on the port. To disable EEE on the port, please use **no eee** command.

Syntax

eee

no eee

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable EEE on port 1/0/1:

```
Switch(config)#interface gigabitEthernet 1/0/1
Switch(config-if)#eee
```

9.2 show interface eee

Description

The **show interface eee** command is used to display the EEE configuration on each port.

Syntax

show interface eee [fastEthernet *port* **| gigabitEthernet** *port* **| two-gigabitEthernet** *port* **| ten-gigabitEthernet** *port* **]**

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the EEE configuration of each port

```
Switch# show interface eee
```

Chapter 10 SDM Template Commands

This chapter describes how to configure the Switch Database Management (SDM) templates to allocate hardware resources on the switch for different uses.

10.1 sdm prefer

Description

The **sdm prefer** command is used to specify the SDM template to be used. The SDM template is used to allocate system resources to best support the features being used in your application. To return to use the default template, please use the **sdm prefer default** command. The template change will take effect after a reboot.

Syntax

sdm prefer { default | enterpriseV4 | enterpriseV6 | extacl | enterpriseMix | pca-default }

Parameter

default —— Specify the SDM template used in the switch as “default”.

enterpriseV4 —— Specify the SDM template used in the switch as “enterpriseV4”.

enterpriseV6 —— Specify the SDM template used in the switch as “enterpriseV6”.

extacl —— Specify the SDM template used in the switch as “extacl”, which provides more ACL support.

enterpriseMix —— Specify the SDM template used in the switch as “enterpriseMix”, which provides both IPv4/IPv6-ACL support and IMPBv4/v6 support.

pca-default —— Specify the SDM template used in the switch as “pca-default”, which provides packet-content-ACL support.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

Some models may not support **pca-default** template. Changes to the SDM preferences cannot take effect until reboot the switch.

Example

Specify the SDM template as enterpriseV4:

```
Switch(config)# sdm prefer enterpriseV4
```

10.2 show sdm prefer

Description

The **show sdm prefer** command is used to display resource allocation of the current SDM template in use, or the SDM templates that can be used.

Syntax

show sdm prefer { used | default | enterpriseV4 | enterpriseV6 | extacl | enterpriseMix | pca-default}

Parameter

used —— Display the resource allocation of the template currently in use, and the template that will become active after a reboot.

default —— Display the resource allocation of the default template.

enterpriseV4 —— Display the resource allocation of the enterpriseV4 template.

enterpriseV6 —— Display the resource allocation of the enterpriseV6 template.

extacl —— Display the resource allocation of the extacl template.

enterpriseMix —— Specify the SDM template used in the switch as "enterpriseMix", which provides both IPv4/IPv6-ACL support and IMPBv4/v6 support.

pca-default —— Specify the SDM template used in the switch as "pca-default", which provides packet-content-ACL support.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the resource allocation of the template currently in use, and the template that will become active after a reboot:

Switch(config)#show sdm prefer used

Chapter 11 Time Range Commands

With this feature, you can configure a time range and bind it to a PoE port or an ACL rule.

11.1 time-range

Description

The **time-range** command is used to create time-range entry for the switch and enter Time-range Create Configuration Mode. After a time-range entry is created, you need to specify the date and time. A time-range can implement multiple time-ranges simultaneously as long as they do not conflict with each other. To delete the corresponding time-range configuration, please use **no time-range** command.

Syntax

time-range *name*

no time-range *name*

Command Mode

Global Configuration Mode

Parameter

name —— The time-range name, ranging from 1 to 16 characters.

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a time-range named “tRange1” for the switch:

```
Switch(config)# time-range tRange1
```

11.2 absolute

Description

The **absolute** command is used to create an absolute time-range for the time-range of the switch. To delete the corresponding absolute time-range configuration, please use **no absolute** command.

Syntax

absolute from *start-date* **to** *end-date*

no absolute [*index*]

Parameter

start-date —— The start date in Absoluteness Mode, in the format of MM/DD/YYYY.

end-date —— The end date in Absoluteness Mode, in the format of MM/DD/YYYY.

Command Mode

Time-Range Create Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create an absolute time-range for the switch and specify the date extending from May 5th, 2017 through Oct. 5th, 2017:

Switch(config)#time-range tRange1

Switch(config-time-range)#absolute from 05/05/2017 **to** 10/05/2017

11.3 periodic

Description

The **periodic** command is used to create a periodic mode time-range for the time-range of the switch. To delete the corresponding periodic mode time-range configuration, please use **no periodic** command.

Syntax

periodic start *start-time* **end** *end-time* **day-of-the-week** *week-day*

no periodic [*index*]

Parameter

start-time——Specify the start time in the format of HH:MM

end-time——Specify the end time in the format of HH:MM

week-day——In the format of 1-3, 6, daily, off-day, or working-day. For example, 1-3,6 represents Monday, Tuesday, Wednesday and Saturday; daily represents every day; off-day represents the weekends; working-day represents the working days.

Command Mode

Time-Range Create Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the time-range tSeg1 with time from 8:30 to 12:00 at weekends:

Switch(config)#time-range tSeg1

Switch(config -time-range)#periodic start 08:30 **end** 12:00

day-of-the-week 6-7

11.4 holiday (time-range mode)

Description

The **holiday** command is used to create holiday mode time-range for the time-range of the switch. When the holiday which is excluded from time-range occurs, the switch will not supply power.

Syntax

holiday { exclude | include }

Parameter

exclude ——The time range will not take effect on holiday.

include —— The time range will take effect on holiday.

Command Mode

Time-Range Create Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a time-range entry named “tRange3” and configure time-range to exclude the holiday:

Switch(config)#time-range tRange3

Switch(config-time-range)#holiday exclude

11.5 holiday

Description

The **holiday** command is used to create holiday for the switch. To delete the corresponding holiday configuration, please use **no holiday** command.

Syntax

holiday *name* **start-date** *start-date* **end-date** *end-date*

no holiday *name*

Parameter

name —— The holiday name, ranging from 1 to 16 characters.

start-date —— The start date of the holiday, in the format of MM/DD, for instance, 05/01.

end-date ——The end date of the holiday, in the format of MM/DD, for instance, 05/01.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a holiday named "holiday1" and configure the start date as October 1st and the end date as October 3rd:

```
Switch(config)# holiday holiday1 start-date 10/01 end-date 10/03
```

11.6 show holiday

Description

The **show holiday** command is used to display the defined holiday.

Syntax

show holiday

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the defined holiday:

```
Switch# show holiday
```

11.7 show time-range

Description

The **show time-range** command is used to display the defined time-range.

Syntax

show time-range [*time-range-name*]

Parameter

time-range-name —— Specify the time range name with 1 to 16 characters.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the defined time-range:

```
Switch# show time-range
```

Chapter 12 Interface Configuration Commands

Ethernet Configuration Commands can be used to configure the Bandwidth Control, Negotiation Mode and Storm Control for Ethernet ports.

12.1 interface

Description

The **interface** command is used to enter the Interface Configuration Mode and configure the corresponding port.

Syntax

interface *fastEthernet* / *gigabitEthernet* / *two-gigabitEthernet* / *ten-gigabitEthernet*port**Parameter**

fastEthernet port—— The 100M Ethernet port number.

gigabitEthernet port—— The Gigabit Ethernet port number.

ten-gigabitEthernet port—— The 10-Gigabit Ethernet port number.

two-gigabitEthernet port—— The 2.5-Gigabit Ethernet port number.

port-channel num—— The Ethernet channel number.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

To enter the Interface gigabitEthernet Configuration Mode and configure port 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
```

12.2 interface range

Description

The **interface range** command is used to enter the interface rangeConfiguration Mode and configure multipleEthernet ports at the same time.

Syntax

interface range fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet *port-list*

Parameter

fastEthernet port —— The 100M Ethernet port number.

gigabitEthernet port —— The Gigabit Ethernet port number.

ten-gigabitEthernet port —— The 10-Gigabit Ethernet port number.

two-gigabitEthernet port —— The 2.5-Gigabit Ethernet port number.

port-list —— The list of Ethernet ports.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

Command in the **Interface Range gigabitEthernet** Mode is executed independently on all ports in the range. It does not affect the execution on the other ports at all if the command results in an error on one port.

Example

To enter the Interface range gigabitEthernet Configuration Mode, and configure ports 1, 2, 3, 6, 7 and 9 at the same time by adding them to one port-list:

Switch(config)# interface range gigabitEthernet 1/0/1-3,1/0/6-7,1/0/9

12.3 description

Description

The **description** command is used to add a description to the Ethernet port. To clear the description of the corresponding port, please use **no description** command.

Syntax

description *string*

no description

Parameter

string —— Content of a port description, ranging from 1 to 16 characters.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add a description Port_5 to port 1/0/5:

Switch(config)# interface gigabitEthernet 1/0/5

Switch(config-if)# description Port_5

12.4 shutdown

Description

The **shutdown** command is used to disable an Ethernet port. To enable this port again, please use **no shutdown** command.

Syntax

shutdown

no shutdown

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# shutdown
```

12.5 flow-control

Description

The **flow-control** command is used to enable the flow-control function for a port. To disable the flow-control function for this corresponding port, please use **no flow-control** command. With the flow-control function enabled, the Ingress Rate and Egress Rate can be synchronized to avoid packet loss in the network.

Syntax

flow-control

no flow-control

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the flow-control function for port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# flow-control
```

12.6 duplex

Description

The **duplex** command is used to configure the Duplex Mode for an Ethernet port. To return to the default configuration, please use **no duplex** command.

Syntax

duplex { auto | full | half }

no duplex

Parameter

auto | full | half —— The duplex mode of the Ethernet port. There are three options: auto-negotiation mode, full-duplex mode and half-duplex mode. By default, the Gigabit Ethernet port is auto-negotiation mode.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the Duplex Mode as full-duplex for port 1/0/3:

Switch(config)# interface gigabitEthernet 1/0/3

Switch(config-if)# duplex full

12.7 jumbo-size

Description

The **jumbo-size** command is used to specify the size of jumbo frames.

Syntax

jumbo-size *size*

Parameter

size —— The value of jumbo frames. It ranges from 1518 to 9216 bytes, and the default is 1518 bytes.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Globally configure the size of jumbo frames as 9216:

Switch(config)# jumbo-size 9216

12.8 speed

Description

The **speed** command is used to configure the Speed Mode for an Ethernet port. To return to the default configuration, please use **no speed** command.

Syntax

speed { 10 | 100 | 1000 | 2500 | 5000 | 10000 | auto }

no speed

Parameter

10 | 100 | 1000 | 2500 | 5000 | 10000 | auto —— The speed mode of the Ethernet port. There are seven options: 10Mbps, 100Mbps, 1000Mbps, 2500Mbps, 5000Mbps, 10000Mbps and Auto negotiation mode (default).

Command Mode

Interface Configuration Mode (interface fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet / interface range fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the Speed Mode as 100Mbps for port 1/0/3:

Switch(config)# interface gigabitEthernet 1/0/3

Switch(config-if)# speed 100

12.9 clear counters

Description

The **clear counters** command is used to clear the statistics information of all the Ethernet ports and port channels.

Syntax

clear counters

clear counters interface [**fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet** *port*] [**port-channel** *port-channel-id*]

Parameter

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Clear the statistic information of all ports and port channels:

```
Switch(config)# clear counters
```

12.10 show fiber-ports

Note: This command is only available on certain devices.

Description

The **show fiber-ports** command is used to display the information of all optical modules.

Syntax

show fiber-ports

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of all fiber ports:

```
Switch(config)# show fiber-ports
```

12.11 show interface status

Description

The **show interface status** command is used to display the connection status of the Ethernet port/port channel.

Syntax

show interface status [**fastEthernet** *port*] [**gigabitEthernet** *port*] [**two-gigabitEthernet** *port*] [**ten-gigabitEthernet** *port*] [**port-channel** *port-channel-id*]

Parameter

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel..

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the connection status of all ports and port channels:

```
Switch(config)# show interface status
```

Display the connection status of port 1/0/1:

```
Switch(config)# show interface status gigabitEthernet 1/0/1
```

12.12 show interface counters

Description

The **show interface counters** command is used to display the statistics information of all ports/port channels.

Syntax

show interface counters [**fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet** *port*] [**port-channel** *port-channel-id*]

Parameter

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the statistics information of all Ethernet ports and port channels:

Switch(config)# show interface counters

Display the statistics information of port 1/0/2:

Switch(config)# show interface counters gigabitEthernet 1/0/2

12.13 show interface configuration

Description

The **show interface configuration** command is used to display the configurations of all ports and port channels, including Port-status, Flow Control, Negotiation Mode and Port-description.

Syntax

show interface configuration [**fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet** *port*] [**port-channel** *port-channel-id*]

Parameter

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configurations of all Ethernet ports and port channels:

```
Switch(config)# show interface configuration
```

Display the configurations of port 1/0/2:

```
Switch(config)# show interface configuration gigabitEthernet 1/0/2
```

12.14 show onvif ipc-classify

Description

The **show onvif ipc-classify** command is used to display whether a port is in a direct connection state (has only learned one MAC address), the current traffic identification status, and traffic identification results. The identification results are used to indicate whether the device connected to the port is an IPC. There are two possible displays for the result (IPC and Other).

Syntax

show onvif ipc-classify

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the current port traffic identification results:

```
Switch(config)# show onvif ipc-classify
```

Chapter 13 Port Isolation Commands

Port Isolation provides a method of restricting traffic flow to improve the network security by forbidding the port to forward packets to the ports that are not on its forwarding port list.

13.1 port isolation

Description

The **port isolation** command is used to configure the forward port/port channel list of a port/port channel, so that this port/port channel can only communicate with the ports/port channels on its list. To delete the corresponding configuration, please use **no port isolation** command.

Syntax

port isolation { [**fa-forward-list** *fa-forward-list*] [**gi-forward-list** *gi-forward-list*] [**tw-forward-list** *tw-forward-list*] [**te-forward-list** *te-forward-list*] } [**po-forward-list** *po-forward-list*]

no port isolation

Parameter

fa-forward-list / *gi-forward-list* / *tw-forward-list* / *te-forward-list* —— The list of Ethernet ports.

po-forward-list —— The list of port channels.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set port 1, 2, 4 and port channel 2 to the forward list of port 1/0/5:

```
Switch(config)# interface gigabitEthernet 1/0/5
Switch(config-if)# port isolation gi-forward-list 1/0/1-2,1/0/4
po-forward-list 2
```

Set all Ethernet ports and port channels to forward list of port 1/0/2, namely restore to the default setting:

```
Switch(config)# interface gigabitEthernet 1/0/2
```

```
Switch(config-if)# no port isolation
```

13.2 show port isolation interface

Description

The **show port isolation interface** command is used to display the forward port list of a port/port channel.

Syntax

show port isolation interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **two-gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The number of Ethernet port you want to show its forward port list, in the format of 1/0/2.

port-channel-id —— The ID of port channel you want to show its forward port list, ranging from 1 to 6.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the forward-list of port 1/0/2:

```
Switch# show port isolation interface gigabitEthernet 1/0/2
```

Display the forward-list of all Ethernet ports and port channels:

```
Switch# show port isolation interface
```

Chapter 14 Loopback Detection Commands

With loopback detection feature enabled, the switch can detect loops using loopback detection packets. When a loop is detected, the switch will display an alert or further block the corresponding port according to the configuration.

14.1 loopback-detection (global)

Description

The **loopback-detection** command is used to enable the loopback detection function globally. To disable it, please use **no loopback detection** command.

Syntax

loopback-detection

no loopback-detection

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the loopback detection function globally:

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

14.2 loopback-detection interval

Description

The **loopback-detection interval** command is used to define the interval of sending loopback detection packets from switch ports to network, aiming at detecting network loops periodically.

Syntax

loopback-detection interval *interval-time*

Parameter

interval-time —— The interval of sending loopback detection packets. It ranges from 1 to 1000 seconds. By default, this value is 30.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the interval-time as 50 seconds:

```
Switch(config)# loopback-detection interval 50
```

14.3 loopback-detection recovery-time

Description

The **loopback-detection recovery-time** command is used to configure the time after which the blocked port would automatically recover to normal status.

Syntax

loopback-detection recovery-time *recovery-time*

Parameter

recovery-time —— The time after which the blocked port would automatically recover to normal status, and the loopback detection would restart. It ranges from 2 to 1000000 seconds. By default, this value is 90.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the recovery-time as 70 seconds:

```
Switch(config)# loopback-detection recovery-time 70
```

14.4 loopback-detection (interface)

Description

The **loopback-detection** command is used to enable the loopback detection function of the specified port. To disable it, please use **no loopback-detection** command.

Syntax

loopback-detection

no loopback-detection

Command Mode

Interface Configuration Mode (interface fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet / interface range fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the loopback detection function of ports 1-3:

```
Switch(config)# interface range gigabitEthernet 1/0/1-3
Switch(Config-if-range)# loopback-detection
```

14.5 loopback-detection config process-mode

Description

The **loopback-detection config process-mode** command is used to configure the process-mode for the ports by which the switch copes with the detected loops. You also need to configure the recovery mode to remove the block status of the port or VLAN when the process-mode is Port Based or VLAN Based.

Syntax

loopback-detection config process-mode { alert | port-based | vlan-based }

recovery-mode { auto | manual }

Parameter

alert —— When a loop is detected, the switch will send a trap message and generate an entry on the log file. It is the default setting.

port-based —— When a loop is detected, the switch will send a trap message and generate an entry on the log file. In addition, the switch will block the port on which the loop is detected and no packets can pass through the port.

vlan-based —— When a loop is detected, the switch will send a trap message and generate an entry on the log file. In addition, the switch will block the VLAN in which the loop is detected and only the packets of the blocked VLAN cannot pass through the port.

auto —— Block status can be automatically removed after recovery time.

manual —— Block status can only be removed manually.

Command Mode

Interface Configuration Mode (interface gigabitEthernet | interface range gigabitEthernet | interface port-channel | interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the loopback detection process-mode as port-based, and configure the recovery mode as manual for port 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# loopback-detection config process-mode port-based
recovery-mode manual
```

14.6 loopback-detection recover

Description

The **loopback-detection recover** command is used to remove the block status of selected ports, recovering the blocked ports to normal status,

Syntax

loopback-detection recover

Command Mode

Interface Configuration Mode (interface gigabitEthernet | interface range gigabitEthernet | interface port-channel | interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Recover the blocked port 1/0/2 to normal status:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# loopback-detection recover
```

14.7 show loopback-detection global

Description

The **show loopback-detection global** command is used to display the global configuration of loopback detection function such as loopback detection global status, loopback detection interval and loopback detection recovery time.

Syntax

show loopback-detection global

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of loopback detection function:

```
Switch# show loopback-detection global
```

14.8 show loopback-detection interface

Description

The **show loopback-detection interface** command is used to display the configuration of loopback detection function and the status of the specified Ethernet port.

Syntax

show loopback-detection interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **two-gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *lagid*] [**detail**]

Parameter

port —— The Ethernet port number.

lagid —— The number of LAG, ranging from 1 to 14.

detail —— Displays the loop status and block status of the VLAN which the specified port belongs to.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of loopback detection function and the status of all ports:

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

Display the configuration of loopback detection function and the status of port 5:

```
Switch# show loopback-detection interface gigabitEthernet 1/0/5
```

Chapter 15 Stack Commands (Only for Certain Devices)

Stack is a device virtualization technology that connects two and above switches supporting stack features via cables through their stack ports, which logically virtualize them to one device as a whole to forward data in the network in Layer 2 and Layer 3 protocols. Through this feature, switches can be stacked to improve reliablity, expand port numbers, increase bandwidth, simplify networking, and etc.

In a stack system, the switches can be categorized mainly into two roles: Master Switch and Member Switch. The master switch manages and controls devices in the whole stack system while the member switch only forwards data as a standby device of the master switch.

As the following figure shows, the switches are connected to form a stack which works as a unified system that enables multiple devices to collaborate under the management of the master switch as a whole.

15.1 switch stack-name

Description

The **switch stack-name** command is used to specify the name of the stack system.

Syntax

switch stack-name {*name***}**

Parameter

name —— Specify the name of the stack system.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the name of the stack system:

```
Switch(config)#switch stack-name “test”
```

15.2 switch stack-group

Description

The **switch stack-group** command is used to access the viewing page of a specified stack port group configuration of the specified device.

Syntax

switch {*unitid***} stack-group {***groupid***}**

Parameter

unitid —— Device ID in the stack system, ranging from 1-12.

groupid —— ID of the stack port group, ranging from 1-12.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enter the viewing page of a stack port group 1 on switch 1:

```
Switch(config)#switch 1 stack-group 1
```

15.3 group-info

Description

The **group-info** command is used to view the specified stack port group configuration of the specified device.

Syntax

group-info

Parameter

group-info —— Display the information of the stack group.

Command Mode

Stack-Group Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

View the inforamtion of the stack port group 1 on switch 2.

```
Switch(config)# switch 2 stack-group 1
Switch(stack-group)#group-info
```

15.4 interface port

Description

The **interface port** command is used to enable the stack function for a specified slot. To disable this function, please use the **no interface port** command.

Syntax

interface *port*

no interface *port*

Parameter

port—— Port which the stack function to be enabled/disabled on

Command Mode

Stack-Group Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure 1/0/28 as a stack port and join stack-group 1 of uinit 2:

```
Switch(stack-group)# interface 1/0/28
```

15.5 switch priority

Description

The **switch priority** command is used to configure the stack priority of the device with specified unit ID.

Syntax

switch {*unitid***} priority {***priority***}**

Parameter

unitid—— Device ID in the stack system, ranging from 1 to 12.

Priority—— Stack priority. The higher the priority, the more likely the device is to become the master device. The value ranges from 1 to 255.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the stack priority of unit 1 as 5:

```
Switch(config)#switch 1 priority 5
```

15.6 switch renumber

Description

The **switch renumber** command is used to modify the stack unit ID of a specified device, which will take effect after the switch reboots.

Syntax

switch {*unitid***} renumber {***new-unitid***}**

Parameter

unitid—— ID in the stack system, ranging from 1 to 12.

new-unitid—— New device ID to be configured, ranging from 1 to 12.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Renumber the stack unit ID of unit 1 as 2:

```
Switch(config)# switch 1 renumber 2
WARNING: Changing the Unit number may result in a configuration change for that unit. The interface configuration associated with the old unit number will remain as a provisioned configuration. Do you want to continue?[Y/N] y
```

Changing Unit Number 1 to Unid Number 1. New Unit Number will be effective after next reboot

15.7 switch provision

Description

The **switch provision** command is used to create a preconfigured entry specifying unitid and device-type. After creation, you can use other configuration commands to configure the unit. The configuration will take effect after the stack is connected. To delete the entry, please use the **no switch provision** command.

Syntax

switch {*unitid***} provision {***device-type***}**

no switch {*unitid***} provision {***device-type***}**

Parameter

unitid —— Device ID, which should be less than 32 characters and range from 1 to 12.

device-type —— Device type. The provision device needs to be of the same type as the connected device.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure provision entries:

Switch(config)#switch 1 provision 3

15.8 switch mac-delay

Description

The **switch mac-delay** command is used to enable or disable the virtual MAC feature. To disable this feature, please use the parameter "immediately".

Syntax

switch mac-delay { *delay-time* | immediately }

Parameter

delay-time: The delay time for virtual MAC switching(in minutes), ranging from 0-60 minutes. 0 indicates never switching the stack MAC. The default value is 10 minutes. If the original master switch in the stacking system temporarily leaves and returns within the switching time, the stack MAC address will not change. However, if the master siwtch does not return to the stacking system within the switching time, the stacking system will use the MAC address of the current master switch as the new MAC address.

immediately: When the stacking system changes, the stacking system MAC changes immediately, that is, the virtual MAC feature is not enabled.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the virtual MAC switching time to 5 minutes:

```
Switch(config)# switch mac-delay 5
```

15.9 switch mad enable

Description

The **switch mad enable** command is used to enable Multi-Active Detection (MAD) globally. MAD is a protocol for detecting and handling stack splits, primarily used in stack systems to monitor operational status, detect stack splits, resolve conflicts, and recover from faults, thereby minimizing service disruption. It is a sub-feature of the stacking module, with configuration and display commands located under the stacking module.

When the management channel of a stack system fails, the stack splits. The original logical device divides into multiple devices, which may retain identical system parameters and cause conflicts. To prevent this, split devices will "self-terminate" by erroring down all service ports except stacking member ports, reserved ports, and MAD-configured ports.

Syntax

switch mad enable

Parameter

None.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable MAD globally:

```
Switch(config)# switch mad enable
```

15.10 switch mad disable

Description

The **switch mad disable** command is used to disable MAD globally. The retain-config parameter preserves MAD-related configurations while disabling the feature.

Syntax

switch mad disable { retain-config **}**

Parameter

retain-config —— Disables MAD but retains all related configurations.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable MAD globally:

```
Switch(config)# switch mad disable
```

15.11 switch mad restore

Description

The **switch mad restore** command is used to restore a stack system in recovery state by re-enabling error-down ports.

Syntax

switch mad restore

Parameter

None

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Restore a stack system in recovery state by re-enabling error-down ports:

```
Switch(config)# switch mad restore
```

15.12 switch mad detect mode direct interface

Description

The **switch mad detect mode direct interface** command is used to configure direct ports for MAD detection. MAD ports are blocked and cannot carry service traffic.

Syntax

switch mad detect mode direct interface { *portList* **}**

no switch mad detect mode direct interface

Parameter

portList —— Physical ports of the switch, e.g. (1/0/1-2, 2/0/1). The MAD port will be blocked and services cannot be performed. Please avoid performing other configurations on this port. The LAG port cannot be configured and is mutually exclusive with the stack port. That is, the stack port cannot be configured as a MAD port, and the MAD port cannot be configured as a stack port.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure port 1/0/1 for MAD detection:

```
Switch(config)# switch mad detect mode direct interface 1/0/1
```

15.13 switch mac-delay show

Description

The **switch mac-delay show** command is used to display the MAC-delay switching time of the current stacking system.

Syntax

switch mac-delay show

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the MAC-delay switching time of the current stacking system:

```
Switch# switch mac-delay show
```

15.14 show switch mad detail

Description

The **show switch mad detail** command is used to display the relevant configuration of the MAD function and the current status of the switch.

Syntax

show switch mad detail

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the relevant configuration of the MAD function and the current status of the switch:

```
Switch# show switch mad detail
```

15.15 show switch stack-ports

Description

The **show switch stack-ports** command is used to display the stack port information of all members of the stack group.

Syntax

show switch stack-ports

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the stack port information of all members of the stack group:

```
Switch#show switch stack-ports
```

15.16 show switch

Description

The **show switch** command is used to display the information of all devices in the stack system.

Syntax

show switch *unit-id*

Parameter

unitid: Device ID in the stack system, ranging from 1 to 12

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the information of member switch 2:

```
Switch#show switch 2
```

15.17 show switch neighbors

Description

The **show switch neighbors** command is used to display the group ID of the stack port and the unit ID of its neighboring member device in the current stack system.

Syntax

show switch neighbors

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the unit ID of the current stack system:

```
Switch#show switch neghbors
```

Chapter 16 DDM Commands (Only for Certain Devices)

Note: DDM commands are only available on certain devices.

The DDM (Digital Diagnostic Monitoring) function allows the user to monitor the status of the SFP modules inserted into the SFP ports on the switch. The user can choose to shut down the monitoring SFP port automatically when specified parameter exceeds the alarm threshold or warning threshold. The monitoring parameters include: Temperature, Voltage, Bias Current, Tx Power and Rx Power.

16.1 ddm state enable

Description

The **ddm state enable** command is used to enable the DDM function on the specified SFP port.

Use the **no ddm state enable** command to disable the DDM function on this port.

Syntax

ddm state enable

no ddm state enable

Default Setting

Enabled on all the SFP ports.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Enable DDM function on port 1/0/25:

```
Switch(config)#interface gigabitEthernet 1/0/25
Switch(config-if)#ddm state enable
```

16.2 ddm shutdown

Description

The **ddm shutdown** command is used to configure whether to shut down the port when an exceeding alarm threshold or warning threshold event is encountered.

Syntax

ddm shutdown { none | warning | alarm }

Parameter

none —— The port will never be shut down regardless of the exceeding alarm threshold and warning threshold events.

warning —— Shut down the port when an exceeding warning threshold event is encountered.

alarm —— Shut down the port when an exceeding alarm threshold event is encountered.

Default Setting

none, which means the port will never be shut down regardless of the exceeding alarm threshold and warning threshold events.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Shut down the port 1/0/25 when an exceeding warning threshold event is encountered:

```
Switch(config)#interface gigabitEthernet 1/0/25
Switch(config-if)#ddm shutdown warning
```

16.3 ddm temperature_threshold

Description

The **ddm temperature_threshold** command is used to configure the threshold of the DDM temperature value.

Syntax

ddm temperature_threshold { high_alarm | high_warning | low_alarm | low_warning } *value*

Parameter

high_alarm —— Specify the highest threshold for the alarm. When the operating parameter rises above the value hereinafter, action associated with the alarm will be taken.

high_warning ——Specify the highest threshold for the warning. When the operating parameter rises above the value hereinafter, action associated with the warning will be taken.

low_alarm ——Specify the lowest threshold for the alarm. When the operating parameter falls below the value hereinafter, action associated with the alarm will be taken.

low_warning —— Specify the lowest threshold for the warning. When the operating parameter falls below the value hereinafter, action associated with the warning will be taken.

value —— Enter the threshold value in Celsius.

Default Setting

None.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Configure the high_alarm threshold of DDM temperature on the port 1/0/25 as 5:

```
Switch(config)#interface gigabitEthernet 1/0/25
Switch(config-if)#ddm temperature_threshold high_alarm 5
```

16.4 ddm voltage_threshold

Description

The **ddm voltage_threshold** command is used to configure the threshold of the DDM voltage value.

Syntax

ddm voltage_threshold { high_alarm | high_warning | low_alarm | low_warning } *value*

Parameter

high_alarm —— Specify the highest threshold for the alarm. When the operating parameter rises above the value hereinafter, action associated with the alarm will be taken.

high_warning ——Specify the highest threshold for the warning. When the operating parameter rises above the value hereinafter, action associated with the warning will be taken.

low_alarm ——Specify the lowest threshold for the alarm. When the operating parameter falls below the value hereinafter, action associated with the alarm will be taken.

low_warning —— Specify the lowest threshold for the warning. When the operating parameter falls below the value hereinafter, action associated with the warning will be taken.

value —— Enter the threshold value in Volt.

Default Setting

None.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Configure the high_alarm threshold of DDM voltage on the port 1/0/25 as 5:

Switch(config)#interface gigabitEthernet 1/0/25

Switch(config-if)#ddm voltage_threshold high_alarm 5

16.5 ddm bias_current_threshold

Description

The **ddm bias_current_threshold** command is used to configure the threshold of the DDM Bias Current value.

Syntax

ddm bias_current_threshold { high_alarm | high_warning | low_alarm | low_warning } *value*

Parameter

high_alarm —— Specify the highest threshold for the alarm. When the operating parameter rises above the value hereinafter, action associated with the alarm will be taken.

high_warning ——Specify the highest threshold for the warning. When the operating parameter rises above the value hereinafter, action associated with the warning will be taken.

low_alarm ——Specify the lowest threshold for the alarm. When the operating parameter falls below the value hereinafter, action associated with the alarm will be taken.

low_warning —— Specify the lowest threshold for the warning. When the operating parameter falls below the value hereinafter, action associated with the warning will be taken.

value —— Enter the threshold value in mA.

Default Setting

None.

Command Mode

Interface Configuration Mode (interface fastEthernet / interface range fastEthernet / interface gigabitEthernet / interface range gigabitEthernet)

Example

Configure the high_alarm threshold of DDM Bias Current on the port 1/0/25 as 5:

```
Switch(config)#interface gigabitEthernet 1/0/25
Switch(config-if)#ddm bias_current_threshold high_alarm 5
```

16.6 ddm tx_power_threshold

Description

The **ddm tx_power_threshold** command is used to configure the threshold of the DDM Tx Power value.

Syntax

ddm tx_power_threshold { high_alarm | high_warning | low_alarm | low_warning } *value*

Parameter

high_alarm —— Specify the highest threshold for the alarm. When the operating parameter rises above the value hereinafter, action associated with the alarm will be taken.

high_warning ——Specify the highest threshold for the warning. When the operating parameter rises above the value hereinafter, action associated with the warning will be taken.

low_alarm ——Specify the lowest threshold for the alarm. When the operating parameter falls below the value hereinafter, action associated with the alarm will be taken.

low_warning —— Specify the lowest threshold for the warning. When the operating parameter falls below the value hereinafter, action associated with the warning will be taken.

value —— Enter the threshold value in mW.

Default Setting

None.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Configure the high_alarm threshold of DDM Tx Power on the port 1/0/25 as 5:

```
Switch(config)#interface gigabitEthernet 1/0/25
Switch(config-if)#ddm tx_power_threshold high_alarm 5
```

16.7 ddm rx_power_threshold

Description

The **ddm rx_power_threshold** command is used to configure the threshold of the DDM Rx Power value.

Syntax

ddm rx_power_threshold { high_alarm | high_warning | low_alarm | low_warning } *value*

Parameter

high_alarm —— Specify the highest threshold for the alarm. When the operating parameter rises above the value hereinafter, action associated with the alarm will be taken.

high_warning ——Specify the highest threshold for the warning. When the operating parameter rises above the value hereinafter, action associated with the warning will be taken.

low_alarm ——Specify the lowest threshold for the alarm. When the operating parameter falls below the value hereinafter, action associated with the alarm will be taken.

low_warning —— Specify the lowest threshold for the warning. When the operating parameter falls below the value hereinafter, action associated with the warning will be taken.

value —— Enter the threshold value in mW.

Default Setting

None.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Example

Configure the high_alarm threshold of DDM Rx Power on the port 1/0/25 as 5:

```
Switch(config)#interface gigabitEthernet 1/0/25
Switch(config-if)#ddm rx_power_threshold high_alarm 5
```

16.8 show ddm configuration

Description

The **show ddm configuration** command is used to display the DDM configuration.

Syntax

show ddm configuration { state | temperature | voltage | bias_current | tx_power | rx_power }

Parameter

state —— Display the DDM configuration state.

temperature —— Displays the threshold of the DDM temperature value.

voltage —— Displays the threshold of the DDM Voltage value.

bias_current —— Displays the threshold of the DDM Bias Current value.

tx_power —— Displays the threshold of the DDM Tx Power value.

rx_power —— Displays the threshold of the DDM Rx Power value.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

View the DDM configuration state:

```
Switch(config)#show ddm configuration state
```

View the threshold of the DDM Voltage value:

```
Switch(config)#show ddm configuration voltage
```

16.9 show ddm status

Description

The **show ddm status** command is used to display the DDM status, which is the digital diagnostic monitoring status of SFP modules inserting into the switch's SFP ports.

Syntax

show ddm status

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

View the DDM status:

```
Switch(config)#show ddm status
```

16.10 show fiber-ports

Note: This command is only available on certain devices.

Description

The **show fiber-ports** command is used to display the information of all fiber ports.

Syntax

show fiber-ports

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of all fiber ports:

```
Switch(config)# show fiber-ports
```

Chapter 17 Etherchannel Commands

Etherchannel Commands are used to configure LAG and LACP function.

LAG (Link Aggregation Group) is to combine a number of ports together to make a single high-bandwidth data path, which can highly extend the bandwidth. The bandwidth of the LAG is the sum of bandwidth of its member port.

LACP (Link Aggregation Control Protocol) is defined in IEEE802.3ad and enables the dynamic link aggregation and disaggregation by exchanging LACP packets with its partner. The switch can dynamically group similarly configured ports into a single logical link, which will highly extend the bandwidth and flexibly balance the load.

17.1 channel-group

Description

The **channel-group** command is used to add a port to the EtherChannel Group and configure its mode. To delete the port from the EtherChannel Group, please use **no channel-group** command.

Syntax

channel-group *num* **mode** { on | active | passive }

no channel-group

Parameter

num —— The number of the EtherChannel Group, which ranges from 1 to 8 for L2/L2+ switches, 1 to 64 for L3 access switches, and 1 to 120 for L3 aggregation switches.

on —— Enable the static LAG.

active —— Enable the active LACP mode.

passive —— Enable the passive LACP mode.

Command Mode

Interface Configuration Mode (interface fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet / interface range fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add ports 2-4 to EtherChannel Group 1 and enable the static LAG:

```
Switch(config)# interface range gigabitEthernet 1/0/2-4
Switch(config-if-range)# channel-group 1 mode on
```

17.2 port-channel load-balance

Description

The **port-channel load-balance** command is used to configure the Aggregate Arithmetic for LAG. To return to the default configurations, please use **no port-channel load-balance** command.

Syntax

port-channel load-balance { src-mac | dst-mac | src-dst-mac | src-ip | dst-ip | src-dst-ip }

no port-channel load-balance

Parameter

src-mac —— The source MAC address. When this option is selected, the Aggregate Arithmetic will be based on the source MAC address of the packets.

dst-mac —— The destination MAC address. When this option is selected, the Aggregate Arithmetic will be based on the destination MAC address of the packets.

src-dst-mac —— The source and destination MAC address. When this option is selected, the Aggregate Arithmetic will be based on the source and destination MAC addresses of the packets. The Aggregate Arithmetic for LAG is “src-dst-mac” by default.

src-ip —— The source IP address. When this option is selected, the Aggregate Arithmetic will be based on the source IP address of the packets.

dst-ip —— The destination IP address. When this option is selected, the Aggregate Arithmetic will be based on the destination IP address of the packets.

src-dst-ip —— The source and destination IP address. When this option is selected, the Aggregate Arithmetic will be based on the source and destination IP addresses of the packets.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the Aggregate Arithmetic for LAG as "src-dst-ip":

Switch(config)# port-channel load-balance src-dst-ip

17.3 lacp system-priority

Description

The **lacp system-priority** command is used to configure the LACP system priority globally. To return to the default configurations, please use **no lacp system-priority** command.

Syntax

lacp system-priority *pri*

no lacp system-priority

Parameter

pri—— The system priority, ranging from 0 to 65535. It is 32768 by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the LACP system priority as 1024 globally:

Switch(config)# lacp system-priority 1024

17.4 lacp port-priority

Description

The **lacp port-priority** command is used to configure the LACP port priority for specified ports. To return to the default configurations, please use **no lacp port-priority** command.

Syntax

lacp port-priority *pri*

no lacp port-priority

Parameter

pri—— The port priority, ranging from 0 to 65535. It is 32768 by default.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the LACP port priority as 1024 for ports 1-3:

Switch(config)# interface range gigabitEthernet 1/0/1-3

Switch(config-if-range)# lacp port-priority 1024

Configure the LACP port priority as 2048 for port 4:

Switch(config)# interface gigabitEthernet 1/0/4

Switch(config-if)# lacp port-priority 2048

17.5 show etherchannel

Description

The **show etherchannel** command is used to display the EtherChannel information.

Syntax

show etherchannel [*channel-group-num*] { detail | summary }

Parameter

channel-group-num —— The EtherChannel Group number, which ranges from 1 to 8 for L2/L2+ switches, 1 to 64 for L3 access switches, and 1 to 120 for L3 aggregation switches. By default, it is empty, and will display the information of all EtherChannel Groups.

detail —— The detailed information of EtherChannel.

summary —— The EtherChannel information in summary.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the detailed information of EtherChannel Group 1:

```
Switch(config)# show etherchannel 1 detail
```

17.6 show etherchannel load-balance

Description

The **show etherchannel load-balance** command is used to display the Aggregate Arithmetic of LAG.

Syntax

show etherchannel load-balance

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the Aggregate Arithmetic of LAG:

```
Switch(config)# show etherchannel load-balance
```

17.7 show lacp

Description

The **show lacp** command is used to display the LACP information for a specified EtherChannel Group.

Syntax

show lacp [*channel-group-num*] { internal /neighbor }

Parameter

channel-group-num —— The EtherChannel Group number, which ranges from 1 to 8 for L2/L2+ switches, 1 to 64 for L3 access switches, and 1 to 120 for L3 aggregation switches. By default, it is empty, and will display the information of all LACP groups.

internal —— The internal LACP information.

neighbor —— The neighbor LACP information.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the internal LACP information of EtherChannel Group 1:

```
Switch(config)# show lacp 1 internal
```

17.8 show lacp sys-id

Description

The **show lacp sys-id** command is used to display the LACP system priority globally.

Syntax

show lacp sys-id

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the LACP system priority:

```
Switch(config)# show lacp sys-id
```

Chapter 18 MLAG Commands (Only for Certain Devices)

MLAG (Multi-Chassis Link Aggregation) enables two network switches to act as a single logical entity, bonding their physical links into a shared aggregated connection. This setup enhances redundancy and bandwidth while preventing traffic disruption if one switch fails. Commonly used in data centers, MLAG ensures seamless failover, simplifies network management, and avoids single points of failure without requiring complex protocols like stacking.

18.1 mlag enable

Description

The **malg enable** command is used to enable and configure the MLAG domain name.

Syntax

mlag enable {*domainName*}

Parameter

domainName —— The MLAG group domain name, domainName, is used to uniquely identify an MLAG system. An MLAG system can only be established between two devices if they share the same domainName. The allowed range for this parameter is a string of 1 to 31 characters.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable MALG and configure the domain name as 1:

```
Switch(config)# mlag enable 1
```

18.2 mlag disable

Description

The **malg disable** command is used to disable the MLAG function.

Syntax

mlag disable *retain-mlag-config*

Parameter

retain-mlag-config —— Indicates whether to retain MLAG-related configurations. If the retain-mlag-config parameter is specified, existing MLAG parameters will be preserved; otherwise, all MLAG-related configurations will be cleared, including MLAG member ports (while aggregation groups will remain intact). By default, configurations will not be retained.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable the MLAG function:

```
Switch(config)# mlag disable
```

18.3 interface

Description

The **interface** command is used to configure the peer-link port for the internal control link of MLAG.

Syntax

interface {*peer-link-port*}

Parameter

peer-link-port —— Specifies the peer-link port list. Only the highest-rate optical ports are allowed to be configured as peer-links. Multiple ports can be configured to form a peer-link group when specified collectively.

Command Mode

MLAG-domain Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the peer-link port of 1/0/29-30:

Switch(config)#mlag domain *1*

Switch(mlag-doamin)#interrface *1/0/29-30*

18.4 priority

Description

The **priority** command is used to configure the device's priority during MLAG pairing. A higher priority increases the likelihood of becoming the primary device.

Syntax

priority {*priority*}

Parameter

priority—— The priority value. The default is 5, with a higher value being more likely to become the primary device. The valid range is 1 to 255.

Command Mode

MLAG-domain Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the device's priority as 100:

Switch(config)#mlag domain *1*

Switch(mlag-doamin)# priority *100*

18.5 dad interface

Description

The **dad interface** command is used to configure the DAD interface.

Syntax

dad interface {*dadInterface*}

Parameter

dadInterface —— MLAG dual-primary detection interface. Only one physical port can be configured as the dad-interface. To replace the existing configuration, you must first delete the existing configuration before adding a new one.

Command Mode

MLAG-domain Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the DAD interface 1/0/29:

Switch(config)#mlag domain *1*

Switch(mlag-doamin)# dad interface *1/0/29*

18.6 dad param

Description

The **dad param** command is used to configure DAD intercommunication parameters. The MLAG dual-active detection function operates at Layer 3, therefore IP addresses and related parameters need to be configured for this feature. Ensure DAD IP addresses between peer devices reside in the same subnet and can communicate, and avoid conflicts with other interface subnets.

Syntax

dad param peer-ip-address {*peerIpAddr*} src-ip-addresss {*localIpAddr*} port {*l4Port*}

Parameter

peerIpAddr —— DAD-IP address of the MLAG peer device (IPv4). Must be in the same subnet as the local DAD IP with connectivity, and must not conflict with other interface subnets.

localIpAddr —— Local DAD-IP address for this MLAG device (IPv4). Must be in the same subnet as the peer DAD IP with connectivity, and must not conflict with other interface subnets.

l4Port —— (Optional) Communication port for MLAG DAD. Valid range: 50000-60000. Default: 50000 when unconfigured.

Command Mode

MLAG-domain Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the DAD intercommunication parameters:

Switch(config)#mlag domain *1*

Switch(mlag-doamin)# dad param peer-ip-address *192.168.2.1*

src-ip-addresss *192.168.2.2* **port** *60000*

18.7 dad tx-interval

Description

The **dad tx-interval** command is used to configure the DAD message transmission interval. Both devices in the MLAG domain must use the same value; otherwise, DAD may malfunction if one device's transmission interval is shorter than the peer's timeout duration.

Syntax

dad tx-interval {*intervalTime*}

Parameter

intervalTime —— The interval for MLAG dual-active detection messages, in milliseconds (ms). Default: 3000 ms. Configurable range: 3s to 10s (note: the interval must not exceed the DAD timeout).

Command Mode

MLAG-domain Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the DAD message transmission interval as 3000ms:

```
Switch(config)#mlag domain 1
Switch(mlag-doamin)# dad tx-interval 3000
```

18.8 dad timeout

Description

The **dad timeout** command is used to configure the DAD timeout duration. Both devices in the MLAG domain must use the same value; otherwise, DAD may malfunction if one device's transmission interval is shorter than the peer's timeout.

Syntax

dad timeout { *timeoutTime* }

Parameter

timeoutTime —— The timeout duration for MLAG dual-active detection, in milliseconds (ms). Default: 4000 ms. Configurable range: 4s to 15s (note: the message interval must not exceed the DAD timeout).

Command Mode

MLAG-domain Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the DAD timeout duration as 4000ms:

```
Switch(config)#mlag domain 1
Switch(mlag-doamin)# dad timeout 4000
```

18.9 dad enable

Description

The **dad enable** command is used to enable the DAD function. DAD-interface and DAD parameters must be fully configured before enabling DAD. To disable this function, please use the **no dad enable** command.

Syntax

dad enable

no dad enable

Parameter

None

Command Mode

MLAG-domain Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable the DAD function

Switch(config)#mlag domain *1*

Switch(mlag-doamin)# no dad enable

18.10 keep-alive interval

Description

The **keep-alive interval** command is used to configure the keep-alive message interval (must be less than 1/3 of the KA timeout).

Syntax

keep-alive interval {*kaInterval***}**

Parameter

kaInterval —— Keep-alive message interval, in milliseconds (ms). Default: 500 ms. Configurable range: 300 to 5000.

Command Mode

MLAG-domain Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the keep-alive message interval as 500ms:

Switch(config)#mlag domain *1*

Switch(mlag-doamin)# keep-alive interval *500*

18.11 keep-alive timeout

Description

The **keep-alive timeout** command is used to configure the keep-alive timeout (must be greater than 3× the KA interval).

Syntax

keep-alive timeout {*kaTimeout***}**

Parameter

kaTimeout —— Keep-alive timeout duration, in milliseconds (ms). Default: 7000 ms. Configurable range: 900 to 15000, with the timeout being at least 3× the interval.

Command Mode

MLAG-domain Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the timeout as 7000ms:

Switch(config)#mlag domain *1*

Switch(mlag-doamin)# keep-alive timeout *7000*

18.12 mlag

Description

The **mlag** command is used to configure a regular aggregation group as an MLAG member port. Only MLAG member ports support cross-device link aggregation. MLAG systems pair identical aggregation groups (same lagid) from both devices into the same MLAG member group. To add/remove ports, use standard aggregation group commands. Use no mlag to revert an MLAG member group to a regular aggregation group.

Prerequisites: 1. MLAG is enabled. 2. The aggregation group is configured.

Syntax

mlag

Parameter

None

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure interface 1 as an MLAG member port:

```
Switch(config)# interface port-channel 1
Switch(mlag-doamin)# mlag
```

18.13 mlag config-consistency-check

Description

The **mlag config-consistency-check** command is used to enable MLAG configuration consistency checks. This function is enabled by default. A 120-second log silence period applies after MLAG pairing to suppress consistency alerts; users should resolve any mismatches promptly. To disable this function, use the **no mlag config-consistency-check** command. If disabled, users must manually ensure configuration consistency.

Syntax

mlag config-consistency-check

no mlag config-consistency-check

Parameter

None

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable MLAG configuration consistency checks:

```
Switch(config)# mlag config-consistency-check
```

18.14 mlag config-consistency-check mode

Description

The **mlag config-consistency-check mode** command is used to enable the MLAG configuration consistency check feature, which is enabled by default. A 120-second alert log suppression period for consistency checks begins immediately after MLAG pairing is completed. Users must promptly adjust configurations on both ends if inconsistencies are detected. To disable this feature, use the **mlag config-consistency-check mode** command. If the MLAG configuration consistency check is disabled, users are solely responsible for manually ensuring configuration consistency between both devices.

Syntax

mlag config-consistency-check mode

no mlag config-consistency-check mode

Parameter

None

Command Mode

Gloabl Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

```
Switch(config)# mlag config-consistency-check
```

18.15 show mlag info

Description

The **show mlag info** command is used to view the basic MLAG domain information.

Syntax

show mlag info

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

View the basic MLAG domain information:

```
Switch(config)# show mlag info
```

18.16 show mlag dual-active

Description

The **show mlag dual-active** command is used to view the MLAG dual-active detection details.

Syntax

show mlag dual-active

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

View the MLAG dual-active detection details:

```
Switch(config)# show mlag dual-active
```

18.17 show mlag keep-alive

Description

The **show mlag keep-alive** command is used to view the MLAG keep-alive heartbeat status.

Syntax

show mlag keep-alive

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

View the MLAG keep-alive heartbeat status:

```
Switch(config)# show mlag keep-alive
```

18.18 show mlag members-info

Description

The **show mlag members-info** command is used to view the MLAG member port details.

Syntax

show mlag members-info

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

View the MLAG member port details:

```
Switch(config)# show mlag members-info
```

18.19 show mlag config-consistency-check

Description

The **show mlag config-consistency-check** command is used to view the MLAG configuration consistency check status.

Syntax

show mlag config-consistency-check

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

View the MLAG configuration consistency check status:

```
Switch(config)# show mlag config-consistency-check
```

Chapter 19 MAC Address Commands

MAC Address configuration can improve the network security by configuring the Port Security and maintaining the address information by managing the Address Table.

19.1 mac address-table static

Description

The **mac address-table static** command is used to add the static MAC address entry. To remove the corresponding entry, please use **no mac address-table static** command. The static address can be added or removed manually, independent of the aging time. In the stable networks, the static MAC address entries can facilitate the switch to reduce broadcast packets and enhance the efficiency of packets forwarding remarkably.

Syntax

mac address-table static *mac-addr* **vid** *vid* **interface** { **fastEthernet** *port* | **gigabitEthernet** *port* | **two-gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **hundred-gigabitEthernet** *port* }

}**no mac address-table static** { *mac-addr* [**vid** *vid*] | **vid** *vid* | **interface** { **fastEthernet** *port* | **gigabitEthernet** *port* | **hundred-gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **twentyFive-gigabitEthernet** *port* | **two-gigabitEthernet** *port* } }

Parameter

mac-addr ——The MAC address of the entry you desire to add.

vid —— The VLAN ID number of your desired entry. It ranges from 1 to 4094.

port —— The Ethernet port number of your desired entry.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add a static Mac address entry to bind the MAC address 00:02:58:4f:6c:23, VLAN1 and port 1 together:

Switch(config)# mac address-table static 00:02:58:4f:6c:23 **vid** 1 **interface gigabitEthernet** 1/0/1

19.2 no mac address-table dynamic

Description

The **no mac address-table dynamic** command is used to delete the specified dynamic MAC address, or dynamic MAC addresses based on the VLAN or the port.

Syntax

no mac address-table dynamic { *mac-addr* | **vid** vid | **interface {fastEthernet** *port* | **gigabitEthernet** *port* | **two-gigabitEthernet** *port* | **ten-gigabitEthernet** *port*} }

Parameter

mac-addr ——The MAC address you desire to delete.

vid ——The VLAN ID on which you desire to delete MAC addresses.

port ——The Ethernet port on which you desire to delete MAC addresses.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Delete the MAC addresses on VLAN 1:

Switch(config)# no mac address-table dynamic vid 1

19.3 mac address-table aging-time

Description

The **mac address-table aging-time** command is used to configure aging time for the dynamic address. To return to the default configuration, please use **no mac address-table aging-time** command.

Syntax

mac address-table aging-time *aging-time*

no mac address-table aging-time

Parameter

aging-time —— The aging time for the dynamic address. The value of it can be 0 or ranges from 10 to 630 seconds. When 0 is entered, the Auto Aging function is disabled. It is 300 by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the aging time as 500 seconds:

Switch(config)# mac address-table aging-time 500

19.4 mac address-table filtering

Description

The **mac address-table filtering** command is used to add the filtering address entry. To delete the corresponding entry, please use **no mac address-table filtering** command. The filtering address function is to forbid the undesired package to be forwarded. The filtering address can be added or removed manually, independent of the aging time.

Syntax

mac address-table filtering *mac-addr* **vid** *vid*

no mac address-table filtering {[*mac-addr*] [**vid** *vid*]}

Parameter

mac-addr —— The MAC address to be filtered.

vid —— The corresponding VLAN ID of the MAC address. It ranges from 1 to 4094.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add a filtering address entry of which VLAN ID is 1 and MAC address is 00:1e:4b:04:01:5d:

Switch(config)# mac address-table filtering 00:1e:4b:04:01:5d **vid** 1

19.5 mac address-table notification

Note: This command is only available on certain devices.

Description

The **mac address-table notification** command is used to configure global settings of MAC address table notification.

Syntax

mac address-table notification { [**global-status** enable | disable] [**table-full-status** enable | disable] [**interval** *time*] }

Parameter

global-status enable | disable —— Enable/Disable the notification function globally.

table-full-status enable | disable —— Enable/Disable the MAC threshold notification. With this feature enabled, a SNMP notification is generated and sent to the network management system (NMS) when the threshold of the switch's MAC address table is reached or exceeded.

interval *time* —— Specify the notification trap interval between each set of traps that are generated to the NMS. The interval ranges from 1 to 1000 seconds, and it's 1 second by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the global MAC address notification and table full notification, specify the notification sending interval as 2 seconds:

Switch(config)# mac address-table notification global-status enable **table-full-status** enable **interval** 2

19.6 mac address-table max-mac-count

Description

The **mac address-table max-mac-count** command is used to configure the Port Security. To return to the default configurations, please use **no mac address-table max-mac-count** command. Port Security is to protect the switch from the malicious MAC address attack by limiting the maximum number of the MAC addresses that can be learned on the port. The port with Port Security feature enabled will learned the MAC address dynamically. When the learned MAC address number reaches the maximum, the port will stop learning. Therefore, the other devices with the MAC address unlearned cannot access to the network via this port.

Syntax

mac address-table max-mac-count { [**max-number** *num*] [**mode** { dynamic | static | permanent }] [**status** { forward | drop | disable }] [**exceed-max-learned** enable | disable] }

no mac address-table max-mac-count [max-number | mode | status]

Parameter

num —— The maximum number of MAC addresses that can be learned on the port. It ranges from 0 to 64. By default, this value is 64.

dynamic | static | permanent —— Learn mode for MAC addresses. There are three modes, including Dynamic mode, Static mode and Permanent mode. When Dynamic mode is selected, the learned MAC address will be deleted automatically after the aging time. When Static mode is selected, the learned MAC address will be out of the influence of the aging time and can only be deleted manually. The learned entries will be cleared after the switch is rebooted. When permanent mode is selected, the learned MAC address will be out of the influence of the aging time and can only be deleted manually too. However, the learned entries will be saved even the switch is rebooted.

status —— Select the action to be taken when the number of the MAC addresses reaches the maximum learning number on the port. By default, this function is disabled.

- forward: The packets will be forward but not be learned when learned MAC number exceeds the maximum MAC address number on this port.
- drop: The packets will be dropped when learned MAC number exceeds the maximum MAC address number on this port.
- disable: The MAC address threshold on this port is disabled.

exceed-max-learned enable | disable —— Enable/Disable the new-mac-learned notification on this port. With this feature enabled, a SNMP notification is generated and sent to the network management system (NMS) when the port learns a new MAC address.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable Port Security function for port 1/0/1, select Static mode as the learn mode, and specify the maximum number of MAC addresses that can be learned on this port as 30. When the number of MAC address entries reaches 30 on this port, new entry will be dropped:

Switch(config)# interface gigabitEthernet 1/0/1

Switch(config-if)# mac address-table max-mac-count max-number 30 **mode** static **status** drop

19.7 mac address-table notification (interface)

Note: This command is only available on certain devices.

Description

The **mac address-table notification** command is used to configure the MAC change notification on port.

Syntax

mac address-table notification { [**learn-mode-change** enable | disable] [**new-mac-learned** enable | disable] [**exceed-max-learned** enable | disable] }

Parameter

learn-mode-change enable | disable —— Enable/Disable the learn-mode-change notification. With this feature enabled, a SNMP notification is generated and sent to the network management system (NMS) when the learning mode of this port changes. To configure the learning mode configuration, please refer to **mac address-table max-mac-count**.

new-mac-learned enable | disable —— Enable/Disable the new-mac-learned notification on this port. With this feature enabled, a SNMP notification is generated and sent to the network management system (NMS) when the port learns a new MAC address.

exceed-max-learned **enable | disable —— Enable/Disable the new-mac-learned notification on this port. With this feature enabled, a SNMP notification is generated and sent to the network management system (NMS) when the port learns a new MAC address.**

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the learn-mode-change notification on port 1/0/2:

Switch(config)# mac address-table notification global-status enable

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# mac address-table notification learn-mode-change enable

19.8 mac address-table security

Note: This command is only available on certain devices.

Description

The **mac address-table security** command is used to configure the maximum number of MAC address cane be learned in specified VLANs.

Syntax

mac address-table security vid *vid* **max-learn** *number* { forward | drop }

Parameter

vid—— Specify the VLAN ID to configure its MAC address table.

number—— Configure the threshold of the MAC address table in this VLAN. It ranges from 0 to 16383.

forward | drop | disable —— Choose the mode when learned MAC number exceeds the threshold of the MAC address table in this VLAN.

- Drop: The packets will be dropped when learned MAC number exceeds the threshold of the MAC address table in this VLAN.
- Forward: The packets will be forward but not be learned when learned MAC number exceeds the threshold of the MAC address table in this VLAN.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the max learned MAC address number is VLAN 2 as 1000, and drop the packets that have no match in the MAC address table:

```
Switch(config)# mac address-table security vid 2 max-learn 1000 drop
```

19.9 mac address-table vlan-security

Note: This command is only available on certain devices.

Description

The **mac address-table security** command is used to configure the maximum number of MAC address cane be learned in specified VLANs.

Syntax

mac address-table vlan-security { vid *vid* **max-learn** *number* **| mode** { forward | drop } **}**

Parameter

vid—— Specify the VLAN ID to configure its MAC address table.

number—— Configure the threshold of the MAC address table in this VLAN. It ranges from 0 to 16383.

forward | drop | disable —— Choose the mode when learned MAC number exceeds the threshold of the MAC address table in this VLAN.

- Drop: The packets will be dropped when learned MAC number exceeds the threshold of the MAC address table in this VLAN.
- Forward: The packets will be forward but not be learned when learned MAC number exceeds the threshold of the MAC address table in this VLAN.
- Disable: The threshold of the MAC address table is disabled.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the max learned MAC address number is VLAN 2 as 1000:

```
Switch(config)# mac address-table vlan-security vid 2 max-learn 1000
```

19.10 show mac address-table

Description

The **show mac address-table** command is used to display the information of all address entries.

Syntax

show mac address-table [{ dynamic | static | filtering }]

Parameter

dynamic | static | filtering —— The type of your desired entry. By default, all the entries are displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of all address entries:

Switch(config)# show mac address-table

19.11 clear mac address-table

Description

The **show mac address-table** command is used to clear the specified address entries.

Syntax

clear mac address-table { dynamic | static | filtering }

Parameter

dynamic | static | filtering —— The type of your desired entry.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear the information of all static address entries:

Switch(config)# clear mac address-table static

19.12 show mac address-table aging-time

Description

The **show mac address-table aging-time** command is used to display the Aging Time of the MAC address.

Syntax

show mac address-table aging-time

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the Aging Time of the MAC address:

Switch(config)# show mac address-table aging-time

19.13 show mac address-table max-mac-count

Description

The **show mac address-table max-mac-count interface gigabitEthernet** command is used to display the security configuration of all ports or the specified port.

Syntax

show mac address-table max-mac-count { all | **interface** { **fastEthernet** *port* | **gigabitEthernet** *port* | **hundred-gigabitEthernet** *port* | **port-channel** *port-channel-id* | **ten-gigabitEthernet** *port* | **twentyFive-gigabitEthernet** *port* | **two-gigabitEthernet** *port* } }

Parameter

all —— Displays the security information of all the Ethernet ports.

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the security configuration of all ports:

Switch(config)# show mac address-table max-mac-count all

Display the security configuration of port 1/0/1:

Switch(config)# show mac address-table max-mac-count interface gigabitEthernet 1/0/1

19.14 show mac address-table interface

Description

The **show mac address-table interface** command is used to display the address configuration of the specified port/port channel.

Syntax

show mac address-table interface { **fastEthernet** *port* | **gigabitEthernet** *port* | **hundred-gigabitEthernet** *port* | **port-channel** *port-channel-id* | **ten-gigabitEthernet** *port* | **twentyFive-gigabitEthernet** *port* | **two-gigabitEthernet** *port* }

Parameter

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the address configuration of port 1/0/1:

Switch(config)# show mac address-table interface gigabitEthernet 1/0/1

19.15 show mac address-table count

Description

The **show mac address-table count** command is used to display the total amount of MAC address table.

Syntax

show mac address-table count [**vlan** *vlan-id*]

Parameter

vlan-id —— Specify the VLAN which the MAC entries belong to.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the total MAC entry information in different VLANs:

```
Switch(config)# show mac address-table count
```

19.16 show mac address-table address

Description

The **show mac address-table address** command is used to display the information of the specified MAC address.

Syntax

show mac address-table address *mac-addr* [**interface** { **fastEthernet** *port* | **gigabitEthernet** *port* | **port-channel** *port-channel-id* } | **vid** *vlan-id*]

Parameter

mac-addr ——The specified MAC address.

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

vlan-id —— Specify the VLAN which the entry belongs to.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of the MAC address 00:00:00:00:23:00 in VLAN 1:

```
Switch(config)#show mac address-table address 00:00:00:00:23:00 vid 1
```

19.17 show mac address-table vlan

Description

The **show mac address-table vlan** command is used to display the MAC address configuration of the specified vlan.

Syntax

show mac address-table vlan *vid*

Parameter

vid——The specified VLAN id.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the MAC address configuration of vlan 1:

```
Switch(config)# show mac address-table vlan 1
```

19.18 show mac address-table notification

Note: This command is only available on certain devices.

Description

The **show mac address-table notification** command is used to display the MAC notification configuration globally or on the specified port.

Syntax

show mac address-table notification all

Parameter

all —— Displays the notification information globally and of all the Ethernet ports.

port—— Displays the notification information on the specified port.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the notification configuration of all the ports:

Switch(config)# show mac address-table notification all

19.19 show mac address-table security

Note: This command is only available on certain devices.

Description

The **show mac address-table security** command is used to display the MAC address security configuration globally or of the specified VLAN.

Syntax

show mac address-table security [**vid** *vid*]

Parameter

vid——The specified VLAN id.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the MAC address security configuration of VLAN 1:

Switch(config)# show mac address-table security vid 1

Chapter 20 IEEE 802.1Q VLAN Commands

VLAN (Virtual Local Area Network) technology is developed for the switch to divide the LAN into multiple logical LANs flexibly. Hosts in the same VLAN can communicate with each other, regardless of their physical locations. VLAN can enhance performance by conserving bandwidth, and improve security by limiting traffic to specific domains.

20.1 vlan

Description

The **vlan** command is used to create IEEE 802.1Q VLAN and enter VLAN Configuration Mode. To delete the IEEE 802.1Q VLAN, please use **no vlan** command.

Syntax

vlan *vlan-list*

no vlan *vlan-list*

Parameter

vlan-list —— Specify IEEE 802.1Q VLAN ID list, ranging from 2 to 4094, in the format of 2-3, 5. It is multi-optional.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create VLAN 2-10 and VLAN 100:

```
Switch(config)# vlan 2-10,100
```

Delete VLAN 2:

```
Switch(config)# no vlan 2
```

20.2 name

Description

The **name** command is used to assign a description to a VLAN. To clear the description, please use **no name** command.

Syntax

name *descript*

no name

Parameter

descript——String to describe the VLAN, which contains 16 characters at most.

Command Mode

VLAN Configuration Mode(VLAN)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the name of VLAN 2 as "group1":

```
Switch(config)# vlan 2
Switch(config-vlan)# name group1
```

20.3 vlan_trunk (globally)

Description

The **vlan_trunk** command is used to enable VLAN Trunk globally. When enabled, the switch will automatically create all VLANs (2-4094). To disable VLAN Trunk, use the **no vlan_trunk** command.

Syntax

vlan_trunk

no vlan_trunk

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable VLAN Trunk globally:

```
Switch(config)#vlan_trunk
```

20.4 vlan_trunk (interface)

Description

The **vlan_trunk** command is used to enable VLAN Trunk for the desired port. When enabled, all packets in VLANs can pass through this port. For VLANs that have been added through switchport general allowed vlan command, data will be forwarded according to the configured egress rule. For VLANs that have not been manually added, data will be forwarded through the egress rule "tagged". To disable VLAN Trunk, use the **no vlan_trunk** command. By default, it is disabled.

Syntax

vlan_trunk

no vlan_trunk

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable VLAN Trunk for port 1/0/3:

```
Switch(config)#interface gigabitEthernet 1/0/3
Switch(config-if)#vlan_trunk
```

20.5 switchport general allowed vlan

Description

The **switchport general allowed vlan** command is used to add the desired port to IEEE 802.1Q VLAN, or to remove a port from the corresponding VLAN.

Syntax

switchport general allowed vlan *vlan-list* { tagged | untagged }

no switchport general allowed vlan *vlan-list*

Parameter

vlan-list —— VLAN ID list, ranging from 2 to 4094, in the format of 2-3, 5. It is multi-optional. "all" can also be entered to indicate all configured VLANs.

tagged | untagged —— egress-rule. When the vlan-list is entered with "all", the egress-rule is "tagged" by default and cannot be modified.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure Gigabit Ethernet port 1/0/4 whose link type is "general" to VLAN 2 and its egress-rule as "tagged":

```
Switch(config)#interface gigabitEthernet 1/0/4
Switch(config-if)#switchport general allowed vlan 2 tagged
```

20.6 switchport pvid

Description

The **switchport pvid** command is used to configure the PVID for the switch ports.

Syntax

switchport pvid *vlan-id*

Parameter

vlan-id—— VLAN ID, ranging from 1 to 4094.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the PVID of port 1/0/2 as 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# switchport pvid 2
```

20.7 switchport check ingress

Description

The **switchport check ingress** command is used to enable the Ingress Checking function for the switch ports. With this function enabled, the port will accept the packet of which the VLAN ID is in the port's VLAN list and discard others. With this function disabled, the port will forward the packet directly. To disable this function, please use **no switchport check ingress** command.

Syntax

switchport check ingress

no switchport check ingress

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable Ingress Checking on the port 1/0/2:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# switchport check ingress

20.8 switchport acceptable frame

Description

The **switchport acceptable frame** command is used to specify the acceptable frame type for the switch ports and the ports will perform this operation before Ingress Checking. To restore to the default setting, please use **no switchport acceptable frame** command.

Syntax

switchport acceptable frame { all | tagged }

no switchport acceptable frame

Parameter

all | tagged —— the acceptable frame type.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the acceptable frame type of Gigabit Ethernet port 1/0/4 as “tagged”:

Switch(config)#interface gigabitEthernet 1/0/4

Switch(config-if)#switchport acceptable frame general

20.9 show vlan summary

Description

The **show vlan summary** command is used to display the summarized information of IEEE 802.1Q VLAN.

Syntax

show vlan summary

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the summarized information of IEEE 802.1Q VLAN:

```
Switch(config)# show vlan summary
```

20.10 show vlan brief

Description

The **show vlan brief** command is used to display the brief information of IEEE 802.1Q VLAN.

Syntax

show vlan brief

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the brief information of IEEE 802.1Q VLAN:

```
Switch(config)# show vlan brief
```

20.11 show vlan

Description

The **show vlan** command is used to display the information of IEEE 802.1Q VLAN.

Syntax

show vlan [**id** *vlan-id*]

Parameter

vlan-id—— Specify IEEE 802.1Q VLAN ID, ranging from 1 to 4094. It is multi-optional. Using the **show vlan** command without parameter displays the detailed information of all VLANs.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of vlan 5:

```
Switch(config)# show vlan id 5
```

20.12 show interface switchport

Description

The **show interface switchport** command is used to display the IEEE 802.1Q VLAN configuration information of the specified port/port channel.

Syntax

show interface switchport [**fastEthernet** *port* **| gigabitEthernet** *port* | **ten-gigabitEthernet** *port* **| port-channel** *port-channel-id*]

Parameter

port—— The port number.

port-channel-id—— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the VLAN configuration information of all ports and port channels:

```
Switch(config)# show interface switchport
```

Chapter 21 MAC-based VLAN Commands

MAC VLAN (Virtual Local Area Network) is the way to classify the VLANs based on MAC Address. A MAC address is relative to a single VLAN ID. The untagged packets and the priority-tagged packets coming from the MAC address will be tagged with this VLAN ID.

21.1 mac-vlan mac-address

Description

The **mac-vlan mac-address** command is used to create a MAC-based VLAN entry. To delete a MAC-based VLAN entry, please use the **no mac-vlan mac-address** command.

Syntax

mac-vlan mac-address *mac-addr* **vlan** *vlan-id* [**description** *descript*]

no mac-vlan mac-address *mac-addr*

Parameter

mac-addr —— MAC address, in the format of XX:XX:XX:XX:XX:XX.

vlan-id —— Specify IEEE 802.1Q VLAN ID, ranging from 1 to 4094.

descript —— Give a description to the MAC address for identification, which contains 8 characters at most.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create VLAN 2 with the MAC address 00:11:11:01:01:12 and the name “TP”:

Switch(config)#mac-vlan mac-address 00:11:11:01:01:12 **vlan** 2 **description** TP

21.2 mac-vlan

Description

The **mac-vlan** command is used to enable a port for the MAC-based VLAN feature. Only the port is enabled can the configured MAC-based VLAN take effect. To disable the MAC-based VLAN function, please use **no mac-vlan** command. All the ports are disabled by default.

Syntax

mac-vlan

no mac-vlan

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the Gigabit Ethernet port 1/0/3 for the MAC-based VLAN feature:

```
Switch(config)#interface gigabitEthernet 1/0/3
Switch(config-if)#mac-vlan
```

21.3 show mac-vlan

Description

The **show mac-vlan** command is used to display the information of the MAC-based VLAN entry. MAC address and VLAN ID can be used to filter the displayed information.

Syntax

show mac-vlan { **all** | **mac-address** *mac-addr* | **vlan** *vlan-id*}

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Parameter

mac-addr —— MAC address, in the format of XX:XX:XX:XX:XX:XX.

vlan-id —— Specify IEEE 802.1Q VLAN ID, ranging from 1 to 4094.

Example

Display the information of all the MAC-based VLAN entry:

```
Switch(config)#show mac-vlan all
```

21.4 show mac-vlan interface

Description

The **show mac-vlan interface** command is used to display the port state of MAC-based VLAN.

Syntax

show mac-vlan interface

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the enable state of all the ports:

```
Switch(config)#show mac-vlan interface
```

Chapter 22 Protocol-based VLAN Commands

Protocol VLAN (Virtual Local Area Network) is the way to classify VLANs based on Protocols. A Protocol is relative to a single VLAN ID. The untagged packets and the priority-tagged packets matching the protocol template will be tagged with this VLAN ID.

22.1 protocol-vlan template

Description

The **protocol-vlan template** command is used to create Protocol-based VLAN template. To delete Protocol-based VLAN template, please use **no protocol-vlan template** command.

Syntax

For L2/L2+ switches:

protocol-vlan template name *protocol-name* **frame** { **ether_2 ether-type** *type* | **snap ether-type** *type* | **llc dsap** *dsap_type* **ssap** *ssap_type* }

no protocol-vlan template *template-idx*

For L3 switches:

protocol-vlan template name *protocol-name* **frame** { **ether_2 ether-type** *type* | **snap ether-type** *type* | **llc dsap** *dsap_type* **ssap** *ssap_type* }

no protocol-vlan template *template-name*

Parameter

protocol-name —— Give a name for the Protocol-based VLAN Template , which contains 8 characters at most.

ether_2 ether-type *type* —— Specify the Ethernet type.

snap ether-type *type* —— Specify the Ethernet type.

llc dsap *dsap_type* **ssap** *ssap_type* —— Specify the DSAP type and the SSAP type.

template-idx —— The number of the Protocol-based VLAN Template. You can get the template corresponding to the number by the show protocol-vlan template command.

template-name —— The name of the Protocol-base VLAN Template. You can get the template corresponding to the number by the show protocol-vlan template command.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a Protocol-based VLAN template named “TP” whose Ethernet protocol type is 0x2024:

Switch(config)#protocol-vlan template name TP **frame ether_2 ether-type** 2024

22.2 protocol-vlan vlan

Description

The **protocol-vlan vlan** command is used to create a Protocol-based VLAN entry. To delete a Protocol-based VLAN entry, please use **no protocol-vlan vlan** command.

Syntax

For L2/L2+ switches:

protocol-vlan vlan *vlan-id* **priority** *priority* **template** *template-idx*

no protocol-vlan vlan *group-idx*

For L3 switches:

protocol-vlan vlan *vlan-id* **priority** *priority* **template** *template-name*

no protocol-vlan vlan *group-name*

Parameter

vlan-id—— Specify IEEE 802.1Q VLAN ID, ranging from 1-4094.

priority—— Specify the 802.1p priority for the packets that belong to the protocol VLAN, ranging from 0–7. The switch will determine the forwarding sequence according this value. The packets with larger value of 802.1p priority have the higher priority.

template-idx——The number of the Protocol-based VLAN Template. You can get the template corresponding to the number by the show protocol-vlan template command.

group-idx——The number of the Protocol-based VLAN entry. You can get the Protocol-based VLAN entry corresponding to the number by the show protocol-vlan vlan command.

template-name——The name of the Protocol-based VLAN Template. You can get the template corresponding to the number by the show protocol-vlan template command.

group-name——The name of the Protocol-based VLAN entry. You can get the Protocol-based VLAN entry corresponding to the number by the show protocol-vlan vlan command.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create Protocol-based VLAN 2 and bind it with Protocol-based VLAN Template 3:

```
Switch(config)#protocol-vlan vlan 2 template 3
```

22.3 protocol-vlan group

Description

The **protocol-vlan** command is used to add the port to a specified protocol group. To remove the port from this protocol group, please use **no protocol-vlan group** command.

Syntax

For L2/L2+_ switches:

protocol-vlan group *index*

no protocol-vlan group *index*

For L3_ switches:

protocol-vlan group *name*

no protocol-vlan group *name*

Parameter

index —— Specify the protocol group ID.

name—— Specify the protocol group name.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add Gigabit Ethernet port 20 to protocol group 1:

```
Switch(config)#interface gigabitEthernet 1/0/20
Switch(config-if)#protocol-vlan group 1
```

22.4 show protocol-vlan template

Description

The **show protocol-vlan template** command is used to display the information of the Protocol-based VLAN templates.

Syntax

show protocol-vlan template

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of the Protocol-based VLAN templates:

```
Switch(config)#show protocol-vlan template
```

22.5 show protocol-vlan vlan

Description

The **show protocol-vlan vlan** command is used to display the information about Protocol-based VLAN entry.

Syntax

show protocol-vlan vlan

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display information of the Protocol-based VLAN entry:

```
Switch(config)#show protocol-vlan vlan
```

Chapter 23 Private VLAN Commands (Only for Certain Devices)

Note: Private VLAN commands are only available on certain devices.

Private VLANs are configured specially for saving VLAN resource of uplink devices and decreasing broadcast.

23.1 private-vlan primary

Description

The **private-vlan primary** command is used to configure the designated VLAN as the primary VLAN of the Private VLAN. To remove the primary VLAN property pf the current VLAN, please use **no private-vlan primary** command.

Syntax

private-vlan primary

no private-vlan primary

Command Mode

VLAN Configuration Mode (VLAN)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the VLAN 3 as the primary VLAN of the private VLAN:

Switch(config)#vlan 3

Switch(config-vlan)#private-vlan primary

23.2 private-vlan community

Description

The **private-vlan community** command is used to configure the designated VLAN as the community VLAN of the Private VLAN. To remove the

community VLAN property pf the current VLAN, please use **no private-vlan community** command.

Syntax

private-vlan community

no private-vlan community

Command Mode

VLAN Configuration Mode (VLAN)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the VLAN 4 as the community VLAN of the private VLAN:

```
Switch(config)#vlan 4
Switch(config-vlan)#private-vlan community
```

23.3 private-vlan isolated

Description

The **private-vlan isolated** command is used to configure the designated VLAN as the isolated VLAN of the Private VLAN. To remove the isolated VLAN property pf the current VLAN, please use **no private-vlan isolated** command.

Syntax

private-vlan isolated

no private-vlan isolated

Command Mode

VLAN Configuration Mode (VLAN)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the VLAN 3 as the isolated VLAN of the private VLAN:

```
Switch(config)#vlan 3
```

```
Switch(config-vlan)#private-vlan isolated
```

23.4 private-vlan association

Description

The **private-vlan association** command is used to associate primary VLAN with secondary VLAN. To exterminate the currently association, please use **no private-vlan association** command.

Syntax

private-vlan association *vlan_list*

no private-vlan association *vlan_list*

Parameter

vlan_list —— Secondary VLAN ID, ranging from 2 to 4094.

Command Mode

VLAN Configuration Mode (VLAN)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Associate primary VLAN 3 with community VLAN 4 as a private VLAN:

```
Switch(config)#vlan 3
Switch(config-vlan)#private-vlan association 4
```

23.5 switchport private-vlan

Description

The **switchport private-vlan** command is used to configure the private VLAN mode for the switchport. To invalid the configuration, please use **no switchport private-vlan** command.

Syntax

switchport private-vlan { promiscuous | host }

no switchport private-vlan

Parameter

promiscuous | host —— Configure the private VLAN mode for the switchport.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure Gigabit Ethernet port 3 as "host":

Switch(config)#interface gigabitEthernet 1/0/3

Switch(config-if)#switchport private-vlan host

23.6 switchport private-vlan host-association

Description

The **switchport private-vlan host-association** command is used to add host type port to private VLAN. To remove the port from Private VLAN, please use **no switchport private-vlan host-association** command.

Syntax

switchport private-vlan host-association *primary_vlan_id secondary_vlan_id vlantype*

no switchport private-vlan host-association

Parameter

primary-vlan-id —— Primary VLAN ID, ranging from 2 to 4094.

secondary-vlan-id —— Secondary VLAN ID, ranging from 2 to 4094.

vlantype —— Specify the type of the secondary VLAN, either *community* or *isolated*.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure host type Gigabit Ethernet port 1/0/3 as a member of primary VLAN 3 and secondary VLAN 4, with the type of VLAN 4 as community:

Switch(config)#interface gigabitEthernet 1/0/3

Switch(config-if)#switchport private-vlan host-association 3 4 community

23.7 switchport private-vlan mapping

Description

The **switchport private-vlan mapping** command is used to add promiscuous type port to private VLAN. To remove the port from Private VLAN, please use **no switchport private-vlan mapping** command.

Syntax

switchport private-vlan mapping *primary_vlan_id secondary_vlan_id*

no switchport private-vlan mapping

Parameter

primary-vlan-id —— Primary VLAN ID, ranging from 2 to 4094.

secondary-vlan-id —— Secondary VLAN ID, ranging from 2 to 4094.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure promiscuous type Gigabit Ethernet port 1/0/3 as a member of primary VLAN 3 and secondary VLAN 4:

Switch(config)#interface gigabitEthernet 1/0/3

Switch(config-if)#switchport private-vlan mapping 3 4

23.8 show vlan private-vlan

Description

The **show vlan private-vlan** command is used to display the Private VLAN configuration information of the switch.

Syntax

show vlan private-vlan

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Display the configuration information of all Private VLAN:

```
Switch(config)#show vlan private-vlan
```

23.9 show vlan private-vlan interface

Description

The **show vlan private-vlan interface** command is used to display the Private VLAN configuration information of the specified port(s).

Syntax

show vlan private-vlan interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Display the configuration information of all the Ethernet ports:

```
Switch(config)#show vlan private-vlan interface
```

Chapter 24 VLAN-VPN Commands (Only for Certain Devices)

Note: VLAN-VPN commands are only available on certain devices.

VLAN-VPN (Virtual Private Network) function, the implement of a simple and flexible Layer 2 VPN technology, allows the packets with VLAN tags of private networks to be encapsulated with VLAN tags of public networks at the network access terminal of the Internet Service Provider. And these packets will be transmitted with double-tag across the public networks.

24.1 dot1q-tunnel

Description

The **dot1q-tunnel** command is used to enable the VLAN-VPN function globally. To disable the VLAN-VPN function, please use the **no dot1q-tunnel** command.

Syntax

dot1q-tunnel

no dot1q-tunnel

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the VLAN-VPN function globally:

```
Switch(config)#dot1q-tunnel
```

24.2 switchport dot1q-tunnel tpid

Description

The **switchport dot1q-tunnel tpid** command is used to configure Global TPID for the ports. To restore to the default value, please use the **no switchport dot1q-tunnel tpid** command.

Syntax

switchport dot1q-tunnel tpid *tpid*

no switchport dot1q-tunnel tpid

Parameter

tpid—— The value of Global TPID. It must be 4 Hex integers. By default, it is 8100.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure TPID of port 1/0/2 as 0x9100:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)#switchport dot1q-tunnel tpid 9100
```

24.3 dot1q-tunnel mapping

Description

The **dot1q-tunnel mapping** command is used to enable the VLAN Mapping feature globally. To disable this function, please use the **no dot1q-tunnel mapping** command. By default, the VLAN Mapping feature is disabled.

Syntax

dot1q-tunnel mapping

no dot1q-tunnel mapping

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the VLAN mapping feature globally:

```
Switch(config)#dot1q-tunnel mapping
```

24.4 switchport dot1q-tunnel mode

Description

The **switchport dot1q-tunnel mode** command is used to configure the VPN port's mode. To close this VPN port, please use the **no switchport dot1q-tunnel mode** command. By default, no port has been configured as the VPN port. The VPN port mode uni and nni cannot switch to each other directly, so please close the VPN port and switch to the other mode if needed.

Syntax

switchport dot1q-tunnel mode { uni | nni }

no switchport dot1q-tunnel mode

Parameter

uni——The port connected to the clients.

nni——The port connected to the ISP.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the Gigabit Ethernet port 1/0/3 as the VPN UNI ports:

Switch(config)#interface gigabitEthernet 1/0/3

Switch(config-if)#switchport dot1q-tunnel mode uni

24.5 switchport dot1q-tunnel missdrop (only for certain devices)

Note:

For some devices, Missdrop can only be enabled on UNI ports.

For other devices, Missdrop can only be enabled on NNI ports.

Description

The **switchport dot1q-tunnel missdrop** command is used to enable the VLAN-VPN missdrop function for a specific port. To disable the VLAN-VPN missdrop function, please use the **no switchport dot1q-tunnel missdrop** command.

Syntax

switchport dot1q-tunnel missdrop

no switchport dot1q-tunnel missdrop

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the VLAN-VPN missdrop function for Gigabit Ethernet port 1/0/3:

Switch(config)#interface gigabitEthernet 1/0/3

Switch(config-if)#switchport dot1q-tunnel missdrop

24.6 switchport dot1q-tunnel use_inner_priority

Description

The **switchport dot1q-tunnel use_inner_priority** command is used to use the inner 802.1p priority. To disable this function, please use the **no switchport dot1q-tunnel use_inner_priority** command.

Syntax

switchport dot1q-tunnel use_inner_priority

no switchport dot1q-tunnel use_inner_priority

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the use inner priority function for Gigabit Ethernet port 1/0/3:

Switch(config)#interface gigabitEthernet 1/0/3

Switch(config-if)#switchport dot1q-tunnel use_inner_priority

24.7 switchport dot1q-tunnel mapping

Note:

For some devices, choose a UNI port to enable VLAN mapping.

For other devices, choose a NNI port to enable VLAN mapping.

Description

The **switchport dot1q-tunnel mapping** command is used add the VLAN Mapping entry on a specified port. To delete the VLAN Mapping entry on this port, please use the **no switchport dot1q-tunnel mapping** command.

Syntax

switchport dot1q-tunnel mapping *c-vlan sp-vlan* [*descript*]

no switchport dot1q-tunnel mapping [*c-vlan*]

Parameter

c-vlan —— Customer VLAN ID, ranging from 1 to 4094.

sp-vlan —— Service Provider VLAN ID, ranging from 1 to 4094.

descript —— Give a Description to the VLAN Mapping entry, which contains 16 characters at most.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add a VLAN Mapping entry on the Gigabit Ethernet port 1/0/3 with the Customer VLAN as VLAN 2 and the Service Provider VLAN as VLAN 3:

```
Switch(config)#interface gigabitEthernet 1/0/3
Switch(config-if)#switchport dot1q-tunnel mapping 2 3
```

24.8 switchport dot1q-tunnel replace

Description

The **switchport dot1q-tunnel replace** command is used to replace the customer VLAN ID with a VLAN ID of service provider on a specified port, rather than adds an outer tag. To delete the VLAN Replace entry on this port, please use the **no switchport dot1q-tunnel replace** command.

Syntax

switchport dot1q-tunnel replace *c-vlan sp-vlan* [*descript*]

no switchport dot1q-tunnel replace *c-vlan sp-vlan* [*descript*]

Parameters

c-vlan —— Customer VLAN ID, ranging from 1 to 4094.

sp-vlan —— Service Provider VLAN ID, ranging from 1 to 4094.

descript —— Give a Description to the VLAN Mapping entry, which contains 16 characters at most.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

Before configuring VLAN Replace, enable VLAN Mapping globally.

Example

Add a VLAN Replace entry on the Gigabit Ethernet port 1/0/3 to replace the Customer VLAN (VLAN 2) with the Service Provider VLAN (VLAN 3):

```
Switch(config)# switchport dot1q-tunnel replace 2 3
```

24.9 switchport dot1q-tunnel replace-out

Description

The **switchport dot1q-tunnel replace-out** command is used to replace the VLAN ID of service provider with a customer VLAN ID on a specified port. To delete the VLAN Replace entry on this port, please use the **no switchport dot1q-tunnel replace-out** command.

Syntax

switchport dot1q-tunnel replace-out *sp-vlan c-vlan* [*descript*]

no switchport dot1q-tunnel replace-out *sp-vlan c-vlan* [*descript*]

Parameters

sp-vlan —— Service Provider VLAN ID, ranging from 1 to 4094.

c-vlan —— Customer VLAN ID, ranging from 1 to 4094.

descript —— Give a Description to the VLAN Mapping entry, which contains 16 characters at most.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

Before configuring VLAN Replace-Out, enable VLAN Mapping globally.

Example

Add a VLAN Replace entry on the Gigabit Ethernet port 1/0/3 to replace the Service Provider VLAN (VLAN 2) with the Customer VLAN (VLAN 3):

```
Switch(config)# switchport dot1q-tunnel replace-out 2 3
```

24.10 show dot1q-tunnel

Description

The **show dot1q-tunnel** command is used to display the global configuration information of the VLAN VPN.

Syntax

show dot1q-tunnel

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration information of the VLAN VPN:

```
Switch(config)#show dot1q-tunnel
```

24.11 show dot1q-tunnel mapping

Description

The **show dot1q-tunnel mapping** command is used to display the information of VLAN Mapping entry.

Syntax

show dot1q-tunnel mapping

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of VLAN Mapping entry:

```
Switch(config)#show dot1q-tunnel mapping
```

24.12 show dot1q-tunnel interface

Description

The **show dot1q-tunnel mapping interface** command is used to display the VLAN VPN port type.

Syntax

show dot1q-tunnel interface

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the port type of all VLAN VPN ports:

Switch(config)#show dot1q-tunnel interface

Chapter 25 ERPS Commands

ERPS (Ethernet Ring Protection Switching) is an Ethernet ring link layer technology with high reliability and stability. It can prevent broadcast storms caused by the data loop if the Ethernet ring is complete. With a high convergence speed, it can quickly restore the communication paths among the nodes in the ring network when a link failure happens.

25.1 erps ring

Description

The **erps ring** command is used to enable the ERPS ring function globally and create an ERPS ring. To disable the ERPS ring function, please use **no erps ring** command.

Syntax

erps ring *ring-id*

no erps ring *ring-id*

Parameter

ring-id—— The ID of the ERPS ring, ranging from 1 to 8.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the ERPS ring function globally:

```
Switch(config)#erps ring 1
```

25.2 control-vlan

Description

The **control-vlan** command is used to configure a control VLAN for an ERPS ring to forward RAPS PDUs .

Syntax

control-vlan *vlan-id*

Parameter

vlan-id——Specify the ID of a control VLAN for ERPS ring, ranging from 1 to 4094.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure control VLAN 2 in ERPS ring 1:

```
Switch(config)#erps ring 1
Switch(ring-config)#control-vlan 2
```

25.3 description

Description

The **description** command is used to add description information of an ERPS ring.

Syntax

description *description*

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add description information “ring 1”:

```
Switch(ring-config)#description “ring 1”
```

25.4 guard-timer

Description

The **guard-timer** command is used to configure the Guard timer in an ERPS ring. By default, the Guard timer is 200 centiseconds in an ERPS ring. To disable the guard-timer function, please use **no guard-timer** command.

Syntax

guard-timer *time*

no guard-timer

Parameter

time —— The time setting for guard-timer, ranging from 1 to 200, In centiseconds.

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the time for guard-timer as 100:

```
Switch(ring-config)#guard-timer 100
```

25.5 wtr-timer

Description

The **wtr-timer** command is used to configure the Wait to Restore (WTR) timer in an ERPS ring. By default, the WTR timer is 5 minutes in an ERPS ring. To disable the wtr-timer function, please use **no wtr-timer** command.

Syntax

wtr-timer *time*

no wtr-timer

Parameter

time —— The time setting for wtr-timer, ranging from 1 to 12.

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the time for wtr-timer as 1:

```
Switch(ring-config)#wtr-timer 1
```

25.6 holdoff-timer

Description

The **holdoff-timer** command is used to configure the Holdoff timer in an ERPS ring. By default, the Holdoff timer is 0 deciseconds in an ERPS ring. When a fault occurs, the fault is not immediately reported to ERPS. Instead, the Holdoff timer starts. If the fault persists after the timer expires, the fault will be reported to ERPS. To disable the holdoff-timer function, please use **no holdoff-timer** command.

Syntax

holdoff-timer *time*

no holdoff-timer

Parameter

time —— The time setting for holdoff-timer, ranging from 1 to 100.

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the time for holdoff-timer as 10:

```
Switch(ring-config)#holdoff-timer 10
```

25.7 protected-instance

Description

The **protected-instance** command is used to configure the Ethernet ring protection (ERP) instances in an ERPS ring. To disable the protected-instance function, please use **no protected-instance** command. By default, no ERP instance is configured in an ERPS ring.

Syntax

protected-instance *instance*

no protected-instance *instance*

Parameter

instance —— The protected instance for the ERPS ring, ranging from 1 to 8.

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the protected instance as 1, and map VLAN10-20 to instance 1:

```
Switch(ring)#spanning-tree mode mstp
Switch(ring)#spanning-tree mst configuration
Switch(ring)#instance 1 vlan 10-20
Switch(ring-config)#protected-instance 1
```

25.8 raps-mel

Description

The **raps-mel** command is used to configure the value of the MEL field in Ring Auto Protection Switching (RAPS) Protocol Data Units (PDUs) of the ERPS ring. By default, the value of the MEL field in RAPS PDUs is 7.

Syntax

raps-mel *mel*

Parameter

mel—— MEL value of the ERPS ring, ranging from 0 to 7.

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MEL value as 1:

```
Switch(ring-config)#raps-mel 1
```

25.9 revertive

Description

The **revertive** command is used to configure the revertive switching or non-revertive switching of the ERPS ring. To disable this function, please use the **revertive disable** command. By default, ERPS rings use revertive switching.

Syntax

revertive enable

revertive disable

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the revertive function:

```
Switch(ring-config)#revertive enable
```

25.10 sub-ring

Description

The **sub-ring** command is used to configure the ERPS ring as an sub-ring. To disable this function, please use the **no sub-ring** command.

Syntax

sub-ring

no sub-ring

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the sub-ring function:

```
Switch(ring-config)#sub-ring
```

25.11 tc-notify erps

Description

The **tc-notify erps** command is used to enable the network topology change notification function. To disable this function, please use the **no tc-notify erps** command. By default, this function is disabled.

Syntax

tc-notify erps ring *ring-id*

no tc-notify erps ring *ring-id*

Parameter

ring-id—— the ring ID of the notification, ranging from 1 to 8.

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the network topology change notification function of ring 1:

```
Switch(ring-config)#tc-notify erps ring 1
```

25.12 tc-protection interval

Description

The **tc-protection interval** command is used to configure the network topology change protection interval for sending topology change notification messages. To disable this function, please use the **no tc-protection interval** command.

Syntax

tc-protection interval *interval*

no tc-protection interval *interval*

Parameter

interval—— the time interval for tc-protection, ranging from 1 to 600.

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the tc-protection interval of the ERPS ring as 1:

```
Switch(ring-config)#tc-protection interval 1
```

25.13 tc-protection threshold

Description

The **tc-protection threshold** command is used to configure the number of times ERPS parses topology change notifications and updates forwarding entries in the topology change protection interval. To disable this function, please use the **no tc-protection threshold** command.

Syntax

tc-protection threshold *threshold*

no tc-protection threshold

Parameter

threshold—— the threshold for tc-protection, ranging from 1 to 255.

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the tc-protection threshold of the ERPS ring as 1:

```
Switch(ring-config)#tc-protection threshold 1
```

25.14 version

Description

The **version** command is used to configure the ERPS version.

Syntax

version *version*

Parameter

version—— the version of the ERPS function, ranging from 1 to 2.

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the ERPS version as 2:

```
Switch(ring-config)#version 2
```

25.15 virtual-channel

Description

The **virtual-channel** command is used to configure the virtual channel (VC) mode for RAPS PDU transmission in a sub-ring. To disable this function, please use the **no virtual-channel** command.

Syntax

virtual-channel

no virtual-channel

Command Mode

ERPS Ring Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the virtual-channel function:

```
Switch(ring-config)#virtual-channel
```

25.16 erps ring rpl

Description

The **erps ring rpl** command is used to add a port to the ERPS ring and specify the role of the port. To remove the role of the port, please use the **no erps ring rpl** command.

Syntax

erps ring *ring id* [**rpl** *owner*|*neighbour*]

Parameter

ring id—— the ID of the ring that the port joins.

owner—— configure the role of the port as owner.

neighbour—— configure the role of the port as neighbour.

Command Mode

Interface Configuration Mode (interface gigabitEthernet | interface range gigabitEthernet | interface port-channel | interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the role of port 1/0/2 in ring 1 as owner:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)#erps ring 1 rpl owner
```

25.17 erps ring protect-switch

Description

The **erps ring protect-switch** command is used to configure a port blocking mode for the ERPS port.

Syntax

erps ring *ring id* [**protect-switch** *force*|*manual*]

Parameter

ring id—— the ID of the ERPS ring, ranging from 1-255.

force——block a port forcibly.

manual—— indicate the MS mode for blocking an ERPS port.

Command Mode

Interface Configuration Mode (interface gigabitEthernet | interface range gigabitEthernet | interface port-channel | interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the switch mode of port 1/0/2 in ring 1 as force:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)#erps ring 1 protect-switch force
```

25.18 show erps ring

Description

The **show erps ring** command is used to display the erps ring information..

Syntax

show erps ring {*ring-id* | *all*}

Parameter

ring id—— show the information of a specified ring, ranging from 1 to 8.

all—— show the information of all rings.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Show the information of all rings:

```
Switch(config)#show erps ring all
```

Chapter 26 GVRP Commands

GVRP (GARP VLAN registration protocol) is an implementation of GARP (generic attribute registration protocol). GVRP allows the switch to automatically add or remove the VLANs via the dynamic VLAN registration information and propagate the local VLAN registration information to other switches, without having to individually configure each VLAN.

26.1 gvrp

Description

The **gvrp** command is used to enable the GVRP function globally. To disable the GVRP function, please use **no gvrp** command.

Syntax

gvrp

no gvrp

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the GVRP function globally:

```
Switch(config)#gvrp
```

26.2 gvrp (interface)

Description

The **gvrp** command is used to enable the GVRP function for the desired port. To disable it, please use **no gvrp** command. The GVRP feature can only be enabled for the trunk-type ports.

Syntax

gvrp

no gvrp

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the GVRP function for Gigabit Ethernet ports 1/0/2-6:

```
Switch(config)#interface range gigabitEthernet 1/0/2-6
Switch(config-if-range)#gvrp
```

26.3 gvrp registration

Description

The **gvrp registration** command is used to configure the GVRP registration type for the desired port. To restore to the default value, please use **no gvrp registration** command.

Syntax

gvrp registration { normal | fixed | forbidden }

no gvrp registration

Parameter

normal | fixed | forbidden —— Registration mode. By default, the registration mode is “normal”.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the GVRP registration mode as “fixed” for Gigabit Ethernet ports 1/0/2-6:

Switch(config)#interface range gigabitEthernet 1/0/2-6

Switch(config-if-range)#gvrp registration fixed

26.4 gvrp timer

Description

The **gvrp timer** command is used to set a GVRP timer for the desired port. To restore to the default setting of a GARP timer, please use **no gvrp timer** command.

Syntax

gvrp timer { leaveall | join | leave } *value*

no gvrp timer [leaveall | join | leave]

Parameter

leaveall | join | leave —— They are the three timers: leave All, join and leave. Once the LeaveAll Timer is set, the port with GVRP enabled can send a LeaveAll message after the timer times out, so that other GARP ports can re-register all the attribute information. After that, the LeaveAll timer will start to begin a new cycle. To guarantee the transmission of the Join messages, a GARP port sends each Join message two times. The Join Timer is used to define the interval between the two sending operations of each Join message. Once the Leave Timer is set, the GARP port receiving a Leave message will start its Leave timer, and deregister the attribute information if it does not receive a Join message again before the timer times out.

value ——The value of the timer. The LeaveAll Timer ranges from 1000 to 30000 centiseconds and the default value is 1000 centiseconds. The Join Timer ranges from 20 to 1000 centiseconds and the default value is 20 centiseconds. The Leave Timer ranges from 60 to 3000 centiseconds and the default value is 60 centiseconds.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the GARP leaveall timer of Gigabit Ethernet port 1/0/6 as 2000 centiseconds and restore the join timer of it to the default value:

```
Switch(config)#interface gigabitEthernet 1/0/6
Switch(config-if)#gvrp timer leaveall 2000
Switch(config-if)#no gvrp timer join
```

26.5 show gvrp interface

Description

The **show gvrp interface** command is used to display the GVRP configuration information of a specified Ethernet port or of all Ethernet ports.

Syntax

show gvrp interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the GVRP configuration information of Gigabit Ethernet port 1:

```
Switch(config)#show gvrp interface gigabitEthernet 1/0/1
```

Display the GVRP configuration information of all Ethernet ports:

```
Switch(config)#show gvrp interface
```

26.6 show gvrp global

Description

The **show gvrp global** command is used to display the global GVRP status.

Syntax

show gvrp global

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global GVRP status:

```
Switch(config)#show gvrp global
```

Chapter 27 IGMP Snooping Commands

IGMP Snooping (Internet Group Management Protocol Snooping) is a multicast control mechanism running on Layer 2 switch. It can effectively prevent multicast groups being broadcasted in the network.

27.1 ip igmp snooping (global)

Description

The **ip igmp snooping** command is used to configure IGMP Snooping globally. To disable the IGMP Snooping function, please use **no ip igmp snooping** command.

Syntax

ip igmp snooping

no ip igmp snooping

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IGMP Snooping function:

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

27.2 ip igmp snooping version

Description

The **ip igmp snooping version** command is used to configure IGMP version globally. To return to the default configuration, please use **no ip igmp snooping version** command.

Syntax

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

no ip igmp snooping version

Parameter

v1 | v2 | v3—— Specify the IGMP version. By default, it is IGMP v3.

v1: The switch works as an IGMPv1 Snooping switch. It can only process IGMPv1 messages from the host. Report messages of other versions are ignored.

v2: The switch works as an IGMPv2 Snooping switch. It can process both IGMPv1 and IGMPv2 messages from the host. IGMPv3 messages are ignored.

v3: The switch works as an IGMPv3 Snooping switch. It can process IGMPv1, IGMPv2 and IGMPv3 messages from the host.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the IGMP version as v2:

```
Switch (config)# ip igmp snooping version v2
```

27.3 ip igmp snooping drop-unknown

Description

The **ip igmp snooping drop-unknown** command is used to configure the way how the switch processes multicast streams that are sent to unknown multicast groups as Discard. By default, it is Forward. To return to the default configuration, please use **no ip igmp snooping drop-unknown** command.

Syntax

ip igmp snooping drop-unknown

no ip igmp snooping drop-unknown

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the operation to process unknown multicast as discard:

```
Switch(config)# ip igmp snooping drop-unknown
```

27.4 ip igmp snooping header-validation

Description

The **ip igmp snooping header-validation** command is used to enable IGMP Header Validation globally. To disable the IGMP Header Validation function, please use **no ip igmp snooping header-validation** command.

Generally, for IGMP packets, the TTL value should be 1, ToS field should be 0xC0, and Router Alert option should be 0x94040000. The fields to be validated depend on the IGMP version being used. IGMPv1 only checks the TTL field. IGMPv2 checks the TTL field and the Router Alert option. IGMPv3 checks TTL field, ToS field and Router Alert option. Packets that fail the validation process will be dropped.

Syntax

ip igmp snooping header-validation

no ip igmp snooping header-validation

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IGMP Header Validation:

```
Switch(config)# ip igmp snooping header-validation
```

27.5 ip igmp snooping vlan-config

Description

The **ip igmp snooping vlan-config** command is used to enable VLAN IGMP Snooping function or to modify IGMP Snooping parameters. To disable the

VLAN IGMP Snooping function, please use **no ip igmp snooping vlan-config** command. To restore the default values, please use **no ip igmp snooping vlan-config** with specified parameters.

Syntax

ip igmp snooping vlan-config *vlan-id-list* [**rtime** *router-time* | **mtime** *member-time* | **ltime** *leave-time*]

no ip igmp snooping vlan-config *vlan-id-list* [**rtime** | **mtime** | **ltime**]

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

router-time —— The Router Port Aging Time. Within this time, if the switch does not receive IGMP query message from the router port, it will consider this port is not a router port any more. Valid values are from 60 to 600 in seconds, and the default value is 300 seconds.

member-time —— The Member Port Aging Time. Within this time, if the switch does not receive IGMP report message from the member port, it will consider this port is not a member port any more. Valid values are from 60 to 600 in seconds, and the default value is 260 seconds.

leave-time —— The Leave Time. Valid values are from 1 to 30 in seconds, and the default value is 1 second. When the switch receives a leave message from a port to leave a multicast group, it will wait for a Leave Time before removing the port from the multicast group. During the period, if the switch receives any report messages from the port, the port will not be removed from the multicast group. Exceptions are as follows:

- If the member port ages out before the Leave Time ends and no report messages are received, the port will be removed from the multicast group once its Member Port Aging Time ends.
- The Leave Time mechanism will not take effect when Fast Leave takes effect.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IGMP Snooping function and modify Router Port Aging Time as 300 seconds, Member Port Aging Time as 200 seconds for VLAN 1-3:

Switch(config)# ip igmp snooping vlan-config 1-3 **rtime** 300

Switch(config)# ip igmp snooping vlan-config 1-3 **mtime** 200

27.6 ip igmp snooping vlan-config (immediate-leave)

Description

This command is used to enable the Fast Leave feature for specific VLANs. To disable Fast Leave on the VLANs, please use **no ip igmp snooping vlan-config** *vlan-id-list* **immediate-leave** command. This function is disabled by default.

Syntax

ip igmp snooping vlan-config *vlan-id-list* **immediate-leave**

no ip igmp snooping vlan-config *vlan-id-list* **immediate-leave**

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the Fast Leave for VLAN 1-3:

Switch(config)# ip igmp snooping vlan-config 1-3 **immediate-leave**

27.7 ip igmp snooping vlan-config (report-suppression)

Description

This command is used to enable the IGMP Report Suppression function for specific VLANs. When enabled, the switch will only forward the first IGMP report message for each multicast group to the IGMP querier and suppress subsequent IGMP report messages for the same multicast group during one query interval. This feature prevents duplicate report messages from being sent to the IGMP querier. To disable the IGMP report suppression function and forward all the IGMP reports to the Layer 3 device in specific VLANs, please use **no ip igmp snooping vlan-config** *vlan-id-list* **report-suppression** command. This function is disabled by default.

Syntax

ip igmp snooping vlan-config *vlan-id-list* **report-suppression**

no ip igmp snooping vlan-config *vlan-id-list* **report-suppression**

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IGMP Report Suppression for VLAN 1-3:

```
Switch(config)# ip igmp snooping vlan-config 1-3 report-suppression
```

27.8 ip igmp snooping vlan-config (router-ports-forbidden)

Description

This command is used to forbid the specified ports as being router ports in the specified VLAN(s). To delete the forbidden router ports, please use **no ip igmp snooping vlan-config** *vlan-id-list* **router-ports-forbidd** command.

Syntax

ip igmp snooping vlan-config *vlan-id-list* **router-ports-forbidd interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list* }

no ip igmp snooping vlan-config *vlan-id-list* **router-ports-forbidd interface** [**gigabitEthernet** *port-list* | **port-channel** *port-channel-list*]

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

port-list —— Forbid the specified ports as being router ports. Packets sent from multicast routers to these ports will be discarded.

port-channel-list —— Forbid the specified port-channels as being router ports. Packets sent from multicast routers to these port-channels will be discarded.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Forbid the Ethernet ports 1/0/1-3 as being router ports in VLAN 1 :

```
Switch(config)# ip igmp snooping vlan-config 1 router-ports-forbidd
interface gigabitEthernet 1/0/1-3
```

27.9 ip igmp snooping vlan-config (rport interface)

Description

This command is used to specify the static router ports for specific VLANs. To delete the static router ports, please use **no ip igmp snooping vlan-config** *vlan-id-list* **rport interface** command.

Syntax

ip igmp snooping vlan-config *vlan-id-list* **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list* }

no ip igmp snooping vlan-config *vlan-id-list* **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list* }

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

port-list —— The list of Ethernet ports.

port-channel-list—— The ID of the port channels.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the router port as 1/0/1 for VLAN 1-2:

```
Switch(config)# ip igmp snooping vlan-config 1-2 rport interface
gigabitEthernet 1/0/1
```

27.10 ip igmp snooping vlan-config (static)

Description

This command is used to configure interfaces to statically join a multicast group. To remove interfaces from a static multicast group, please use **no ip igmp snooping vlan-config** *vlan-id-list* **static**command.

Syntax

ip igmp snooping vlan-config *vlan-id-list* **static** *ip* **interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list* }

no ip igmp snooping vlan-config *vlan-id-list* **static** *ip* **interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list* }

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

ip ——Specify the IP address of the multicast group that the hosts want to join.

port-list —— The list of Ethernet ports.

port-channel-list —— The ID of the port channels.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure port ports 1/0/1-3 in VLAN 2 to statically join multicast group 225.0.0.1:

```
Switch(config)# ip igmp snooping vlan-config 2 static 225.0.0.1 interface gigabitEthernet 1/0/1-3
```

27.11 ip igmp snooping vlan-config (querier)

Description

This command is used to enable the IGMP Snooping Querier feature for specific VLANs. To disable the IGMP Snooping Querier feature on the VLANs, please use **no ip igmp snooping vlan-config** *vlan-id-list* **querier** command without any parameters. To restore the default values, please use **no ip igmp snooping vlan-config** *vlan-id-list* **querier** command with specified parameters.

Syntax

ip igmp snooping vlan-config *vlan-id-list* **querier [max-response-time** *response-time* **| query-interval** *interval* **| general-query source-ip** *ip-addr* **| last-member-query-count** *count* **| last-member-query-interval** *interval* **]**

no ip igmp snooping vlan-config *vlan-id-list* **querier [max-response-time | query-interval | general-query source-ip | last-member-query-count]**

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

response-time—— The host's maximum response time to general query messages. Valid values are from 1 to 25 seconds, and the default value is 10 seconds.

query-interval *interval*—— The interval between general query messages sent by the switch. Valid values are from 10 to 300 seconds, and the default value is 60 seconds.

ip-addr—— The source IP address of the general query messages sent by the switch. It should be a unicast address. By default, it is 0.0.0.0.

count —— The number of group-specific queries to be sent. With IGMP Snooping Querier enabled, when the switch receives an IGMP leave message, it obtains the address of the multicast group that the host wants to leave from the message. Then the switch sends out group-specific queries to this multicast group through the port receiving the leave message. If specified count of group-specific queries are sent and no report message is received, the switch will delete the multicast address from the multicast forwarding table. Valid values are from 1 to 5, and the default value is 2.

last-member-query-interval *interval* —— The interval between group-specific queries.. Valid values are from 1 to 5 seconds, and the default value is 1 second.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IGMP Snooping Querier for VLAN 3, and configure the query interval as 100 seconds:

```
Switch(config)# ip igmp snooping vlan-config 3 querier
Switch(config)# ip igmp snooping vlan-config 3 querier query interval 100
```

27.12 ip igmp snooping (interface)

Description

The **ip igmp snooping** command is used to enable the IGMP Snooping function for the desired port. To disable the IGMP Snooping function, please use **no ip igmp snooping** command.

Syntax

ip igmp snooping

no ip igmp snooping

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IGMP Snooping function of port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# ip igmp snooping
```

27.13 ip igmp snooping max-groups

Description

The **ip igmp snooping max-groups** command is used to configure the maximum number of groups that a port can join in. The **ip igmp snooping max-groups action** is used to configure the action that the port takes when it receives an IGMP report message and the maximum number of entries is in the forwarding table. To remove the maximum group limitation and return to the default of no limitation on the specified port, please use the **no ip igmp snooping max-groups** command. To return to the default action of dropping

the report, please use the **no ip igmp snooping max-groups action** command. These commands only apply to the dynamic multicast groups.

Syntax

ip igmp snooping max-groups *maxgroup*

ip igmp snooping max-groups action { drop | replace }

no ip igmp snooping max-groups

no ip igmp snooping max-groups action

Parameter

maxgroup —— Specify the maximum numbers of groups that the port can join. It ranges from 0 to 1000 and the default value is 1000.

drop —— When the number of the dynamic multicast groups that a port joins has exceeded the max-group, the port will not join any new multicast group.

replace —— When the number of the dynamic multicast groups that a port joins has exceeded the max-group, the newly joined multicast group will replace an existing multicast group with the lowest multicast group address.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the maximum numbers of groups that ports 1/0/2-5 can join as 10, and configure the throttling action as replace:

Switch(config)#interface range gigabitEthernet 1/0/2-5

Switch(config-if-range)#ip igmp snooping max-groups 10

Switch(config-if-range)#ip igmp snooping max-groups action replace

27.14 ip igmp snooping immediate-leave

Description

The **ip igmp snooping immediate-leave** command is used to configure the Fast Leave function for port. To disable the Fast Leave function, please use **no ip igmp snooping immediate-leave** command.

Syntax

ip igmp snooping immediate-leave

no ip igmp snooping immediate-leave

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the Fast Leave function for port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# ip igmp snooping immediate-leave
```

27.15 ip igmp snooping authentication

Note: This command is only available on certain devices.

Description

The **ip igmp snooping authenticaiton** command is used to authenticate the users who want to join the limited multicast source. To disable the multicast authentication, please use **no ip igmp snooping authentication** command.

Syntax

ip igmp snooping authentication

no ip igmp snooping authentication

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

The IGMP Authentication feature will take effect only when AAA function is enabled and the RADIUS server is configured. For how to enable AAA function and configure RADIUS server, please refer to aaa enable and radius-server host.

Example

Enable IGMP authentication on port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# ip igmp snooping authentication
```

27.16 ip igmp snooping accounting

Note: This command is only available on certain devices.

Description

The **ip igmp snooping accounting** command is used to enable IGMP accounting globally. To disable the IGMP accouting, please use **no ip igmp snooping accounting** command.

Syntax

ip igmp snooping accounting

no ip igmp snooping accounting

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IGMP accounting globally:

```
Switch(config)# ip igmp snooping accounting
```

27.17 ip igmp snooping vlan-config drop-unknown

Note: This command is only available on certain devices.

Description

The **ip igmp snooping vlan-config drop-unknown** command is used to enable the drop-unknown function for the specified VLAN. When enabled, unregistered IPv4 multicast traffic within this VLAN will be discarded. To disable this function, please use the **no ip igmp snooping vlan-config drop-unknown** command.

Syntax

ip igmp snooping vlan-config *vlan-id-list* **drop-unknown**

no ip igmp snooping vlan-config *vlan-id-list* **drop-unknown**

Parameter

vlan-id-list —— Single VLAN or VLAN range, maximum length 64 characters.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable drop-unknown for VLAN 1:

```
Switch(config)# ip igmp snooping vlan-config 1 drop-unknown
```

27.18 ipv6 mld snooping vlan-config drop-unknownwn

Note: This command is only available on certain devices.

Description

The **ipv6 mld snooping vlan-config drop-unknown** command is used to enable the drop-unknown function for the specified VLAN. When enabled, unregistered IPv6 multicast traffic within this VLAN will be discarded. To disable this function, please use the **no ipv6 mld snooping vlan-config drop-unknown** command.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* **drop-unknown**

no ipv6 mld snooping vlan-config *vlan-id-list* **drop-unknown**

Parameter

vlan-id-list —— Single VLAN or VLAN range, maximum length 64 characters.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable drop-unknown for VLAN 1:

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

27.19 ip igmp snooping vlan-config route-unknown

Note: This command is only available on certain devices.

Description

The **ip igmp snooping vlan-config route-unknown** command is used to enable the route-unknown function for the specified VLAN. When enabled, unregistered multicast traffic in this VLAN will be forwarded to IGMP snooping router ports. To disable this function, please use the **no ip igmp snooping vlan-config route-unknown** command.

Syntax

ip igmp snooping vlan-config *vlan-id-list* **route-unknown**

no ip igmp snooping vlan-config *vlan-id-list* **route-unknown**

Parameter

vlan-id-list —— Single VLAN or VLAN range, maximum length 64 characters.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable route-unknown for VLAN 1:

```
Switch(config)# ip igmp snooping vlan-config 1 route-unknown
```

27.20 ipv6 mld snooping vlan-config route-unknown

Note: This command is only available on certain devices.

Description

The **ipv6 mld snooping vlan-config route-unknown** command is used to enable the route-unknown function for the specified VLAN. When enabled, unregistered multicast traffic in this VLAN will be forwarded to MLD snooping router ports. To disable this function, please use the **no ipv6 mld snooping vlan-config route-unknown** command.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* **route-unknown**

no ipv6 mld snooping vlan-config *vlan-id-list* **route-unknown**

Parameter

vlan-id-list —— Single VLAN or VLAN range, maximum length 64 characters.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable route-unknown for VLAN 1:

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

27.21 ip igmp profile

Description

The **ip igmp profile** command is used to create the configuration profile. To delete the corresponding profile, please use **no ip igmp profile** command.

Syntax

ip igmp profile *id*

no ip igmp profile *id*

Parameter

id —— Specify the id of the configuration profile, ranging from 1 to 999.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create the profile 1:

```
Switch(config)# ip igmp profile 1
```

27.22 deny

Description

The **deny** command is used to configure the filtering mode of profile as deny.

Syntax

deny

Command Mode

Profile Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the filtering mode of profile 1 as deny:

```
Switch(config)# ip igmp profile 1
Switch(config-igmp-profile)#deny
```

27.23 permit

Description

The **permit** command is used to configure the filtering mode of profile as permit.

Syntax

permit

Command Mode

Profile Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the filtering mode of profile 1 as permit:

```
Switch(config)# ip igmp profile 1
Switch(config-igmp-profile)#permit
```

27.24 range

Description

The **range** command is used to configure the range of the profile's filtering multicast address. To delete the corresponding filtering multicast address, please use **no range** command. A profile contains 16 filtering IP-range entries at most.

Syntax

range *start-ip end-ip*

no range *start-ip end-ip*

Parameter

start-ip —— The start filtering multicast IP address.

end-ip —— The end filtering multicast IP address.

Command Mode

Profile Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure one of the filter multicast address entry as range 225.1.1.1 to 226.3.2.1 in profile 1:

```
Switch(config)# ip igmp profile 1
Switch(config-igmp-profile)#range 225.1.1.1 226.3.2.1
```

27.25 ip igmp filter

Description

The **ip igmp filter** command is used to bind the specified profile to the interface. To delete the binding, please use **no ip igmp filter** command.

Syntax

ip igmp filter *profile-id*

no ip igmp filter

Parameter

profile-id—— Specify the profile ID, ranging from 1 to 999.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Bind profile 1 to interface gigabitEthernet 1/0/2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# ip igmp filter 1
```

27.26 clear ip igmp snooping statistics

Description

The **clear ip igmp snooping statistics** command is used to clear the statistics of the IGMP packets.

Syntax

clear ip igmp snooping statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear the statistics of the IGMP packets:

```
Switch(config)# clear ip igmp snooping statistics
```

27.27 show ip igmp snooping

Description

The **show ip igmp snooping** command is used to display the global configuration of IGMP snooping.

Syntax

show ip igmp snooping

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of IGMP:

```
Switch# show ip igmp snooping
```

27.28 show ip igmp snooping interface

Description

The **show ip igmp snooping interface** command is used to display the port configuration of IGMP snooping. If no interface is specified, it displays all interfaces' IGMP snooping configurations.

Syntax

show ip igmp snooping interface [**gigabitEthernet** [*port-list*] | **port-channel** [*port-channel-list*]] { authentication | basic-config | max-groups | packet-stat }

Parameter

port-list —— The list of Ethernet ports.

Port-channel-list —— The list of port channels.

authentication | basic-config | max-groups | packet-stat —— The related configuration information selected to display.

Note: Authentication is only available on certain devices.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IGMP baisic configuration configuration of all ports and port channels:

Switch# show ip igmp snooping interface basic-config

Display the IGMP basic configuration of port 1/0/2:

Switch# show ip igmp snooping interface gigabitEthernet 1/0/2 basic-config

Display the IGMP packet statistics of ports 1/0/1-4:

Switch# show ip igmp snooping interface gigabitEthernet 1/0/1-4 packet-stat

27.29 show ip igmp snooping vlan

Description

The **show ip igmp snooping vlan** command is used to display the VLAN configuration of IGMP snooping.

Syntax

show ip igmp snooping vlan [*vlan-id*]

Parameter

vlan-id——The VLAN ID selected to display.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IGMP snooping configuration information of VLAN 2:

Switch# show ip igmp snooping vlan 2

27.30 show ip igmp snooping groups

Description

The **show ip igmp snooping groups** command is used to display the information of all IGMP snooping groups. It can be extended to some other commands to display the dynamic and static multicast information of a selected VLAN.

Syntax

show ip igmp snooping groups [**vlan** *vlan-id*] [*multicast_addr* | count | dynamic | dynamic count | static | static count]

Parameter

vlan-id——The VLAN ID selected to display the information of all multicast items.

multicast_addr—— IP address of the multicast group.

count—— The numbers of all multicast groups.

dynamic—— Display dynamic multicast groups.

dynamic count—— The numbers of all dynamic multicast groups.

static—— Display static multicast groups.

static count—— The numbers of all static multicast groups.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of all IGMP snooping groups:

Switch#show ip igmp snooping groups

Display all the multicast entries in VLAN 5:

Switch(config)#show ip igmp snooping groups vlan 5

Display the count of multicast entries in VLAN 5:

Switch(config)#show ip igmp snooping groups vlan 5 count

Display the dynamic multicast groups of VLAN 5

Switch(config)#show ip igmp snooping groups vlan 5 dynamic

Display the static multicast groups of VLAN 5

Switch(config)#show ip igmp snooping groups vlan 5 static

Display the count of dynamic multicast entries of VLAN 5

Switch(config)#show ip igmp snooping groups vlan 5 dynamic count

Display the count of static multicast entries of VLAN 5

Switch(config)#show ip igmp snooping groups vlan 5 static count

27.31 show ip igmp profile

Description

The **show ip igmp profile** command is used to display the configuration information of all the profiles or a specific profile.

Syntax

show ip igmp profile [*id*]

Parameter

id —— Specify the ID of the profile, ranging from 1 to 999.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration information of all profiles:

Switch(config)# show ip igmp profile

Chapter 28 Layer 3 IGMP Commands (Only for Certain Devices)

28.1 ip igmp (global)

Description

The **ip igmp** command is used to enable IGMP globally. To disable the IGMP function, please use **no ip igmp** command.

Syntax

ip igmp

no ip igmp

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IGMP function globally:

```
Switch(config)# ip igmp
```

28.2 ip igmp (on specific ports)

Description

The **ip igmp** command is used to enable IGMP on specific ports. To disable the IGMP function, please use **no ip igmp** command.

Syntax

ip igmp

no ip igmp

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IGMP function on VLAN 2:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip igmp
```

28.3 ip igmp header-validation

Description

The **ip igmp header-validation** command is used to enable IGMP message header validation functions: TTL (Time To Live), ToS (Type of Service), and Router Alert options. For IGMPv1, only the TTL field is validated. For IGMPv2, the TTL and Router Alert fields are validated. For IGMPv3, the TTL, ToS and Router Alert fields are validated. To disable the IGMP function, please use **no ip igmp header-validation** command.

Syntax

ip igmp header-validation

no ip igmp header-validation

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IGMP message header validation:

```
Switch(config)# ip igmp header-validation
```

28.4 ip igmp version

Description

The **ip igmp version** command is used to configure IGMP version globally. To return to the default configuration IGMPv3, please use **no ip igmp version** command.

Syntax

ip igmp version {v1 | v2 | v3 **}**

no ip igmp version

Parameter

v1 | v2 | v3—— Specify the IGMP version. By default, it is IGMP v3.

v1: The switch works as an IGMPv1 switch. It can only process IGMPv1 messages from the host. Report messages of other versions are ignored.

v2: The switch works as an IGMPv2 switch. It can process both IGMPv1 and IGMPv2 messages from the host. IGMPv3 messages are ignored.

v3: The switch works as an IGMPv3 switch. It can process IGMPv1, IGMPv2 and IGMPv3 messages from the host.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the IGMP version as v2:

```
Switch (config)#ip igmp version v2
```

28.5 ip igmp last-member-query-count

Description

The **ip igmp last-member-query-count** command is used to configure the number of times special group query messages sent on the specified interface. To restore the default value, please use **no ip igmp last-member-query-count** command.

Syntax

ip igmp last-member-query-count *count*

no ip igmp last-member-query-count

Parameter

count: The number of times IGMP group-specific query messages are sent, ranging from 1-20. The default value is 2.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the number of times special group query messages sent on VLAN 2 as 3:

Switch (config)#interface vlan 2

Switch (config-if)#ip igmp last-member-query-count 3

28.6 ip igmp last-member-query-interval

Description

The **ip igmp last-member-query-interval** command is used to configure the time interval for sending special group query messages on the specified interface. To restore the default value, please use **no ip igmp last-member-query-interval** command.

Syntax

ip igmp last-member-query-interval *interval*

no ip igmp last-member-query-interval

Parameter

inteval: The interval for sending IGMP group-specific query messages. The value range is 10-255 (1/10 second). The default value is 10 (1/10 second).

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the time interval for sending special group query messages sent on VLAN 2 to 2 seconds:

Switch (config)#interface vlan 2

Switch (config-if)#ip igmp last-member-query-interval 20

28.7 ip igmp query-interval

Description

The **ip igmp query-interval** command is used to configure the IGMP general query interval on a specified interface. To restore the default value, please use **no ip igmp query-interval** command.

Syntax

ip igmp query-interval *interval*

no ip igmp query-interval

Parameter

inteval: The time interval for sending IGMP general query messages on the specified interface. The value range is 1-3600 seconds. The default value is 125 seconds.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the interval for sending IGMP general query messages on VLAN 2 to 50 seconds:

```
Switch (config)#interface vlan 2
Switch (config-if)#ip igmp query-interval 50
```

28.8 ip igmp query-max-response-time

Description

The **ip igmp query-max-response-time** command is used to configure the maximum response time to IGMP general query messages on the specified interface. To restore the default value, please use **no ip igmp query-max-response-time** command.

Syntax

ip igmp query-max-response-time *time*

no ip igmp query-max-response-time

Parameter

time: The maximum response time for general group query messages on the specified interface, the value range is 10-255 (1/10 seconds), the default value is 100 (1/10 seconds).

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum response time for general group query messages on VLAN 2 to 5 seconds:

Switch (config)#interface vlan 2

Switch (config-if)#ip igmp query-max-response-time 50

28.9 ip igmp robustness

Description

The **ip igmp robustness** command is used to configure the robustness coefficient on the specified interface. To restore the default value, please use **no ip igmp robustness** command.

Syntax

ip igmp robustness *robustness*

no ip igmp robustness

Parameter

robustness: Specify the IGMP robustness coefficient, the value range is 1-255, and the default value is 2.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the robustness coefficient on VLAN 2 to 3:

```
Switch (config)#interface vlan 2
Switch (config-if)#ip igmp robustness 3
```

28.10 ip igmp startup-query-interval

Description

The **ip igmp startup-query-interval** command is used to configure the time interval for sending initial query packets on the specified interface. To restore the default value, please use **no ip igmp startup-query-interval** command.

Syntax

ip igmp startup-query-interval *interval*

no ip igmp startup-query-interval

Parameter

interval: The interval for sending IGMP initial query messages. The value range is 1-300 seconds. The default value is 31 seconds.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the time interval for sending initial query packets on VLAN 2 to 10 seconds:

```
Switch (config)#interface vlan 2
Switch (config-if)#ip igmp query-interval 10
```

28.11 ip igmp last-member-query-count

Description

The **ip igmp last-member-query-count** command is used to configure the number of initial query packets sent on the specified interface. To restore the default value, please use **no ip igmp last-member-query-count** command.

Syntax

ip igmp last-member-query-count *count*

no ip igmp last-member-query-count

Parameter

count: The number of times IGMP initial query message is sent, the value range is 1-20, the default value is 2

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the number of initial query packets sent on VLAN 2 to 3:

```
Switch (config)#interface vlan 2
Switch (config-if)# ip igmp last-member-query-count 3
```

28.12 show ip igmp

Description

The **show ip igmp** command is used to display basic IGMP information.

Syntax

show ip igmp

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display basic IGMP information:

```
Switch(config)#show ip igmp
```

28.13 show ip igmp groups

Description

The **show ip igmp groups** command is used to display the information of all dynamic multicast groups or specified multicast groups.

Syntax

show ip igmp groups {*group-address***} [detail]**

Parameter

group-address: Multicast group address

detail: Detailed information of dynamic multicast group

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of dynamic multicast 224.0.2.40:

Switch(config)#show ip igmp groups 224.0.2.40 **[detail]**

28.14 show ip igmp groups interface

Description

The **ip igmp groups interface vlan** command is used to display all dynamic multicast group information on the specified port.

Syntax

show ip igmp groups interface { fastEthernet | gigabitEthernet | ten-gigabitEthernet **}** *port* **[detail]**

Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet: Interface type

port: Port number

detail: Detailed information of dynamic multicast group

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display detailed configuration information of all dynamic multicast groups on port 1/0/1:

Switch(config)#show ip igmp groups interface gigabitEthernet 1/0/1 **detail**

28.15 show ip igmp groups interface vlan

Description

The **show ip igmp groups interface vlan** command is used to display all dynamic multicast group information on the specified VLAN interface.

Syntax

show ip igmp groups interface vlan *vlan-id* **[detail]**

Parameter

vlan-id: VLAN port ID

detail: Detailed information of dynamic multicast group

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration information of all dynamic multicast groups on VLAN 1:

Switch(config)#show ip igmp groups interface vlan 1

28.16 show ip igmp groups interface vlan

Description

The **show ip igmp interface** command is used to display IGMP configuration information on a specified port.

Syntax

show ip igmp interface { fastEthernet | gigabitEthernet | ten-gigabitEthernet **}** *port* **[** statistic **]**

Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet: Interface type

port: Port number

statistic**:** Statistics of IGMP packets received on the specified port

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display statistics of IGMP packets received on port 1/0/1:

Switch(config)#show ip igmp interface gigabitEthernet 1/0/1 statistic

28.17 show ip igmp interface vlan

Description

The **show ip igmp interface vlan** command is used to display IGMP configuration information on the specified VLAN interface.

Syntax

show ip igmp interface vlan *vlan-id* **[** statistic **]**

Parameter

vlan-id: VLAN port ID

statistic**:** Statistics of IGMP packets received on the specified port

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display IGMP configuration information on VLAN 2:

```
Switch(config)#show ip igmp interface vlan 2
```

Chapter 29 PIM Commands (Only for Certain Devices)

Protocol Independent Multicast, abbreviated as PIM, uses unicast routing information to provide multicast forwarding functions in a layer 3 network. PIM works in dense mode.

29.1 ip multicast-routing

Description

The **ip multicast-routing** command is used to enable the IP multicast-routing function globally. To disable this function, please use the **no ip multicast-routing** command.

Syntax

ip multicast-routing

no ip multicast-routing

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IP multicast-routing function globally:

```
Switch(config)#ip multicast-routing
```

29.2 ip pim (globally)

Description

The **ip pim** command is used to enable IP PIM globally. To disable the IP PIM function, please use **no ip pim** command.

Syntax

ip pim {dense-mode | sparse-mode }

no ip pim {dense-mode | sparse-mode }

Parameter

dense-mode: Enable PIM DM globally.

sparse-mode: Enable PIM SM globally

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable PIM DM globally:

```
Switch (config)#ip pim dense-mode
```

29.3 ip pim (on specific ports)

Description

The **ip pim** command is used to configure IP PIM on a specified port. To disable the IP PIM function, please use **no ip pim** command.

Syntax

ip pim

no ip pim

Parameter

dense-mode: Enable PIM DM globally.

sparse-mode: Enable PIM SM globally

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable PIM DM on port 2:

```
Switch (config)#interface vlan 2
Switch (config-if)#ip pim
```

29.4 ip pim bsr-candidate interface

Description

This command is used to configure a candidate BSR on the interface.

Syntax

ip pim bsr-candidate interface { { fastEthernet | gigabitEthernet | ten-gigabitEthernet } **port** | **vlan** *vlan-id*} [*mask-len*] [*pri*] [*interval*]

no ip pim bsr-candidate

Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet: interface type port: port number

vlan-id: VLAN interface ID.

mask-len: Hashmask length, ranging from 0 to 32.

pri: The priority of the candidate BSR, ranging from 0 to 255.

interval: The interval for the candidate BSR to send Bootstrap messages. The value range is from 1 to 16383 seconds.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure a candidate BSR on VLAN interface 2 with a hash mask length of 10 and a priority of 20:

```
Switch(config)#ip pim bsr-candidate interface vlan 2 10 20
```

29.5 ip pim rp-candidate interface

Description

This command is used to configure a candidate RP on the interface.

Syntax

ip pim rp-candidate interface { { fastEthernet | gigabitEthernet | ten-gigabitEthernet } *port* | **vlan** *vlan-id* } [**group-addr** *grouplp*] [**group-mask** *groupMask*] [*interval*]

no ip pim rp-candidate interface { { fastEthernet | gigabitEthernet | ten-gigabitEthernet } *port* | **vlan** *vlan-id* } [**group-addr** *grouplp*] [**group-mask** *groupMask*]

Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet: interface type

port: port number

vlan-id: VLAN interface ID.

grouplp: Multicast group IP address of the candidate RP.

groupMask: Multicast group subnet mask of the candidate RP.

interval: The interval for the candidate BSR to send Bootstrap messages. The value range is from 1 to 16383 seconds.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure a candidate RP on VLAN interface 2, with the multicast group address 235.0.0.1, the multicast group mask 255.255.255.0, and the interval for sending RP advertisement messages 70 seconds:

```
Switch(config)# ip pim rp-candidate interface vlan 2 235.0.0.1
255.255.255.0 70
```

29.6 ip pim rp-address

Description

This command is used to configure a static RP on the interface.

Syntax

ip pim rp-address *ip-addr* [**group-address** *grouplp*] [**group-mask** *groupMask*] [*override*]

no ip pim rp-address *ip-addr* [**group-address** *grouplp*] [**group-mask** *groupMask*] [*override*]

Parameter

ip-addr: P address of static RP.

grouplp: Multicast group IP address of static RP.

groupMask: Multicast group subnet mask of static RP.

override: If the static RP configured by this command is inconsistent with the RP elected by BSR, the static RP will take effect.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the static RP address to 20.20.20.2, and the RP multicast group and mask to 235.0.0.0 255.255.255.0:

```
Switch(config)#ip pim rp-address 20.20.20.2 235.0.0.0 255.255.255.0
```

29.7 ip pim bsr-border

Description

This command is used to configure the management border of the BSR domain.

Syntax

ip pim bsr-border

no ip pim bsr-border

Parameter

None

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the BSR management border on VLAN interface 2:

```
Switch(config)# ip pim bsr-border
```

29.8 ip pim ssm

Description

This command is used to configure the PIM-SSM

Syntax

ip pim ssm *{* ***group-address*** *grouplp [* ***group-mask*** *groupMask] |* ***default****}*

no ip pim ssm *{* ***group-address*** *grouplp [* ***group-mask*** *groupMask] |* ***default****}*

Parameter

grouplp: SSM multicast group address.

groupMask: SSM multicast group subnet mask

default: Configure the default SSM multicast group address range. (The default range is 232.0.0.0/8)

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the SSM multicast group address range to 235.0.0.1 255.255.0.0:

```
Switch(config)# ip pim ssm 235.0.0.1 255.255.0.0
```

29.9 ip pim dr-priority

Description

This command is used to configure he priority of the designated router (DR).

Syntax

ip pim dr-priority *pri*

no ip pim dr-priority

Parameter

pri: DR priority, ranging from 0 to 4294967295. Its default value is 1.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the DR priority on VLAN interface 2 to 100:

```
Switch(config)#interface vlan 2
Switch(config-if)#  ip pim dr-priority 100
```

29.10 ip pim hello-interval

Description

The **ip pim hello-interval** command is used to configure the time interval for sending Hello messages on the interface. To restore the default value, please use **no ip pim hello-interval** command.

Syntax

ip pim hello-interval *interval*

no ip pim hello-interval

Parameter

interval: The time interval for sending Hello messages, ranging from 1 to 18725 seconds. The default value is 30 seconds.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the interval for VLAN interface 2 to send Hello messages to 100 seconds:

```
Switch (config)#interface vlan 2
Switch (config-if)# ip pim hello-interval 100
```

29.11 ip pim join-prune-interval

Description

This command is used to configure the interval for sending join/prune messages on the interface. To restore the default configuration, please use the **no ip pim join-prune-interval** command.

Syntax

ip pim join-prune-interval *interval*

no ip pim join-prune-interval

Parameter

interval: The interval for sending join/prune messages, ranging from 1 to 18724 seconds. The default value is 60 seconds.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the interval for sending join/prune messages to 100 seconds.

```
Switch (config)#interface vlan 2
Switch (config-if)# pim join-prune-interval 100
```

29.12 show ip multicast

Description

The **show ip multicast** command is used to display the global configuration information of IP multicast.

Syntax

show ip multicast

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration information of IP multicast:

```
Switch(config)#show ip multicast
```

29.13 show ip mroute

Description

The **show ip mroute** command is used to display the multicast routing table.

Syntax

show ip mroute [[group *ip-addr* **] | [source** *ip-addr* **] | detail | static [** source *source-ip* **] | [summary]]**

Parameter

group *ip-addr*: Multicast group IP address

source *ip-addr:* Multicast source IP address

detail**:** Displays detailed multicast routing table

static [source *source-ip* **]:** Displays all static multicast routing entries or static multicast routing entries with a specified source IP address

summary**:** Displays summary information of multicast routing entries

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display all multicast routing entries:

```
Switch(config)#show ip mroute
```

29.14 show ip pim interface

Description

The **show ip pim interface** command is used to display the IP PIM interface information.

Syntax

show ip pim interface { fastEthernet | gigabitEthernet | ten-gigabitEthernet **}** *port* **vlanid** *vlan-id*

Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet: Interface type

port: Port number

vlan-id: VLAN ID

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information on PIM VLAN 2:

```
Switch(config)#show ip pim interface vlan 2
```

29.15 show ip pim neighbor

Description

The **show ip pim neighbor** command is used to display the IP PIM neighbor information.

Syntax

show ip pim neighbor { fastEthernet | gigabitEthernet | ten-gigabitEthernet **}** *port* **vlanid** *vlan-id*

Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet: Interface type

port: Port number

vlan-id: VLAN ID

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display all PIM neighbor information:

```
Switch(config)#show ip pim neighbor
```

29.16 show ip pim statistic

Description

The **show ip pim neighbor** command is used to display the IP PIM statistic information.

Syntax

show ip pim statistic { fastEthernet | gigabitEthernet | ten-gigabitEthernet **}** *port* **vlanid** *vlan-id*

Parameter

fastEthernet | gigabitEthernet | ten-gigabitEthernet: Interface type

port: Port number

vlan-id: VLAN ID

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display packet count information of all PIM interfaces:

```
Switch(config)#show ip pim statistic
```

29.17 show ip pim bsr-router

Description

This command is used to view the information of candidate BSRs and candidate RPs.

Syntax

show ip pim bsr-router

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Vew the information of candidate BSRs and candidate RPs.

```
Switch(config)# show ip pim bsr-router
```

29.18 show ip pim bsr-router

Description

This command is used to view the RP information. The data of each multicast group can only be forwarded by one unique RP.

Syntax

show ip pim rp mapping { **rp-address** *rpAddr* **| candidate** *candidate* **|static** *static*}

Parameter

rpAddr: Displays the RP information corresponding to the specified multicast group address.

candidate: Displays the information of candidate RPs in the switch.

static: Displays the information of static RPs in the switch.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the RP information corresponding to all multicast groups.

```
Switch(config)# show ip pim rp mapping
```

29.19 show ip pim rp-hash

Description

This command is used to view the the hash result of the specified multicast group.

Syntax

show ip pim rp-hash *ip-addr*

Parameter

ip-addr: Multicast group address.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the hash result for multicast group 224.1.1.2:

```
Switch(config)# show ip pim rp-hash 224.1.1.2
```

Chapter 30 Static Multicast Routing Commands (Only for Certain Devices)

Multicast routing creates multicast routing table entries based on existing unicast routing information or multicast static routing. When creating multicast routing table entries, multicast routing protocols use the RPF (Reverse Path Forward) checking mechanism to ensure that multicast data can be forwarded along the correct path. Multicast static route entries are one of the important basis for RPF inspection and are mainly used to change or connect RPF routes.

30.1 ip mroute

Description

The **ip mroute** command is used to add/modify static multicast routing entries globally. To delete the specified static multicast routing entry, please use the **no ip mroute** command.

Syntax

ip mroute { *source-address* } {*mask*} { *rpf-address* } [*distance*]

no ip mroute { *source-address* } {*mask*}

Parameter

source-address: IP address of the multicast source, in the format 192.168.0.1

mask: Subnet mask for the multicast source IP address

rpf-address: Specify the ingress interface of the RPF entry

distance: Management parameters of static multicast routing entries, ranging from 0 to 255. The smaller the value, the higher the priority. If the value of the static multicast route is smaller than the value of other RPF entries, the static multicast route takes effect. The default value is 1.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add a static multicast routing entry with the source address 192.168.0.1, the subnet mask 255.255.255.255, the incoming interface of the RPF entry 192/168.1.1, and the management parameter 1:

Switch(config)#ip mroute 192.168.0.1 255.255.255.255 192.168.1.1 1

30.2 show ip mroute static

Description

The **show ip mroute static** command is used to display the IP mroute static information.

Syntax

show ip mroute static {source *source-ip*}

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Display all static multicast routing entries:

Switch(config)#show ip mroute static

Chapter 31 VRF Commands (Only for Certain Devices)

Virtual Routing and Forwarding (VRF) allows multiple instances of routing tables to coexist on the same router (switch).

Each VRF can be considered a virtual router, which includes the following elements:

1) An independent routing table (including an independent address space);
2) A set of interfaces belonging to this VRF;
3) Routing protocols dedicated to this VRF;
4) Each device can maintain one or more VRFs alongside a public routing table (global routing table). Multiple VRF instances are isolated and independent.

Purpose:

VRF enhances functionality by enabling the division of network paths without requiring multiple devices, effectively transforming one physical router into multiple virtual routers.

Benefits:

Because routing instances are independent, identical or overlapping IP addresses can be used without conflict. VRF improves network security through automatic traffic isolation and can eliminate the need for encryption or authentication. VRF is commonly used by ISPs to create separate VPNs for customers, hence it is often called VPN Routing and Forwarding.

31.1 vrf

Description

The **vrf** command is used to create a VRF instance and enters its configuration view. To delete the instance, please use the **no vrf** command.

Syntax

vrf *vrf-name*

no vrf *vrf-name*

Parameter

vrf-name: VRF instance name (1-15 characters).

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a VRF instance named vrf1:

```
Switch(config)#vrf vrf1
```

31.2 address-family

Description

The **address-family** command is used to enable the specified address family (IPv4/IPv6) for the VRF and enter its configuration view. To disable the address family, please use the **no address-family** command.

Syntax

address-family {ipv4 | ipv6}

no address-family {ipv4 | ipv6}

Parameter

None

Command Mode

VRF Instance View

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IPv4 for the vrf1 instance:

```
Switch(config)#vrf vrf1
Switch (config-vrf)#address-family ipv4
```

31.3 exit-address-family

Description

The **exit-address-family** command is used to exit the VRF address family view and returns to the VRF configuration view.

Syntax

exit-address-family

Parameter

None

Command Mode

VRF Address Family View

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Exit the IPv4 view of vrf1:

```
Switch(config)#vrf vrf1
Switch (config-vrf)#address-family ipv4
Switch (config-vrf-af)#exit-address-family
```

31.4 vrf forwarding

Description

The **vrf forwarding** command is used to assign a L3 interface to a VRF instance. To remove the interface from the VRF and returns it to the global routing table, please use the **no vrf forwarding** command. Note: Switching VRFs deletes all existing interface configurations.

Syntax

vrf forwarding *vrf-name*

no vrf forwarding *vrf-name*

Parameter

vrf-name: VRF instance name (1-15 characters).

Command Mode

L3 Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Assign interface VLAN 1 to the vrf1 instance:

```
Switch(config) # interface vlan 1
Switch(config-if)# vrf forwarding vrf1
```

31.5 show vrf

Description

The **show vrf** command is used to view the configured VRF instance information.

Syntax

show vrf {brief | interface | name *vrf-name***}**

Parameter

vrf-name: VRF instance name

Command Mode

Privileged EXEC Mode or Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

View the configured VRF instance information:

Switch (config)# show vrf brief

Switch (config)# show vrf interface

Switch (config)# show vrf name vrf1

Chapter 32 MLD Snooping Commands

MLD Snooping (Multicast Listener Discovery Snooping) is a multicast control mechanism running on Layer 2 switch. It can effectively prevent multicast groups being broadcasted in the IPv6 network.

32.1 ipv6 mld snooping (global)

Description

The **ipv6 mld snooping** command is used to enable MLD Snooping function globally. If this function is disabled, all related MLD Snooping function would not work. To disable this function, please use **no ipv6 mld snooping** command.

Syntax

ipv6 mld snooping

no ipv6 mld snooping

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable MLD Snooping:

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

32.2 ipv6 mld snooping drop-unknown

Description

The **ipv6 mld snooping drop-unknown** command is used to enable the unknown multicast packets filter function. To disable this function, please use **no ipv6 mld snooping drop-unknown** command. By default, it is disabled.

Syntax

ipv6 mld snooping drop-unknown

no ipv6 mld snooping drop-unknown

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable unknown multicast filter function:

```
Switch(config)# ipv6 mld snooping drop-unknown
```

32.3 ipv6 mld snooping vlan-config

Description

The **ipv6 mld snooping vlan-config** command is used to enable VLAN MLD Snooping function or to modify MLD Snooping parameters. To disable the VLAN MLD Snooping function, please use **no ipv6 mld snooping vlan-config** command.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* [**rtime** *router-time* | **mtime** *member-time* | **ltime** *leave-time*]

no ipv6 mld snooping vlan-config *vlan-id-list* [**rtime** | **mtime** | **ltime**]

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

router-time —— The Router Port Aging Time. Within this time, if the switch does not receive any MLD query messages from the router port, it will consider this port is not a router port any more. Valid values are from 60 to 600 in seconds, and the default value is 300 seconds.

member-time —— The Member Port Aging Time. Within this time, if the switch does not receive any MLD report messages from the member port, it will consider this port is not a member port any more. Valid values are from 60 to 600 in seconds, and the default value is 260 seconds.

leave-time —— The Leave Time. Valid values are from 1 to 30 in seconds, and the default value is 1 second. When the switch receives a done message from a port to leave a multicast group, it will wait for a Leave Time before removing the port from the multicast group. During the period, if the switch receives

any report messages from the port, the port will not be removed from the multicast group. Exceptions are as follows:

- If the member port ages out before the Leave Time ends and no report messages are received, the port will be removed from the multicast group once its Member Port Aging Time ends.
- The Leave Time mechanism will not take effect when Fast Leave takes effect.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the MLD Snooping function and modify Router Port Time as 300 seconds, Member Port Time as 200 seconds for VLAN 1-3:

Switch(config)# ipv6 mld snooping vlan-config 1-3 **rtime** 300

Switch(config)# ipv6 mld snooping vlan-config 1-3 **mtime** 200

32.4 ipv6 mld snooping vlan-config (immediate-leave)

Description

This command is used to enable the Fast Leave feature for specific VLANs. To disable Fast Leave on the VLANs, please use **no ipv6 mld snooping vlan-config** *vlan-id-list* **immediate-leave** command. This function is disabled by default.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* **immediate-leave**

no ipv6 mld snooping vlan-config *vlan-id-list* **immediate-leave**

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the Fast Leave for VLAN 1-3:

Switch(config)# ipv6 mld snooping vlan-config 1-3 **immediate-leave**

32.5 ipv6 mld snooping vlan-config (report-suppression)

Description

This command is used to enable the MLD Report Suppression function for specific VLANs. When enabled, the switch will only forward the first MLD report message for each multicast group to the MLD querier and suppress subsequent MLD report messages for the same multicast group during one query interval. This feature prevents duplicate report messages from being sent to the MLD querier. To disable the MLD report suppression function and forward all the MLD reports to the Layer 3 device in specific VLANs, please use **no ipv6 mld snooping vlan-config** *vlan-id-list* **report-suppression** command. This function is disabled by default.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* **report-suppression**

no ipv6 mld snooping vlan-config *vlan-id-list* **report-suppression**

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the MLD Report Suppression for VLAN 1-3:

Switch(config)# ipv6 mld snooping vlan-config 1-3 **report-suppression**

32.6 ipv6 mld snooping vlan-config (router-ports-forbidden)

Description

This command is used to forbid the specified ports as being router ports in the specified VLAN(s). To delete the forbidden router ports, please use **no ipv6 mld snooping vlan-config** *vlan-id-list* **router-ports-forbidd** command.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* **router-ports-forbidd interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list* }

no ipv6 mld snooping vlan-config *vlan-id-list* **router-ports-forbidd interface** [**gigabitEthernet** *port-list* | **port-channel** *port-channel-list*]

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

port-list —— Forbid the specified ports as being router ports. Packets sent from multicast routers to these ports will be discarded.

port-channel-list —— Forbid the specified port-channels as being router ports. Packets sent from multicast routers to these port-channels will be discarded.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Forbid the Ethernet ports 1/0/1-3 as being router ports in VLAN 1:

Switch(config)# ipv6 mld snooping vlan-config 1 **router-ports-forbidd interface gigabitEthernet** 1/0/1-3

32.7 ipv6 mld snooping vlan-config (rport interface)

Description

This command is used to specify the static router ports for specific VLANs. To delete the static router ports, please use **no ipv6 mld snooping vlan-config** *vlan-id-list* **rport interface** command.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list* }

no ipv6 mld snooping vlan-config *vlan-id-list* **rport interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list* }

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

port-list —— The list of Ethernet ports.

port-channel-list—— The ID of the port channels.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the router port as 1/0/1 for VLAN 1-2:

```
Switch(config)# ipv6 mld snooping vlan-config 1-2 rport interface
gigabitEthernet 1/0/1
```

32.8 ipv6 mld snooping vlan-config (static)

Description

This command is used to configure interfaces to statically join a multicast group. To remove interfaces from a static multicast group, please use **no ipv6 mld snooping vlan-config** *vlan-id-list* **static**command.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* **static** *ip* **interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list* }

no ipv6 mld snooping vlan-config *vlan-id-list* **static** *ip* **interface** { **gigabitEthernet** *port-list* | **port-channel** *port-channel-list*}

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

ip ——Specify the IP address of the multicast group that the hosts want to join.

port-list —— The list of Ethernet ports.

port-channel-list —— The ID of the port channels.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure port ports 1/0/1-3 in VLAN 2 to statically join multicast group ff80::1234:1:

Switch(config)# ipv6 mld snooping vlan-config 2 **static** ff80::1234:1 **interface gigabitEthernet** 1/0/1-3

32.9 ipv6 mld snooping vlan-config (querier)

Description

This command is used to enable the MLD Snooping Querier feature for specific VLANs. To disable the MLD Snooping Querier feature on the VLANs, please use **no ipv6 mld snooping vlan-config** *vlan-id-list* **querier** command without any parameters. To restore the default values, please use **no ipv6 mld snooping vlan-config** *vlan-id-list* **querier** command with specified parameters.

Syntax

ipv6 mld snooping vlan-config *vlan-id-list* **querier [max-response-time** *response-time* **| query-interval** *interval* **| general-query source-ip** *ip-addr* **| last-listener-query-count** *count* **| last-listener-query-interval** *interval* **]**

no ipv6 mld snooping vlan-config *vlan-id-list* **querier [max-response-time | query-interval | general-query source-ip | last-listener-query-count | last-listener-query-interval]**

Parameter

vlan-id-list —— The ID list of the VLAN desired to modify configuration, ranging from 1 to 4094, in the format of 1-3, 5.

response-time—— The host's maximum response time to general query messages. Valid values are from 1 to 25 seconds, and the default value is 10 seconds.

query-interval *interval*—— The interval between general query messages sent by the switch. Valid values are from 10 to 300 seconds, and the default value is 60 seconds.

ip-addr—— The source IP address of the general query messages sent by the switch. It should be a unicast address. By default, it is fe80::2ff:ffff:fe00:1.

count —— The number of group-specific queries to be sent. With MLD Snooping Querier enabled, when the switch receives an MLD done message, it obtains the address of the multicast group that the host wants to leave from the message. Then the switch sends out group-specific queries to this multicast group through the port receiving the done message. If specified count of group-specific queries are sent and no report message is received, the switch will delete the multicast address from the multicast forwarding table. Valid values are from 1 to 5, and the default value is 2.

last-member-query-interval *interval* —— The interval between group-specific queries. Valid values are from 1 to 5 seconds, and the default value is 1 second.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the MLD Snooping Querier for VLAN 3, and configure the query interval as 100 seconds:

```
Switch(config)# ipv6 mld snooping vlan-config 3 querier
Switch(config)# ipv6 mld snooping vlan-config 3 querier query interval 100
```

32.10 ipv6 mld snooping (interface)

Description

The **ipv6 mld snooping** command is used to enable MLD Snooping function on the desired port. To disable this function, please use **no ipv6 mld snooping** command.

Syntax

ipv6 mld snooping

no ipv6 mld snooping

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable MLD Snooping on port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# ipv6 mld snooping
```

32.11 ipv6 mld snooping max-groups

Description

The **ipv6 mld snooping max-groups** command is used to configure the maximum number of groups that a port can join in. The **ipv6 mld snooping max-groups action** is used to configure the action that the port takes when it

receives an MLD report message and the maximum number of entries is in the forwarding table. To remove the maximum group limitation and return to the default of no limitation on the specified port, please use the **no ipv6 mld snooping max-groups** command. To return to the default action of dropping the report, please use the **no ipv6 mld snooping max-groups action** command. These commands only apply to the dynamic multicast groups.

Syntax

ipv6 mld snooping max-groups *maxgroup*

ipv6 mld snooping max-groups action { drop | replace }

no ipv6 mld snooping max-groups

no ipv6 mld snooping max-groups action

Parameter

maxgroup —— Specify the maximum numbers of groups that the port can join. It ranges from 0 to 1000 and the default value is 1000.

drop —— When the number of the dynamic multicast groups that a port joins has exceeded the max-group, the port will not join any new multicast group.

replace —— When the number of the dynamic multicast groups that a port joins has exceeded the max-group, the newly joined multicast group will replace an existing multicast group with the lowest multicast group address.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Specify the maximum numbers of groups that ports 1/0/2-5 can join as 10, and configure the throttling action as replace:

```
Switch(config)#interface range gigabitEthernet 1/0/2-5
Switch(config-if-range)#ipv6 mld snooping max-groups 10
Switch(config-if-range)#ipv6 mld snooping max-groups action replace
```

32.12 ipv6 mld snooping immediate-leave

Description

The **ipv6 mld snooping immediate-leave** command is used to configure the Fast Leave function for port. To disable the Fast Leave function, please use **no ipv6 mld snooping immediate-leave** command.

Syntax

ipv6 mld snooping immediate-leave

no ipv6 mld snooping immediate-leave

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the Fast Leave function for port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# ipv6 mld snooping immediate-leave
```

32.13 ipv6 mld profile

Description

The **ipv6 mld profile** command is used to create the configuration profile. To delete the corresponding profile, please use **no ipv6 mld profile** command.

Syntax

ipv6 mld profile *id*

no ipv6 mld profile *id*

Parameter

id —— Specify the id of the configuration profile, ranging from 1 to 999.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Create the profile 1:

```
Switch(config)# ipv6 mld profile 1
```

32.14 deny

Description

The **deny** command is used to configure the filtering mode of profile as deny.

Syntax

deny

Command Mode

Profile Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the filtering mode of profile 1 as deny:

```
Switch(config)# ipv6 mld profile 1
Switch(config-MLD-profile)#deny
```

32.15 permit

Description

The **permit** command is used to configure the filtering mode of profile as permit.

Syntax

permit

Command Mode

Profile Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the filtering mode of profile 1 as permit:

```
Switch(config)# ipv6 mld profile 1
Switch(config-igmp-profile)#permit
```

32.16 range

Description

The **range** command is used to configure the range of the profile's filtering multicast address. To delete the corresponding filtering multicast address, please use **no range** command. A profile contains 16 filtering IP-range entries at most.

Syntax

range *start-ip end-ip*

no range *start-ip end-ip*

Parameter

start-ip —— Start IPv6 multicast address of the filter entry..

end-ip —— End IPv6 multicast address of the filter entry.

Command Mode

Profile Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure one of the filter multicast address entry as range ff80::1234 to ff80::1235 in profile 1:

```
Switch(config)# ipv6 mld profile 1
Switch(config-igmp-profile)#range ff80::1234 ff80::1235
```

32.17 ipv6 mld filter

Description

The **ipv6 mld filter** command is used to bind the specified profile to the interface. To delete the binding, please use **no ipv6 mld filter** command.

Syntax

ipv6 mld filter *profile-id*

no ipv6 mld filter

Parameter

profile-id—— Specify the profile ID, ranging from 1 to 999.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Bind profile 1 to interface gigabitEthernet 1/0/2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# ipv6 mld filter 1
```

32.18 clear ipv6 mld snooping statistics

Description

The **clear ipv6 mld snooping statistics** command is used to clear the statistics of the MLD packets.

Syntax

clear ipv6 mld snooping statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear the statistics of the MLD packets:

```
Switch(config)# clear ipv6 mld snooping statistics
```

32.19 show ipv6 mld snooping

Description

The **show ipv6 mld snooping** command is used to display the global configuration of MLD Snooping.

Syntax

show ipv6 mld snooping

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of MLD Snooping:

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

32.20 show ipv6 mld snooping interface

Description

The **show ipv6 mld snooping interface** command is used to display the port configuration of MLD snooping.

Syntax

show ipv6 mld snooping interface [**gigabitEthernet** [*port* | *port-list*]] { basic-config | max-groups | packet-stat }

show ipv6 mld snooping interface [**port-channel** [*port-channel-list*]] { basic-config | max-groups }

Parameter

port —— The Ethernet port number.

port-list —— The list of Ethernet ports.

basic-config | max-groups | packet-stat —— The related configuration information selected to display.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the MLD baisic configuration configuration of all ports and port channels:

Switch# show ipv6 mld snooping interface basic-config

Display the MLD basic configuration of port 1/0/2:

Switch# show ipv6 mld snooping interface gigabitEthernet 1/0/2 basic-config

Display the MLD packet statistics of ports 1/0/1-4:

Switch# show ipv6 mld snooping interface gigabitEthernet 1/0/1-4 packet-stat

32.21 show ipv6 mld snooping vlan

Description

The **show ipv6 mld snooping vlan** command is used to display VLAN information of MLD Snooping.

Syntax

show ipv6 mld snooping vlan [*vlan-id*]

Parameter

vlan-id—— The VLAN ID selected to display, ranging from 1 to 4094.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display all of the VLAN information:

Switch(config)# show ipv6 mld snooping vlan

32.22 show ipv6 mld snooping groups

Description

The **show ipv6 mld snooping groups** command is used to display multicast groups.

Syntax

show ipv6 mld snooping groups [**vlan** { *vlan-id*}] [*ipv6_multicast_addr* | count | dynamic | dynamic count | static | static count]

Parameter

vlan-id——The VLAN ID selected to display the information of all multicast items.

ipv6_multicast_addr—— IPv6 address of the multicast group.

count—— The numbers of all multicast groups.

dynamic—— Display dynamic multicast groups.

dynamic count—— The numbers of all dynamic multicast groups.

static—— Display static multicast groups.

static count—— The numbers of all static multicast groups.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display all of the multicast groups:

```
Switch(config)# show ipv6 mld snooping groups
```

32.23 show ipv6 mld profile

Description

The **show ipv6 mld profile** command is used to display the configuration information of all the profiles or a specific profile.

Syntax

show ipv6 mld profile [*id*]

Parameter

id —— Specify the ID of the profile, ranging from 1 to 999.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration information of all profiles:

```
Switch(config)# show ipv6 mld profile
```

Chapter 33 MVR Commands

MVR (Multicast VLAN Registration) allows a single multicast VLAN to be shared for multicast member ports in different VLANs in IPv4 network. In IGMP Snooping, if member ports are in different VLANs, a copy of the multicast streams is sent to each VLAN that has member ports. While MVR provides a dedicated multicast VLAN to forward multicast traffic over the Layer 2 network, to avoid duplication of multicast streams for clients in different VLANs. Clients can dynamically join or leave the multicast VLAN without interfering with their relationships in other VLANs.

33.1 mvr (global)

Description

The **mvr** command is used to enable MVR globally. To disable MVR, please use **no mvr** command.

Syntax

mvr

no mvr

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable MVR globally:

```
Switch(config)# mvr
```

33.2 mvr group

Description

The **mvr group** command is used to add multicast groups to MVR. To delete multicast groups from MVR, please use **no mvr group** command. You can configure up to 511 multicast groups.

Syntax

mvr group *ip-addr* [*count*]

no mvr group *ip-addr* [*count*]

Parameter

ip-addr —— The start IP address of the contiguous series of multicast groups.

count —— The number of the multicast groups to be added to the MVR. Valid values are from 1 to 256, and the default value is 1.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add multicast groups 225.1.2.3 -239.1.2.5 to MVR:

Switch (config)# mvr group 225.1.2.3 3

33.3 mvr mode

Description

The **mvr mode** command is used to configure the MVR mode as compatible or dynamic. By default, it is compatible. To return to the default configuration, please use **no mvr mode** command.

Syntax

mvr mode { compatible | dynamic **}**

no mvr mode

Parameter

compatible —— In this mode, the switch does not forward report or leave messages from the hosts to the IGMP querier. So the IGMP querier cannot learn the multicast groups membership information from the switch. You have to statically configure the IGMP querier to transmit all the required multicast streams to the switch via the multicast VLAN.

dynamic —— In this mode, after receiving report or leave messages from the hosts, the switch will forward them to the IGMP querier via the multicast VLAN (with appropriate translation of the VLAN ID). So the IGMP querier can learn the multicast groups membership information through the report and leave messages, and transmit the multicast streams to the switch via the multicast VLAN according to the multicast forwarding table.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MVR mode as dynamic:

```
Switch(config)# mvr mode dynamic
```

33.4 mvr querytime

Description

The **mvr querytime** command is used to configure the maximum time to wait for IGMP report on a receiver port before removing the port from multicast group membership. To return to the default configuration, please use **no mvr querytime** command.

Syntax

mvr querytime *time*

no mvr querytime

Parameter

time —— The query response time. Valid values are from 1 to100 tenths of a second, and the default value is 5 tenths of a second.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the query response time of MVR as 1 second, that is 10 tenths of a second:

```
Switch(config)# mvr querytime 10
```

33.5 mvr vlan

Description

The **mvr vlan** command is used to specify the multicast VLAN. By default, it is VLAN 1. To return to the default configuration, please use **no mvr vlan** command.

Syntax

mvr vlan *vlan-id*

no mvr vlan

Parameter

vlan-id—— The ID of the multicast VLAN. Valid values are from 1 to 4094.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the multicast VLAN as VLAN 10:

```
Switch(config)# mvr vlan 10
```

33.6 mvr (interface)

Description

This command is used to enable MVR for specific interfaces. To disable MVR for the interfaces, please use **no mvr** command. By default, it is disabled.

Syntax

mvr

no mvr

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable MVR for port 1/0/1:

```
Switch(config)# interface gigabitEthernet 1/0/1
Switch(config-if)#mvr
```

33.7 mvr type

Description

The **mvr type** command is used to configure the MVR port type as receiver or source. By default, the port is a non-MVR port. If you attempt to configure a non-MVR port with MVR characteristics, the operation fails. To return to the default configuration, please use **no mvr type** command.

Syntax

mvr type { source | receiver **}**

no mvr type

Parameter

source —— Configure the uplink ports that receive and send multicast data on the multicast VLAN as source ports. Source ports should belong to the multicast VLAN.

receiver —— Configure the ports that are connecting to the hosts as receiver ports. A receiver port can only belong to one VLAN, and cannot belong to the multicast VLAN.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the port 1/0/3 as a receiver port:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)#mvr type receiver
```

33.8 mvr immediate

Description

The **mvr immediate** command is used to enable the Fast Leave feature of MVR for specified port. To disable the Fast Leave feature of MVR for specific ports, please use **no mvr immediate** command.

Syntax

mvr immediate

no mvr immediate

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

Only receiver ports support Fast Leave. Before enabling Fast Leave for a port, make sure there is only a single receiver device connecting to the port.

Example

Enable the Fast Leave feature of MVR for port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)#mvr immediate
```

33.9 mvr vlan (group)

Description

This command is used to statically add ports to an MVR group. Then the ports can receive multicast traffic sent to the IP multicast address via the multicast VLAN.

Syntax

mvr vlan *vlan-id* **group** *ip-addr*

Parameter

vlan-id—— The ID of the multicast VLAN. Valid values are from 1 to 4094.

ip-addr—— The IP address of the multicast group.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

This command applies to only receiver ports. The switch adds or removes the receiver ports to the corresponding multicast groups by snooping the report and leave messages from the hosts. You can also statically add a receiver port to an MVR group.

Example

Add port 1/0/3 to MVR group 225.1.2.3 statically. The multicast VLAN is VLAN 10:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)#mvr vlan 10 group 225.1.2.3
```

33.10 mvr vlan (rule)

Description

This command is used to change the VLAN of the receiver port, which will remove the receiver port from the original VLAN..

Syntax

mvr vlan *vlan-id* **rule** [*untagged*|*tagged*]

Parameter

vlan-id—— New VLAN ID, ranging from 1 to 4094.

untagged—— Add a new VLAN in the untagged way.

tagged—— Add a new VLAN in the tagged way.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Change the VLAN of port 1/0/3 to 100 in the untagged way:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)#mvr vlan 100 rule untagged
```

33.11 mvr mode dynamic auto-enable

Description

The **mvr mode dynamic auto-enable** command is used to enable automatic addition of source ports to all multicast groups. To disable this function, please use **no mvr mode dynamic auto-enable** command.

Syntax

mvr mode dynamic auto-enable

no mvr mode dynamic auto-enable

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable automatic addition of source ports to all multicast groups:

```
Switch(config)#mvr mode dynamic auto-enable
```

33.12 show mvr

Description

The **show mvr** command is used to display the global configuration of MVR.

Syntax

show mvr

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of mvr:

```
Switch# show mvr
```

33.13 show mvr interface

Description

The **show mvr interface** command is used to display the MVR configurations of specific interfaces.

Syntax

show mvr interface gigabitEthernet [*port* | *port-list*]

Parameter

port——The Ethernet port number.

port-list—— The list of Ethernet ports.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the MVR configuration of port 1/0/3:

```
Switch# show mvr interface gigabitEthernet 1/0/3
```

33.14 show mvr members

Description

The **show mvr members** command is used to display the membership information of all MVR groups or the specified MVR group.

Syntax

show mvr members [*ip-addr*] [**status** active | inactive]

Parameter

ip-addr——The multicast IP address of the MVR group.

active—— Display all active MVR groups.

inactive——Display all inactive MVR groups.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the membership information of all MVR groups:

```
Switch# show mvr members
```

Chapter 34 MSTP Commands

MSTP (Multiple Spanning Tree Protocol), compatible with both STP and RSTP and subject to IEEE 802.1s, can disbranch a ring network. STP is to block redundant links and backup links as well as optimize paths.

34.1 debug spanning-tree

Description

The **debug spanning-tree** command is used to enable debugging of spanning-tree activities. To disable the debugging function, please use **no debug spanning-tree** command.

Syntax

debug spanning-tree { all | bpdu receive | bpdu transmit | cmpmsg | errors | flush | init | migration | proposals | roles | state | tc }

no debug spanning-tree { all | bpdu receive | bpdu transmit | cmpmsg | errors | flush | init | migration | proposals | roles | state | tc }

Parameters

all —— Display all the spanning-tree debug messages.

bpdu receive —— Display the debug messages of the received spanning-tree bridge protocol data unit (BPDU).

bpdu transmit —— Display the debug messages of the sent spanning-tree BPDU.

cmpmsg —— Display the message priority debug messages.

errors —— Display the MSTP error debug messages.

flush —— Display the address table flushing debug messages.

init —— Display the data structure initialization debug messages.

migration —— Display the version migration debug messages.

proposals —— Display the MSTP handshake debug messages.

roles —— Display the MSTP interface role switchling debug messages.

state —— Display the MSTP interface state change debug messages.

tc —— Display the MSTP topology event debug messages.

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display all the spanning-tree debug messages:

```
Switch# debug spanning-tree all
```

34.2 spanning-tree (global)

Description

The **spanning-tree** command is used to enable STP function globally. To disable the STP function, please use **no spanning-tree** command.

Syntax

spanning-tree

no spanning-tree

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the STP function:

```
Switch(config)# spanning-tree
```

34.3 spanning-tree (interface)

Description

The **spanning-tree** command is used to enable STP function for a port. To disable the STP function, please use **no spanning-tree** command.

Syntax

spanning-tree

no spanning-tree

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the STP function for port 1/0/2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# spanning-tree
```

34.4 spanning-tree common-config

Description

The **spanning-tree common-config** command is used to configure the parameters of the ports for comparison in the CIST and the common parameters of all instances. To return to the default configuration, please use **no spanning-tree common-config** command. CIST (Common and Internal Spanning Tree) is the spanning tree in a switched network, connecting all devices in the network.

Syntax

spanning-tree common-config [**port-priority** *pri*] [**ext-cost** *ext-cost*] [**int-cost** *int-cost*] [**portfast** { enable | disable }] [**point-to-point** { auto | open | close }]

no spanning-tree common-config

Parameter

pri—— Port Priority, which must be multiple of 16 ranging from 0 to 240. By default, the port priority is 128. Port Priority is an important criterion on determining if the port connected to this port will be chosen as the root port. In the same condition, the port with the highest priority will be chosen as the root port. The lower value has the higher priority.

ext-cost—— External Path Cost, which is used to choose the path and calculate the path costs of ports in different MST regions. It is an important criterion on determining the root port. The lower value has the higher priority. It ranges from o to 2000000. By default, it is 0 which is mean auto.

int-cost—— Internal Path Cost, which is used to choose the path and calculate the path costs of ports in an MST region. It is an important criterion on determining the root port. The lower value has the higher priority. By

default, it is automatic. It ranges from o to 2000000. By default, it is 0 which is mean auto.

portfast —— Enable/ Disable Edge Port. By default, it is disabled. The edge port can transit its state from blocking to forwarding rapidly without waiting for forward delay.

point-to-point —— The P2P link status, with auto, open and close options. By default, the option is auto. If the two ports in the P2P link are root port or designated port, they can transit their states to forwarding rapidly to reduce the unnecessary forward delay.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the STP function of port 1, and configure the Port Priority as 64, ExtPath Cost as 100, IntPath Cost as 100, and then enable Edge Port:

Switch(config)# interface gigabitEthernet 1/0/1

Switch(config-if)# spanning-tree common-config port-priority 64 **ext-cost** 100 **int-cost** 100 **portfast** enable **point-to-point** open

34.5 spanning-tree mode

Description

The **spanning-tree mode** command is used to configure the STP mode of the switch. To return to the default configurations, please use **no spanning-tree mode** command.

Syntax

spanning-tree mode { stp | rstp | mstp }

no spanning-tree mode

Parameter

stp ——Spanning Tree Protocol, the default value.

rstp ——Rapid Spanning Tree Protocol

mstp ——Multiple Spanning Tree Protocol

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the spanning-tree mode as mstp:

```
Switch(config)# spanning-tree mode mstp
```

34.6 spanning-tree mst configuration

Description

The **spanning-tree mst configuration** command is used to access MST Configuration Mode from Global Configuration Mode, as to configure the VLAN-Instance mapping, region name and revision level. To return to the default configuration of the corresponding Instance, please use **no spanning-tree mst configuration** command.

Syntax

spanning-tree mst configuration

no spanning-tree mst configuration

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enter into the MST configuration mode:

```
Switch(config)# spanning-tree mst configuration
Switch(Config-mst)#
```

34.7 instance

Description

The **instance** command is used to configure the VLAN-Instance mapping. To remove the VLAN-instance mapping or disable the corresponding instance, please use **no instance** command. When an instance is disabled, the related mapping VLANs will be removed.

Syntax

instance *instance-id* **vlan** *vlan-id*

no instance *instance-id* [**vlan** *vlan-id*]

Parameters

instance-id—— Instance ID, ranging from 1 to 8.

vlan-id—— The VLAN ID selected to mapping with the corresponding instance.

Command Mode

MST Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Map the VLANs 1-100 to Instance 1:

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# instance 1 vlan 1-100
```

Disable Instance 1, namely remove all the mapping VLANs 1-100:

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# no instance 1
```

Remove VLANs 1-50 in mapping VLANs 1-100 for Instance 1:

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# no instance 1 vlan 1-50
```

34.8 name

Description

The **name** command is used to configure the region name of MST instance.

Syntax

name *name*

Parameters

name —— The region name, used to identify MST region. It ranges from 1 to 32 characters.

Command Mode

MST Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the region name of MST as "region1":

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# name region1
```

34.9 revision

Description

The **revision** command is used to configure the revision level of MST instance.

Syntax

revision *revision*

Parameters

revision —— The revision level for MST region identification, ranging from 0 to 65535.

Command Mode

MST Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the revision level of MST as 100:

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# revision 100
```

34.10 spanning-tree mst instance

Description

The **spanning-tree mst instance** command is used to configure the priority of MST instance. To return to the default value of MST instance priority, please use **no spanning-tree mst instance** command.

Syntax

spanning-tree mst instance *instance-id* **priority** *pri*

no spanning-tree mst instance *instance-id* **priority**

Parameter

instance-id—— Instance ID, ranging from 1 to 8.

pri—— MSTI Priority, which must be multiple of 4096 ranging from 0 to 61440. By default, it is 32768. MSTI priority is an important criterion on determining if the switch will be chosen as the root bridge in the specific instance.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the MST Instance 1 and configure its priority as 4096:

```
Switch(config)# spanning-tree mst instance 1 priority 4096
```

34.11 spanning-tree mst

Description

The **spanning-tree mst** command is used to configure MST Instance Port. To return to the default configuration of the corresponding Instance Port, please use **no spanning-tree mst** command. A port can play different roles in different spanning tree instance. You can use this command to configure the parameters of the ports in different instance IDs as well as view status of the ports in the specified instance.

Syntax

spanning-tree mst instance *instance-id* {[**port-priority** *pri*] | [**cost** *cost*]}

no spanning-tree mst instance *instance-id*

Parameter

instance-id—— Instance ID, ranging from 1 to 8.

pri—— Port Priority, which must be multiple of 16 ranging from 0 to 240. By default, it is 128. Port Priority is an important criterion on determining if the port will be chosen as the root port by the device connected to this port.

cost—— Path Cost, ranging from 0 to 200000. The lower value has the higher priority. Its default value is 0 meaning "auto".

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the priority of port 1 in MST Instance 1 as 64, and path cost as 2000:

```
Switch(config)# interface gigabitEthernet 1/0/1
Switch(config-if)# spanning-tree mst instance 1 port-priority 64 cost 2000
```

34.12 spanning-tree priority

Description

The **spanning-tree priority** command is used to configure the bridge priority. To return to the default value of bridge priority, please use **no spanning-tree priority** command.

Syntax

spanning-tree priority *pri*

no spanning-tree priority

Parameter

pri—— Bridge priority, ranging from 0 to 61440. It is 32768 by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the bridge priority as 4096:

```
Switch(config)# spanning-tree priority 4096
```

34.13 spanning-tree timer

Description

The **spanning-tree timer** command is used to configure forward-time, hello-time and max-age of Spanning Tree. To return to the default configurations, please use **no spanning-tree timer** command.

Syntax

spanning-tree timer {[**forward-time** *forward-time*] [**hello-time** *hello-time*] [**max-age** *max-age*]}

no spanning-tree timer

Parameter

forward-time —— Forward Delay, which is the time for the port to transit its state after the network topology is changed. Forward Delay ranges from 4 to 30 in seconds and it is 15 by default. Otherwise, 2 * (Forward Delay - 1) >= Max Age.

hello-time ——Hello Time, which is the interval to send BPDU packets, and used to test the links. Hello Time ranges from 1 to 10 in seconds and it is 2 by default. Otherwise, 2 * (Hello Time + 1) <= Max Age.

max-age —— The maximum time the switch can wait without receiving a BPDU before attempting to reconfigure, ranging from 6 to 40 in seconds. By default, it is 20.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure forward-time, hello-time and max-age for Spanning Tree as 16 seconds, 3 seconds and 22 seconds respectively:

Switch(config)# spanning-tree timer forward-time 16 **hello-time** 3 **max-age** 22

34.14 spanning-tree hold-count

Description

The **spanning-tree hold-count** command is used to configure the maximum number of BPDU packets transmitted per Hello Time interval. To return to the default configurations, please use **no spanning-tree hold-count** command.

Syntax

spanning-tree hold-count *value*

no spanning-tree hold-count

Parameter

value —— The maximum number of BPDU packets transmitted per Hello Time interval, ranging from 1 to 20 in pps. By default, it is 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the hold-count of STP as 8pps:

Switch(config)# spanning-tree hold-count 8

34.15 spanning-tree max-hops

Description

The **spanning-tree max-hops** command is used to configure the maximum number of hops that occur in a specific region before the BPDU is discarded. To return to the default configurations, please use **no spanning-tree max-hops** command.

Syntax

spanning-tree max-hops *value*

no spanning-tree max-hops

Parameter

value —— The maximum number of hops that occur in a specific region before the BPDU is discarded, ranging from 1 to 40 in hop. By default, it is 20.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the max-hops of STP as 30:

Switch(config)# spanning-tree max-hops 30

34.16 spanning-tree bpdufilter

Description

The **spanning-tree bpdufilter** command is used to enable the BPDU filter function for a port. With the BPDU Filter function enabled, the port does not forward BPDUs from the other switches. To disable the BPDU filter function, please use **no spanning-tree bpdufilter** command.

Syntax

spanning-tree bpdufilter

no spanning-tree bpdufilter

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the BPDU filter function for port 1/0/2:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# spanning-tree bpdufilter

34.17 spanning-tree bpduflood

Description

The **spanning-tree bpduflood** command is used to enable the BPDU forward function for a port. With the function enabled, the port still can forward spanning tree BPDUs when the spanning tree function is disabled on this port. To disable the BPDU filter function, please use **no spanning-tree bpduflood** command.

Syntax

spanning-tree bpduflood

no spanning-tree bpduflood

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the BPDU forward function for port 1/0/2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# spanning-tree bpduflood
```

34.18 spanning-tree bpduguard

Description

The **spanning-tree bpduguard** command is used to enable the BPDU protect function for a port. With the BPDU protect function enabled, the port will set itself automatically as ERROR-PORT when it receives BPDU packets, and the port will disable the forwarding function for a while. To disable the BPDU protect function, please use **no spanning-tree bpduguard** command.

Syntax

spanning-tree bpduguard

no spanning-tree bpduguard

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the BPDU protect function for port 1/0/2:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# spanning-tree bpduguard

34.19 spanning-tree guard loop

Description

The **spanning-tree guard loop** command is used to enable the Loop Protect function for a port. Loop Protect is to prevent the loops in the network brought by recalculating STP because of link failures and network congestions. To disable the Loop Protect function, please use **no spanning-tree guard loop** command.

Syntax

spanning-tree guard loop

no spanning-tree guard loop

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the Loop Protect function for port 2:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# spanning-tree guard loop

34.20 spanning-tree guard root

Description

The **spanning-tree guard root** command is used to enable the Root Protect function for a port. With the Root Protect function enabled, the root bridge will set itself automatically as ERROR-PORT when receiving BPDU packets with higher priority, in order to maintain the role of root ridge. To disable the Root Protect function, please use **no spanning-tree guard root** command.

Syntax

spanning-tree guard root

no spanning-tree guard root

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the Root Protect function for port 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# spanning-tree guard root
```

34.21 spanning-tree guard tc

Description

The **spanning-tree guard tc** command is used to enable the TC Protect of Spanning Tree function for a port. To disable the TC Protect of Spanning Tree function, please use **no spanning-tree guard tc** command. A switch removes MAC address entries upon receiving TC-BPDUs. If a malicious user continuously sends TC-BPDUs to a switch, the switch will be busy with removing MAC address entries, which may decrease the performance and stability of the network. With the Protect of Spanning Tree function enabled, you can configure the number of TC-BPDUs in a required time, so as to avoid the process of removing MAC addresses frequently.

Syntax

spanning-tree guard tc

no spanning-tree guard tc

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the TC Protect of Spanning Tree for port 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# spanning-tree guard tc
```

34.22 spanning-tree mcheck

Description

The **spanning-tree mcheck** command is used to enable mcheck.

Syntax

spanning-tree mcheck

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable mcheck for port 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# spanning-tree mcheck
```

34.23 show spanning-tree active

Description

The **show spanning-tree active** command is used to display the active information of spanning-tree.

Syntax

show spanning-tree active

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the active information of spanning-tree:

```
Switch(config)# show spanning-tree active
```

34.24 show spanning-tree bridge

Description

The **show spanning-tree bridge** command is used to display the bridge parameters.

Syntax

show spanning-tree bridge [forward-time | hello-time | hold-count | max-age | max-hops | mode | priority | state]

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the bridge parameters:

```
Switch(config)# show spanning-tree bridge
```

34.25 show spanning-tree interface

Description

The **show spanning-tree interface** command is used to display the spanning-tree information of all ports or a specified port.

Syntax

show spanning-tree interface [**gigabitEthernet** *port* | **port-channel** *port-channel-id*] [edge | ext-cost | int-cost | mode | p2p | priority | role | state | status]

Parameter

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the spanning-tree information of all ports:

Switch(config)# show spanning-tree interface

Display the spanning-tree information of port 1/0/2:

Switch(config)# show spanning-tree interface gigabitEthernet 1/0/2

Display the spanning-tree mode information of port 1/0/2:

Switch(config)# show spanning-tree interface gigabitEthernet 1/0/2 mode

34.26 show spanning-tree interface-security

Description

The **show spanning-tree interface-security** command is used to display the protect information of all ports or a specified port.

Syntax

show spanning-tree interface-security [**gigabitEthernet** *port* | **port-channel** *port-channel-id*] [bpdufilter | bpduflood | bpduguard | loop | root | tc]

Parameter

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the protect information of all ports:

```
Switch(config)# show spanning-tree interface-security
```

Display the protect information of port 1:

```
Switch(config)# show spanning-tree interface-security gigabitEthernet
1/0/1
```

Display the interface security bpdufilter information:

```
Switch(config)# show spanning-tree interface-security bpdufilter
```

34.27 show spanning-tree mst

Description

The **show spanning-tree mst** command is used to display the related information of MST Instance.

Syntax

show spanning-tree mst { **configuration** [**digest**] | **instance** *instance-id* [**interface** [**gigabitEthernet** *port* | **port-channel** *port-channel-id*]] }

Parameter

instance-id—— Instance ID desired to show, ranging from 1 to 8.

port—— The Ethernet port number.

port-channel-id—— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the region information and mapping information of VLAN and MST Instance:

```
Switch(config)#show spanning-tree mst configuration
```

Display the related information of MST Instance 1:

Switch(config)#show spanning-tree mst instance 1

Display all the ports information of MST Instance 1:

Switch(config)#show spanning-tree mst instance 1 **interface**

Chapter 35 Debug Commands

35.1 debug tppacket packet-print (only for certain devices)

Description

The **debug tppacket packet-print** command is used to enable the message printing function, which will only happen on the serial port and will affect switch performance. To disable this function, please use **no debug tppacket packet-print** command.

Syntax

debug tppacket packet-print

no tppacket packet-print

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

This command may cause network connections to be interrupted and some functions may not work properly, so please don't open it at will.

Example

Enable the message printing function:

```
Switch# debug tppacket packet-print
```

35.2 debug spanning-tree

Description

The **debug spanning-tree** command is used to enable debugging of spanning-tree activities. To disable the debugging function, please use **no debug spanning-tree** command.

Syntax

debug spanning-tree { all | bpdu receive | bpdu transmit | cmpmsg | errors | flush | init | migration | proposals | roles | state | tc }

no debug spanning-tree { all | bpdu receive | bpdu transmit | cmpmsg | errors | flush | init | migration | proposals | roles | state | tc }

Parameters

all —— Display all the spanning-tree debug messages.

bpdu receive —— Display the debug messages of the received spanning-tree bridge protocol data unit (BPDU).

bpdu transmit —— Display the debug messages of the sent spanning-tree BPDU.

cmpmsg —— Display the message priority debug messages.

errors —— Display the MSTP error debug messages.

flush —— Display the address table flushing debug messages.

init —— Display the data structure initialization debug messages.

migration —— Display the version migration debug messages.

proposals —— Display the MSTP handshake debug messages.

roles —— Display the MSTP interface role switchling debug messages.

state —— Display the MSTP interface state change debug messages.

tc —— Display the MSTP topology event debug messages.

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display all the spanning-tree debug messages:

```
Switch# debug spanning-tree all
```

Chapter 36 LLDP Commands

LLDP function enables network devices to advertise their own device information periodically to neighbors on the same LAN. The information of the LLDP devices in the LAN can be stored by its neighbor in a standard MIB, so it is possible for the information to be accessed by a Network Management System (NMS) using SNMP.

36.1 lldp

Description

The **lldp** command is used to enable LLDP function. To disable the LLDP function, please use **no lldp** command.

Syntax

lldp

no lldp

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable LLDP function globally:

```
Switch(config)#lldp
```

36.2 lldp forward_message

Description

The **lldp forward_message** command is used to enable the switch to forward LLDP messages when LLDP function is disabled. To disable the LLDP messages forwarding function, please use **no lldp forward_message** command.

Syntax

lldp forward_message

no lldp forward_message

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the switch to forward LLDP messages when LLDP function is disabled globally:

Switch(config)#lldp forward_message

36.3 lldp hold-multiplier

Description

The **lldp hold-multiplier** command is used to configure the Hold Multiplier parameter. The aging time of the local information in the neighbor device is determined by the actual TTL value used in the sending LLDPDU. TTL = Hold Multiplier * Transmit Interval. To return to the default configuration, please use **no lldp hold-multiplier** command.

Syntax

lldp hold-multiplier *multiplier*

no lldp hold-multiplier

Parameter

multiplier —— Configure the Hold Multiplier parameter. It ranges from 2 to 10. By default, it is 4.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify Hold Multiplier as 5:

Switch(config)#lldp hold-multiplier 5

36.4 lldp timer

Description

The **lldp timer** command is used to configure the parameters about transmission. To return to the default configuration, please use **no lldp timer** command.

Syntax

lldp timer { **tx-interval** *tx-interval* /**tx-delay** *tx-delay* /**reinit-delay** *reinit-delay* /**notify-interval** *notify-interval* /**fast-count** *fast-count* }

no lldp timer { tx-interval | tx-delay | reinit-delay | notify-interval | fast-count }

Parameter

tx-interval—— Configure the interval for the local device to transmit LLDPDU to its neighbors. The value ranges from 5 to 32768 and the default value is 30 seconds.

tx-delay—— Configure a value from 1 to 8192 in seconds to specify the time for the local device to transmit LLDPDU to its neighbors after changes occur so as to prevent LLDPDU being sent frequently. By default, it is 2 seconds.

reinit-delay—— This parameter indicates the amount of delay from when LLDP status becomes "disable" until re-initialization will be attempted. The value ranges from 1 to 10 and the default value is 2.

notify-interval—— Specify the interval of Trap message which will be sent from local device to network management system. The value ranges from 5 to 3600 and the default value is 5 seconds.

fast-count—— When the port's LLDP state transforms from Disable (or Rx_Only) to Tx&Rx (or Tx_Only), the fast start mechanism will be enabled, that is, the transmit interval will be shorten to a second, and several LLDPDUs will be sent out (the number of LLDPDUs equals this parameter). The value ranges from 1 to 10 and the default value is 3.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the Transmit Interval of LLDPDU as 45 seconds and Trap message to NMS as 120 seconds:

```
Switch(config)#lldp timer tx-interval 45
Switch(config)#lldp timer notify-interval 120
```

36.5 lldp receive

Description

The **lldp receive** command is used to enable the designated port to receive LLDPDU. To disable the function, please use **no lldp receive** command.

Syntax

lldp receive

no lldp receive

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable port 1/0/1 to receive LLDPDU:

```
Switch(config)#interface gigabitEthernet 1/0/1
Switch(config-if)#lldp receive
```

36.6 lldp transmit

Description

The **lldp transmit** command is used to enable the designated port to transmit LLDPDU. To disable the function, please use **no lldp transmit** command.

Syntax

lldp transmit

no lldp transmit

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable Gigabit Ethernet port 1/0/1 to transmit LLDPDU:

Switch(config)# interface gigabitEthernet 1/0/1

Switch(config-if)#lldp transmit

36.7 lldp snmp-trap

Description

The **lldp snmp-trap** command is used to enable the port's SNMP notification. If enabled, the port will notify the trap event to network management system.

To disable the ports' SNMP notification, please use **no lldp snmp-trap** command.

Syntax

lldp snmp-trap

no lldp snmp-trap

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the SNMP notification for Gigabit Ethernet port 1/0/1:

Switch(config)#interface gigabitEthernet 1/0/1

Switch(config-if)#lldp snmp-trap

36.8 lldp tlv-select

Description

The **lldp tlv-select** command is used to configure TLVs to be included in outgoing LLDPDU. To exclude TLVs, please use **no lldp tlv-select** command. By default, All TLVs are included in outgoing LLDPDU.

Syntax

lldp tlv-select { [port-description] [system-capability] [system-description] [system-name] [management-address] [port-vlan] [protocol-vlan] [vlan-name] [link-aggregation] [mac-phy-cfg] [max-frame-size] [power] [all] }

no lldp tlv-select { [port-description] [system-capability] [system-description] [system-name] [management-address] [port-vlan] [protocol-vlan] [vlan-name] [link-aggregation] [mac-phy-cfg] [max-frame-size] [power] [all] }

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Exclude “management-address” and “port-vlan-id” TLVs in LLDPDU outgoing from Gigabit Ethernet port 1/0/1:

```
Switch(config)# interface gigabitEthernet 1/0/1
Switch(config-if)# no lldp tlv-select management-address port-vlan
```

36.9 lldp management-address

Description

The **lldp management-address** command is used to configure the port‘s management address to be included in management address TLV. The NMS uses management addresses to identify the devices. To delete the port‘s management address, please use **no lldp management address** command.

Syntax

lldp management-address { *ip-address* }

no lldp management-address

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the port's management address as 192.168.1.100 for port 1/0/1:

Switch(config)# interface gigabitEthernet 1/0/1

Switch(config-if)# lldp management-address 192.168.0.100

36.10 lldp med-fast-count

Description

The **lldp med-fast-count** command is used to configure the number of the LLDP-MED frames that will be sent out. When LLDP-MED fast start mechanism is activated, multiple LLDP-MED frames will be transmitted based on this parameter. The default value is 4. To return to the default configuration, please use **no lldp med-fast-count** command.

Syntax

lldp med-fast-count *count*

no lldp med-fast-count

Parameter

count—— Configure the Fast Start Count parameter. It ranges from 1 to 10. By default, it is 4.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Specify Fast Start Count as 5:

```
Switch(config)# lldp med-fast-count 5
```

36.11 lldp med-status

Description

The **lldp med-status** command is used to enable the LLDP-MED feature for the corresponding port. After the LLDP-MED feature is enabled, the port's Admin Status will be changed to Tx&Rx. To disable the LLDP-MED feature for the corresponding port, please use **no lldp med-status** command.

Syntax

lldp med-status

no lldp med-status

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the LLDP-MED feature for port 1/0/2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# lldp med-status
```

36.12 lldp med-tlv-select

Description

The **lldp med-tlv-select** command is used to configure LLDP-MED TLVs to be included in outgoing LLDPDU for the corresponding port. To exclude LLDP-MED TLVs, please use **no lldp med-tlv-select** command. By default, All TLVs are included in outgoing LLDPDU.

Syntax

lldp med-tlv-select { [inventory-management] [location] [network-policy] [power-management] [all] }

no lldp med-tlv-select { [inventory-management] [location] [network-policy] [power-management] [all] }

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Exclude "network policy" and "inventory" TLVs in LLDPDU outgoing from port 1/0/2:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# no lldp med-tlv-select network-policy inventory-management

36.13 lldp med-location

Description

The lldp med-location command is used to configure the Location Identification TLV's content in outgoing LLDPDU of the port.

Syntax

lldp med-location { **emergency-number** *identifier* | **civic-address** [[language *language*] [province-state *province-state*] [lci-county-name *county-name*] [lci-city *city*] [street *street*] [house-number *house-number*] [name *name*] [postal-zipcode *postal-zipcode*] [room-number *room-number*] [post-office-box *post-office-box*] [additional *additional*] [country-code *country-code*] [what { dhcp-server | endpoint | switch }]] }

Parameter

emergency-number —— Emergency Call Service ELIN identifier, which is used during emergency call setup to a traditional CAMA or ISDN trunk-based PSAP. The length of this field ranges from 10 to 25 characters.

civic-address —— The civic address is defined to reuse the relevant sub-fields of the DHCP option for civic Address based Location Configuration Information as specified by IETF.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the civic address in the Location Identification TLV's content in outgoing LLDPDU of port 1/0/2. Configure the language as English and city as London:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# lldp med-location civic-address language English lci-city London

36.14 show lldp

Description

The **show lldp** command is used to display the global configuration of LLDP.

Syntax

show lldp

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of LLDP:

Switch#show lldp

36.15 show lldp interface

Description

The **show lldp interface** command is used to display LLDP configuration of the corresponding port. By default, the LLDP configuration of all the ports will be displayed.

Syntax

show lldp interface [**gigabitEthernet** *port*]

Parameters

port—— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the LLDP configuration of Gigabit Ethernet port 1/0/1:

Switch#show lldp interface gigabitEthernet 1/0/1

36.16 show lldp local-information interface

Description

The **show lldp local-information interface** command is used to display the LLDP information of the corresponding port. By default, the LLDP information of all the ports will be displayed.

Syntax

show lldp local-information interface [**gigabitEthernet** *port*]

Parameters

port—— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the LLDP information of 1/0/1:

Switch#show lldp local-information interface gigabitEthernet 1/0/1

36.17 show lldp neighbor-information interface

Description

The **show lldp neighbor-information interface** command is used to display the neighbor information of the corresponding port. By default, the neighbor information of all the ports will be displayed.

Syntax

show lldp neighbor-information interface [**gigabitEthernet** *port*]

Parameters

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the neighbor information of Gigabit Ethernet port 1/0/1:

Switch#show lldp neighbor-information interface gigabitEthernet 1/0/1

36.18 show lldp traffic interface

Description

The **show lldp traffic interface** command is used to display the LLDP statistic information between the local device and neighbor device of the corresponding port. By default, the LLDP statistic information of all the ports will be displayed.

Syntax

show lldp traffic interface [**gigabitEthernet** *port*]

Parameters

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the LLDP statistic information of Gigabit Ethernet port 1/0/1:

```
Switch#show lldp traffic interface gigabitEthernet 1/0/1
```

Chapter 37 L2PT Commands (Only for Certain Devices)

Note: L2PT commands are only available on certain devices.

L2PT (Layer 2 Protocol Tunneling) is a feature for service providers to transmit packets from different customers across their ISP networks and maintain Layer 2 protocol configurations of each customer. The supported Layer 2 protocols are STP (Spanning Tree Protocol), GVRP (GARP VLAN Registration Protocol), CDP (Cisco Discovery Protocol), VTP (VLAN Trunking Protocol), PAgP (Port Aggregation Protocol), UDLD (UniDirectional Link Detection) and PVST+(Per VLAN Spanning Tree Plus).

37.1 l2protocol-tunnel

Description

The **l2protocol-tunnel** command is used to enable the layer 2 protocol tunneling (L2PT) function globally. To disable the L2PT function, please use **no l2protocol-tunnel** command.

Syntax

l2protocol-tunnel

no l2protocol-tunnel

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the L2PT function globally:

```
Switch(config)# l2protocol-tunnel
```

37.2 l2protocol-tunnel type

Description

The **l2protocol-tunnel type** command is used to configure the L2PT function on a specified port. To disable the L2PT function on the specified port, please use **no l2protocol-tunnel** command.

Syntax

l2protocol-tunnel type nni

l2protocol-tunnel type uni { 01000ccccccc | 01000ccccccd | gvrp | stp | lacp | all } [**threshold** *threshold*]

no l2protocol-tunnel

Parameter

nni —— Specify the port type according to its connecting device in the network. Specify the port's type as NNI if it is connecting to the ISP network.

uni —— Specify the port type according to its connecting device in the network. Specify the port's type as UNI if it is connecting to the user's local network.

01000ccccccc | 01000ccccccd | gvrp | stp | lacp | all —— Select the supported Layer 2 protocol type. Packets of the specified protocol will be encapsulated with their destination MAC address before they are sent to the ISP network. Packets will be decapsulated to restore their Layer 2 protocol and MAC address information before they are sent to the customer network.

- 01000ccccccc: Enable protocol tunneling for the packets with destination MAC address 01-00-0C-CC-CC-CC. 01-00-0CC-CC-CC-CC is used as the destination MAC address of the CDP/VTP/PAgP/UDLD packets.
- 01000ccccccd: Enable protocol tunneling for the packets with destination MAC address 01-00-0C-CC-CC-CD. 01-00-0CC-CC-CC-CD is used as the destination MAC address of Cisco PVST+ BPDUs.
- gvrp: Enable protocol tunneling for the GVRP packets.
- stp: Enable protocol tunneling for the STP packets.
- lacp: Enable protocol tunneling for the LACP packets.
- all: All the above Layer 2 protocols are supported for tunneling.

- threshold ——Configure the threshold for packets-per-second accepted for encapsulation. Packets beyond the threshold will be dropped. It ranges from 0 to 1000.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure port 1/0/3 as a UNI port for STP packets with the threshold as 1000 packets/second:

```
Switch(config)#interface gigabitEthernet 1/0/3
Switch(config-if)# l2protocol-tunnel type uni stp threshold 1000
```

37.3 show l2protocol-tunnel global

Description

The **show l2protocol-tunnel global** command is used to display the global L2PT status.

Syntax

show l2protocol-tunnel global

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global L2PT status:

```
Switch(config)# show l2protocol-tunnel global
```

37.4 show l2protocol-tunnel interface

Description

The **show l2protocol-tunnel interface** command is used to display the L2PT configuration information of a specified Ethernet port or of all Ethernet ports.

Syntax

show l2protocol-tunnel interface [**gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The port number.
port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the L2PT configuration information of Gigabit Ethernet port 1/0/1:

```
Switch(config)#show l2protocol-tunnel interface gigabitEthernet 1/0/1
```

Display the L2PT configuration information of all Ethernet ports:

```
Switch(config)#show l2protocol-tunnel interface
```

37.5 l2protocol-tunnel dst-mac

Description

The **l2protocol-tunnel dst-mac** command is used to customize the dst-mac, which can come from the destination mac address of messages after l2pt encapsulation. To restore the dst-mac to default, please use the **no l2protocol-tunnel dst-mac** command.

Syntax

l2protocol-tunnel dst-mac *mac-addr*

no l2protocol-tunnel dst-mac *mac-addr*

Parameter

mac-addr—— specify a legal mac address.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Customize the l2pt destination mac address as 58-11-22-0F-6D-B1:

Switch(config)#l2protocol-tunnel dst-mac 58-11-22-0F-6D-B1

37.6 show l2protocol-tunnel dst-mac

Description

The **show l2protocol-tunnel dst-mac** command is used to display the current dst-mac.

Syntax

show l2protocol-tunnel dst-mac

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Display the current dst-mac:

Switch(config)#show l2protocol-tunnel dst-mac

Chapter 38 PPPoE ID-Insertion Commands (Only for Certain Devices)

Note: PPPoE ID-Insertion commands are only available on certain devices.

The PPPoE ID-Insertion feature provides a way to extract a Vendor-specific tag as an identifier for the authentication, authorization, and accounting (AAA) access requests on an Ethernet interface. When enabled, the switch attaches a tag to the PPPoE discovery packets, which is called the PPPoE Vendor-Specific tag and it contains a unique line identifier. There are two formats of Vendor-specific tags: Circuit-ID format and Remote-ID format. The BRAS receives the tagged packet, decodes the tag, and uses the Circuit-ID/Remote-ID field of that tag as a NAS-Port-ID attribute in the RADIUS server for PPP authentication and AAA (authentication, authorization, and accounting) access requests. The switch will remove the Circuit-ID/Remote-ID tag from the received PPPoE Active Discovery Offer and Session-confirmation packets from the BRAS.

38.1 pppoe id-insertion (global)

Description

The **pppoe id-insertion** command is used to enable the PPPoE ID-Insertion function globally. To disable the PPPoE ID-Insertion function, please use **no pppoe id-insertion** command.

Syntax

pppoe id-insertion

no pppoe id-insertion

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the PPPoE ID-Insertion function:

```
Switch(config)# pppoe id-insertion
```

38.2 pppoe circuit-id (interface)

Description

The **pppoe circuit-id** command is used to enable the PPPoE Circuit-ID Insertion function for a specified port. To disable the PPPoE Circuit-ID Insertion function on a specified port, please use **no pppoe circuit-id** command.

Syntax

pppoe circuit-id

no pppoe circuit-id

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the PPPoE Circuit-ID Insertion function for the Gigabit Ethernet port 1/0/1:

Switch (config)# interface gigabitEthernet 1/0/1

Switch (config-if)# pppoe circuit-id

38.3 pppoe circuit-id type

Description

The **pppoe circuit-id type** command is used to configure the type of PPPoE Circuit-ID for a specified port. By default, the PPPoE Circuit-ID type is “ip”.

Syntax

pppoe circuit-id type { mac | ip | udf [*Value*] | udf-only [*Value*] }

Parameter

mac | ip | udf | udf-only —— The type of PPPoE Circuit-ID for the port.

mac: The MAC address of the switch will be used to encode the Circuit-ID option.

ip: The IP address of the switch will be used to encode the Circuit-ID option. This is the default value.

udf: A user specified string with the maximum length of 40 characters will be used to encode the Circuit-ID option.

udf-only: Only the user specified string with the maximum length of 40 will be used to encode the Circuit-ID option.

Value —— The value of udf/udf-only. The maximum length is 40 characters.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the type of PPPoE Circuit-ID as "mac" for the Gigabit Ethernet port 1/0/1:

Switch (config)# interface gigabitEthernet 1/0/1

Switch (config-if)# pppoe circuit-id type mac

38.4 pppoe remote-id

Description

The **pppoe remote-id** command is used to enable the PPPoE Remote-ID Insertion and configure the Remote-ID value for a specified port. To disable the PPPoE Remote-ID Insertion function on a specified port, please use **no pppoe remote-id** command. By default, the PPPoE Remote-ID Insertion is disabled.

Syntax

pppoe remote-id [*Value*]

no pppoe remote-id

Parameter

Value —— The value of UDF. The maximum length is 40 characters. If not specified, the default value will be the PPPoE client's MAC address.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the remote-ID as “mac” for the Gigabit Ethernet port 1/0/1:

Switch (config)# interface gigabitEthernet 1/0/1

Switch (config-if)# pppoe remote-id mac

38.5 show pppoe id-insertion global

Description

The **show pppoe id-insertion global** command is used to display the global configuration of PPPoE Circuit-ID Insertion function.

Syntax

show pppoe id-insertion global

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of PPPoE Circuit-ID Insertion function globally:

Switch # show pppoe circuit-id global

38.6 show pppoe id-insertion interface

Description

The **show pppoe id-insertion interface** command is used to display all ports' or the specified port's configuration information of PPPoE Circuit-ID Insertion function.

Syntax

show pppoe id-insertion interface [**gigabitEthernet** *port*]

Parameter

port—— The Fast/Gigabit Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration information of PPPoE Circuit-ID Insertion function of all Ethernet ports:

```
Switch# show pppoe id-insertion interface
```

Display the configuration of PPPoE Circuit-ID Insertion function of the Gigabit Ethernet port 1/0/1 :

```
Switch# show pppoe id-insertion interface gigabitEthernet 1/0/1
```

Chapter 39 Static Routes Commands

39.1 ip routing

Description

This **ip routing** command is used to enable IPv4 routing globally. To disable IPv4 routing, please use the **no ip routing** command.

Syntax

ip routing

no ip routing

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IPv4 routing feature for the switch:

```
Switch(config)# ip routing
```

39.2 interface vlan

Description

This **interface vlan** command is used to create the VLAN interface. To delete the specified VLAN interface, please use the **no interface vlan** command.

Syntax

interface vlan { *vid*}

no interface vlan { *vid*}

Parameter

vid—— The ID of the VLAN.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create the VLAN interface 2:

```
Switch(config)# interface vlan 2
```

39.3 interface loopback

Description

This **interface loopback** command is used to create the loopback interface. To delete the specified loopback interface, please use the **no interface loopback** command.

Syntax

interface loopback { *id*}

no interface loopback { *id*}

Parameter

id—— The ID of the loopback interface, ranging from 1 to 64.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create the loopback interface 1:

```
Switch(config)# interface loopback 1
```

39.4 switchport

Description

This **switchport** command is used to switch the Layer 3 interface into the Layer 2 port. To switch the Layer 2 port into the Layer 3 routed port, please use the **no switchport** command.

Syntax

switchport

no switchport

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Switch port 1/0/9 into the routed port:

```
Switch(config)# interface gigabitEthernet 1/0/9
Switch(config-if)# no switchport
```

39.5 interface range port-channel

Description

This **interface range port-channel** command is used to create multiple port-channel interfaces.

Syntax

interface range port-channel *port-channel-list*

Parameter

port-channel-list —— The list of the port-channel interface, ranging from 1 to 14, in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create the port-channel interfaces 1, 3, 4 and 5:

Switch(config)# interface port-channel 1,3-5

39.6 description

Description

This **description** command is used to add a description to the Layer 3 interface, including routed port, port-channel interface, loopback interface and VLAN interface. To clear the description of the corresponding interface, please use the **no description** command.

Syntax

description *string*

no description

Parameter

string —— Content of an interface description, ranging from 1 to 32 characters.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add a description system-if to the routed port 1/0/9 :

Switch(config)# interface gigabitEthernet 1/0/9
Switch(config-if)# no switchport
Switch(config-if)# description system-if

39.7 shutdown

Description

This **shutdown** command is used to shut down the specified interface. The interface type include: routed port, port-channel interface, loopback interface

and VLAN interface. To enable the specified interface, please use the **no shutdown** command.

Syntax

shutdown

no shutdown

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Shut down the routed port 1/0/9:

```
Switch(config)# interface gigabitEthernet 1/0/9
Switch(config-if)# no switchport
Switch(config-if)# shutdown
```

39.8 interface port-channel

Description

This **interface port-channel** command is used to create the port-channel interface. To delete the specified port-channel interface, please use the **no interface port-channel** command.

Syntax

interface port-channel { *port-channel-id*}

no interface port-channel { *port-channel-id*}

Parameter

port-channel-id—— The ID of the port-channel interface, ranging from 1 to 14.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create the port-channel interface 1:

Switch(config)# interface port-channel 1

39.9 ip route

Description

This **ip route** command is configure the static route. To clear the corresponding entry, please use the **no ip route** command.

Syntax

ip route [**vrf** *vrf-name*] { *dest-address* } { *mask* } [**nexthop-vrf** *vrf-name*] { *next-hop-address* } [*distance*]

no ip route [**vrf** *vrf-name*] { *dest-address* } { *mask* } [**nexthop-vrf** *vrf-name*] { *next-hop-address* } [*distance*]

Parameter

vrf-name —— VRF instance name.

dest-address —— The destination IP address.

mask —— The subnet mask.

next-hop-address —— The address of the next-hop.

distance —— The distance metric of this route, ranging from 1 to 255. The smaller the distance is, the higher the priority is.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a static route with the destination IP address as 192.168.2.0, the subnet mask as 255.255.255.0 and the next-hop address as 192.168.0.2:

Switch(config)# ip route 192.168.2.0 255.255.255.0 192.168.0.2

39.10 ipv6 routing

Description

This **ipv6 routing** command is enale the IPv6 routing feature globally. To diable IPv6 routing, please use the **no ipv6 routing** command.

Syntax

ipv6 routing

no ipv6 routing

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable IPv6 routing globally:

```
Switch(config)# ipv6 routing
```

39.11 ipv6 route

Description

This **ipv6 route** command is configure the IPv6 static route. To clear the corresponding entry, please use the **no ipv6 route** command.

Syntax

ipv6 route [**vrf** *vrf-name*] { *ipv6-dest-address* } [**nexthop-vrf** *vrf-name*] { *next-hop-address* } [*distance*]

no ipv6 route [**vrf** *vrf-name*] { *ipv6-dest-address* } [**nexthop-vrf** *vrf-name*] { *next-hop-address* } [*distance*]

Parameter

vrf-name —— VRF instance name.

ipv6-dest-address——Destination IPv6 address and mask length.

next-hop-address——Next hop IPv6 address.

distance——Routing metric, value range 1~255.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure a static route with a destination IP of 3200::/64, a prefix vrf of vrf1, a next hop IP of 3100::1234, and a next hop vrf of vrf2:

Switch(config)# ipv6 route vrf vrf1 3200::/64 **nexthop-vrf** vrf2 3100::1234

39.12 show interface vlan

Description

The **show interface vlan** command is used to display the information of the specified interface VLAN.

Syntax

show interface vlan *vid*

Parameter

vid—— The VLAN ID.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the information of VLAN 2:

Switch(config)#show interface vlan 2

39.13 show ip interface

Description

This **show ip interface** command is used to display the detailed information of the specified Layer 3 interface.

Syntax

show ip interface [**gigabitEthernet** *port* /**port-channel** *port-channel-id* / **loopback** *id*| **vlan** *vlan-id*]

Parameter

port—— The port number.

port-channel-id—— The ID of the port channel. Member ports in this port channel should all be routed ports.

id—— The loopback interface ID.

vlan-id—— The VLAN interface ID.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the detailed information of the VLAN interface 2:

```
Switch(config)# show ip interface vlan 2
```

39.14 show ip interface brief

Description

This **show ip interface brief** command is used to display the summary information of the Layer 3 interfaces.

Syntax

show ip interface brief

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the summary information of the Layer 3 interfaces:

```
Switch(config)# show ip interface brief
```

39.15 show ip route

Description

This **show ip route** command is used to display IPv4 routing table information, and can be expanded to display routing table information of a certain VRF.

Syntax

show ip route [vrf *vrf-name***]**

Parameter

vrf-name —— VRF instance name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IPv4 routing table information under VRF1:

Switch(config)# show ip route vrf vrf1

39.16 show ip route specify

Description

This **show ip route specify** command is used to display the valid routing information to the specified IP address or network segments.

Syntax

show ip route specify { *ip* } [*mask*] [**longer-prefixes**]

Parameter

ip —— Specify the destination IP address.

mask —— Specify the destination IP address together with the parameter *ip*.

longer-prefixes —— Specify the destination subnets that match the network segment determined by the ip and mask parameters.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the shortest route to 192.168.0.100:

Switch(config)# show ip route specify 192.168.0.100

Look up the route entry with the destination as 192.168.0.0/24:

Switch(config)# show ip route specify 192.168.0.0 255.255.255.0

Display the routes to all the subnets that belongs to 192.168.0.0/16:

Switch(config)# show ip route specify 192.168.0.0 255.255.0.0 **longer-prefixes**

39.17 show ip route summary

Description

This **show ip route summary** command is used to display the summary information of the route entries classified by their sources.

Syntax

show ip route summary

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the summary information of route entries:

Switch(config)# show ip route summary

39.18 show ipv6 interface

Description

This command is used to display the configured IPv6 information of the management interface, including ipv6 function status, link-local address and global address, IPv6 multicast groups etc.

Syntax

show ipv6 interface

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IPv6 information of the management interface:

```
Switch(config)# show ipv6 interface
```

39.19 show ipv6 route

Description

This **show ipv6 route** command is used to display IPv6 routing table information, and can be expanded to display routing table information of a certain VRF.

Syntax

show ipv6 route [vrf *vrf-name***]**

Parameter

vrf-name —— VRF instance name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IPv6 routing table information under VRF1:

```
Switch(config)# show ipv6 route vrf vrf1
```

39.20 show ipv6 route summary

Description

This **show ipv6 route summary** command is used to display the summary information of the IPv6 route entries classified by their sources.

Syntax

show ipv6 route summary

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the summary information of IPv6 route entries:

```
Switch(config)# show ipv6 route summary
```

Chapter 40 RIP Configuration Commands (Only for Certain Devices)

RIP (Routing Information Protocol) is a routing protocol suitable for small networks and has lower requirements in terms of bandwidth, configuration, and management. As a routing protocol based on distance vector algorithm, RIP uses hop count as the measurement standard.

40.1 router rip

Description

This **router rip** command is used to enable the RIP function on the switch. To disable this function, please use the **no router rip** command. You can specify to create a RIP instance under a certain VRF.

Syntax

router rip [**vrf** *vrf-name*]

no router rip [**vrf** *vrf-name*]

Parameter

vrf-name: VRF instance name

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the RIP function of the switch in VRF v1:

Switch(config)#router rip vrf v1

40.2 network

Description

The **network** command is used to enable the RIP function on the corresponding interface of the configured network segment. To disable the

RIP function on the corresponding interface, please use **no network** command.

Syntax

network *network number*

no network *network number*

Parameter

network number: Network number, the format is 192.168.0.0. If you enter an IP address, the network number will be automatically obtained based on the mask length of the natural network segment. Entering 0.0.0.0 means enabling the RIP function on all interfaces.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the rip function of network segment 192.168.0.0:

```
Switch(config-router)#network 192.168.0.0
```

40.3 version

Description

The **version** command is used to configure the version of packets sent and received by RIP. By default, the switch sends RIPv2 packets and receives RIPv1 and RIPv2 packets. To restore the default message version settings, please use the **no version** command.

Syntax

version {1|2}

no version

Parameter

1: Send and receive RIPv1 messages.

2: Send and receive RIPv2 messages.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the RIP message version as RIPv1:

```
Switch(config-router)#version 1
```

40.4 timer basic

Description

The **timer basic** command is used to configure the RIP timer. To restore the timer configuration to its default, please use the **no timer basic** command.

Syntax

timer basic *update-value timeout-value garbage-collect-value*

no timer basic

Parameter

update-value: Routing table update time, ranging from 5 to 86400 seconds. The default value is 30.

timeout-value: Routing table aging time, ranging from 5 to 86400 seconds. The default value is 180.

garbage-collect-value: The expiration time after the routing entry is unreachable. When the entry is unreachable, the routing entry is removed from the routing table after the expiration time. The range is 5~86400 seconds, and the default value is 120.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the routing table update time to 50 seconds, the routing table aging time to 100 seconds, and the routing entry expiration time to 100 seconds:

```
Switch(config-router)#timer basic 50 100 100
```

40.5 distance

Description

The **distance** command is used to configure the management distance of RIP routing. To restore the default configuration, please use the **no distance** command.

Syntax

distance *distance*

no distance

Parameter

distance: Management distance of RIP routing, ranging from 1 to 255. The default value is 120.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the management distance of RIP routing to100:

```
Switch(config-router)#distance 100
```

40.6 auto-summary

Description

The **auto-summary** command is used to enable the automatic summary function of RIP. After this function is enabled, routing entries will be automatically summarized into natural network segments, which can reduce the number of routing entries issued for each update. To disable this function, use the **no auto-summary** command.

Syntax

auto-summary

no auto-summary

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the automatic summary function of RIP:

```
Switch(config-router)#auto-summary
```

40.7 default-metric

Description

The **default-metric** command is used to set the default metric for redirection routes. To restore the default configuration, please use the **no default-metric** command.

Syntax

default-metric *metric*

no default-metric

Parameter

metric: The default metric of the redirect route, ranging from 1 to 15, and the default value is 1.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the default metric for redirection routes to 5:

```
Switch(config-router)#default-metric 5
```

40.8 redistribute

Description

The **redistribute** command is used to set the metric for redirection routes. To restore the default configuration, please use the **no redistribute** command.

Syntax

redistribute { ospf *process-id* | connected | static } [**metric** *metric-value*]

no redistribute { ospf *process-id* | connected | static } [**metric**]

Parameter

ospf: Enable RIP redirect OSPF routing function.

process-id: Redirected OSPF process number.

connected: Enable RIP redirect direct routing function.

static: Enable RIP redirect static routing function.

metric-value: The metric of the redirect route.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set RIP to redirect ospf process 1, and set metric to 3:

Switch(config-router)#redistribute ospf 1 **metric** 3

40.9 allow-ecmp

Description

The **allow-ecmp** command is used to enable the ECMP function. To disable this function, please use the **no allow-ecmp** command.

Syntax

allow-ecmp

no allow-ecmp

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the ECMP function of RIP:

Switch(config-router)#allow-ecmp

40.10 default-information originate

Description

The **default-information originate** command is used to introduce a default route into RIP. To disable this function, please use the **no default-information originate** command.

Syntax

default-information originate

no default-information originate

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Introduce a default route into RIP:

```
Switch(config-router)#default-information originate
```

40.11 neighbor

Description

The **neighbor** command is used to configure the neighbor of RIP. After configuring the neighbor, RIP will send RIP packets to the neighbor through unicast packets. To clear the neighbor configuration, please use the **no neighbor** command.

Syntax

neighbor *ip-address*

no neighbor *ip-address*

Parameter

ip-address: IP address of RIP's neighbor.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Specify 192.168.0.100 as the RIP neighbor:

Switch(config-router)#neighbor 192.168.0.100

40.12 passive-interface

Description

The **passive-interface** command is used to configure the interface not to send RIP packets but only to receive RIP packets. A unicast response will be sent out when a neighbor is configured at the same time.To disable this function, please use the **no passive-interface** command.

Syntax

passive-interface interface { fastEthernet | gigabitEthernet | hundred-gigabitEthernet | loopback | port-channel | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet | vlan } *interface-value*

no passive-interface interface { fastEthernet | gigabitEthernet | hundred-gigabitEthernet | loopback | port-channel | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet | vlan } *interface-value*

Parameter

interface-value: Specify the interface to be configured as passive-interface.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure VLAN 2 as passive-interface:

Switch(config-router)# passive-interface interface vlan 2

40.13 ip rip authentication mode

Description

The **ip rip authentication mode** command is used to configure the authentication mode of RIP messages, and its no command is used to clear the configuration of authentication mode. The authentication function only takes effect when the authentication mode and password are configured.

Syntax

ip rip authentication mode { md5 | simple }

no ip rip authentication mode

Parameter

md5: Configure the authentication mode of RIP to md5 authentication.

simple: Configure the authentication mode of RIP to plain text authentication.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the RIP authentication mode of VLAN 2 to md5 authentication:

Switch(config)#interface vlan 2

Switch(config-if)#ip rip authentication mode md5

40.14 ip rip authentication string

Description

The **ip rip authentication string** command is used to configure the password and key ID for RIP authentication. The key ID is only used for md5 authentication.This command cannot be configured at the same time as the ip rip authentication key-chain command. To clear the password and key ID of RIP authentication, please use the **no ip rip authentication string** command.

Syntax

ip rip authentication string *password* **[key-id** *key-id-value* **]**

no ip rip authentication string

Parameter

password: RIP authentication password, 16 characters at most.

key-id-value: Key ID for RIP authentication, ranging from 1 to 255. The default value is 1.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the rip authentication password of interface VLAN 2 as tplink and the key ID as 2:

Switch(config)#interface vlan 2

Switch(config-if)#ip rip authentication string tplink **key-id 2**

40.15 ip rip authentication key-chain

Description

The **ip rip authentication key-chain** command is used to configure the password and key ID for RIP authentication by binding key-chain. This command cannot be configured at the same time as the ip rip authentication string command. To clear key-chain binding, please use the **no ip rip authentication key-chain** command.

Syntax

ip rip authentication key-chain *key-chain-name*

no ip rip authentication key-chain

Parameter

key-chain-name: The name of the key-chain to be bound.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure key chain as 1, set key as 0, the corresponding password as tplink, and bind the RIP authentication of VLAN 1 to key chain 1:

Switch(config)#key chain 1

Switch (config-keychain)#key 0 key-string tplink

Switch (config-keychain)#exit

Switch (config)#interface vlan 1

Switch (config-if)#ip rip authentication key-chain 1

40.16 ip rip receive version

Description

The **ip rip receive version** command is used to configure the version of RIP packets received by the interface. If the receive version of an interface is not configured, it will be determined by the global configuration. To restore the default configuration, please use the **no ip rip receive version** command.

Syntax

ip rip receive version { 1 | 2 }

no ip rip receive version

Parameter

1: Configure the receive version of the interface to RIPv1.

2: Configure the receive version of the interface to RIPv2.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the receive version of VLAN 1 to RIPv1:

```
Switch (config)#interface vlan 1
Switch (config-if)#ip rip receive version 1
```

40.17 ip rip send version

Description

The **ip rip send version** command is used to configure the version of RIP packets sent by the interface. If the send version of an interface is not configured, it will be determined by the global configuration. To restore the default configuration, please use the **no ip rip receive version** command.

Syntax

ip rip send version { 1 | 2 }

no ip rip send version

Parameter

1: Configure the send version of the interface to RIPv1.

2: Configure the send version of the interface to RIPv2.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the send version of VLAN 1 to RIPv1:

```
Switch (config)#interface vlan 1
Switch (config-if)#ip rip send version 1
```

40.18 ip rip split-horizon

Description

The **ip rip split-horizon** command is used to configure the split horizon function of the interface. This function is enabled by default. When this function is enabled, RIP will not send routing entries learned from this interface out of this interface. When this function is disabled, RIP will only send routing entries according to the routing table. To disable this function, please use the **no ip rip split-horizon** command.

Syntax

ip rip split-horizon [poison-reverse]

no ip rip split-horizon

Parameter

poison-reverse: Enable the poison-reverse function of the interface. After this function is enabled, the entries learned from the interface will have the metric set to 16 before being sent out. Disable the poison reversal function by configuring the ip rip split-horizon command.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the poison-reverse function of VLAN 1:

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

```
Switch (config-if)#ip rip split-horizon poison-reverse
```

40.19 ip rip v2-broadcast

Description

The **ip rip v2-broadcast** command is used to enable the RIPv2 packet broadcast function of the interface. By default, RIPv2 messages are sent through multicast. After this function is enabled on an interface, RIPv2 messages on the interface are sent through broadcast. To disable this function, please use the **no ip rip v2-broadcast** command.

Syntax

ip rip v2-broadcast

no ip rip v2-broadcast

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the RIPv2 packet broadcast function of VLAN 1:

```
Switch (config)#interface vlan 1
Switch (config-if)#ip rip v2-broadcast
```

40.20 show ip rip

Description

The **show ip rip** command is used to display the RIP routing table.

Syntax

show ip rip [**vrf** *vrf-name*]

Parameter

vrf-name: VRF instance name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the RIP routing table of VRF v1:

```
Switch#show ip rip vrf v1
```

40.21 show ip rip status

Description

The **show ip rip status** command is used to display the RIP status.

Syntax

show ip rip [**vrf** *vrf-name*] **status**

Parameter

vrf-name: VRF instance name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the RIP status of VRF v1:

```
Switch#show ip rip status vrf v1
```

40.22 clear ip rip

Description

The **clear ip rip** command is used to clear the routing entries for RIP learning and re-request routing information from other devices.

Syntax

clear ip rip [**vrf** *vrf-name*]

Parameter

vrf-name: VRF instance name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Clear the routing entries for RIP learning and rerequest routing information from of VRF v1:

```
Switch#clear ip rip vrf v1
```

Chapter 41 RIPng Configuration Commands (Only for Certain Devices)

RIPng (RIP next generation) is a routing protocol that improves the RIP protocol in order to solve the compatibility problem between the RIP protocol and IPv6.

41.1 router ripng

Description

This **router ripng** command is used to enable the RIPng function. Only when the RIPng function is enabled can the global configuration of the RIPng function be performed. When the RIPng function is disabled, the global configuration of the RIPng function will be cleared. To disable this function, please use the **no router ripng** command. You can specify to create a RIPng instance under a certain VRF.

Syntax

router ripng [**vrf** *vrf-name*]

no router ripng [**vrf** *vrf-name*]

Parameter

vrf-name: VRF instance name.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the RIPng function in VRF v1:

```
Switch(config)#router ripng vrf v1
```

41.2 ipv6 rip enable

Description

The **ipv6 rip enable** command is used to enable the ripng function of the interface. This command only takes effect after the global switch of RIPng is enabled.To disable this function, please use **no ipv6 rip enable** command.

Syntax

ipv6 rip enable

no ipv6 rip enable

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the RIPng function of VLAN 1:

```
Switch(config)#interface vlan 1
Switch(config-if)# ipv6 rip enable
```

41.3 timer basic

Description

The **timer basic** command is used to configure the RIPng timer. To restore the timer configuration to its default, please use the **no timer basic** command.

Syntax

timer basic *update-value timeout-value garbage-collect-value*

no network

Parameter

update-value: Routing table update time, ranging from 5 to 86400 seconds. The default value is 30.

timeout-value: Routing table aging time, ranging from 5 to 86400 seconds. The default value is 180.

garbage-collect-value: The expiration time after the routing entry is unreachable. When the entry is unreachable, the routing entry is removed

from the routing table after the expiration time. The range is 5~86400 seconds, and the default value is 120.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the routing table update time to 50 seconds, the routing table aging time to 100 seconds, and the routing entry expiration time to 100 seconds:

```
Switch(config-router)#timer basic 50 100 100
```

41.4 default-metric

Description

The **default-metric** command is used to set the default metric for redirect routes. To restore the default configuration, please use the **no default-metric** command.

Syntax

default-metric *metric*

no default-metric

Parameter

metric: The default metric of the redirect route, ranging from 1 to 15, and the default value is 1.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the default metric for redirection routes to 5:

```
Switch(config-router)#default-metric 5
```

41.5 redistribute

Description

The **redistribute** command is used to set RIPng to redirect external routes. Its no command has two forms: if it does not contain the metric parameter, it is used to disable the redirection function of the corresponding external route. If it contains the metric parameter, it is used to restore the metric used for redirect routes to the default value.

Syntax

redistribute { ospfv3 | static } [**metric** *metric-value*]

no redistribute { ospfv3 | static } [**metric**]

Parameter

ospfv3: Enable RIPng redirect OSPFv3 routing function.

static: Enable RIPng redirect static routing function.

metric-value: The metric of the redirect route.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set RIPng to redirect OSPFv3, and set metric to 3:

```
Switch(config-router)#redistribute ospfv3 metric 3
```

41.6 allow-ecmp

Description

The **allow-ecmp** command is used to enable the ECMP function. To disable this function, please use the **no allow-ecmp** command.

Syntax

allow-ecmp

no allow-ecmp

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the ECMP function of RIPng:

```
Switch(config-router)#allow-ecmp
```

41.7 default-information originate

Description

The **default-information originate** command is used to introduce a default route into RIPng. To disable this function, please use the **no default-information originate** command.

Syntax

default-information originate

no default-information originate

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Introduce a default route into RIPng:

```
Switch(config-router)#default-information originate
```

41.8 passive-interface

Description

The **passive-interface** command is used to configure the interface not to send RIPng packets but only to receive RIPng packets. A unicast response will be sent out when a neighbor is configured at the same time.To disable this function, please use the **no passive-interface** command.

Syntax

passive-interface interface { fastEthernet | gigabitEthernet | hundred-gigabitEthernet | loopback | port-channel | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet | vlan } *interface-value*

no passive-interface interface { fastEthernet | gigabitEthernet | hundred-gigabitEthernet | loopback | port-channel | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet | vlan } *interface-value*

Parameter

interface-value: Specify the interface to be configured as passive-interface.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure VLAN 2 as passive-interface:

Switch(config-router)# passive-interface interface vlan 2

41.9 ip rip split-horizon

Description

The **ipv6 rip split-horizon** command is used to configure the split horizon function of the interface. This function is enabled by default. When this function is enabled, RIPng will not send routing entries learned from this interface out of this interface. When this function is disabled, RIPng will only send routing entries according to the routing table. To disable this function, please use the **no ipv6 rip split-horizon** command.

Syntax

ipv6 rip split-horizon [poison-reverse]

no ipv6 rip split-horizon

Parameter

poison-reverse: Enable the poison-reverse function of the interface. After this function is enabled, the entries learned from the interface will have the metric set to 16 before being sent out. Disable the poison reversal function by configuring the ipv6 rip split-horizon command.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the poison-reverse function of VLAN 1:

Switch (config)#interface vlan 1

Switch (config-if)#ipv6 rip split-horizon poison-reverse

41.10 show ipv6 rip

Description

The **show ipv6 rip** command is used to display the RIPng routing table.

Syntax

show ipv6 rip [**vrf** *vrf-name*]

Parameter

vrf-name: VRF instance name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the RIPng routing table in VRF v1:

Switch#show ipv6 rip vrf v1

41.11 show ipv6 rip status

Description

The **show ipv6 rip status** command is used to display the RIPng status.

Syntax

show ipv6 rip [**vrf** *vrf-name*] **status**

Parameter

vrf-name: VRF instance name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the RIPng status in VRF v1:

```
Switch#show ipv6 rip status vrf v1
```

41.12 clear ipv6 rip

Description

The **clear ipv6 rip** command is used to clear the routing entries for RIPng learning and re-request routing information from other devices.

Syntax

clear ipv6 rip [**vrf** *vrf-name*]

Parameter

vrf-name: VRF instance name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Clear the routing entries for RIPng learning and rerequest routing information from other devices:

```
Switch#clear ipv6 rip vrf v1
```

Chapter 42 OSPF Configuration Commands (Only for Certain Devices)

OSPF is an Interior Gateway Protocol (IGP) designed expressly for IP networks, supporting IP subnetting and tagging of externally derived routing information. OSPF also allows packet authentication and uses IP multicast when sending and receiving packets.

Currently, OSPF Version 2 (RFC2328) is used for the IPv4 protocol; Use OSPF Version 3 (RFC2740) for IPv6 protocol. Unless otherwise specified, the OSPF referred to in this chapter is OSPF Version 2.

42.1 router ospf

Description

When the OSPFv2 instance specified by the process-id has not been created, this command is used to create an OSPFv2 instance and enter Router configuration mode. If a vrf name is specified when using the command, it indicates that this OSPFv2 instance belongs to the specified VRF instance. If the vrf parameter is not specified, the created OSPFv2 instance will belong to the public network. When the OSPFv2 instance specified by the process-id already exists, using this command with the correct vrf name (or without the vrf parameter) will allow entry into Router configuration mode. The no command is used to delete the OSPFv2 instance. When the vrf parameter is not specified, the corresponding instance will be deleted based on the process-id.

Syntax

router ospf *process-id* [**vrf** *vrf-name*]

no router ospf *process-id* [**vrf** *vrf-name*]

Parameter

process-id: Process ID, ranging from 1 to 65535. Sixteen processes can be created at most.

vrf-name: VRF instance name.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create an OSPFv2 instance with process ID 1 and add it to vrf1:

```
Switch(config)#router ospf 1 vrf vrf1
```

42.2 router-id

Description

The **router-id** command is used to configure the router ID. To delete the configured router-id, please use the **no router-id** command.

Syntax

Router-id *router-id*

no router-id

Parameter

router-id: The route ID in the format of dotted decimal notation. 0.0.0.0 is illegal.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the router ID of OSPF routing process 1 as 1.1.1.1:

```
Switch(config)#router ospf 1
Switch(config-router)#router-id 1.1.1.1
```

42.3 network

Description

This **network** command is used to configure the network of a specified area. All the interfaces fallen into the configured network will belong to this area. To

delete the specified network and its corresponding interfaces from this area, please use the **no network** command.

Syntax

network *ip-address wildcard-mask* **area** *area-id*

no network *ip-address wildcard-mask* **area** *area-id*

Parameter

ip-address: The IP address of the network.

wildcard-mask: The wildcard mask of the network (such as 0.0.0.255). The subnet mask is also compatible (such as 255.0.0.0).

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the network 192.168.0.0/24 in the area 0.0.0.0:

```
Switch(config)#router ospf 1
Switch(config-router)# network 192.168.0.0 255.255.255.0 area 0.0.0.0
```

42.4 maximum-paths

Description

The **maximum-paths** command is used to configure the maximum number of the equal-cost multipath routings. To restore to default value, please use the **no maximum-paths** command.

Syntax

maximum-paths *number*

no maximum-paths

Parameter

number: The maximum number of the equal-cost multipath routings, ranging from 1 to 32. The default value is 32.

Command Mode

Router Configuration Mode

Example

Configure the maximum number of the equal-cost multipath routings as 2:

```
Switch(config)#router ospf 1
Switch(config-router)#maximum-paths 2
```

42.5 redistribute

Description

The **redistribute** command is used to configure the ASBR to redistribute the external routes from other routing protocols to the OSPF domain in type-5 LSAs. To restore the certain optional parameters to default values, please use the **no redistribute** command with corresponding parameters.

Syntax

redistribute { **connected** | **static** /**rip** | **ospf** *process-id*} [**metric** *cost*] [**metric-type** *type*]

no redistribute { **connected** | **static** /**rip** | **ospf** *process-id*} [**metric** *cost*] [**metric-type** *type*]

Parameter

connected: Specify the external route type as connected.

static: Specify the external route type as static.

rip: Specify the external route type as RIP.

ospf: Specify the external route type as OSPF.

process-id: The OSPF routing process ID, ranging from 1 to 65535. It's not allowed to

redirect to the own process, for example, OSPF process 1 cannot redirect itself.

cost: The cost of the external routes, ranging from 1 to 16777214. Its default value is

defined in the command default-metric.

type: The type of the external routes, either 1 or 2. The default value is 2.

Command Mode

Router Configuration Mode

Example

Redistribute the RIP routes from the external and advertise them as type 1 external routes in the OSPF domain:

```
Switch(config)#router ospf 1
Switch(config-router)#redistribute rip metric-type 1
```

42.6 default-metric

Description

The **default-metric** command is used to configure the default cost of the redistributing external route. To restore to the default value, please use the **no default-metric** command.

Syntax

default-metric *cost*

no default-metric

Parameter

cost: The default cost of the redistributing external route, ranging form 1 to 16777214.

Command Mode

Router Configuration Mode

Example

Configure the default cost of the redistributing external route as 12:

```
Switch(config)#router ospf 1
Switch(config-router)#default-metric 12
```

42.7 default-metric

Description

The **default-information originate** command is used to advertise the default route as AS-External LSA. To cancel the advertisement of the default route, please use the **no default-information originate** command without any optional parameters. To restore the certain parameters to default values, please use the **no default-information originate** command with corresponding parameters.

Syntax

default-information originate [**always**] [**metric** *cost*] [**metric-type** *type*]

no default-information originate [**always**] [**metric** *cost*] [**metric-type** *type*]

Parameter

always: OSPF will advertise the default route whether there is default route is the IP routing table or not. If the parameter is not configured, OSPF will advertise the default route only when there is default route in the IP routing table.

cost: The default cost of the default route, ranging form 1 to 16777214. Its default value is 1.

type: The type of the external routes, either 1 or 2. The default value is 2.

Command Mode

Router Configuration Mode

Example

Configure OSPF to advertise the default route whether there is default route is the IP routing table or not:

```
Switch(config)#router ospf 1
Switch(config-router)#default-information originate always
```

42.8 auto-cost

Description

The **auto-cost** command is used to enable the auto computing function of the interface cost and configure the reference bandwidth. The interface cost is the ratio of the reference bandwidth to the interface bandwidth. To restore the reference bandwidth to default value, please use the **no auto-cost reference-bandwidth** command.

Syntax

auto-cost reference-bandwidth *bandwidth*

no auto-cost reference-bandwidth

Parameter

bandwidth: The reference bandwidth, ranging from 1 to 4294967 Mbps. Its default value is 100Mbps.

Command Mode

Router Configuration Mode

Example

Enable the auto computing function of the interface cost and configure the reference bandwidth as 10000 Mbps:

```
Switch(config)#router ospf 1
Switch(config-router)#auto-cost reference-bandwidth 10000
```

42.9 distance

Description

The **distance** command is used to configure the OSPF administrative distance. To restore to the default distance, please use the **no distance** command. The administrative distance represents the priority of the routes. The smaller administrative distance corresponds to higher priority. When different routing protocols possess the same route to the same destination, the route with the highest priority will be selected to add to the IP routing table according to the administrative distance.

Syntax

distance *administrative-distance*

no distance

Parameter

administrative-distance: Routing administrative distance, ranging from 1 to 255. Its default value is 110. When this value is set to 255, it indicates that the source of routing information is unreliable and all related routes are ignored.

Command Mode

Router Configuration Mode

Example

Configure the OSPF routing administrative distance as 100:

Switch(config)#router ospf 1

Switch(config-router)#distance 100

42.10 timers throttle spf

Description

The **timers throttle spf** command is used to configure the computing delay and interval of the SPF, thus preventing the consumption of the CPU and memory caused by frequent SPF computing. To restore to the default value, please use the **no timers throttle spf** command.

Syntax

timers throttle spf *spf-delay spf-holdtime spf-max-holdtime*

no timers throttle spf

Parameter

spf-delay: The delay time of the SPF computing, ranging from 1 to 600000 milliseconds. The default value is 0 milliseconds.

spf-holdtime: The minimum interval between two SPF computings, ranging from 1 to 600000 milliseconds. The default value is 50 milliseconds.

spf-max-holdtime: The Maximum interval between two SPF computings, ranging from 1 to 600000 milliseconds. The default value is 5000 milliseconds.

Command Mode

Router Configuration Mode

Example

Configure the computing delay and interval of the SPF as 10 seconds:

Switch(config)#router ospf 1

Switch(config-router)#timers throttle spf 10000 10000 50000

42.11 compatible rfc 1583

Description

The **compatible rfc 1583** command is used to configure the OSPF's compatibility for the routing rules in the RFC 1583. To cancel the compatibility, please use the **no compatible rfc1583** command. It is compatible by default.

Syntax

compatible rfc1583

no compatible rfc1583

Command Mode

Router Configuration Mode

Example

Configure the OSPF's compatibility for the routing rules in RFC 1583:

Switch(config)#router ospf 1

Switch(config-router)#compatible rfc1583

42.12 area stub

Description

The **area stub** command is used to define an area as a stub area. To restore the stub area to a normal one, please use the **no area stub** command. To restore the certain parameters to default values, please use the **no area stub** command with corresponding parameters.

Syntax

area *area-id* **stub [no-summary]**

no area *area-id* **stub [no-summary]**

Parameter

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 1 to 4294967295.

no-summary: Configure the stub are as a totally stub area, where the ABR advertises neither the destinations in other areas nor the external routes. The stub area is not a totally stub area by default

Command Mode

Router Configuration Mode

Example

Configure the area 1 as a totally stub area:

```
Switch(config)#router ospf 1
Switch(config-router)# area 1 stub no-summary
```

42.13 area nssa

Description

The **area nssa** command is used to define an area as a NSSA area. To restore the NSSA area to a normal one, please use the **no area nssa** command without any optional parameters. To restore the certain parameters to default values, please use the **no area nssa** command with corresponding parameters.

Syntax

area *area-id* **nssa [no summary | default-information-originate [metric** *cost* **] [metrictype** *type***]]**

no *area-id* **nssa [no summary | default-information-originate [metric** *cost* **] [metrictype** *type***]]**

Parameter

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 1 to 4294967295.

no-summary: Configure the NSSA area as a totally NSSA area, where the ABR advertises neither the destinations in other areas nor the external routes. The NSSA area is not a totally NSSA area by default.

default-information-originate: Enable or disable advertising default route into NSSA area by sending a NSSA-External LSA. OSPF will not advertise default route if this parameter is not specified

cost: The default cost of the default route, ranging form 1 to 16777214. Its default value is 1.

type: The type of the external routes, either 1 or 2. The default value is 2.

Command Mode

Router Configuration Mode

Example

Configure the Area 1 as a totally NSSA area:

```
Switch(config)#router ospf 1
Switch(config-router)# area 1 nssa no-summary
```

42.14 area default-cost

Description

The **area default-cost** command is used to configure the cost of default route sent from ABR to stub or NSSA area.

Syntax

area *area-id* **default-cost** *cost*

no area *area-id* **default-cost**

Parameter

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 1 to 4294967295.

cost: The cost value. It ranges from 1 to 16777214 and the default value is 1.

Command Mode

Router Configuration Mode

Example

Configure the cost of default route sent to Area 1 as 10:

```
Switch(config)#router ospf 1
Switch(config-router)#area 1 nssa
Switch(config-router)#area 1 default-cost 10
```

42.15 area range

Description

The **area range** command is used to configure a summary route. To delete this route, please use the **no area range** command. By default no route is summarized.

This command is only used with the ABR to summarize the route information of a certain area. The ABR only sends one summarized route of the routes in the aggregated segment to the other areas. An area can be configured with multiple summary segments, which can be aggregated by OSPF.

If the no area range command is configured, the formally summarized routes will be redistributed.

Syntax

area *area-id* **range** *ip-address mask* [**advertise**] [**cost** *cost*] [**not-advertise**]

no area *area-id* **range** *ip-address mask* [**advertise**] [**cost** *cost*] [**not-advertise**]

Parameter

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

ip-address: The destination of the aggregated route.

mask: The network mask of the aggregated route, in the format of dotted decimal notation.

advertise: Allow route aggregation of ABR broadcast.

not-advertise: Suppress route aggregation of ABR broadcast.

cost: The cost of the aggregated route, ranging from 1 to 16777214. The default value is the maximum one of all the aggregated routes. The cost parameter can be configured only when the advtise parameter is enabled. When configured as not-advtise, the cost parameter will be restored to the default value.

Command Mode

Router Configuration Mode

Example

Configure one aggregated route 100.100.0.0/16 with the cost 10 in the Area 0:

Switch(config)#router ospf 1

Switch(config-router)#area 0 **range** 100.100.0.0 255.255.0.0 **cost** 10

42.16 area authentication

Description

The **area authentication** command is used to configure the authentication type of the ospf process. The process is not authenticated by default. To restore to default value, please use the **no area authentication** command.

Syntax

area *area-id* **authentication** [message-digest]

no area authentication

Parameter

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

message-digest: Configure the configuration type as MD5.

If no authentication mode is specified here, the default mode will be simple authentication.

Command Mode

Router Configuration Mode

Example

Configure the authentication method to MD5 in the Area 0:

Switch(config)#router ospf 1

Switch(config-router)#area 0 **authentication** message-digest

42.17 area virtual-link

Description

The **area virtual-link** command is used to configure the virtual-link. To delete the configured virtual-link, please use the **no area virtual-link** without any optional parameters. To restore the certain parameters to default values, please use the **no area virtual-link** command with corresponding parameters.

Syntax

area *transit-area* **virtual-link** *router-id* [**dead-interval** *dead-interval*] [**hello-interval** *hello-interval*] [**retransmit-interval** *rtx-interval*] [**transmit-delay** *trans-delay*]

no area *transit-area* **virtual-link** *router-id*

Parameter

transit-area: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 1 to 4294967295.

router-id: The ID of the neighboring router on the opposite end of the virtual link, in the format of dotted decimal notation.

hello-interval: The interval of the hello packets, ranging from 1 to 65535 seconds and the default value is 10 seconds.

dead-interval: The time after which the neighbor becomes invalid. It ranges from 1 to 65535 seconds and the default value is 4 times as the hello-interval.

rtx-interval: The retransmission interval of the LSA, DD and LSR packets. It ranges from 1 to 65535 seconds and the default value is 5 seconds.

trans-delay: The LSA transmission delay. It ranges from 1 to 65535 seconds and the default value is 1 seconds.

Command Mode

Router Configuration Mode

Example

Configure a virtual-link with the transmission area as Area 1 and the ID of the neighboring router on the other endpoint as 1.1.1.1:

```
Switch(config)#router ospf 1
Switch(config-router)#area 1 virtual-link 1.1.1.1
```

42.18 area virtual-link authentication

Description

The **area virtual-link authentication** command is used to configure the authentication type of the virtual link. The virtual link is not authenticated by default. To restore to default value, please use the **no area virtual-link authentication** command.

Syntax

area *transit-area* **virtual-link** *router-id* **authentication** [message-digest | null]

no area *transit-area* **virtual-link** *router-id* **authentication**

Parameter

transit-area: The transition area ID in the format of an IP address in dotted decimal notation or decimal value ranging from 1 to 4294967295.

router-id: The ID of the neighboring router on the other endpoint of the virtual link, in the format of dotted decimal notation.

message-digest: Configure the configuration type as MD5.

null: No authentication. By default it is no authentication.

If no authentication mode is specified here, the default mode will be simple authentication.

Command Mode

Router Configuration Mode

Example

Configure simple authentication as the authentication mode of a virtual-link with the transmission area as Area 2 and the ID of the neighboring router on the other endpoint as 3.3.3.3:

```
Switch(config)#router ospf 1
Switch(config-router)#area 2 virtual-link 3.3.3.3 authentication
```

42.19 area virtual-link authentication-key

Description

The **area virtual-link authentication-key** command is used to configure the simple authentication key. To delete the key, please use the **no area virtual-link authentication-key** command.

Syntax

area *transit-area* **virtual-link** *router-id* **authentication-key [0|7]***password*

no area *transit-area* **virtual-link** *router-id* **authentication-key**

Parameter

transit-area: The transition area ID in the format of an IP address in dotted decimal notation or decimal value ranging from 1 to 4294967295.

router-id: The ID of the neighboring router on the other endpoint of the virtual link, in the format of dotted decimal notation.

[0|7]: Key form, 0 represents plaintext, 7 represents ciphertext.

password: A string from 1 to 8 alphanumeric characters or symbols. The password is case-sensitive, and cannot contain question marks. By default, it is empty.

Command Mode

Router Configuration Mode

Example

Configure the authentication mode of a virtual-link as simple authentication, with the transmission area as Area 2 and the ID of the neighboring router on the other endpoint as 3.3.3.3, and the authentication key as 123456:

```
Switch(config)#router ospf 1
Switch(config-router)#area 2 virtual-link 3.3.3.3 authentication-key
123456
```

42.20 area virtual-link message-digest-key

Description

The **area virtual-link message-digest-key** is used to configure the MD5 authentication ID and key of the virtual-link. To delete the specified configuration, please use the **no area virtual-link message-digest- key** command.

Syntax

area *transit-area* **virtual-link** *router-id* **message-digest-key** *id* **md5 [0|7]** *password*

no area *transit-area* **virtual-link** *router-id* **message-digest-key** *id*

Parameter

transit-area: The transition area ID in the format of an IP address in dotted decimal notation or decimal value ranging from 1 to 4294967295.

router-id: The ID of the neighboring router on the other endpoint of the virtual link, in the format of dotted decimal notation.

id: The key ID of the MD5, ranging from 1 to 255.

[0|7]: Key form, 0 represents plaintext, 7 represents ciphertext.

password: A string from 1 to 16 alphanumeric characters or symbols. The password is case-sensitive, and cannot contain question marks. By default, it is empty.

Command Mode

Router Configuration Mode

Example

Configure the authentication mode of a virtual-link as md5 authentication, with the transmission area as Area 2 and the ID of the neighboring router on the other endpoint as 3.3.3.3, with the authentication ID as 2 and the authentication key as 123456:

```
Switch(config)#router ospf 1
Switch(config-router)#area 2 virtual-link 3.3.3.3 message-digest- key 2
md5 123456
```

42.21 capability opaque

Description

The **capability opaque** is used to enable the Opaque LSA feature. To disable this feature, please use the **no capability opaque** command.

Syntax

capability opaque

no capability opaque

Parameter

None

Command Mode

Router Configuration Mode

Example

Enable the Opaque LSA feature:

```
Switch(config)#router ospf 1
Switch(config-router)#capability opaque
```

42.22 graceful-restart

Description

The **graceful-restart** is used to enable the OSPF GR feature. Before performing a graceful restart, ensure that the GR Restarter is configured with this feature. To disable this feature, please use the **no graceful-restart** command.

Syntax

graceful-restart

no graceful-restart

Parameter

None

Command Mode

Router Configuration Mode

Example

Enable the OSPF GR feature:

```
Switch(config)#router ospf 1
Switch(config-router)#graceful-restart
```

42.23 graceful-restart grace-period

Description

The **graceful-restart grace-period** is used to configure the graceful restart period, that is, the maximum time required for the graceful restart process. If the actual restart time exceeds this value, the graceful restart will fail. To restore the default configuration, please use the **no graceful-restart grace-period** command.

Syntax

graceful-restart grace-period *period*

no graceful-restart grace-period *period*

Parameter

period: Graceful restart period, ranging from 1 to 1800 seconds, and the default value is 120.

Command Mode

Router Configuration Mode

Example

Configure the graceful restart period to 180 seconds:

```
Switch(config)#router ospf 1
Switch(config-router)#graceful-restart grace-period 180
```

42.24 graceful-restart helper

Description

The **graceful-restart helper** is used to enable the GR Helper feature to assist the GR Restarter in its graceful restart process. To restore the default configuration, please use the **no graceful-restart helper** command.

Syntax

graceful-restart helper *[rid]*

no graceful-restart helper *[rid]*

Parameter

rid: GR Helper is supported for the neighboring GR Restarter whose router-id is rid. If rid is not specified, GR Helper is supported for all neighboring GR Restarters by default.

Command Mode

Router Configuration Mode

Example

Configure GR Helper to support graceful restart for all neighboring GR Restarters:

```
Switch(config)#router ospf 1
Switch(config-router)#graceful-restart helper
```

42.25 graceful-restart helper planned-only

Description

The **graceful-restart helper planned-only** is used to configure the GR Helper to only support planned-only restart function, which is disabled by default. To restore the default configuration, please use the **no graceful-restart helper planned-only** command.

Syntax

graceful-restart helper planned-only

no graceful-restart helper planned-only

Parameter

None.

Command Mode

Router Configuration Mode

Example

Enable the GR Helper to support planned-only restart function:

```
Switch(config)#router ospf 1
Switch(config-router)#graceful-restart helper planned-only
```

42.26 graceful-restart helper strict-lsa-checking

Description

The **graceful-restart helper strict-lsa-checking** is used to configure the GR Helper to strictly check LSA, which is disabled by default. When this function is configured, once the LSAs of the GR Restarter and the GR Helper do not match, the graceful restart will be failed. To restore the default configuration, please use the **no graceful-restart helper strict-lsa-checking** command.

Syntax

graceful-restart helper strict-lsa-checking

no graceful-restart helper strict-lsa-checking

Parameter

None.

Command Mode

Router Configuration Mode

Example

Configure the GR Helper to strictly check LSA:

```
Switch(config)#router ospf 1
Switch(config-router)#graceful-restart helper strict-lsa-checking
```

42.27 ip ospf cost

Description

The **ip ospf cost** is used to configure the interface cost. To restore to the default value, please use the **no ip ospf cost** command.

Syntax

ip ospf cost *cost*

no ip ospf cost

Parameter

cost —— The interface cost, ranging from 1 to 65535. The default value is calculated according to the bandwidth.

Command Mode

Interface Configuration Mode

Example

Configure the cost of interface VLAN 2 as 10:

```
Switch(config)#interface vlan 2
Switch(config-if)# ip ospf cost 10
```

42.28 ip ospf retransmit-interval

Description

The **ip ospf retransmit-interval** command is used to configure the interval to retransmit the LSA, DD and LSR packets on the specified interface. To restore to default value, please use the **no ip ospf retransmit-interval** command.

Syntax

ip ospf retransmit-interval *interval*

no ip ospf retransmit-interval

Parameter

interval—— The retransmit interval, ranging from 1 to 65535 seconds. The default value is 5 seconds.

Command Mode

Interface Configuration Mode

Example

Configure the retransmission interval of interface VLAN 2 as 10 seconds:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip ospf retransmit-interval 10
```

42.29 ip ospf transmit-delay

Description

The **ip ospf transmit-delay** is used to configure the transmission delay of LSA on the specified interface. To restore to default value, please use the **no ip ospf transmit-delay**.

Syntax

ip ospf transmit-delay *delay*

no ip ospf transmit-delay

Parameter

delay—— The LSA transmission delay, ranging from 1 to 65535 seconds. The default value is 1 second.

Command Mode

Interface Configuration Mode

Example

Configure the LSA transmission delay of interface VLAN 2 as 2 seconds.

```
Switch(config)#interface vlan 2
Switch(config-if)#ip ospf retransmit-delay 2
```

42.30 ip ospf priority

Description

The **ip ospf priority** is used to configure the priority of the specified interface. To restore to the default value, please use the **no ip ospf priority** command.

Syntax

ip ospf priority *pri*

no ip ospf priority

Parameter

pri—— The priority of the interface, ranging from 0 to 255 and the default value is 1. Interface with the priority 0 cannot be elected as DR or BDR.

Command Mode

Interface Configuration Mode

Example

Configure the priority of the interface VLAN 2 as 1:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip ospf priority 1
```

42.31 ip ospf hello-interval

Description

The **ip ospf hello-interval** is used to configure the hello intervals on the specified interface. To restore to the default value, please use the **no ip ospf hello-interval** command.

Syntax

ip ospf hello-interval *interval*

no ip ospf hello-interval

Parameter

Interval—— The interval of the hello packets, ranging from 1 to 65535 seconds and the default value is 10 seconds.

Command Mode

Interface Configuration Mode

Example

Configure the interval of the hello packets sent on interface VLAN 2 as 20 seconds:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip ospf hello-interval 20
```

42.32 ip ospf dead-interval

Description

The **ip ospf dead-interval** command is used to set the number of seconds after the last device hello packet was seen before its neighbors declare the OSPF router to be down. To restore to default value, please use the **no ip ospf dead-interval** command.

Syntax

ip ospf dead-interval *interval*

no ip ospf dead-interval

Parameter

Interval—— The interval of the hello packets, ranging from 1 to 65535 seconds and the default value is 10 seconds.

Command Mode

Interface Configuration Mode

Example

Configure the neighbor's failure interval on interface VLAN 2 as 50 seconds:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip ospf dead-interval 50
```

42.33 ip ospf authentication

Description

The **ip ospf authentication** command is used to configure the authentication mode of the specified interface. To restore to default value, please use the **no ip ospf authentication** command.

Syntax

ip ospf authentication [**message-digest**] [**null**]

no ip ospf authentication

Parameter

message-digest—— Specify the authentication type as MD5.

null —— No authentication. By default it is no authentication.

If no authentication mode is specified here, the default mode will be simple authentication.

Command Mode

Interface Configuration Mode

Example

Configure the authentication type of interface VLAN 2 as MD5:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip ospf authentication message-digest
```

42.34 ip ospf authentication-key

Description

The **ip ospf authentication-key** command is used to configure the key of the simple authentication. To cancel this configuration, please use the **no ip ospf authentication-key** command.

Syntax

ip ospf authentication-key *password*

no ip ospf authentication-key

Parameter

password—— Super password, a string from 1 to 8 alphanumeric characters or symbols. The password is case sensitive, allows spaces but ignores leading spaces, and cannot contain question marks. By default, it is empty.

Command Mode

Interface Configuration Mode

Example

Configure the authentication mode of interface VLAN 2 as simple authentication, and the password as 123:

```
Switch(config)#interface vlan 2

Switch(config-if)#ip ospf authentication-key 123
```

42.35 ip ospf message-digest-key

Description

The **ip ospf message-digest-key** is used to configure the ID and password of the md5 authentication on the specified interface. To cancel the configuration, please use **no ip ospf message-digest-key** command.

Syntax

ip ospf message-digest-key *id* **md5** *password*

no ip ospf message-digest-key *id*

Parameter

id—— The ID of the md5 authentication key, ranging from 1 to 255.

password—— A string from 1 to 16 alphanumeric characters or symbols. The password is case sensitive, and cannot contain question marks. Key configuration is required to take effect.

Command Mode

Interface Configuration Mode

Example

Configure md5 authentication key ID as 1 and password as abc on interface VLAN 2:

```
Switch(config)#interface vlan 2

Switch(config-if)#ip ospf message-digest-key 1 md5 abc
```

42.36 ip ospf network

Description

The **ip ospf network** command is used to configure the network type on the specified interface. To restore to default, please use the **no ip ospf network** command.

Syntax

ip ospf network { broadcast | non-broadcast | point-to-multipoint | point-to-point }

no ip ospf network

Parameter

broadcast —— The broadcast network type. It is the default value.

non-broadcast —— The NBMA network type.

point-to-multipoint —— The point-to-multipoint network type.

point-to-point —— The point-to-point network type.

Command Mode

Interface Configuration Mode

Example

Configure the network type on interface VLAN 2 as broadcast:

```
Switch(config)#interface vlan 2

Switch(config-if)#ip ospf network broadcast
```

42.37 ip ospf mtu-ignore

Description

The **ip ospf mtu-ignore** command is used to ignore the MTU check in the DD exchanging process. This check is scheduled by default and the adjacency relationship will not establish if the MTUs are not matched. To restore to the default value, please use the **no ip ospf mtu-ignore** command.

Syntax

ip ospf mtu-ignore

no ip ospf mtu-ignore

Command Mode

Interface Configuration Mode

Example

Configure interface VLAN 2 to ignore the MTU field check in the DD exchange process:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip ospf mtu-ignore
```

42.38 ip ospf passive

Description

The **ip ospf passive** command is used to prevent an interface from sending OSPF packets. To restore to the default settings, please use **no ip ospf passive** command. The interface is allowed to send OSPF packets by default.

Syntax

ip ospf passive

no ip ospf passive

Command Mode

Interface Configuration Mode

Example

Prevent interface VLAN 2 from sending OSPF packets:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip ospf passive
```

42.39 clear ip ospf

Description

The **clear ip ospf** command is used to reset the OSPF process, which will clear all the dynamic information. The **clear ip ospf process** command will reset all the OSPF processes.

Syntax

clear ip ospf [*process-id*]

clear ip ospf process

Parameter

process-id—— The process ID, ranging from 1 to 65535.

Command Mode

Privileged EXEC Mode

Example

Reset all the OSPF processes:

```
Switch#clear ip ospf process
Reset selected OSPF processes? (Y/N):y
```

42.40 show ip ospf

Description

The **show ip ospf** is used to display the global information of the OSPF process.

Syntax

show ip ospf [*process-id*]

Parameter

process-id—— The process ID, ranging from 1 to 65535. The global information of all the OSPF processes will be displayed if no process-id is specified.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the global information of all the OSPF processes:

```
Switch#show ip ospf
```

42.41 show ip ospf database

Description

The **show ip ospf database** command is used to display the LSDB. The detailed LSA information will be displayed if the LSA type is specified. The LSDB summary information will be displayed if the LSA type is not specified.

Syntax

show ip ospf [*process-id*] **database** [asbr-summary | external | network | nssa-external | router | summary]

Parameter

process-id—— The process ID, ranging from 1 to 65535. The LSDBs of all processes will be displayed if no process ID is specified.

asbr-summary | external | network | nssa-external | router | summary —— The LSA type.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the detailed information of router-LSA in process 1:

```
Switch#show ip ospf 1 database router
```

42.42 show ip ospf interface

Description

The **show ip ospf interface** command is used to display the interface information.

Syntax

show ip ospf [*process-id*] **interface** [*interface-name interface-number*]

Parameter

process-id—— The process ID. The information of all the processes will be displayed if process ID is not specified.

interface-name interface-number—— Specify the interface name and number to display the interface's detailed information.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the information of the interfaces in all the OSPF processes:

```
Switch#show ip ospf interface
```

42.43 show ip ospf neighbor

Description

The **show ip ospf neighbor** command is used to display information of the OSPF neighbor.

Syntax

show ip ospf [*process-id*] **neighbor** [**detail |** *interface-name interface-number*]

Parameter

process-id—— The process ID, ranging from 1 to 65535. The neighbors' information of all processes will be displayed if no process ID is specified.

detail—— The detailed information of the neighbor.

interface-name interface-number——Specify the interface name and number to display the neighbor's detailed information on this interface.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the neighbors' detailed information in process 1:

```
Switch#show ip ospf 1 neighbor detail
```

42.44 show ip ospf border-routers

Description

The **show ip ospf border-routers** is used to display the routing tables of the ABR/ASBR.

Syntax

show ip ospf [*process-id*] **border-routers**

Parameter

process-id—— The process ID, ranging from 1 to 65535. The ABR/ASBR routing tables of all processes will be displayed if no process ID is specified.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the ABR/ASBR routing tables of all the OSPF processes:

```
Switch#show ip ospf border-routers
```

42.45 show ip ospf route

Description

The **show ip ospf route** command is used to display the OSPF routing table.

Syntax

show ip ospf route

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the routing tables of OSPF:

```
Switch#show ip ospf route
```

42.46 show ip ospf [process-id] graceful-restart helper

Description

The **show ip ospf [process-id] graceful-restart helper** command is used to view the status and configuration information of the GR Helper and the reason of last exit.

Syntax

show ip ospf *[process-id]* **graceful-restart helper**

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the status and configuration information of the GR Helper and the reason of last exit:

```
Switch# show ip ospf graceful-restart helper
```

Chapter 43 OSPFv3 Configuration Commands (Only for Certain Devices)

OSPF is an Interior Gateway Protocol (IGP) designed expressly for IP networks, supporting IP subnetting and tagging of externally derived routing information. OSPF also allows packet authentication and uses IP multicast when sending and receiving packets.

Currently, OSPF Version 2 (RFC2328) is used for the IPv4 protocol; Use OSPF Version 3 (RFC2740) for IPv6 protocol. OSPFv3 is short for OSPF Version 3 and is the OSPF routing protocol running on IPv6 (RFC5340, same as RFC2740).

43.1 ipv6 router ospf

Description

The **ipv6 router ospf** command is used to enable an OSPFv3 routing process and enter the router configuration mode. To delete the specified OSPFv3 routing process, please use the **no ipv6 router ospf** command.

When the OSPFv3 instance has not been created, this command is used to create an OSPFv3 instance and enter the Router configuration mode. When the command has a VRF name, it means that the OSPFv3 instance belongs to the VRF instance; if the VRF parameter is not specified, the OSPFv3 instance belongs to the public network after it is created. When the OSPFv3 instance has been created, using this command with or without the correct VRF name can enter the Router configuration mode.

Syntax

ipv6 router ospf [**vrf** *vrf-name*]

no ipv6 router ospf [**vrf** *vrf-name*]

Parameter

vrf-name ——VRF instance name.

Command Mode

Global Configuration Mode

Example

Create an OSPFv3 instance and add it to vrf1:

```
Switch(config)#ipv6 router ospf vrf vrf1
```

43.2 router-id

Description

The **router-id** command is used to configure the router ID. The **no router-id** command is used to delete the configured router ID. If no router ID is configured manually or the configured router ID is deleted, the highest IPV6 address among all loopback interfaces will be chosen as the router ID.

Syntax

Router-id *router-id*

no router-id

Parameter

router-id —— The route ID in the format of dotted decimal notation. 0.0.0.0 is illegal.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the router ID of OSPFv3 routing process 1 as 1.1.1.1:

```
Switch(config)#ipv6 router ospf 1
Switch(config-router)#router-id 1.1.1.1
```

43.3 maximum-paths

Description

The **maximum-paths** command is used to configure the maximum number of the equal-cost multipath routings. To restore to default value, please use the **no maximum-paths** command.

Syntax

maximum-paths *number*

no maximum-paths

Parameter

number —— The maximum number of the equal-cost multipath routings, ranging from 1 to 32. The default value is 32.

Command Mode

Router Configuration Mode

Example

Configure the maximum number of the equal-cost multipath routings as 2:

```
Switch(config)#ipv6 router ospf
Switch(config-router)#maximum-paths 2
```

43.4 redistribute

Description

The **redistribute** command is used to configure the ASBR to redistribute the external routes from other routing protocols to the OSPFv3 domain in type-5 LSAs. To restore the certain optional parameters to default values, please use the **no redistribute** command with corresponding parameters.

Syntax

redistribute { **connected** | **static** | **rip** }

no redistribute { **connected** | **static** | **rip** }

Parameter

connected —— Specify the external route type as connected.

static —— Specify the external route type as static.

rip —— Specify the external route type as RIPNG.

Command Mode

Router Configuration Mode

Example

Redistribute the RIPNG routes from the external in the OSPFv3 domain.

```
Switch(config)#ipv6 router ospf
Switch(config-router)#redistribute rip
```

43.5 default-information originate

Description

The **default-information originate** command is used to advertise the default route as AS-External LSA. To cancel the advertisement of the default route, please use the **no default-information originate** command without any optional parameters. To restore the certain parameters to default values, please use the **no default-information originate** command with corresponding parameters.

Syntax

default-information originate [**always**] [**metric** *cost*] [**metric-type** *type*]

no default-information originate [**always**] [**metric** *cost*] [**metric-type** *type*]

Parameter

always —— OSPFv3 will advertise the default route whether there is default route is the IPV6 routing table or not. If the parameter is not configured, OSPFv3 will advertise the default route only when there is default route in the IPV6 routing table.

cost——The default cost of the default route, ranging form 1 to 16777214. Its default value is 1.

type —— The type of the external routes, either 1 or 2. The default value is 2.

Command Mode

Router Configuration Mode

Example

Configure OSPF to advertise the default route whether there is default route is the IP routing table or not:

```
Switch(config)#router ospf 1
Switch(config-router)#default-information originate always
```

43.6 auto-cost

Description

The **auto-cost** command is used to enable the auto computing function of the interface cost and configure the reference bandwidth. The interface cost is the ratio of the reference bandwidth to the interface bandwidth. To restore the reference bandwidth to default value, please use the **no auto-cost reference-bandwidth** command.

Syntax

auto-cost reference-bandwidth *bandwidth*

no auto-cost reference-bandwidth

Parameter

bandwidth —— The reference bandwidth, ranging from 1 to 4294967 Mbps. Its default value is 100Mbps.

Command Mode

Router Configuration Mode

Example

Enable the auto computing function of the interface cost and configure the reference bandwidth as 10000 Mbps:

```
Switch(config)#ipv6 router ospf
Switch(config-router)#auto-cost reference-bandwidth 10000
```

43.7 distance

Description

The **distance** command is used to configure the OSPFv3 administrative distance. To restore to the default distance, please use the **no distance** command. The administrative distance represents the priority of the routes. The smaller administrative distance corresponds to higher priority. When different routing protocols possess the same route to the same destination, the route with the highest priority will be selected to add to the IPv6 routing table according to the administrative distance.

Syntax

distance *administrative-distance*

no distance

Parameter

administrative-distance —— Routing administrative distance, ranging from 1 to 254. Its default value is 110.

Command Mode

Router Configuration Mode

Example

Configure the OSPFV3 routing administrative distance as 100:

```
Switch(config)#ipv6 router ospf
Switch(config-router)#distance 100
```

43.8 distance ospf

Description

The **distance ospf** command is used to configure the OSPFv3 distance for different types of routes. To restore to the default distance, please use the **no distance** command.

Syntax

distance ospf { external *distance* **| inter-area** *distance* **| intra-area** *distance* **}**

no distance

Parameter

external —— External type 5 and type 7 routes.

inter-area —— Inter-area routes.

intra-area —— Intra-area routes.

distance —— Distance for different types of routes, ranging from 1 to 254. Its default value is 110.

Command Mode

Router Configuration Mode

Example

Configure the OSPFV3 routing administrative distance as 100:

Switch(config)#ipv6 router ospf

Switch(config-router)#distance 100

43.9 timers throttle spf

Description

The **timers throttle spf** command is used to configure the computing delay and interval of the SPF, thus preventing the consumption of the CPU and memory caused by frequent SPF computing. To restore to the default value, please use the **no timers throttle spf** command.

Syntax

timers throttle spf *spf-delay spf-holdtime spf-max-holdtime*

no timers throttle spf

Parameter

spf-delay—— The delay time of the SPF computing, ranging from 1 to 600000 milliseconds. The default value is 0 milliseconds.

spf-holdtime —— The minimum interval between two SPF computings, ranging from 1 to 600000 milliseconds. The default value is 50 milliseconds

spf-max-holdtime —— The Maximum interval between two SPF computings, ranging from 1 to 600000 milliseconds. The default value is 5000 milliseconds

Command Mode

Router Configuration Mode

Example

Configure the computing delay and interval of the SPF as 10 seconds:

Switch(config)#ipv6 router ospf

Switch(config-router)#timers throttle spf 10000 10000 50000

43.10 timers lsa arrival

Description

The **timers lsa arrival** command is used to configure the time interval for OSPFv3 LSA reception. To restore to the default value, please use the **no timers lsa arrival** command.

Syntax

timers lsa arrival *delay-time*

no timers lsa arrival

Parameter

delay-time—— The time interval for OSPFv3 LSA reception, ranging from 1 to 600000 milliseconds. The default value is 1000 milliseconds.

Command Mode

Router Configuration Mode

Example

Configure the time interval for OSPFv3 LSA reception as 10 seconds:

Switch(config)#ipv6 router ospf

Switch(config-router)#timers lsa arrival 10000

43.11 area stub

Description

The **area stub** command is used to define an area as a stub area. To restore the stub area to a normal one, please use the **no area stub** command. To restore the certain parameters to default values, please use the **no area stub** command with corresponding parameters.

Syntax

area *area-id* **stub [no-summary]**

no area *area-id* **stub [no-summary]**

Parameter

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

no-summary —— Configure the stub are as a totally stub area, where the ABR advertises neither the destinations in other areas nor the external routes. The stub area is not a totally stub area by default.

Command Mode

Router Configuration Mode

Example

Configure the area 1 as a totally stub area:

```
Switch(config)#ipv6 router ospf
Switch(config-router)#area 1 stub no-summary
```

43.12 area nssa

Description

The **area nssa** command is used to define an area as a NSSA area. To restore the NSSA area to a normal one, please use the **no area nssa** command without any optional parameters. To restore the certain parameters to default values, please use the **no area nssa** command with corresponding parameters.

Syntax

area *area-id* **nssa** [**no-summary**]

no area *area-id* **nssa** [**no-summary**]

Parameter

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

no-summary —— Select to not send summary LSAs into the NSSA.

Command Mode

Router Configuration Mode

Example

Configure the Area 1 as a totally NSSA area:

```
Switch(config)#router ospf 1
Switch(config-router)# area 1 nssa no-summary
```

43.13 area range

Description

The **area range** is to configure a summary route. To delete this route, please use the **no area range** command. By default no route is summarized.

This command is only used with the ABR to summarize the route information of a certain area. The ABR only sends one summarized route of the routes in the aggregated segment to the other areas. An area can be configured with multiple summary segments, which can be aggregated by OSPF.

If the **no area range** command is configured, the formally summarized routes will be redistributed.

Syntax

area *area-id* **range** *ipv6-address/mask-num* [**advertise**] [**cost** *cost*] [**not-advertise**]

no area *area-id* **range** *ip-address mask* [**advertise**] [**cost** *cost*] [**not-advertise**]

Parameter

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

ipv6-address —— The destination of the aggregated route.

mask-num —— The network mask for aggregated route, in the format of mask bits.

cost—— The cost of the aggregated route, ranging from 1 to 16777214. The default value is the maximum one of all the aggregated routes.

Command Mode

Router Configuration Mode

Example

Configure one aggregated route 2001::1/64 with the cost 10 in the Area 0:

```
Switch(config)# ipv6 router ospf
Switch(config-router)# area 0 range 2001::1/64 cost 10
```

43.14 ipv6 ospf area

Description

The **ipv6 ospf area** is used to assign the interface to different regions. By default, the interface does not belong to any area. Only the interface attached to a certain area can receive ospfv3 packets normally. To restore to the default value, please use the **no ipv6 ospf area** command.

Syntax

ip ospf area *area-id* [**instance-id** *instance-id*]

no ip ospf area *area-id* [**instance-id** *instance-id*]

Parameter

area-id: The area ID, in the format of an IP address in dotted decimal notation or decimal value ranging from 0 to 4294967295.

instance-id—— The instance ID, ranging from 0 to 255. OSPFv3 supports running multiple instances on a single link, using the optional parameter instance-id as the instance identifier. The instance number only affects the reception of OSPFv3 messages. By default, this parameter value is 0. To restore the default value, use the no ipv6 ospf area area-id instance-id command.

Command Mode

Interface Configuration Mode

Example

Assign interface VLAN 2 to area 10:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf area 10
```

43.15 ipv6 ospf cost

Description

The **ipv6 ospf cost** is used to configure the interface cost. To restore to the default value, please use the **no ipv6 ospf cost** command.

Syntax

ipv6 ospf cost *cost*

no ipv6 ospf cost

Parameter

cost —— The interface cost, ranging from 1 to 65535. The default value is calculated according to the bandwidth.

Command Mode

Interface Configuration Mode

Example

Configure the cost of interface VLAN 2 as 10:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf cost 10
```

43.16 ipv6 ospf retransmit-interval

Description

The **ipv6 ospf retransmit-interval** command is used to configure the interval to retransmit the LSA, DD and LSR packets on the specified interface. To restore to default value, please use the **no ipv6 ospf retransmit-interval** command.

Syntax

Ipv6 ospf retransmit-interval *interval*

no ipv6 ospf retransmit-interval

Parameter

interval—— The retransmit interval, ranging from 1 to 65535 seconds. The default value is 5 seconds.

Command Mode

Interface Configuration Mode

Example

Configure the retransmission interval of interface VLAN 2 as 10 seconds:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf retransmit-interval 10
```

43.17 ipv6 ospf transmit-delay

Description

The **ipv6 ospf transmit-delay** is used to configure the transmission delay of LSA on the specified interface. To restore to default value, please use the **no ipv6 ospf transmit-delay**.

Syntax

ipv6 ospf transmit-delay *delay*

no ipv6 ospf transmit-delay

Parameter

delay—— The LSA transmission delay, ranging from 1 to 3600 seconds. The default value is 1 second.

Command Mode

Interface Configuration Mode

Example

Configure the LSA transmission delay of interface VLAN 2 as 2 seconds.

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf retransmit-delay 2
```

43.18 ipv6 ospf priority

Description

The **ipv6 ospf priority** is used to configure the priority of the specified interface. To restore to the default value, please use the **no ipv6 ospf priority** command.

Syntax

ipv6 ospf priority *pri*

no ipv6 ospf priority

Parameter

pri—— The priority of the interface, ranging from 0 to 255 and the default value is 1. Interface with the priority 0 cannot be elected as DR or BDR.

Command Mode

Interface Configuration Mode

Example

Configure the priority of the interface VLAN 2 as 1:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf priority 1
```

43.19 ipv6 ospf hello-interval

Description

The **ipv6 ospf hello-interval** is used to configure the hello intervals on the specified interface. To restore to the default value, please use the **no ipv6 ospf hello-interval** command.

Syntax

ipv6 ospf hello-interval *interval*

no ipv6 ospf hello-interval

Parameter

Interval—— The interval of the hello packets, ranging from 1 to 65535 seconds and the default value is 10 seconds.

Command Mode

Interface Configuration Mode

Example

Configure the interval of the hello packets sent on interface VLAN 2 as 20 seconds:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf hello-interval 20
```

43.20 ipv6 ospf dead-interval

Description

The **ipv6 ospf dead-interval** command is used to set the number of seconds after the last device hello packet was seen before its neighbors declare the OSPFv3 router to be down. To restore to default value, please use the **no ipv6 ospf dead-interval** command.

Syntax

ipv6 ospf dead-interval *interval*

no ipv6 ospf dead-interval

Parameter

Interval—— The interval of the hello packets, ranging from 1 to 65535 seconds and the default value is 10 seconds.

Command Mode

Interface Configuration Mode

Example

Configure the neighbor's failure interval on interface VLAN 2 as 50 seconds:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf dead-interval 50
```

43.21 ipv6 ospf network

Description

The **ipv6 ospf network** command is used to configure the network type on the specified interface. To restore to default, please use the **no ipv6 ospf network** command.

Syntax

ipv6 ospf network { broadcast | point-to-point }

no ipv6 ospf network

Parameter

broadcast —— The broadcast network type. It is the default value.

point-to-point —— The point-to-point network type.

Command Mode

Interface Configuration Mode

Example

Configure the network type on interface VLAN 2 as broadcast:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf network broadcast
```

43.22 ipv6 ospf mtu-ignore

Description

The **ipv6 ospf mtu-ignore** command is used to ignore the MTU check in the DD exchanging process. This check is scheduled by default and the adjacency relationship will not establish if the MTUs are not matched. To restore to the default value, please use the **no ipv6 ospf mtu-ignore** command.

Syntax

ipv6 ospf mtu-ignore

no ipv6 ospf mtu-ignore

Command Mode

Interface Configuration Mode

Example

Configure interface VLAN 2 to ignore the MTU field check in the DD exchange process:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf mtu-ignore
```

43.23 ipv6 ospf passive

Description

The **ipv6 ospf passive** command is used to prevent an interface from sending OSPFv3 packets. To restore to the default settings, please use **no ipv6 ospf passive** command. The interface is allowed to send OSPFv3 packets by default.

Syntax

ipv6 ospf passive

no ipv6 ospf passive

Command Mode

Interface Configuration Mode

Example

Prevent interface VLAN 2 from sending OSPFv3 packets:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 ospf passive
```

43.24 clear ipv6 ospf

Description

The **clear ipv6 ospf** command is used to reset the OSPFv3 process, which will clear all the dynamic information. The **clear ipv6 ospf process** command will reset the OSPFv3 process. The **clear ipv6 ospf interface** command will reset the configuration of the interface in the OSPFv3 process.

Syntax

clear ipv6 ospf { **process | interface** }

Command Mode

Privileged EXEC Mode

Example

Reset the OSPFv3 process:

```
Switch#clear ipv6 ospf process
```

```
Reset selected OSPFv3 processes? (Y/N):y
```

43.25 show ipv6 ospf

Description

The **show ipv6 ospf** is used to display the global information of the OSPFv3 process.

Syntax

show ipv6 ospf

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the global information of the OSPFv3 processes:

```
Switch#show ipv6 ospf
```

43.26 show ipv6 ospf database

Description

The **show ip ospf database** command is used to display the LSDB.

Syntax

show ipv6 ospf database

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the LSDB in OSPFv3 process:

```
Switch#show ipv6 ospf database
```

43.27 show ipv6 ospf interface

Description

The **show ipv6 ospf interface** command is used to display the interface information.

Syntax

show ipv6 ospf interface

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the information of the interfaces in the OSPFv3 process:

```
Switch#show ipv6 ospf interface
```

43.28 show ipv6 ospf neighbor

Description

The **show ipv6 ospf neighbor** command is used to display information of the OSPFv3 neighbor.

Syntax

show ipv6 ospf neighbor

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the neighbors' detailed information in OSPFv3 process:

```
Switch#show ipv6 ospf neighbor
```

43.29 show ipv6 ospf border-routers

Description

The **show ipv6 ospf border-routers** is used to display the routing tables of the ABR/ASBR.

Syntax

show ipv6 ospf border-routers

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the ABR/ASBR routing tables of the OSPFv3 proces:

```
Switch#show ipv6 ospf border-routers
```

43.30 show ipv6 ospf rib

Description

The **show ipv6 ospf rib** command is used to display the OSPFv3 routing table.

Syntax

show ipv6 ospf route

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the routing tables of OSPFv3:

```
Switch#show ipv6 ospf rib
```

Chapter 44 BFD Configuration Commands (Only for Certain Devices)

Bidirectional Forwarding Detection (BFD) is a unified network detection mechanism used for rapidly detecting and monitoring the forwarding connectivity status of links or IP routes in a network.

In order to minimize the impact of device failures on business operations and enhance network reliability, network devices need to promptly detect communication failures with neighboring devices to take timely action and ensure uninterrupted services. In existing networks, some links are often monitored for faults through hardware detection signals such as SDH alarms; however, not all mediums can provide hardware detection. In such cases, applications rely on the upper-layer protocol's own Hello message mechanism for fault detection. The fault detection time of upper-layer protocols typically exceeds 1 second, which is intolerable for certain applications. In L3 networks, the Hello message detection mechanism cannot detect faults for all routes, such as static routes, posing challenges in diagnosing faults in interconnection between systems.

BFD facilitates rapid detection and monitoring of forwarding connectivity status for links or IP routes in a network, thereby improving network performance. By swiftly identifying communication failures between neighboring systems, users can establish backup channels promptly for communication recovery, ensuring network reliability.

44.1 bfd-template

Description

This command is used to create a BFD template. To delete the BFD template, please use the **no bfd-template** command.

Syntax

bfd-template *template*

no bfd-template *template*

Parameter

template —— Template name, the value range is 1 to 32 characters.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a BFD template named b1:

```
Switch(config)#bfd-template b1
```

44.2 detect-multiplier

Description

This command is used to specify the detect-multiplier of the BFD template. To restore the detect-multiplier of the BFD template to the default, please use the **no detect-multiplier** command.

Syntax

detect-multiplier *multiplier*

no detect-multiplier

Parameter

multiplier —— The detect-multiplier of the BFD template. The value range is an integer between 3 to 50, and the default value is 3.

Command Mode

BFD Template Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the detect-multiplier of BFD template b1 to 10:

```
Switch(config)#bfd-template b1

Switch(config-bfd)#detect-multiplier 10
```

44.3 receive-interval

Description

This command is used to configure the receive interval for BFD packets. To restore the default value, please use the **no receive-interval** command.

Syntax

receive-interval *interval*

no receive-interval

Parameter

interval—— The receive interval for BFD packets. The value range is an integer between 100 to 1000 milliseconds, and the default value is 300.

Command Mode

BFD Template Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the receive interval of BFD template b1 to 500 milliseconds:

```
Switch(config)#bfd-template b1
Switch(config-bfd)#receive-interval 500
```

44.4 transmit-interval

Description

This command is used to configure the transmit interval for BFD packets. To restore the default value, please use the **no transmit-interval** command.

Syntax

transmit-interval *interval*

no transmit-interval

Parameter

interval—— The transmit interval for BFD packets. The value range is an integer between 100 to 1000 milliseconds, and the default value is 300.

Command Mode

BFD Template Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the transmit interval of BFD template b1 to 500 milliseconds:

```
Switch(config)#bfd-template b1
Switch(config-bfd)#transmit-interval 500
```

44.5 transmit-interval

Description

This command is used to disable BFD session detection (enabled by default) and put it into AdminDown state. To enable the session, please use the **no shutdown** command

Syntax

shutdown

no shutdown

Parameter

none

Command Mode

BFD Template Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable the BFD session detection of BFD template b1:

```
Switch(config)#bfd-template b1
Switch(config-bfd)#shutdown
```

44.6 passive-mode

Description

This command is used to enable the passive mode of the BFD session (disabled by default). When it is enabled, the local BFD will not actively send BFD packets. To disable the passive mode of the BFD session, please use the **no passive-mode** command.

Syntax

passive-mode

no passive-mode

Parameter

None

Command Mode

BFD Template Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the passive mode of BFD template b1:

```
Switch(config)#bfd-template b1
Switch(config-bfd)#passive mode
```

44.7 ip ospf bfd

Description

This command is used to enable the BFD feature on a specific OSPF interface (disabled by default). When it is enabled, the default BFD session parameters are used. To disable BFD feature on the interface, please use the **no ip ospf bfd** command.

Syntax

passive-mode

no passive-mode

Parameter

None

Command Mode

interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable BFD on interface vlan 10:

```
Switch(config)#interface vlan 10
Switch (config-if)#ip ospf bfd
```

44.8 ip ospf bfd template

Description

This command is used to bind a BFD template to a specific interface with OSPF enabled. The BFD template to be bound must exist. To cancel the binding and restore the BFD session parameters to the default values, please use the **no ip ospf bfd template** command. By default, no BFD template is bound to a specific interface with OSPF enabled.

Syntax

ip ospf bfd template *template*

no ip ospf bfd template

Parameter

template —— Template name. It should be configured BFD template

Command Mode

interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create BFD template b1, set the minimum sending interval to 400 ms, the minimum receiving interval to 400 ms, and the local detection multiplier to 4, enable BFD on interface vlan 10, and bind BFD template b1:

```
Switch(config)#bfd-template b1
Switch(config-bfd)#detect-multiplier 4
Switch(config-bfd)#receive-interval 400
Switch(config-bfd)#transmit-interval 400
Switch(config-bfd)#exit
Switch(config)#interface vlan 10
```

```
Switch(config-if)#ip ospf bfd

Switch(config-if)#ip ospf bfd template b1
```

44.9 ipv6 ospf bfd

Description

This command is used to enable the BFD feature on a specific OSPFv3 interface (disabled by default). When it is enabled, the default BFD session parameters are used. To disable BFD feature on the interface, please use the **no ipv6 ospf bfd** command.

Syntax

ipv6 ospf bfd

no ipv6 ospf bfd

Parameter

template —— Template name. It should be configured BFD template

Command Mode

interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable BFD on interface vlan 10:

```
Switch(config)#interface vlan 10

Switch(config-if)#ipv6 ospf bfd
```

44.10 ipv6 ospf bfd

Description

This command is used to bind a BFD template to a specific interface with OSPF enabled. The BFD template to be bound must exist. To cancel the binding and restore the BFD session parameters to the default values, please use the no ipv6 ospf bfd template command. By default, no BFD template is bound to a specific interface with OSPF enabled.

Syntax

ipv6 ospf bfd template *template*

no ipv6 ospf bfd template

Parameter

None

Command Mode

interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create BFD template b1, set the minimum sending interval to 400 ms, the minimum receiving interval to 400 ms, and the local detection multiplier to 4, enable BFD on interface vlan 10, and bind BFD template b1:

```
Switch(config)#bfd-template b1
Switch(config-bfd)#detect-multiplier 4
Switch(config-bfd)#receive-interval 400
Switch(config-bfd)#transmit-interval 400
Switch(config-bfd)#exit
Switch(config)#interface vlan 10
Switch(config-if)#ip ospfv6 bfd
Switch(config-if)#ip ospfv6 bfd template b1
```

44.11 isis bfd

Description

This command is used to configure BFD features or bind a BFD template on a specific interface with IS-IS enabled. The BFD template to be bound must exist. To disable the BFD features on the interface or cancel the binding to restore the BFD session parameters to default values, please use the **no isis bfd** command. By default, the BFD feature is disabled on a specific interface with IS-IS enabled.

Syntax

isis bfd [*template***]**

no isis bfd [*template***]**

Parameter

template —— Template name. It should be configured BFD template.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a BFD template b1, set the minimum sending interval to 400 ms, the minimum receiving interval to 400 ms, and the local detection multiplier to 4, enable BFD on interface vlan 10, and bind BFD template b1 to the interface:

```
Switch(config)#bfd-template b1
Switch(config-bfd)#detect-multiplier 4
Switch((config-bfd)#receive-interval 400
Switch((config-bfd)#transmit-interval 400
Switch((config-bfd)#exit
Switch((config)#interface vlan 10
Switch((config-if)#ipv6 enable
Switch((config-if)#isis bfd
Switch((config-if)#isis bfd b1
Switch(config)#end
```

44.12 show bfd counters

Description

This command is used to view the statistics of BFD sessions (such as the number of sent and received packets).

Syntax

show bfd counters

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the statistics of BFD sessions:

```
Switch# show bfd counters
```

44.13 show bfd neighbors

Description

This command is used to display the information of BFD sessions. The **details** command is used to display the detailed information. The **ipv4** command is used to display the neighbor information of a BFD session.

Syntax

show bfd neighbors

show bfd neighbors details

show bfd neighbors ipv4 [*ip***]**

Parameter

ip —— IPv4 address.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the neighbor information of 192.168.0.100:

```
Switch# show bfd neighbors ipv4 192.168.0.100
```

Chapter 45 BGP Configuration Commands (Only for Certain Devices)

Border Gateway Protocol (BGP) is a distance vector routing protocol that enables routing reachability between Autonomous Systems (AS) and selects the best route.

BGP establishes a unique unicast-based connection for each BGP neighbor. To enhance the reliability of peer connections, BGP uses TCP (port 179) as the underlying transmission mechanism. Since tasks like acknowledgment, retransmission, and sequencing are handled by the TCP layer, the session maintenance and update mechanisms of BGP are greatly simplified. As BGP operates over TCP, a separate point-to-point session needs to be established for each peer.

Each BGP node passes routes from the routing table via downstream neighbors. BGP nodes perform route calculations based on the routes they advertise and pass the calculated results to upstream neighbors, so it's the primary task for routing BGP routes to successfully establish BGP neighbors.

The three earlier versions are BGP-1, BGP-2, and BGP-3, which are mainly used to exchange reachable routing information between ASs, build inter-AS propagation paths, prevent routing loops, and apply some routing policies at the AS level. The current version is BGP-4.

45.1 router bgp

Description

This command is used to enable the BGP function and enter the Router BGP configuration mode. To disable BGP and clear BGP instances, please use the **no router bgp** command.

Syntax

router bgp *as-number*

no router bgp *as-number*

Parameter

as-number —— BGP AS number.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the BGP function on the switch:

```
Switch(config)# router bgp 100
```

45.2 access-list

Description

This command is used to configure IP-based routing ACL rules. To disable the ACL rules, use the **no access-list** command.

Syntax

access-list *word* {deny | permit} *ipv4-address*

no access-list *word* {deny | permit} *ipv4-address*

Parameter

word: indicates the rule name.

deny: indicates intercepting the corresponding message.

permit: indicates releasing the corresponding message.

ipv4-address: ipv4-address.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

```
Switch(config)#router bgp 100

Switch(config-router)#access-list 500 deny 100
```

45.3 aggregate-address

Description

This command is used to create an aggregate route in the BGP routing table. To delete an aggregate route in the BGP routing table, please use the **no aggregate-address** command.

Syntax

aggregate-address *ipv4-address ipv4-mask* [as-set | summary-only]

no aggregate-address *ipv4-address ipv4-mask*

Parameter

ipv4-address: Specifies the IPv4 address of the aggregated route.

ipv4-mask: The network mask of the aggregated route.

as-set: Specifies the generation of routes with AS-SET.

summary-only: Neighbors will not learn the aggregated source detailed routes.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create an aggregate route. The path advertised by this route is an AS set segment that contains all aggregate path information:

```
Switch(config)#router bgp 100
Switch(config-router)#aggregate-address 1.1.1.0 255.255.255.0 as-set
```

45.4 distance bgp

Description

This command is used to specify the management distance.

Syntax

distance bgp *external-distance internal-distance local-distance*

Parameter

external-distance: Management distance of internal routes

internal-distance : Management distance of external routes

local-distance: Management distance of local routes

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the BGP management distance:

Switch(config)#router bgp 100

Switch(config-router)#distance bgp 120 100 100

45.5 maximum-paths

Description

This command is used to configure the number of paths for BGP to perform load balancing.

Syntax

maximum-paths *path-number* **[ibgp]**

Parameter

path-number: Specifies the number of paths

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the number of load-balanced paths to 12 when the next-hop neighbors of multiple paths are all iBGP:

Switch(config)#router bgp 100

```
Switch(config-router)# maximum-paths 12 ibgp
```

45.6 network

Description

This command is used to configure the network routing prefix. To restore the default value, please use the **no network** command.

Syntax

network *ipv4-address* [mask] [*ipv4-mask*] [backdoor]

no network *ipv4-address* [mask] [*ipv4-mask*]

Parameter

ipv4-address: IPv4 address to be announced

ipv4-mask: IPv4 mask to be announced

backdoor: Declare as backdoor link and change ebgp route to ibgp route (advanced BGP feature)

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the LSP refresh interval to 10s:

```
Switch(config)#router bgp 100
Switch(config-router)#network 1.1.1.1 mask 255.255.255.0 backdoor
```

45.7 redistribute

Description

This command is used to enable the route redistribution feature to allow routing information of other routing protocols to be published to BGP. The no command without optional parameters can cancel external route redistribution, and the no command with optional parameters can restoresthe optional parameters to their default values.

Syntax

redistribute { connected | static | rip | isis | ospf *process-id* **| isis [tag** *area-name***] } [metric** *cost* **]**

no redistribute { connected | static | rip | isis | ospf *process-id* **| isis [tag** *area-name***] }**

Parameter

connected | static | rip | ospf | isis: Select the source routing protocol. Differentiated metrics can be defined when the routing information learned by the routing protocol is published to BGP.

process-id: Configure the instance number for redistributing OSPF routes.

area-name: Configure the area name for redistributing IS-ISf routes.

cost: Configure the metric for redistributing routes. The valid value is from 0 to 4294967295. This parameter is optional and defaults to the value specified by the default-metric command.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Redistribute RIP routing information to BGP:

```
Switch(config)#router bgp 100
Switch(config-router)#redistribute rip
```

45.8 timers bgp

Description

This command is used to configure the interval for sending keepalive messages and the neighbor hold time. The no command is used to cancel the configuration.

Syntax

timers bgp *keepalive hold*

no timers bgp

Parameter

keepalive: The interval between for sending keepalive messages between neighbors, ranging from 1-65535 seconds.

hold: Neighbor hold time, ranging from 1-65535 seconds.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the keepalive message sending interval to 10 seconds and the hold time to 30 seconds:

Switch(config)#router bgp 100

Switch(config-router)#timers bgp 10 30

45.9 bgp always-compare-med

Description

This command is used to allow the comparison of MED attribute values of routing paths from different AS neighbors. To restore the default value, please use the **no bgp always-compare-med** command.

Syntax

bgp always-compare-med

no bgp always-compare-med

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Allow the comparison of MED attribute values of routing paths from different AS neighbors:

```
Switch(config)#router bgp 100
Switch(config-router)#bgp always-compare-med
```

45.10 bgp bestpath as-path confed

Description

This command is used to configure BGP routing to use as-path information for routes obtained from confederation neighbors. To cancel this configuration, please use the **no bgp bestpath as-path confed** command.

Syntax

bgp bestpath as-path confed

no bgp bestpath as-path confed

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP routing to use as-path information for routes obtained from confederation neighbors:

```
Switch(config)#router bgp 100
Switch(config-router)#bgp bestpath as-path confed
```

45.11 bgp bestpath as-path ignore

Description

This command is used to configure BGP to ignore AS path information when selecting routes. To cancel this configuration, please use the **no bgp bestpath as-path ignore** command.

Syntax

bgp bestpath as-path ignore

no bgp bestpath as-path ignore

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP to ignore AS path information when selecting routes:

```
Switch(config)#router bgp 100
Switch(config-router)# bgp bestpath as-path ignore
```

45.12 bgp bestpath as-path multipath-relax

Description

This command is used to configure the BGP multipath decision process to consider paths with the same AS_ PATH length. If not configured, the entire AS_PATH must match the multipath calculation. To cancel this configuration, please use the **no bgp bestpath as-path multipath-relax** command.

Syntax

bgp bestpath as-path multipath-relax

no bgp bestpath as-path multipath-relax

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the BGP multipath decision process to consider paths with the same AS_PATH length:

```
Switch(config)#router bgp 100
Switch(config-router)#bgp bestpath as-path multipath-relax
```

45.13 bgp bestpath compare-routerid

Description

This command is used to enable the router ID information comparison when selecting EBGP routes. To disable this configuration, please use the **no bgp bestpath compare-routerid** command.

Syntax

bgp bestpath compare-routerid

no bgp bestpath compare-routerid

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the router ID information comparison when selecting EBGP routes:

```
Switch(config)#router bgp 100
Switch(config-router)#bgp bestpath as-path compare-routerid
```

45.14 bgp bestpath med confed

Description

This command is used to allow MED comparison between BGP confederation paths. To disable this configuration, please use the **no bgp bestpath med confed** command.

Syntax

bgp bestpath med confed

no bgp bestpath med confed

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the router ID information comparison when selecting EBGP routes:

```
Switch(config)#router bgp 100
Switch(config-router)#bgp bestpath med confed
```

45.15 bgp bestpath med missing-as-worst

Description

This command is used to allow MED comparison between BGP confederation paths. To disable this configuration, please use the **no bgp bestpath med missing-as-worst** command.

Syntax

bgp bestpath med missing-as-worst

no bgp bestpath med missing-as-worst

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP to regard the missed MED as the worst:

```
Switch(config)#router bgp 100
Switch(config-router)# bgp bestpath med missing-as-worst
```

45.16 bgp client-to-client reflection

Description

This command is used to configure the client-to-client route reflection. To disable this configuration, please use the **no bgp client-to-client reflection** command.

Syntax

bgp client-to-client reflection

no bgp client-to-client reflection

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the client-to-client route reflection:

Switch(config)#router bgp 100

Switch(config-router)#bgp client-to-client reflection

45.17 bgp cluster-id

Description

This command is used to configure the cluster ID of the route reflector. To disable this configuration, please use the **no bgp cluster-id** command.

Syntax

bgp cluster-id *ip-address*

no bgp cluster-id

Parameter

ip-address: IP address

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the reflector's cluster ID to be 1.1.1.1:

Switch(config)#router bgp 100

Switch(config-router)# bgp cluster-id 1.1.1.1

45.18 bgp cluster-id

Description

This command is used to enable the BGP function and enter the Router BGP configuration mode.

Syntax

bgp confederation identifier *as*

no bgp confederation identifier

Parameter

as: The confederation ID of the route reflector, ranging from 1 to 4294967295.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the confederation ID to 1:

```
Switch(config)#router bgp 100

Switch(config-router)# bgp confederation identifier 1
```

45.19 bgp confederation peers

Description

This command is used to configure a sub-AS belonging to the confederation. To disable this configuration, please use the **no bgp confederation peers** command.

Syntax

bgp confederation peers *as*

no bgp confederation peers

Parameter

as: The sub-AS number of the confederation, ranging from 1 to 4294967295.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the sub-AS belonging to the confederation to 1:

```
Switch(config)#router bgp 100

Switch(config-router)# bgp confederation peers 1
```

45.20 bgp dampening

Description

This command is used to configure route dampening. To disable this configuration, please use the **no bgp dampening** command.

Syntax

bgp dampening *half-life reuse suppress max-suppress-time*

no bgp dampening

Parameter

half-life: half-life: The time it takes for the penalty value to be halved. The range is 1-45 minutes, and the default value is 15.

reuse: The value at which the oscillating route can be reused. The range is 1-20000, and the default value is 750.

suppress: The value at which the oscillating route is suppressed. The range is 1-20000, and the default value is 2000.

max-suppress-time: The maximum duration of route suppression. The range is 1-255, and the default value is 4.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the time required for the route attenuation penalty value to be halved to 30 minutes, the reuse value to 500, the suppression value to 500, and the maximum suppression duration to 10:

```
Switch(config)#router bgp 100

Switch(config-router)# bgp dampening 30 500 500 10
```

45.21 bgp default ipv4-unicast

Description

This command is used to configure IPv4 unicast to be activated for neighbors by default. To disable this configuration, please use the **no bgp default ipv4-unicast** command.

Syntax

bgp default ipv4-unicast

no bgp default ipv4-unicast

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure IPv4 unicast to be activated for neighbors by default:

```
Switch(config)#router bgp 100
Switch(config-router)#bgp default ipv4-unicast
```

45.22 bgp default local-preference

Description

This command is used to configure the local preference. To disable this configuration, please use the **no bgp default local-preference** command.

Syntax

bgp bgp default local-preference *preference*

no bgp default local-preference

Parameter

preference: Local preference, ranging from 0 to 4294967295, and the default value is 100.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the local preference to 200:

Switch(config)#router bgp 100

Switch(config-router)# bgp default local-preference 200

45.23 bgp deterministic-med

Description

This command is used to configure BGP to select the path with the best MED from the paths advertised from the adjacent AS. To disable this configuration, please use the **no bgp deterministic-med** command.

Syntax

bgp deterministic-med

no bgp deterministic-med

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP to select the path with the best MED from the paths advertised from the adjacent AS:

Switch(config)#router bgp 100

Switch(config-router)# bgp deterministic-med

45.24 bgp fast-external-failover

Description

This command is used to configure BGP to reset the session immediately after the directly connected external neighbor is disconnected. To disable this configuration, please use the **no bgp fast-external-failover** command.

Syntax

bgp fast-external-failover

no bgp fast-external-failover

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP to reset the session immediately after the directly connected external neighbor is disconnected:

```
Switch(config)#router bgp 100
Switch(config-router)# bgp fast-external-failover
```

45.25 bgp network import-check

Description

This command is used to configure BGP to check the reachability of the routes configured by the network command. To disable this configuration, please use the **no bgp network import-check** command.

Syntax

bgp network import-check

no bgp network import-check

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP to check the reachability of the routes configured by the network command:

```
Switch(config)#router bgp 100
Switch(config-router)# bgp network import-check
```

45.26 bgp graceful-restart

Description

This command is used to configure graceful restart of BGP. To cancel the configuration, use the **no bgp graceful-restart** command.

Syntax

bgp graceful-restart

no bgp graceful-restart

bgp graceful-restart restart-time *restart-time*

no bgp graceful-restart restart-time

bgp graceful-restart rib-stale-time *rib-stale-time*

no bgp graceful-restart rib-stale-time

bgp graceful-restart select-defer-time *select-defer-time*

no bgp graceful-restart select-defer-time

bgp graceful-restart stalepath-time *stalepath-time*

no bgp graceful-restart stalepath-time

Parameter

restart-time: The maximum wait time for the local BGP neighbor to establish successfully during a graceful restart, ranging from 1 to 4095 seconds, and the default value is 120 seconds.

rib-stale-time: The maximum duration to retain stale BGP routing information during a graceful restart, ranging from 1-3600 seconds, and the default value is 120 seconds.

select-defer-time: The time neighbor routers wait after receiving updated routing information from the restarting router before performing route selection, ranging from 0-3600 seconds, and the default value is 90 seconds.

stalepath-time: The maximum duration to retain stale BGP path information during a graceful restart, ranging from 1 to 4095 seconds, and the default value is 120 seconds.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the gracefule restart of the BGP:

```
Switch(config)#router bgp 100
Switch(config-router)# bgp graceful-restart
```

45.27 bgp log neighbor change

Description

This command is used to enable logging of the reasons for BGP neighbor up/down events. To disable it, use the **no bgp log-neighbor-changes** command.

Syntax

bgp log-neighbor-changes

no bgp log-neighbor-changes

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable logging of BGP neighbor up/down events:

```
Switch(config)#router bgp 100
Switch(config-router)#bgp log-neighbor-changes
```

45.28 bgp network import-check

Description

The command is used to configure BGP to check the reachability of routes configured by the network command. To cancel this configuration, use the **no bgp network import-check** command.

Syntax

bgp network import-check

no bgp network import-check

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP to check the reachability of routes configured by the network command:

```
Switch(config)#router bgp 100
Switch(config-router)# bgp network import-check
```

45.29 bgp router-id

Description

This command is used to set the router ID. If you do not manually configure the router ID, or cancel the configured router ID, BGP will automatically select an interface IP address as the router ID. To delete the router ID, please use the **no bgp router-id** command.

Syntax

bgp router-id *router-id*

no bgp router-id

Parameter

router-id: Router ID, which is a 32-bit unsigned integer in dotted decimal format, excluding 0.0.0.0. To avoid multiple routers using the same router ID during automatic election, it is recommended to configure this manually.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the BGP route ID to 1.1.1.1:

Switch(config)#router bgp 100

Switch(config-router)# bgp router-id 1.1.1.1

45.30 neighbor activate

Description

This command is used to configure BGP to enable the address family for the neighbor. To disable this configuration, please use the **no neighbor activate** command.

Syntax

neighbor *ip-address* | *tag* **activate**

no neighbor *ip-address* | *tag* **activate**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP to enable address family for neighbor 1.1.1.1:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 activate
```

45.31 neighbor advertisement-interval

Description

This command is used to configure the minimum interval for advertising BGP route updates. To disable this configuration, please use the no command.

Syntax

neighbor *ip-address* | *tag* **advertisement-interval** *interval*

no neighbor *ip-address* | *tag* **advertisement-interval**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

interval: The minimum interval for advertising BGP routing updates, ranging from 0-600 seconds.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP to advertise BGP routing updates for neighbor 1.1.1.1 at a minimum interval of 10 seconds:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 advertisement-interval 10
```

45.32 neighbor allowas-in

Description

This command is used to configure the maximum number of ASs in the AS path sent by the neighbor, including its own AS. To disable this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **allowas-in** *number*

no neighbor *ip-address* / *tag* **allowas-in**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

number: AS number, ranging from 1 to10.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum number of ASs in the AS path sent by neighbor 1.1.1.1, including its own AS, to 10:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 allowas-in 10
```

45.33 neighbor attribute-unchanged

Description

This command is used to configure BGP attributes to be sent to neighbors without change. To disable this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **attribute-unchanged** *[as-path] [med] [next-hop]*

no neighbor *ip-address* / *tag* **attribute-unchanged**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

as-path: AS path attribute.

med: MED attribute.

next-hop: Next hop attribute.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure BGP AS path attributes to be sent to neighbor 1.1.1.1 without change:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 attribute-unchanged as-path
```

45.34 neighbor apability dynamic

Description

This command is used to announce dynamic capabilities to neighbors. To disable this configuration, please use the no command.

Syntax

neighbor *ip-address* | *tag* **capability dynamic**

no neighbor *ip-address* | *tag* **capability dynamic**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Announce dynamic capabilities to neighbor 1.1.1.1:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 dynamic
```

45.35 neighbor default-originate

Description

This command is used to send the default route to the neighbor. To disable this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **capability dynamic**

no neighbor *ip-address* / *tag* **capability dynamic**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Send the default route to neighbor 1.1.1.1:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 default-originate
```

45.36 neighbor description

Description

This command is used to configure the neighbor description. To delete the neighbor description, please use the no command.

Syntax

neighbor *ip-address* / *tag* **description** *description*

no neighbor *ip-address* / *tag* **description**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

description: Neighbor description.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the description for neighbor 1.1.1.1 to be internet:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 description internet
```

45.37 neighbor disable-connected-check

Description

This command is used to configure the use of loopback address for one-hop EBGP neighbors. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **disable-connected-check**

no neighbor *ip-address* / *tag* **disable-connected-check**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Use loopback address for neighbor 1.1.1.1:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 disable-connected-check
```

45.38 neighbor distribute-list

Description

This command is used to configure the distribution list to be applied to neighbors to filter routes. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **distribute-list** *name* [in|out]

no neighbor *ip-address* / *tag* **distribute-list**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

name: distribut list name.

in: Filter in the inbound direction.

out: Filter out the outbound direction

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure to the neighbor 1.1.1.1 to apply distribut list a to filter incoming routes:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 distribute-list a in
```

45.39 neighbor dont-capability-negotiate

Description

This command is used to disable the negotiation on capabilities with neighbors. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **dont-capability-negotiate**

no neighbor *ip-address* / *tag* **dont-capability-negotiate**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable capability negotiation with neighbor 1.1.1.1:

Switch(config)#router bgp 100

Switch(config-router)# neighbor 1.1.1.1 **dont-capability-negotiate**

45.40 neighbor ebgp-multihop

Description

This command is used to configure not to negotiate capabilities with neighbors. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **ebgp-multihop** *hops*

no neighbor *ip-address* / *tag* **ebgp-multihop**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

hops: The maximum number of hops to reach an EBGP neighbor. The default value is 1, which means only directly connected neighbors are allowed.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum number of hops to neighbor 1.1.1.1 to 10:

Switch(config)#router bgp 100

Switch(config-router)# neighbor 1.1.1.1 **ebgp-multihop** 10

45.41 neighbor graceful-restart

Description

This command is used to configure the graceful restart of BGP neighbors. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **graceful-restart**

no neighbor *ip-address* / *tag* **graceful-restart**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the graceful restart to neighbor 1.1.1.1:

Switch(config)#router bgp 100

Switch(config-router)# neighbor 1.1.1.1 **graceful-restart**

45.42 neighbor graceful-restart-helper

Description

This command is used to configure BGP to gracefully restart neighbor routers. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **graceful-restart-helper**

no neighbor *ip-address* / *tag* **graceful-restart-helper**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure neighbor 1.1.1.1 to gracefully restart the neighbor router:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 graceful-restart-helper
```

45.43 neighbor local-as

Description

This command is used to prepend the specified local AS to the AS path when BGP sends or receives the AS path from the specified neighbor. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **local-as** *as* [no-prepend] [replace-as]

no neighbor *ip-address* / *tag* **local-as**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

no-prepend: The provided local AS is not added to the received AS list..

replace-as: Only the provided local AS is pre-appended to the AS path when transmitting local routing updates to this neighbor.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Prepend the specified local AS 5 to the AS path when sending or receiving the AS path from neighbor 1.1.1.1:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 local-as 5
```

45.44 neighbor maximum-prefix

Description

This command is used to specify the maximum number of routes received from a specific neighbor. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **maximum-prefix** *number*

no neighbor *ip-address* / *tag* **maximum-prefix**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

number: The maximum number of routes that can be received from this neighbor.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum number of routes received from neighbor 1.1.1.1 to 100:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 maximum-prefix 100
```

45.45 neighbor next-hop-self

Description

This command is used to cancel BGP's processing of the next hop in the route to be released, and use its own address as the next hop. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **next-hop-self**

no neighbor *ip-address* / *tag* **next-hop-self**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the route sent to neighbor 1.1.1.1 to use its own address as the next hop:

```
Switch(config)#router bgp 100

Switch(config-router)# neighbor 1.1.1.1 next-hop-self
```

45.46 neighbor override-capability

Description

This command is used to ignore neighbor capability negotiation information and use the default capability information. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **override-capability**

no neighbor *ip-address* / *tag* **override-capability**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Ignore the capability negotiation information of neighbor 1.1.1.1:

```
Switch(config)#router bgp 100

Switch(config-router)# neighbor 1.1.1.1 override-capability
```

45.47 neighbor passive

Description

This command is used to disable the OPEN message sent to the neighbor. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* | *tag* **passive**

no neighbor *ip-address* | *tag* **passive**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable the OPEN message sent to the neighbor 1.1.1.1:

```
Switch(config)#router bgp 100
```

```
Switch(config-router)# neighbor 1.1.1.1 passive
```

45.48 neighbor password

Description

This command is used to configure the neighbor password. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* | *tag* **password** *password*

no neighbor *ip-address* | *tag* **password**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

password: Neighbor password.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the password for neighbor 1.1.1.1 to be abc:

```
Switch(config)#router bgp 100

Switch(config-router)# neighbor 1.1.1.1 password abc
```

45.49 neighbor peer-group

Description

This command is used to configure neighbors to join the specified neighbor group. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* | *tag* **peer-group** *name*

no neighbor *ip-address* | *tag* **peer-group**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

name: Neighbor group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Join neighbor 1.1.1.1 to neighbor group abc:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 peer-group abc
```

45.50 neighbor port

Description

This command is used to configure the BGP port number of the neighbor. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* | *tag* **port** *port*

no neighbor *ip-address* | *tag* **port**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

port: TCP port number, ranging from 0-65535.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the BGP port number of neighbor 1.1.1.1 to 200:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 port 200
```

45.51 neighbor remote-as

Description

This command is used to configure BGP neighbors. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **remote-as** *as*

no neighbor *ip-address* / *tag* **remote-as**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

as: AS number of the neighbor.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure neighbor 1.1.1.1 in AS 1:

```
Switch(config)#router bgp 100

Switch(config-router)# neighbor 1.1.1.1 remote-as 2
```

45.52 neighbor remove-private-AS

Description

This command is used to remove the private AS number from outbound updates. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **remove-private-AS**

no neighbor *ip-address* / *tag* **remove-private-AS**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Remove the private AS number from updates sent to neighbor 1.1.1.1:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 remove-private-AS
```

45.53 neighbor route-reflector-client

Description

This command is used to configure a neighbor as a client of a route reflector. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* | *tag* **route-reflector-client**

no neighbor *ip-address* | *tag* **route-reflector-client**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure neighbor 1.1.1.1 as a client of the route reflector:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 route-reflector-client
```

45.54 neighbor shutdown

Description

This command is used to manually shut down a neighbor. To cancel this configuration, please use the no command.

Syntax

neighbor *ip-address* / *tag* **shutdown**

no neighbor *ip-address* / *tag* **shutdown**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Manually shut down neighbor 1.1.1.1:

```
Switch(config)#router bgp 100

Switch(config-router)# neighbor 1.1.1.1 shutdown
```

45.55 neighbor soft-reconfiguration inbound

Description

This command is used to enable BGP to make the newly configured route-map and distribution list effective without clearing the neighbor session. To disable this feature, please use the no command.

Syntax

neighbor *ip-address* / *tag* **soft-reconfiguration inbound**

no neighbor *ip-address* / *tag* **soft-reconfiguration inbound**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Make the route-map applied to neighbor 1.1.1.1 effective without clearing the session:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 soft-reconfiguration inbound
```

45.56 neighbor strict-capability-match

Description

This command is used to strictly match the capability negotiation between neighbors. To disable this feature, please use the no command.

Syntax

neighbor *ip-address* | *tag* **strict-capability-match**

no neighbor *ip-address* | *tag* **strict-capability-match**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Strictly match the capability negotiation between neighbor 1.1.1.1:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 strict-capability-match
```

45.57 neighbor timers

Description

This command is used to configure the interval for sending keepalive messages between neighbors and the neighbor hold time:

Syntax

neighbor *ip-address* | *tag* **timers** *keepalive hold*

no neighbor *ip-address* | *tag* **timers**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

keepalive: The interval between for sending keepalive messages between neighbors, ranging from 1-65535 seconds.

hold: Neighbor hold time, ranging from 1-65535 seconds.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the keepalive message interval between neighbor 1.1.1.1 to 10 seconds and the keepalive time to 30 seconds:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 timers 10 30
```

45.58 neighbor timers connect

Description

This command is used to configure the interval of the neighbor reconnecting to the timer. To disable this feature, please use the no command.

Syntax

neighbor *ip-address* / *tag* **timers connect** *connect*

no neighbor *ip-address* / *tag* **timers connect**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

connect: Interval of the neighbor reconnecting to the timer.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the interval of the neighbor reconnecting to the timer to 100 seconds:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 timers connect 100
```

45.59 neighbor ttl-security hops

Description

This command is used to configure the interval of the neighbor reconnecting to the timer. To disable this feature, please use the no command.

Syntax

neighbor *ip-address* / *tag* **ttl-security hops** *hops*

no neighbor *ip-address* / *tag* **ttl-security hops**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

hops: Hop count.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum hop count for neighbor 1.1.1.1 to 10:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 ttl-security hops 10
```

45.60 neighbor update-source

Description

This command is used to configure the neighbor's routing update source. To disable this feature, please use the no command.

Syntax

neighbor *ip-address* / *tag* **update-source** *source*

no neighbor *ip-address* / *tag* **update-source**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

source: Specify the IP address of the source of routing updates.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the routing update source of neighbor 1.1.1.1 to 2.2.2.2:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 update-source 2.2.2.2
```

45.61 neighbor weight

Description

This command is used to set the default weight for routes from this neighbor. To delete the weight, please use the no command.

Syntax

neighbor *ip-address* / *tag* **weight** *weight*

no neighbor *ip-address* / *tag* **weight**

Parameter

ip-address: Neighbor IP address.

tag: Peer-group name.

weight: Default weight, ranging from 0-65535.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the default weight of routes from neighbor 1.1.1.1 to be 10:

```
Switch(config)#router bgp 100
Switch(config-router)# neighbor 1.1.1.1 weight 10
```

45.62 show ip bgp

Description

This command is used to view the BGP routing table.

Syntax

show ip bgp *[ip-address| ip-address/mask-len]*

Parameter

ip-address: Neighbor IP address.

ip-address/mask-len: The network segment IP address and mask length to be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the BGP routing table for the network segment 2.2.2.0:

```
Switch#show ip bgp 2.2.2.0
```

45.63 show ip bgp attribute-info

Description

This command is used to view all BGP attribute information.

Syntax

show ip bgp attribute-info

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View all BGP attribute information:

```
Switch# show ip bgp attribute-info
```

45.64 show ip bgp cidr-only

Description

This command is used to view only routes with non-natural network masks.

Syntax

show ip bgp cidr-only

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View only routes with non-natural network masks:

```
Switch# show ip bgp cidr-only
```

45.65 show ip bgp dampening flap-statistics

Description

This command is used to view the statistics of route flap penalty.

Syntax

show ip bgp dampening flap-statistics

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the statistics of route flap penalty:

```
Switch# show ip bgp dampening flap-statistics
```

45.66 show ip bgp dampening dampened-paths

Description

This command is used to view the information about dampened paths due to flapping.

Syntax

show ip bgp dampening dampened-paths

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the information about dampened paths due to flapping:

```
Switch# show ip bgp dampening dampened-paths
```

45.67 show ip bgp dampening parameters

Description

This command is used to view the parameters related to route flapping.

Syntax

show ip bgp dampening parameters

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the parameters related to route flapping:

```
Switch# show ip bgp dampening parameters
```

45.68 show ip bgp neighbors

Description

This command is used to view the BGP neighbor information.

Syntax

show ip bgp neighbors

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the BGP neighbor information:

```
Switch# show ip bgp neighbors
```

45.69 show ip bgp neighbors advertised-routes

Description

This command is used to view the routing information advertised to neighbors.

Syntax

show ip bgp neighbors *ip-address* **advertised-routes**

Parameter

ip-address: The network segment to be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the routing information advertised to neighbor 1.1.1.1:

Switch# show ip bgp neighbors 1.1.1.1 **advertised-routes**

45.70 show ip bgp neighbors advertised-routes

Description

This command is used to view the dampened routes received from neighbors.

Syntax

show ip bgp neighbors *ip-address* **dampened-routes**

Parameter

ip-address: The network segment to be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the dampened routes received from neighbor 1.1.1.1:

Switch# show ip bgp neighbors 1.1.1.1 **dampened-routes**

45.71 show ip bgp neighbors flap-statistics

Description

This command is used to view the flapping route information of a neighbor.

Syntax

show ip bgp neighbors *ip-address* **flap-statistics**

Parameter

ip-address: The network segment to be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

view the flapping route information of neighbor 1.1.1.1:

Switch# show ip bgp neighbors 1.1.1.1 **flap-statistics**

45.72 show ip bgp neighbors prefix-counts

Description

This command is used to view he detailed prefix counts of a neighbor.

Syntax

show ip bgp neighbors *ip-address* **prefix-counts**

Parameter

ip-address: The network segment to be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the detailed prefix counts of neighbor 1.1.1.1:

Switch# show ip bgp neighbors 1.1.1.1 **prefix-counts**

45.73 show ip bgp neighbors received-routes

Description

This command is used to view the routes received from neighbors.

Syntax

show ip bgp neighbors *ip-address* **received-routes**

Parameter

ip-address: The network segment to be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View he routes received from neighbor 1.1.1.1:

Switch# show ip bgp neighbors 1.1.1.1 **received-routes**

45.74 show ip bgp neighbors routes

Description

This command is used to view the routes learned from neighbors.

Syntax

show ip bgp neighbors *ip-address* **routes**

Parameter

ip-address: The network segment to be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the routes learned from neighbor 1.1.1.1:

Switch# show ip bgp neighbors 1.1.1.1 **routes**

45.75 show ip bgp nexthop

Description

This command is used to view the next hop information.

Syntax

show ip bgp nexthop

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the BGP next hop information:

```
Switch# show ip bgp nexthop
```

45.76 show ip bgp paths

Description

This command is used to view the BGP path information.

Syntax

show ip bgp paths

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the BGP path information:

```
Switch# show ip bgp paths
```

45.77 show ip bgp specify

Description

This command is used to view the specific network information.

Syntax

show ip bgp specify *ip-address* [mask] **[bestpath] [multipath]**

Parameter

ip-address: The IP address to match.

mask: The mask to match.

bestpath: Only display the best matching network segment.

multipath: Only display the multipath network segment.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the network information of 2.2.2.0/24:

```
Switch# show ip bgp specify 2.2.2.0 255.255.255.0
```

45.78 show ip bgp summary

Description

This command is used to view the summary of BGP neighbors.

Syntax

show ip bgp summary

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the summary of BGP neighbors:

Switch# show ip bgp summary

45.79 clear ip bgp

Description

This command is used to reset a specific BGP neighbor.

Syntax

clear ip bgp *as*

clear ip bgp *ip-address*

Parameter

as: AS number of the neighbor.

ip-address: Neighbor's IP.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Reset BGP neighbor 1.1.1.1:

Switch# clear ip bgp 1.1.1.1

45.80 clear ip bgp all

Description

This command is used to reset all BGP neighbors.

Syntax

clear ip bgp all

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Reset all BGP neighbors:

```
Switch# clear ip bgp all
```

45.81 clear ip bgp dampening

Description

This command is used to reset BGP route dampening.

Syntax

clear ip bgp dampening *ip-address* [mask]

Parameter

ip-address: Network segment IP address.

mask: Network segment mask.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Reset route dampening for network segment 1.1.1.0/24:

```
Switch# clear ip bgp dampening 1.1.1.0 255.255.255.0
```

Chapter 46 IS-IS Configuration Commands (Only for Certain Devices)

Intermediate System to Intermediate System (IS-IS) is a dynamic routing protocol proposed by ISO. Currently, IS-IS is also supported in TCP/IP environments. It is a widely used protocol in Interior Gateway Protocols (IGP).

IS-IS is a link-state protocol, and the core concept of its routing calculation is the Shortest Path First (SPF) algorithm.

46.1 router isis

Description

The **router isis** command is used to create an IS-IS instance and enter the Router configuration mode. When the command includes a VRF name, it means that the IS-IS instance belongs to the VRF instance. When the VRF parameter is not specified, the IS-IS instance belongs to the public network. To delete the IS-IS instance, please use the **no router isis** command. When the VRFparameter is not specified, the corresponding instance will be deleted according to the area-tag.

Syntax

router isis *area-tag* [**vrf** *vrf-name*]

no router isis *area-tag* [**vrf** *vrf-name*]

Parameter

area-tag —— IS-IS instance name, used to identify an IS-IS instance on this switch.

vrf-name —— VRF instance name.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create an ISIS instance aaa and add it to vrf1.

```
Switch(config)# router isis aaa vrf vrf1
```

46.2 area-password

Description

This command is used to enable the IS-IS Level-1 area authentication function. After the function is enabled, IS-IS will carry authentication information in the message exchange in the area and verify the authentication information. To disable this function, please use the **no area-password** command.

Syntax

area-password { **clear** | **md5** } { **0** | **7** } *text*

no area-password

Parameter

clear: Encrypt in plain text.

md5: Encrypt using md5 algorithm.

0: Enter plain text.

7: Enter in cipher text.

text: Password text

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure MD5 encrypted authentication for the IS-IS Level-1 area:

```
Switch(config-router)#area-password md5 0 tp-link
```

46.3 domain-password

Description

This command is used to enable the authentication function of the IS-IS Level-2 area. After enabling this function, IS-IS will carry authentication information in the message exchange in this area and verify the authentication information. To disable this function, please use the **no domain-password** command.

Syntax

domain-password { **clear** | **md5** } { **0** | **7** } *text*

no domain-password

Parameter

clear: Encrypt in plain text.

md5: Encrypt using md5 algorithm.

0: Enter plain text.

7: Enter in cipher text.

text: Password text

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure MD5 encrypted authentication for the IS-IS Level-2 area:

Switch(config-router)#domain-password md5 0 *tp-link*

46.4 graceful-restart

Description

This command is used to enable the IS-IS Graceful Restart function. When enabled, IS-IS will send restart notification messages to neighboring routers before initiating a restart. During the restart process, IS-IS strives to preserve routing information to minimize impact on other devices in the network. To disable this function, please use the **no graceful-restart** command.

Syntax

graceful-restart

no graceful-restart

graceful-restart suppress-sa

no graceful-restart suppress-sa

graceful-restart t2-interval *t2-interval*

no graceful-restart t2-interval

graceful-restart t3-interval *t3-interval*

no graceful-restart t3-interval

Parameter

suppress-sa: Suppress partial advertisement information during the IS-IS graceful restart process.

t2-interval: The duration in IS-IS graceful restart during which the restarting router waits for neighboring routers to send CSNP (Complete Sequence Number PDU) to facilitate rapid database synchronization. The range is 30 to 1800 seconds, and the default value is 60 seconds.

T3-interval: The duration in IS-IS graceful restart during which the restarting router waits for neighboring routers to acknowledge its graceful restart. The range is 30 to 1800 seconds, and the default value is 300 seconds.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure graceful restart for IS-IS routes:

```
Switch(config-router)#graceful-restart
Switch(config-router)#graceful-restart suppress-sa
```

46.5 hostname

Description

This command is used to enable the dynamic host name function of IS-IS. After enabling this function, IS-IS will configure a dynamic host name for the IS-IS system on the local switch and notify the neighbor device through the LSP message. To disable this function, please use the **no hostname** command.

Syntax

hostname { *name* | dynamic }

no hostname

Parameter

name: Specified host name, in text form.

dynamic: Use dynamic host name, in this mode, the system configured host name will be obtained.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the dynamic host name function of IS-IS:

```
Switch(config-router)# hostname dynamic
```

46.6 is-type

Description

This command is used to set the IS area type, which is Level-1-2 by default. To restore the default configuration, please use the **no is-type** command.

Syntax

is-type { **level-1** | **level-1-2** | **level-2-only** }

no is-type

Parameter

level-1: Set the IS-IS area type to Level-1

level-1-2: Set the IS-IS area types to Level-1 and Level-2 level-2-only: Set the IS-IS area type to Level-2

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the IS-IS area type to Level-1:

```
Switch(config-router)# is-type level-1
```

46.7 log-adjacency-changes

Description

This command is used to enable S-IS to record events of adjacency state changes. To disable this function, please use the **no log-adjacency-changes** command.

Syntax

log-adjacency-changes

no log-adjacency-changes

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the IS-IS area type to Level-1:

```
Switch(config-router)# log-adjacency-changes
```

46.8 lsp-gen-interval

Description

This command is used to configure the interval for generating LSPs. When the local network flaps, the IS-IS local LSP may be frequently refreshed, causing frequent IS-IS flapping. To restore the default configuration, please use the **no lsp-gen-interval** command.

Syntax

lsp-gen-interval *interval*

no lsp-gen-interval

Parameter

interval: The interval for generating LSPs, ranging from 1 to 120s. It is 30s by default.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the LSP generating interval to 10s:

```
Switch(config-router)# lsp-gen-interval 10
```

46.9 lsp-mtu

Description

This command is used to configure the maximum length of a self-generated LSP. To restore the default configuration, please use the **no lsp-mtu** command.

Syntax

lsp-mtu *size*

no lsp-mtu

Parameter

size: The maximum length of LSP, ranging from 512 to 4352 bytes. It is 1497 bytes by default.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the maximum length of LSP to 1024 bytes:

```
Switch(config-router)# lsp-mtu 1024
```

46.10 lsp-refresh-interval

Description

This command is used to configure the interval for refreshing the IS-IS LSP. To restore the default configuration, please use the **no lsp-refresh-interval** command.

Syntax

lsp-refresh-interval *interval* [level-1 | level-2]

no lsp-refresh-interval

Parameter

interval: The interval for refreshing the IS-IS LSP, ranging from 1 to 65535s. It is 900s by default.

level-1: LSP level-1 refresh interval

level-2: LSP level-2 refresh interval

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the LSP refresh interval to 100s:

```
Switch(config-router)# lsp-refresh-interval 100
```

46.11 max-lsp-lifetime

Description

This command is used to configure the maximum lifetime of an IS-IS LSP packet. To restore the default configuration, please use the **no max-lsp-lifetime** command.

Syntax

max-lsp-lifetime *time* [level-1 | level-2]

no max-lsp-lifetime

Parameter

time: The max lifetime of LSP, ranging from 350 to 65535s. It is 1200s by default.

level-1: LSP level-1 refresh interval

level-2: LSP level-2 refresh interval

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the maximum lifetime of an LSP to 1000s:

```
Switch(config-router)# max-lsp-lifetime 1000
```

46.12 metric-style

Description

This command is used to configure IS-IS metric style. To restore the default configuration, please use the **no metric-style** command.

Syntax

metric-style { **narrow** | **transition** | **wide** }

no metric-style

Parameter

narrow: Narrow mode. It is the default mode.

transition: Compatible mode, supporting both narrow and wide modes.

wide: Wide mode, mainly used for TE scenarios.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set IS-IS metric style to wide:

Switch(config-router)# metric-style wide

46.13 net

Description

This command is used to configure NET of IS-IS. To delete NET, please use the **no net** command.

Syntax

net *net-name*

no net *net-name*

Parameter

net-name: Network Entity Title, in the format of X…X.XXXX.XXXX.XXXX.00. The first "X…X" is the IS-IS area address, the 12 "X"s in the middle are the switch's System ID, and the last "00" is the SEL.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure IS-IS NET as 10.0000.0000.0000.1111.00:

Switch(config-router)#net 10.0000.0000.0000.1111.00

46.14 purge-originator

Description

This command is used to enable the purge originator of IS-IS. To disable this function, please use the **no purge-originator** command.

Syntax

purge-originator

no purge-originator

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the purge originator of IS-IS:

```
Switch(config-router)#purge-originator
```

46.15 set-attached-bit

Description

This command is used to set the ATT bit of IS-IS LSP. By default, Level-1-2 devices will set the ATT bit according to the rules of IS-IS protocol. After this command is configured, the ATT bit will always be set in Level-1 LSP. To cancel the setting of ATT bit, please use the **no set-attached-bit** command.

Syntax

set-attached-bit

no set-attached-bit

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the ATT bit of IS-IS LSP:

```
Switch(config-router)#set-attached-bit
```

46.16 set-overload-bit

Description

This command is used to set the overload bit in IS-IS LSP. To cancel the overload bit setting, please use the **no set-overload-bit** command.

Syntax

set-overload-bit

no set-overload-bit

Parameter

None

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the overload bit in IS-IS LSP:

```
Switch(config-router)#set-overload-bit
```

46.17 spf interval

Description

This command is used to configure the frequency of SPF calculations in IS-IS to balance network convergence speed and CPU load. To restore the default settings, please use the **no spf-interval** command.

Syntax

spf-interval *time*

no spf-interva

Parameter

time: The interval for SPF calculation. The range is 1 to 120 seconds, and the default value is 2 seconds

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the interval for SPF calculation to 5 seconds:

```
Switch(config-router)# spf-interval 5
```

46.18 topology

Description

This command is used to enable global IS-IS network multi-topology, allowing independent logical topologies to be created for different protocols or services. To disable this configuration, please use the **no topology** command.

Syntax

topology { ipv6-unicast } [overload]

no topology { ipv6-unicast }

Parameter

ipv6-unicast: IS-IS enables IPv6 unicast topology.

overload: IS-IS enables topology to set overload bit.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure IS-IS multi-topology:

```
Switch(config-router)#topology ipv6-unicast overload
```

46.19 clear isis neighbor

Description

This command is used to clear the neighbor relationship established by IS-IS and re-establish the relationship with neighbor device.

Syntax

clear isis neighbor [*system-id*]

Parameter

system-id: System ID of the specified neighbor.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear all IS-IS neighbors:

```
Switch(config-router)#clear isis neighbor
```

46.20 redistribute

Description

This command is used to redistribute routes. In a multi-protocol deployment scenario, routes of other protocols or other IS-IS instances can be redistributed to IS-IS, which will then flood the routes throughout the entire area.

Syntax

redistribute { ipv4 { bgp | connected | rip | static | ospf *process-id* **| isis** *area-name* **} | ipv6 { bgp | connected | ospf6 | ripng | static } } { level-1 | level-2 }**

Parameter

ipv4: Redistribute IPv4 routing.

ipv6: Redistribute IPv6 routing.

bgp: Redistribute BGP routing.

connected: Redistribute direct routing.

ospf: redirect OSPF routing.

process-id: redirect OSPF routing instance number

isis: redirect IS-IS routing

area-name: redirect IS-IS routing area name

rip: redirect RIP routing

static: Redistribute static routes.

ospf6: Redistribute OSPFv3 routes.

ripng: Redistribute RIPng routes.

level-1: Redirect to level-1 area.

level-2: Redirect to level-2 area.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Redistribute IPv4 BGP routes to the level-1 area of IS-IS:

```
Switch(config-router)# redistribute ipv4 bgp level-1
```

46.21 distance

Description

This command is used to configure the distance of IS-IS protocol routes, that is, the route priority of IS-IS protocol. This function can change the priority strategy of different protocol routes in multi-protocol scenarios.

Syntax

distance *value*

Parameter

value: Distance value, ranging from 1 to 255, and the default value is 110.

Command Mode

Router Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the distance of the IS-IS protocol to 100:

```
Switch(config-router)#distance 100
```

46.22 ip router isis

Description

This command is used to enable IPv4 IS-IS on an interface, while its no form disables the IPv4 IS-IS functionality under the interface. Configuration of IS-IS settings under an interface is only permitted when either IPv4 or IPv6 IS-IS has been enabled. If both IPv4 and IPv6 IS-IS are disabled simultaneously, all IS-IS configurations under the interface will be cleared.

Syntax

ip router isis *area-name*

no ip router isis

Parameter

area-name: Specify the area name of the IS-IS instance.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable interface VLAN 1 on IS-IS instance 1:

```
Switch(config)#interface vlan 1

Switch(config-if)#ip router isis 1
```

46.23 ipv6 router isis

Description

This command is used to enable IPv6 IS-IS on an interface. Its "no" form disables IPv6 IS-IS functionality on the interface. Interface-specific IS-IS configurations can only be performed when either IPv4 or IPv6 IS-IS is enabled. When both IPv4 and IPv6 IS-IS functionalities are disabled, all IS-IS configurations under the interface will be cleared.

Syntax

Ipv6 router isis *area-name*

no ipv6 router isis

Parameter

area-name: Specify the area name of the IS-IS instance.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable interface VLAN 1 on IS-IS IPV6 instance 1:

```
Switch(config)#interface vlan 1
Switch(config-if)#ipv6 router isis 1
```

46.24 isis bfd

Description

This command is used to enable BFD on an interface and notify IS-IS. IS-IS can quickly detect changes in interface status. To disable this function, please use the no isis bfd command.

Syntax

isis bfd [*bfd-template*]

no isis bfd

Parameter

bfd-template: BFD template name, depending on the global BFD template configuration

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable BFD on interface VLAN 1 and notify IS-IS:

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

46.25 isis circuit-type

Description

This command is used to configure the IS-IS area type of the interface. By default, the area type of the IS-IS interface is the area type configured globally for IS-IS. To restore the default configuration, please use the **no isis circuit-type** command.

Syntax

isis circuit-type { **level-1** | **level-1-2** | **level-2-only** }

no isis circuit-type

Parameter

level-1: Set the IS-IS area type to Level-1

level-1-2: Set the IS-IS area types to Level-1 and Level-2

level-2-only: Set the IS-IS area type to Level-2

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the IS-IS area type of interface VLAN 1 to Level-1:

```
Switch(config)#interface vlan 1
Switch(config-if)#isis circuit-type level-1
```

46.26 isis csnp-interval

Description

This command is used to configure the interval for sending CSNP packets of IS-IS on the interface. To restore the default configuration, please use the **no isis csnp-interval** command.

Syntax

isis csnp-interval *interval*

no isis csnp-interval

Parameter

interval: The interval for sending CSNP packets, ranging from 1 to 600s, and the default value is 10.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the CSNP message sending interval of IS-IS on interface VLAN 1 to 20s:

Switch(config)#interface vlan 1

Switch(config-if)#isis csnp-interval 20

46.27 isis hello-interval

Description

This command is used to configure the interval for sending Hello packets of IS-IS on the interface. To restore the default configuration, please use the **no isis csnp-interval** command.

Syntax

isis hello-interval *interval*

no isis hello-interval

Parameter

interval: The interval for sending Hello packets, ranging from 1 to 600s, and the default value is 3.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the Hello message sending interval of IS-IS on interface VLAN 1 to 10s:

Switch(config)#interface vlan 1

Switch(config-if)#isis hello-interval 10

46.28 isis hello-multiplier

Description

This command is used to configure the multiplier of the IS-IS Hello message on the interface. Hello-interval * Hello-multiplier is the neighbor's Hold timer. To restore the default configuration, please use the **no isis hello-multiplier** command.

Syntax

isis hello-multiplier *value*

no isis hello-multiplier

Parameter

value: Hello multiplier, ranging from 2 to 100. It is 10 by default.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the IS-IS Hello multiplier on interface VLAN 1 to 20:

Switch(config)#interface vlan 1

Switch(config-if)# isis hello-multiplier 20

46.29 isis metric

Description

This command is used to configure the IS-IS metric on the interface. To restore the default configuration, please use the **no isis metric** command.

Syntax

isis metric *value*

no isis metric

Parameter

value: IS-IS metric, ranging from 0 to16777215. It is 10 by default.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the IS-IS metric on interface VLAN 1 to 20:

```
Switch(config)#interface vlan 1
Switch(config-if)#isis metric 20
```

46.30 isis network point-to-point

Description

This command is used to configure the IS-IS network type of the interface. To restore the default configuration, please use the **no isis network point-to-point** command.

Syntax

isis network point-to-point

no isis network point-to-point

Parameter

None.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the IS-IS network type of interface VLAN 1 to P2P:

Switch(config)#interface vlan 1

Switch(config-if)# isis network point-to-point

46.31 isis passive

Description

This command is used to configure the IS-IS silent function on the interface. After it is enabled, the interface will not be able to perform IS-IS message exchange and route calculation. To disable this dunction, please use the **no isis passive** command.

Syntax

isis passive

no isis passive

Parameter

None.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Make the IS-IS on VALN 1 silent:

Switch(config)#interface vlan 1

Switch(config-if)#isis passive

46.32 isis password-key

Description

This command is used to enable the IS-IS authentication function. After the function is enabled, IS-IS will carry authentication information in the message exchange in the area and verify the authentication information. To disable this function, please use the **no area-password** command.

Syntax

isis password-key { **clear** | **md5** } { **0** | **7** } *text*

no isis password-key

Parameter

clear: Encrypt in plain text.

md5: Encrypt using md5 algorithm.

0: Enter plain text.

7: Enter in cipher text.

text: Password text

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure MD5 encrypted authentication for the IS-IS on VLAN 1:

Switch(config)#interface vlan 1

Switch(config-if)#isis password-ket md5 0 tp-link

46.33 isis priority

Description

This command is used to enable the IS-IS authentication function. After the function is enabled, IS-IS will carry authentication information in the message exchange in the area and verify the authentication information. To disable this function, please use the **no area-password** command.

Syntax

isis priority *value*

no isis priority

Parameter

Value: The DIS election priority of the interface, ranging from 0 to 127, and the default value is 64.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the IS-IS priority of interface VLAN 1 to 100:

```
Switch(config)#interface vlan 1
Switch(config-if)# isis priority 100
```

46.34 topology

Description

This command is used to enable IS-IS multi-topology under the interface, allowing the creation of independent logical topologies for different protocols or services. To disable this configuration, please use the **no topology** command.

Syntax

topology { ipv6-unicast }

no topology { ipv6-unicast }

Parameter

ipv6-unicast: IS-IS enabled for IPv6 unicast topology.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure IS-IS multi-topology:

```
Switch(config)#interface vlan 1
Switch(config-if)#topology ipv6-unicast
```

46.35 isis three-way-handshake

Description

This command is used to configure the three-way handshake mechanism of the IS-IS neighbor on the interface. By default, IS-IS neighbor establishment is a two-way handshake mechanism. Two-way handshakes have the problem of one-way neighbor establishment. It is recommended to use the three-way handshake mechanism. To restore the default configuration, please use the **no isis three-way-handshake** command.

Syntax

isis three-way-handshake

no isis three-way-handshake

Parameter

None

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the IS-IS three-way handshake neighbor establishment mechanism on interface VLAN 1:

```
Switch(config)#interface vlan 1

Switch(config-if)#isis three-way-handshake
```

46.36 show isis database

Description

This command is used to view the IS-IS database information.

Syntax

show isis [tag { *area-name* } **] database [** *lsp-id* **| detail]**

Parameter

area-name: Specify the IS-IS area name for the query.

lsp-id: Specify the LSP ID for the query.

detail: View detailed information**Command Mode**

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the brief information of IS-IS database:

```
Switch#show isis database
```

46.37 show isis graceful-restart

Description

This command is used to view the Graceful Restart information for IS-IS.

Syntax

show isis [tag { *area-name* } **] graceful-restart status**

Parameter

area-name: Specify the IS-IS area name for the query.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the IS-IS Graceful Restart information:

```
Switch#show isis database
```

46.38 show isis hostname

Description

This command is used to view the IS-IS host name mapping information.

Syntax

show isis [tag { *area-name* }] hostname**Parameter**

area-name: Specify the IS-IS area name for the query.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the IS-IS host name mapping information:

```
Switch# show isis hostname
```

46.39 show isis neighbor

Description

This command is used to view the IS-IS neighbor information.

Syntax

show isis [tag { *area-name* **}] neighbor** [*system-id* | detail]

Parameter

area-name: Specify the IS-IS area name for the query.

system-id: Specify the neighbor's system ID for the query.

detail: View detailed information.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the brief information of IS-IS neighbor:

```
Switch# show isis neighbor
```

46.40 show isis route

Description

This command is used to view the IS-IS routing information.

Syntax

show isis [tag { *area-name* }] route

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None**Example**

View the IS-IS routing information:

```
Switch# show isis route
```

46.41 show isis summary

Description

This command is used to view the IS-IS summary.

Syntax

show isis [tag { *area-name* }] summary

Parameter

area-name: Specify the IS-IS area name for the query.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None**Example**

View the IS-IS summary:

```
Switch# show isis summary
```

46.42 show isis interface

Description

This command is used to view the IS-IS interface information.

Syntax

show isis [tag { *area-name* }] interface [fastEthernet | gigabitEthernet | hundred-gigabitEthernet | loopback | port-channel | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet | vlan] [detail]

Parameter

area-name: Specify the IS-IS area name for the query.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the IS-IS interface information:

```
Switch# show isis interface
```

46.43 show isis topology

Description

This command is used to view the IS-IS topology information.

Syntax

show isis [tag { *area-name* }] topology [level-1 | level-2 **]**

Parameter

area-name: Specify the IS-IS area name for the query.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the IS-IS topology information:

```
Switch# show isis topology
```

Chapter 47 URPF Configuration Commands (Only for Certain Devices)

Unicast Reverse Path Forwarding (URPF) aims to prevent network attacks based on source IP address spoofing. To safeguard against forged IP packet attacks on the network, at the network ingress point, the origin of IP packets is verified. If the source is suspicious, the packet is dropped directly; if it passes the URPF check, the IP packet is allowed to enter.

47.1 urpf

Description

This command is used to enable or disable the URPF feature. When enabled, it retrieves the previously configured filtering mode for security checks. If no mode was previously configured, it performs security checks based on the default strict-vlan filtering mode. Disabling the URPF feature will not modify the set filtering mode for when URPF was disabled.

Syntax

urpf { enable| disable }

Parameter

None

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the URPF feature on the switch:

```
Switch(config)# urpf enable
```

47.2 urpf mode

Description

This command is used to configure the URPF filter mode.

Syntax

urpf mode { strict-vlan | strict-port | loose }

Parameter

strict-vlan: Filter the packets whose IP or VLAN do not meet the requirements

strict-port: Filter the packets whose IP or port do not meet the requirements

loose: Filter the packets whose IP does not meet the requirements

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the URPF feature on the switch:

Switch(config)# urpf mode strict-vlan

Chapter 48 Tunnel Configuration Commands (Only for Certain Devices)

Tunnel is an encapsulation technique that uses one network protocol to transport another network protocol. It encapsulates data packets generated by another protocol within its own packets, enabling the transmission of IPv6 packets over an IPv4 network and facilitating interconnection between IPv6 networks. A tunnel represents a virtual point-to-point connection where it provides a channel for the transmission of encapsulated data packets, allowing for encapsulation and decapsulation of data packets at both ends of the tunnel.

48.1 interface tunnel

Description

This command is used to create a tunnel interface. Only after a tunnel interface is created can different tunnel-related parameters be configured in the interface view. To delete all configurations of the tunnel interface, please use the **no interface tunnel** command.

Syntax

interface tunnel *tunnel-number*

no interface tunnel *tunnel-number*

Parameter

tunnel-number: Tunnel interface number, a positive integer ranging from 1 to 100.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a tunnel interface1:

```
Switch(config)#interface tunnel 1
```

48.2 tunnel mode

Description

This command is used to specify the tunnel mode. The tunnel will encapsulate different protocol headers for passenger messages according to different tunnel types. To delete the type of the tunnel interface, please use the **no tunnel mode** command.

Syntax

tunnel mode *mode-type*

no tunnel mode

Parameter

mode-type: Tunnel protocol type, currently three manual tunnel types are supported: IPv6IP, GRE IPv4-IPv4, GRE IPv6-IPv4.

Command Mode

Tunnel Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify Tunnel as IPv6IP manual tunnel:

Switch(config)#interface tunnel 1

Switch(config-tunnel)#tunnel mode ipv6ip

48.3 interface tunnel

Description

This command is used to specify the source address or source interface of the tunnel. To delete the source address or source interface of the tunnel, please use the **no tunnel source** command.

Syntax

tunnel source { *ip* | *interface* | *vlan-if*}

no tunnel source

Parameter

ip: Tunnel source IPv4 address.

interface interface-type interface-number: Tunnel source interface.

vlan-if: Tunnel source VLAN type interface.

Command Mode

Tunnel Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the source address of the tunnel as 192.168.1.0:

Switch(config)#interface tunnel 1

Switch(config-tunnel)tunnel source ip address 192.168.1.0

48.4 tunnel destination

Description

This command is used to specify the destination address of the tunnel. To delete the destination address of the tunnel, please use the **no tunnel destination** command.

Syntax

tunnel destination ip address *ipv4-address*

no tunnel destination

Parameter

ipv4-address: Tunnel destination IPv4 address.

Command Mode

Tunnel Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the destination address of the tunnel as 192.168.2.0:

Switch(config)#interface tunnel 1

Switch(config-tunnel)tunnel destination ip address 192.168.2.0

48.5 tunnel ttl

Description

This command is used to configure the TTL value of the encapsulated outer protocol header. It is 0 by default, indicating that the TTL of the external protocol header matches that of the inner passenger packet. To delete the TTL configuration and restore it to the default value of 0, please use the **no tunnel ttl** command.

Syntax

tunnel ttl *ttl-number*

no tunnel ttl

Parameter

ttl-number: The TTL value of the external protocol header of the tunnel encapsulation, ranging from 1 to 255. The default value is 0, which means it is consistent with the TTL of the passenger message.

Command Mode

Tunnel Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the tunnel TTL to 110:

Switch(config)#interface tunnel 1

Switch(config-tunnel) tunnel tti 110

48.6 tunnel ip address

Description

This command is used to specify the interface IP address of the tunnel. GRE IPv4-IPv4 tunnels need to be configured with an IPv4 address, and IPv6IP and GRE IPV6-IPv4 tunnels need to be configured with an IPv6 address. To delete the IP address of the tunnel, please use the no ip address command.

Syntax

ip address *ipv4-address* / **ipv6 address** *ipv6-address*

no ip address / **no ipv6 address**

Parameter

ip-address: IPv4 address of the tunnel interface.

ipv6-address: IPv6 address of the tunnel interface.

Command Mode

Tunnel Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the interface IP address of the GRE IPv4-IPv4 tunnel as 10.1.1.1:

Switch(config)#interface tunnel 1

Switch(config-tunnel) ip address 10.1.1.1

48.7 shutdown

Description

This command is used to disable the tunnel interface encapsulation and decapsulation functions. To enable the functions, please use the **no shutdown** command.

Syntax

shutdown

no shutdown

Parameter

None

Command Mode

Tunnel Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable the tunnel interface encapsulation and decapsulation functions:

```
Switch(config)#interface tunnel 1
Switch(config-tunnel) shutdown
```

48.8 ip route tunnel

Description

This command is used to configure a static route for IPv4 packets to point to a tunnel, so that IPv4 packets can enter the tunnel (including only GRE IPv4-IPv4 type tunnels). To delete the static route configuration, please use the no command.

Syntax

ip route *ip-address mask* **tunnel** *tunnel-number*

no ip route *ip-address mask* **tunnel** *tunnel-number*

Parameter

ip-address: IP address of the static route.

mask: Mask of the static route.

tunnel-number: Tunnel interface to which the static route points

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the IPv4 static route to point to tunnel interface 1:

```
Switch(config)#ip route 192.168.2.0 255.255.255.0 tunnel 1
```

48.9 ipv6 route tunnel

Description

This command is used to configure a static route for IPv6 packets to point to a tunnel, so that IPv6 packets can enter the tunnel (including only IPv6IP and

GRE IPv6-IPv4 type tunnels). To delete the static route configuration, please use the no command.

Syntax

ipv6 route *ipv6-dest-address* **tunnel** *tunnel-number*

no ipv6 route *ipv6-dest-address* **tunnel** *tunnel-number*

Parameter

ipv6-dest-address: Specify the destination IPv6 address of the packets, in the format of X:X:X:X::X/<0-128>.

tunnel-number: Tunnel interface to which the static route points

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the IPv6 static route to point to tunnel interface 1:

```
Switch(config)# ipv6 route fc00:2::/64 tunnel 1
```

48.10 show interface tunnel

Description

This command is used to view the configuration information of the tunnel interface.

Syntax

show interface tunnel { *tunnel-numbber* | *all* }

Parameter

ipv6-dest-address: Specify the destination IPv6 address of the packets, in the format of X:X:X:X::X/<0-128>.

tunnel-number: Tunnel interface to which the static route points

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the configuration information of the tunnel interface 1:

```
Switch(config)# show interface tunnel 1
```

Chapter 49 IPv6 Address Configuration Commands

The IPv6 address configuration commands are provided in the Interface Configuration Mode, which includes the routed port, the port-channel interface and the VLAN interface. Enter the configuration mode of these Layer 3 interfaces and configure their IPv6 parameters.

49.1 ipv6 enable

Description

This command is used to enable the IPv6 function on the specified Layer 3 interface. IPv6 function should be enabled before the IPv6 address configuration management. By default it is enabled on VLAN interface 1. IPv6 function can only be enabled on one Layer 3 interface at a time.

If the IPv6 function is disabled, the corresponding IPv6-based modules will be invalid, for example SSHv6, SSLv6, TFTPv6 and more. To disable the IPv6 function, please use **no ipv6 enable** command.

Syntax

ipv6 enable

no ipv6 enable

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IPv6 function on the VLAN interface 1:

```
Switch(config)# interface vlan 1

Switch(config-if)# ipv6 enable
```

49.2 ipv6 address autoconfig

Description

This command is used to enable the automatic configuration of the ipv6 link-local address. The switch has only one ipv6 link-local address, which can be configured automatically or manually. The general ipv6 link-local address

has the prefix as fe80::/10. IPv6 routers cannot forward packets that have link-local source or destination addresses to other links. The autu-configured ipv6 link-local address is in EUI-64 format. To verify the uniqueness of the link-local address, the manually configured ipv6 link-local address will be deleted when the auto-configured ipv6 link-local address takes effect.

Syntax

ipv6 address autoconfig

Configuration Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the automatic configuration of the ipv6 link-local address on VLAN interface 1:

```
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 address autoconfig
```

49.3 ipv6 address link-local

Description

The **ipv6 address link-local** command is used to configure the ipv6 link-local address manually on a specified interface. To delete the configured link-local address, please use **no ipv6 address link-local** command.

Syntax

ipv6 address *ipv6-addr* **link-local**

no ipv6 address *ipv6-addr* **link-local**

Parameter

ipv6-addr —— The link-local address of the interface. It should be a standardized IPv6 address with the prefix fe80::/10, otherwise this command will be invalid.

Configuration Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the link-local address as fe80::1234 on the VLAN interface 1:

```
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 address fe80::1234 link-local
```

49.4 ipv6 address dhcp

Description

The **ipv6 address dhcp** command is used to enable the DHCPv6 Client function. When this function is enabled, the Layer 3 interface will try to obtain IP from DHCPv6 server. To delete the allocated IP from DHCPv6 server and disable the DHCPv6 Client function, please use **no ipv6 address dhcp** command.

Syntax

ipv6 address dhcp

no ipv6 address dhcp

Configuration Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCP Client function on VLAN interface 1:

```
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 address dhcp
```

49.5 ipv6 address ra

Description

This command is used to configure the interface's global IPv6 address according to the address prefix and other configuration parameters from its

received RA(Router Advertisement) message. To disable this function, please use **no ipv6 address ra** command.

Syntax

ipv6 address ra

no ipv6 address ra

Configuration Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the automatic ipv6 address configuration function to obtain IPv6 address through the RA message on VLAN interface 1:

Switch(config)# interface vlan 1

Switch(config-if)# ipv6 address ra

49.6 ipv6 address eui-64

Description

This command is used to manually configure a global IPv6 address with an extended unique identifier (EUI) in the low-order 64 bits on the interface. Specify only the network prefix. The last 64 bits are automatically computed from the switch MAC address. To remove a EUI-64 IPv6 address from the interface, please use the **no ipv6 address eui-64** command.

Syntax

ipv6 address *ipv6-addr* **eui-64**

no ipv6 address *ipv6-addr* **eui-64**

Parameter

ipv6-addr —— Global IPv6 address with 64 bits network prefix, for example 3ffe::/64.

Configuration Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure an EUI-64 global address on the interface with the network prefix 3ffe::/64:

```
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 address 3ffe::/64 eui-64
```

49.7 ipv6 address

Description

This command is used to manually configure a global IPv6 address on the interface. To remove a global IPv6 address from the interface, please use **no ipv6 address** command.

Syntax

ipv6 address *ipv6-addr*

no ipv6 address *ipv6-addr*

Parameter

ipv6-addr —— Global IPv6 address with network prefix, for example 3ffe::1/64.

Configuration Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the global address 3001::1/64 on VLAN interface 1:

```
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 address 3001::1/64
```

49.8 show ipv6 interface

Description

This command is used to display the configured ipv6 information of the management interface, including ipv6 function status, link-local address and global address, ipv6 multicast groups etc.

Syntax

show ipv6 interface

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the ipv6 information of the management interface:

```
Switch(config)# show ipv6 interface
```

Chapter 50 ARP Commands

Address Resolution Protocol (ARP) is used to resolve an IP address into an Ethernet MAC address. The switch maintains an ARP mapping table to record the IP-to-MAC mapping relations, which is used for forwarding packets. An ARP mapping table contains two types of ARP entries: dynamic and static. An ARP dynamic entry is automatically created and maintained by ARP. A static ARP entry is manually configured and maintained.

50.1 arp

Description

This **arp** command is used to add a static ARP entry. To delete the specified ARP entry, please use the **no arp** command. If the command contains vrf, the arp belongs to the vrf instance.

Syntax

arp *ip mac type* [**vrf** *vrf-name*]

no arp *ip type* [**vrf** *vrf-name*]

Parameter

ip —— The IP address of the static ARP entry.

mac —— The MAC address of the static ARP entry.

type —— The ARP type. Configure it as “arpa”.

vrf-name——Specify the vrf name.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a static ARP entry with the IP as 192.168.0.1 and the MAC as 00:11:22:33:44:55:

```
Switch(config)# arp 192.168.0.1 00:11:22:33:44:55 arpa vrf v1
```

50.2 clear arp-cache

Description

This **clear arp-cache** command is used to clear all the dynamic ARP entries. If the command contains VRF, the ARP entries of the VRF instance are clear.

Syntax

clear arp-cache [**vrf** *vrf-name*]

Parameter

vrf-name——Specify the vrf name.

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear ARP entries in VRF v1:

Switch(config)# clear arp-cache vrf v1

50.3 arp dynamicrenew

Description

This **arp dynamicrenew** command is used to automatically renew dynamic ARP entries. To disable the switch to automatically renew dynamic ARP entries, please use the **no arp dynamicremew** command. By default, it is enabled.

Syntax

arp dynamicremew

no arp dynamicremew

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the switch to automatically renew the dynamic ARP entries:

```
Switch(config)# arp dynamicrenew
```

50.4 arp timeout

Description

This **arp timeout** command is used to configure the ARP aging time of the interface.

Syntax

arp timeout *timeout*

no arp timeout

Parameter

timeout —— Specify the aging time, ranging from 10 to 3000 seconds. The default value is 1200 seconds.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the ARP aging time as 60 seconds:

```
Switch(config)# arp timeout 60
```

50.5 gratuitous-arp intf-status-up enable

Description

This **gratuitous-arp intf-status-up enable** command is used to enable the Layer 3 interface to send a gratuitous ARP packet when the interface's status becomes up.

Syntax

gratuitous-arp intf-status-up enable

no gratuitous-arp intf-status-up enable

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Enable the switch's Layer 3 interfaces to send gratuitous ARP packets when their status becomes up:

```
Switch(config)# gratuitous-arp intf-status-up enable
```

50.6 gratuitous-arp dup-ip-detected enable

Description

This **gratuitous-arp dup-ip-detected enable** command is used to enable the Layer 3 interface to send a gratuitous ARP packet when receiving a gratuitous packets of which the IP address is the same as its own.

Syntax

gratuitous-arp dup-ip-detected enable

no gratuitous-arp dup-ip-detected enable

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Enable the switch's Layer 3 interface to send gratuitous ARP packets when receiving a gratuitous packets of which the IP address is the same as its own:

```
Switch(config)# gratuitous-arp dup-ip-detected enable
```

50.7 gratuitous-arp learning enable

Description

This **gratuitous-arp learning enable** command is used to enable the Layer 3 interface to learn MAC addresses from the gratuitous ARP packets.

Syntax

gratuitous-arp learning enable

no gratuitous-arp learning enable

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Enable the Layer 3 interface to learn MAC addresses from the gratuitous ARP packets:

```
Switch(config)# gratuitous-arp learning enable
```

50.8 gratuitous-arp send-interval

Description

This **gratuitous-arp send-interval** command is used to configure the interval at which the interface periodically send the gratuitous ARP packets.

Syntax

gratuitous-arp send-interval *interval*

Parameter

Interval—— Specify the interval at which the interface periodically send the gratuitous ARP packets. Value 0 means the interface will not send gratuitous ARP packets.

Command Mode

Interface Configuration Mode (interface vlan / interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

None.

Example

Specify the interface VLAN 1 to send gratuitous ARP packets every 1 second:

```
Switch(config)# interface vlan 1
Switch(config-if)# gratuitous-arp send-interval 1
```

50.9 ip proxy-arp

Description

The **ip proxy-arp** command is used to enable Proxy ARP function on the specified VLAN interface or routed port. To disable Proxy ARP on this interface, please use **no ip proxy-arp** command.

Syntax

ip proxy-arp

no ip proxy-arp

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

None

Example

Enable the Proxy ARP function on VLAN Interface 2:

```
Switch(config)# interface vlan 2
Switch(config-if)# ip proxy-arp
```

Enable the Proxy ARP function on routed port 1/0/2:

```
Switch(config)# interface gigabitEthernet 2
Switch(config-if)# no switchport
Switch(config-if)# ip proxy-arp
```

50.10 ip local-proxy-arp

Description

The **ip local-proxy-arp** command is used to enable Local Proxy ARP function on the specified VLAN interface or routed port. To disable Local Proxy ARP function on this interface, please use **no ip local-proxy-arp** command.

Syntax

ip local-proxy-arp
no ip local-proxy-arp

Command Mode

Interface Configuration Mode (Interface vlan / interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

None

Example

Enable the Proxy ARP function on VLAN Interface 2:

```
Switch(config)# interface vlan 2
Switch(config-if)# ip local-proxy-arp
```

Enable the Proxy ARP function on routed port 1/0/2:

```
Switch(config)# interface gigabitEthernet 2
```

```
Switch(config-if)# no switchport

Switch(config-if)# ip local-proxy-arp
```

50.11 show arp

Description

This **show arp** command is used to display the active ARP entries. If no parameter is speicified, all the active ARP entries will be displayed. If the VRF is specified, the arp entries of the VRF instance are displayed.

Syntax

show arp [*ip*] [*mac*] [**vrf** *vrf-name*]

Parameter

ip —— Specify the IP address of your desired ARP entry.

mac —— Specify the MAC address of your desired ARP entry.

vrf-name —— Specify the VRF name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the ARP entry with the IP as 192.168.0.2 in vrf v1:

```
Switch(config)# show arp 192.168.0.2 vrf v1
```

50.12 show ip arp (interface)

Description

This **show ip arp (interface)** command is used to display the active ARP entries associated with a specified Layer 3 interface.

Syntax

show ip arp { **gigabitEthernet** *port* | **port-channel** *port-channel-id* | **vlan** *id*}

Parameter

port —— Specify the number of the routed port.

port-channel-id—— Specify the ID of the port channel.

id—— Specify the VLAN interface ID.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the ARP entry associated with VLAN interface 2:

```
Switch(config)# show ip arp vlan 2
```

50.13 show ip arp summary

Description

This **show ip arp summary** command is used to display the number of the active ARP entries.

Syntax

show ip arp summary

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the number of the ARP entries:

```
Switch(config)# show ip arp summary
```

50.14 show gratuitous-arp

Description

This **show gratuitous arp** command is used to display the configuration of gratuitous ARP.

Syntax

show gratuitous-arp

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of gratuitous ARP:

```
Switch(config)# show gratuitous-arp
```

50.15 show ip proxy-arp

Description

The **show ip proxy-arp** command is used to display the Proxy ARP status.

Syntax

show ip proxy-arp

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Display the Proxy ARP status:

```
Switch(config)# show ip proxy-arp
```

Chapter 51 VRRP Commands (Only for Certain Devices)

VRRP (Virtual Routing Redundancy Protocol) is a function on the switch that dynamically assigns responsibility for a virtual router to one of the VRRP routers on a LAN. The VRRP router that controls the IP address associated with a virtual router is called the Master and will forward packets sent to this IP address. This will allow any Virtual Router IP address on the LAN to be used as the default first hop router by end hosts.

51.1 ip vrrp vrid

Description

The **ip vrrp vrid** command is used to enable the VRRP-V2 protocol on the interface and specify the virtual router ID for it. To disable the protocol on the interface, please use the **no ip vrrp vrid** command.

Syntax

ip vrrp vrid *vrid-index*

no ip vrrp vrid *vrid-index*

Parameter

vrid-index—— Virtual router ID, ranging from 1 to 255.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the VRRP-V2 protocol on VLAN 2 and specify the virtual router ID as 5:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5
```

51.2 ipv6 vrrp vrid

Description

The **ipv6 vrrp vrid** command is used to enable the VRRP-V3 protocol on the interface and specify the virtual router ID for it. To disable the protocol on the interface, please use the **no ipv6 vrrp vrid** command.

Syntax

ipv6 vrrp vrid *vrid-index*

no ipv6 vrrp vrid *vrid-index*

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the VRRP-V3 protocol on VLAN 2 and specify the virtual router ID as 5:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 vrrp vrid 5
```

51.3 ip vrrp vrid authentication-mode

Description

The **ip vrrp vrid authentication-mode** command is used to configure the authentication mode of the virtual router on the specified interface. To restore to the default authentication mode, please use the **no ip vrrp vrid authentication-mode** command.

Syntax

ip vrrp vrid *vrid-index* **authentication-mode** {**simple** | **md5**} *password*

no ip vrrp vrid *vrid-index* **authentication-mode**

Parameter

vrid-index—— Virtual router ID, ranging from 1 to 255.

simple | **md5**—— Authentication mode, by default it is None and no authentication will be performed. "simple" refers to using a text password for authentication, and "md5" refers to using a text password to perform the authentication of MD5, which has a higher security than Simple mode.

password—— Password, a string of 1 to 8 alphabets, numbers or symbols. Passwords are casesensitive, spaces allowed but leading spaces ignored, and cannot contain question marks. It is empty by default.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the md5 authentication mode on the VLAN 2, specify the password as 123 and the virtual router ID as 5:

Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5 **authentication-mode** md5 123

51.4 ip vrrp vrid description

Description

The **ip vrrp vrid description** command is used to configure and modify the description for the virtual router. To delete the description, please use the **no ip vrrp vrid description** command.

Syntax

ip vrrp vrid *vrid-index* **description** *description*

Parameter

vrid-index—— Virtual router ID, ranging from 1 to 255.

description—— A string describing the virtual router, containing up to 256 characters, consisting only of numbers, English letters, and dashes.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the virtual router desceiption as vr5 and the virtual router ID as 5 on the VLAN 2:

Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5 description vr5

51.5 ip vrrp vrid preempt-mode

Description

The **ip vrrp vrid preempt-mode** command is used to configure the preemption mode and delay time of the specified virtual router on the interface. To set the specified virtual router on the interface to non-preempt mode, please use the **no ip vrrp vrid preempt-mode** command. By default, the virtual router is in preempt mode.

Syntax

ip vrrp vrid *vrid-index* **preempt-mode** [**timer-delay** *delay-value*]

no ip vrrp vrid *vrid-index* **preempt-mode**

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

delay-value —— When the current primary router is deemed unavailable, the backup router waits before switching to the primary router. The value ranges from 0 to 255 seconds, and the default is 0.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the virtual router preemption time to 12 seconds and the virtual router ID to 5 on VLAN 2:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5 preempt-mode timer-delay 12
```

51.6 ip vrrp vrid priority

Description

The **ip vrrp vrid priority** command is used to configure the priority of the specified virtual router on the interface. To restore the default priority, please use the **no ip vrrp vrid priority** command.

Syntax

ip vrrp vrid *vrid-index* **priority** *priority*

no ip vrrp vrid *vrid-index* **priority**

Parameter

vrid-index—— Virtual router ID, ranging from 1 to 255.

priority—— Priority, value ranges from 1 to 254. The default priority is 100.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the virtual router priority to 1110 and the virtual router ID to 5 on VLAN 2:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5 priority 110
```

51.7 ip vrrp vrid timer-advertise

Description

The **ip vrrp vrid timer-advertise** command is used to configure the frequency at which the specified virtual router sends advertisements on the interface. To restore the default advertisement interval, please use the **no ip vrrp vrid timer-advertise** command.

Syntax

ip vrrp vrid *vrid-index* **timer-advertise** *adver-interval*

no ip vrrp vrid *vrid-index* **timer-advertise**

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

adver-interval —— Advertisement interval, for VRRP-V2, the value range is 1~255, the unit is seconds, the default is 1 second; for VRRP-V3, the value range is 100~4095, the unit is centiseconds, the default is 100 centiseconds.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the virtual router advertisement interval to 12 seconds and the virtual router ID to 5 on VLAN 2:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5 timer-advertise 12
```

51.8 ip vrrp vrid track

Description

The **ip vrrp vrid track** command is used to configure the specified virtual router on the interface to add a tracking interface. To delete the tracking interface, please use the **no ip vrrp vrid track** command.

Syntax

ip vrrp vrid *vrid-index* **track interface** {{fastEthernet | gigabitEthernet | hundred-gigabitEthernet | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet } *port* / **port-channel** *portchannel-id* / **vlan** *vlan-id*} [**reduce-priority** *priority*]

no ip vrrp vrid *vrid-index* **track interface** {{fastEthernet | gigabitEthernet | hundred-gigabitEthernet | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet } *port* / **port-channel** *portchannel-id* / **vlan** *vlan-id*}

Parameter

vrid-index—— Virtual router ID, ranging from 1 to 255.

fastEthernet | gigabitEthernet | hundred-gigabitEthernet | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet —— Port type, which must be a layer 3 interface.

port—— Port number.

portchannel-id—— LAG group number.

vlan-id—— Decreasing priority of the tracked interface, ranging from 1 to 254, and the default is 10.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the virtual router to track VLAN 3 on the VLAN 2 with a decreasing priority of 20 and a virtual router ID of 5:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5 track interface vlan 3 reduce-priority 20
```

51.9 ip vrrp vrid version

Description

The **ip vrrp vrid version** command is used to configure or switch the VRRP version of the specified virtual router on the interface. The default is VRRP-V2.

Syntax

ip vrrp vrid *vrid-index* **version** *vrrp-version*

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

vrrp-version —— VRRP protocol version, the value is 2 or 3. Due to the differences between VRRP-V2 and VRRP-V3, version switching is only allowed when authentication is not configured, ipv6 virtual address is not configured, and the default notification time is used.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Switch the virtual router on the VALN 2 to VRRP-V3, and the virtual router ID to 5:

```
Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5 version 3
```

51.10 ip vrrp vrid virtual-ip

Description

The **ip vrrp vrid virtual-ip** command is used to add a primary virtual IPv4 address to a virtual router. Each virtual router has only one primary virtual IP that cannot be deleted. If the virtual router does not exist, a VRRP-V2 version of the virtual router will be automatically created.

Syntax

ip vrrp vrid *vrid-index* **virtual-ip** *virtual-ip*

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

virtual-ip —— The virtual IP address of the virtual router, which must be in the same network segment as the interface.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add virtual IP address 192.168.0.10 on VALN 2 with the virtual router ID 5:

Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5 **virtual-ip** 192.168.0.10

51.11 ip vrrp vrid virtual-ip secondary

Description

The **ip vrrp vrid virtual-ip secondary** command is used to add a secondary virtual IPv4 address to a virtual router. Each virtual router can be configured with up to 32 IP addresses. To delete the corresponding secondary virtual IP address, use the **no ip vrrp vrid virtual-ip secondary** command.

Syntax

ip vrrp vrid *vrid-index* **virtual-ip** *virtual-ip* secondary

no ip vrrp vrid *vrid-index* **virtual-ip** *virtual-ip* secondary

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

virtual-ip —— The virtual IP address of the virtual router, which must be in the same network segment as the interface.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add secondary virtual IP address 192.168.0.11 on VALN 2 with the virtual router ID 5:

Switch(config)#interface vlan 2
Switch(config-if)#ip vrrp vrid 5 **virtual-ip** 192.168.0.10 **secondary**

51.12 ipv6 vrrp vrid address link-local

Description

The **ipv6 vrrp vrid address link-local** command is used to add a virtual ipv6 local link address to a virtual router. Each virtual router has only one virtual link-local address. If the virtual router does not exist, a VRRP-V3 version of the virtual router will be automatically created. To delete the virtual link-local address, use the **no ipv6 vrrp vrid address link-local** command.

Syntax

ipv6 vrrp vrid *vrid-index* **address** *virtual-linklocal* **link-local**

no ipv6 vrrp vrid *vrid-index* **address** *virtual-linklocal* **link-local**

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

virtual-linklocal —— The virtual link-local address of the virtual router. The address prefix should be the fe80::/10 standard ipv6 address.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add virtual ipv6 link-local address fe80::10 on VALN 2 with the virtual router ID 5:

Switch(config)#interface vlan 2
Switch(config-if)#ipv6 vrrp vrid 5 **address** fe80::10 **link-local**

51.13 ipv6 vrrp vrid address

Description

The **ipv6 vrrp vrid address** command is used to add a virtual ipv6 address to a virtual router. Each virtual router can be configured with up to 32 ipv6 addresses. To delete the virtual address, use the **no ipv6 vrrp vrid address** command.

Syntax

ipv6 vrrp vrid *vrid-index* **address** *virtual-ipv6*

no ipv6 vrrp vrid *vrid-index* **address** *virtual-ipv6*

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

virtual-ipv6 —— The global ipv6 address of the virtual router, which must be in the same network segment as the interface ipv6 address.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add virtual ipv6 global address 3001::1 on VALN 2 with the virtual router ID 5:

```
Switch(config)#interface vlan 2
Switch(config-if)#ipv6 vrrp vrid 5 address 3001::1
```

51.14 show ip vrrp

Description

The **show ip vrrp** command is used to display basic configuration information of all virtual routers or a specified virtual router.

Syntax

show ip vrrp [**vrid** *vrid-index*] [**interface** {{fastEthernet | gigabitEthernet | hundred-gigabitEthernet | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet } *port* / **port-channel** *portchannel-id* / **vlan** *vlan-id*}]

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

fastEthernet | gigabitEthernet | hundred-gigabitEthernet | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet —— Port type, which must be a layer 3 interface.

port —— Port number.

portchannel-id —— LAG group number.

vlan-id —— VLAN value.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Display the configuration information of the virtual router ID 5 on VLAN 2:

```
Switch(config)#show ip vrrp vrid 5 interface vlan 2
```

51.15 show ip vrrp statistics

Description

The **show ip vrrp statistics** command is used to display statistics for all virtual routers or a specified virtual router.

Syntax

show ip vrrp statistics [**vrid** *vrid-index*] [**interface** {{fastEthernet | gigabitEthernet | hundred-gigabitEthernet | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet } *port* / **port-channel** *portchannel-id* / **vlan** *vlan-id*}]

Parameter

vrid-index —— Virtual router ID, ranging from 1 to 255.

fastEthernet | gigabitEthernet | hundred-gigabitEthernet | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet —— Port type, which must be a layer 3 interface.

port —— Port number.

portchannel-id —— LAG group number.

vlan-id—— VLAN value.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Display statistics of the virtual router ID 5 on VLAN 2:

```
Switch(config)#show ip vrrp statistics vrid 5 interface vlan 2
```

51.16 clear ip vrrp statistics

Description

The **clear ip vrrp statistics** command is used to clear the statistics of all virtual routers on the switch.

Syntax

clear ip vrrp statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

Clear the statistics of all virtual routers on the switch:

```
Switch(config)#clear ip vrrp statistics
```

Chapter 52 DHCP Server Commands

DHCP (Dynamic Host Configuration Protocol) is a network configuration protocol for hosts on TCP/IP networks, and it provides a framework for distributing configuration information to hosts. DHCP server assigns IP addresses from specified address pools on a switch or router to DHCP clients and manages them.

52.1 service dhcp server

Description

The **service dhcp server** command is used to enable DHCP service globally. To disable DHCP server service, please use **no service dhcp server** command.

Syntax

service dhcp server

no service dhcp server

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable DHCP server service globally:

```
Switch(config)# service dhcp server
```

52.2 ip dhcp server extend-option capwap-ac-ip

Description

The **ip dhcp server extend-option capwap-ac-ip** command is used to specify the Option 138, which should be configured as the management IP address of an AC (Access Control) device. If the APs in the local network request this option, the server will inform the APs of the AC's IP address by

sending a packet containing this option. To delete the Option 138, please use **no ip dhcp server extend-option capwap-ac-ip** command.

Syntax

ip dhcp server extend-option capwap-ac-ip *ip-address*

no ip dhcp server extend-option capwap-ac-ip

Parameter

ip-address —— Specify the management IP address of an AC (Access Control) device.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the remote DHCP server's IP address as 192.168.3.1:

Switch(config)# ip dhcp server extend-option capwap-ac-ip 192.168.3.1

52.3 ip dhcp server extend-option vendor-class-id

Description

The **ip dhcp server extend-option vendor-class-id** command is used to configure the class ID of the packets from DHCP server in a different network segment. To delete the class ID settings, please use **no ip dhcp server extend-option vendor-class-id** command.

Syntax

ip dhcp server extend-option vendor-class-id *class-id*

no ip dhcp server extend-option vendor-class-id

Parameter

class-id —— Specify the class ID of the DHCP packets from another network segment.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the class ID of the DHCP packets from another network segment as 34:

Switch(config)# ip dhcp server extend-option vendor-class-id 34

52.4 ip dhcp server excluded-address

Description

The **ip dhcp server excluded-address** command is used to specify the reserved IP addresses which are forbidden to allocate, such as the gateway address, the network segment broadcast address, the server address etc. To delete the reserved IP addresses, please use **no ip dhcp server excluded-address** command.

Syntax

ip dhcp server excluded-address *start-ip-address end-ip-address*

no ip dhcp server excluded-address *start-ip- address end-ip-address*

Parameter

start-ip-address —— Specify the start IP address of the reserved IP pool.

end-ip-address —— Specify the end IP address of the reserved IP pool. Only one IP address will be reserved if the end IP address and the start IP address are the same.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the reserved IP addresses from 192.168.1.1 to 192.168.1.9:

Switch(config)# ip dhcp server excluded-address 192.168.1.1 192.168.1.9

52.5 ip dhcp server pool

Description

The **ip dhcp server pool** command is used to create the address pool of DHCP Server and enter the dhcp configuration mode. To delete the address pool, please use **no ip dhcp server pool** command.

Syntax

ip dhcp server pool *pool-name*

no ip dhcp server pool *pool-name*

Parameter

pool-name —— Specify the address pool name, ranging from 1 to 8 characters.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create the address pool of name POOL1:

Switch(config)# ip dhcp server pool POOL1

52.6 ip dhcp server ping timeout

Description

The **ip dhcp server ping timeout** command is used to specify the timeout of PING process. To resume the default value, please use **no ip dhcp server ping timeout** command.

Syntax

ip dhcp server ping timeout *value*

no ip dhcp server ping timeout

Parameter

value —— Specify the timeout value, ranging from 100 to 10000ms. The default value is 100ms.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the timeout of PING as 200ms:

```
Switch(config)# ip dhcp server ping timeout 200
```

52.7 ip dhcp server ping packets

Description

The **ip dhcp server ping packets** command is used to specify the number of PING packets sent. If this value is set to 0, the PING process will be disabled. To resume the default value, please use **no ip dhcp server ping packets** command.

Syntax

ip dhcp server ping packets *num*

no ip dhcp server ping packets

Parameter

num —— Specify the PING packets' number, ranging from 0 to 10. By default it's 1.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the PING packets' number as 2:

```
Switch(config)# ip dhcp server ping packets 2
```

52.8 network

Description

The **network** command is used to specify the address and subnet of the network pool.

Syntax

network { *network-address subnet-mask*} [*vrf-name*]

Parameter

network-address —— Specify the network address of the pool, with the format A.B.C.D. All the IP addresses in the same subnet are allocatable except the reserved addresses and specific addresses.

subnet-mask —— Specify the subnet mask of the pool, with the format A.B.C.D.

vrf-name —— VRF instance name

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the address pool "product" as 192.168.1.0 255.255.255.0:

```
Switch(config)# ip dhcp server pool p1
Switch(dhcp-config)# network 192.168.1.0 255.255.255.0 vrf1
```

52.9 vrf

Description

The **vrf** command is used to modify the vrf instance to which the network segment of a specific address pool belongs.

Syntax

vrf [*vrf-name*]

Parameter

vrf-name —— VRF instance name

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

```
Switch(config)# ip dhcp server pool p1
Switch(dhcp-config)# vrf vrf1
```

52.10 lease

Description

The **lease** command is used to specify the lease time of the address pool.

Syntax

lease *lease-time*

Parameter

lease-time —— Specify the lease time of the pool, ranging from 1 to 2880 minutes. The default value is 120 minutes.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the lease time of address pool “product” as 10 minutes:

```
Switch(config)# ip dhcp server pool product
Switch(dhcp-config)# lease 10
```

52.11 address hardware-address

Description

The **address hardware-address** command is used to reserve the static address bound with hardware address in the address pool. To delete the binding, please use **no address hardware-address**.

Syntax

address *ip-address* **hardware-address** *hardware-address* **hardware-type** { ethernet | ieee802 }

no address *ip-address*

Parameter

ip-address —— Specify the static binding IP address.

hardware-address —— Specify the hardware address, in the format XX:XX:XX:XX:XX:XX.

ethernet | ieee802 —— Specify the hardware type.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Reserve the IP address 192.168.0.10 in the address pool "product" for the device with the MAC address as 5e:4c:a6:31:24:01 and the hardware type as ethernet:

Switch(config)# ip dhcp server pool product

Switch(dhcp-config)# address 192.168.0.10 **hardware-address**

5e:4c:a6:31:24:01 **hardware-type** ethernet

52.12 address client-identifier

Description

The **address client-identifier** command is used to specify the static address bound with client ID in the address pool. To delete the binding, please use **no address** command.

Syntax

address *ip-address* **client-identifier** *client-id* [**ascii**]

no address *ip-address*

Parameter

ip-address —— Specify the static binding IP address.

client-id —— Specify the client ID, in the format of hex value.

ascii —— The client ID is entered with ASCII characters.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Reserve the IP address 192.168.0.10 in the address pool "product" for the device with the client ID as abc in ASCII:

Switch(config)# ip dhcp pool product

Switch(dhcp-config)# address 192.168.0.10 **client-identifier** abc **ascii**

52.13 default-gateway

Description

The **default-gateway** command is used to specify the default gateway of the address pool. To delete the configuration, please use **no default-gateway**.

Syntax

default-gateway *gateway-list*

no default-gateway

Parameter

gateway-list —— Specify the gateway list, with the format of A.B.C.D,E.F.G.H. At most 8 gateways can be configured, separated by comma.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the address pool product's default gateways as 192.168.0.1 and 192.168.1.1:

Switch(config)# ip dhcp server pool product

Switch(dhcp-config)# default-gateway 192.168.0.1,192.168.1.1

52.14 dns-server

Description

The **dns-server** command is used to specify the DNS server of the address pool. To delete this configuration, please use **no dns-server** command.

Syntax

dns-server *dns-list*

no dns-server

Parameter

dns-list —— Specify the DNS server list, with the format of A.B.C.D,E.F.G.H. At most 8 DNS servers can be configured, separated by comma.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the address pool's DNS servers as 192.168.0.1 and 192.168.1.1:

Switch(config)# ip dhcp server pool product

Switch(dhcp-config)# dns-server 192.168.0.1,192.168.1.1

52.15 ip dns-address

Description

The **ip dns-address** command is used to configure the IPv4 DNS address.

Syntax

ip dns-address primary *primary-dns*

ip dns-address secondary *secondary-dns*

ip dns-address primary secondary *secondary-dns*

no ip dns-address primary

no ip dns-address secondary

no ip dns-address

Parameter

primary-dns——IPv4 address of primary DNS.

secondary-dns——IPv4 address of secondary DNS.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify DNS as 8.8.8.8 and 8.8.4.4:

Switch(config)# ip dns-address primary 8.8.8.8 **secondary** 8.8.4.4

52.16 ipv6 dns-address

Description

The **ipv6 dns-address** command is used to configure the IPv6 DNS address.

Syntax

ipv6 dns-address primary *primary-dns*

ipv6 dns-address secondary *secondary-dns*

ipv6 dns-address primary secondary *secondary-dns*

no ipv6 dns-address primary

no ipv6 dns-address secondary

no ipv6 dns-address

Parameter

primary-dns——IPv6 address of primary DNS.

secondary-dns——IPv6 address of secondary DNS.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify DNS as 2001:4860:4860::8888 and 2001:4860:4860::8844.

Switch (config)# ipv6 dns-address primary 2001:4860:4860::8888

Switch (config)# ipv6 dns-address secondary 2001:4860:4860::8844

52.17 netbios-name-server

Description

The **netbios-name-server** command is used to specify the Netbios server's IP address. To delete the Netbios servers, please use **no netbios-name-server** command.

Syntax

netbios-name-server *NBNS-list*

no netbios-name-server

Parameter

NBNS-list —— Specify the Netbios server list, with the format of A.B.C.D,E.F.G.H. At most 8 Netbios servers can be configured, separated by comma.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the address pool's Netbios servers as 192.168.0.1 and 192.168.1.1:

Switch(config)# ip dhcp server pool product

Switch(dhcp-config)# netbios-name-server 192.168.0.1,192.168.1.1

52.18 netbios-node-type

Description

The **netbios-node-type** command is used to specify the Netbios server's node type. To delete the node type setttings, please use **no netbios-node-type** command.

Syntax

netbios-node-type *type*

no netbios-node-type

Parameter

type —— Specify the node type as b-node, h-node, m-node or p-node.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the address pool's Netbios server type as b-node:

Switch(config)# ip dhcp server pool product

Switch(dhcp-config)# netbios-node-type b-node

52.19 next-server

Description

The **next-server** command is used to specify the next DHCP server's address during the DHCP boot process. To delete the next server, please use **no next-server** command.

Syntax

next-server *ip-address*

next-server

Parameter

ip-address —— Specify the IP address of the next server.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the next server's IP address as 192.168.2.1:

Switch(config)# ip dhcp server pool product

Switch(dhcp-config)# next-server 192.168.2.1

52.20 domain-name

Description

The **domain-name** command is used to specify the domain name for the DHCP client. To delete the domain name, please use **no domain-name** command.

Syntax

domain-name *domainname*

no domain-name

Parameter

domainname —— Specify the domain name for the DHCP client.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the DHCP client's domain name as edu:

Switch(config)# ip dhcp server pool product

Switch(dhcp-config)# domain-name edu

52.21 bootfile

Description

The **bootfile** command is used to specify the name of the DHCP client's bootfile. To delete the bootfile, please use **no bootfile** command.

Syntax

bootfile *file-name*

no bootfile

Parameter

file-name —— Specify the name of the DHCP client's bootfile.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the name of the DHCP client's bootfile as boot1:

Switch(config)# ip dhcp server pool product

Switch(dhcp-config)# bootfile boot1

52.22 option

Description

The **option** command is used to specify an option for the DHCP client. To delete the option, please use **no option** command.

Syntax

option code [**HEX | IP | STRING**] *value*

no option

Parameter

value —— Option value, ranging from 1 to 254.

Command Mode

DHCP Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the option for the DHCP client as IP 1:

```
Switch(config)# ip dhcp server pool product
Switch(dhcp-config)# option code 1
```

52.23 show ip dhcp server status

Description

The **show ip dhcp server status** command is used to display the status of the DHCP service.

Syntax

show ip dhcp server status

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the status of DHCP service:

```
Switch(config)# show ip dhcp server status
```

52.24 show ip dhcp server statistics

Description

The **show ip dhcp server statistics** command is used to display the DHCP packets received and sent by DHCP server.

Syntax

show ip dhcp server statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the statistics of DHCP packets received and sent by the DHCP server:

```
Switch(config)# show ip dhcp server statistics
```

52.25 show ip dhcp server extend-option

Description

The **show ip dhcp server extend-option** command is used to display the configuration of the remote DCHP servers.

Syntax

show ip dhcp server extend-option

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configurations of the remote DCHP servers:

```
Switch(config)# show ip dhcp server extend-option
```

52.26 show ip dhcp server pool

Description

The **show ip dhcp server pool** command is used to display the configuration of the address pool.

Syntax

show ip dhcp server pool

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configured address pool:

```
Switch(config)# show ip dhcp server pool
```

52.27 show ip dhcp server excluded-address

Description

The **show ip dhcp server excluded-address** command is used to display the configuration of reserved addresses.

Syntax

show ip dhcp server excluded-address

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configured reserved addresses:

```
Switch(config)# show ip dhcp server excluded-address
```

52.28 show ip dhcp server manual-binding

Description

The **show ip dhcp server manual-binding** command is used to display the configuration of static binding address.

Syntax

show ip dhcp server manual-binding

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configured static binding address:

```
Switch(config)# show ip dhcp server manual-binding
```

52.29 show ip dhcp server binding

Description

The **show ip dhcp server binding** command is used to display the binding entries.

Syntax

show ip dhcp server binding [**ip** *ip-address*]

Parameter

ip-address —— Specify the binding IP address.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the address binding entries:

```
Switch(config)# show ip dhcp server binding
```

52.30 clear ip dhcp server statistics

Description

The **clear ip dhcp server statistics** command is used to clear the statistics information of DHCP packets.

Syntax

clear ip dhcp server statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear the packet statistics:

```
Switch(config)# clear ip dhcp server statistics
```

52.31 clear ip dhcp server binding

Description

The **clear ip dhcp server binding** command is used to clear the binding information.

Syntax

clear ip dhcp server binding [*ip-address*]

Parameter

ip-address —— Specify the binding IP address.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear all the binding addresses:

```
Switch(config)# clear ip dhcp server binding
```

Chapter 53 DHCP Relay Commands

A DHCP Relay agent is a Layer 3 device that forwards DHCP packets between clients and servers. DHCP Relay forward requests and replies between clients and servers when they are not on the same physical subnet.

53.1 service dhcp relay

Description

The **service dhcp relay** command is used to enable DHCP Relay function globally. To disable DHCP Relay function, please use **no service dhcp relay** command.

Syntax

service dhcp relay

no service dhcp relay

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable DHCP Relay function globally:

```
Switch(config)# service dhcp relay
```

53.2 ip dhcp relay hops

Description

The **ip dhcp relay hops** command is used to specify the maximum hops (DHCP Relay agent) that the DHCP packets can be relayed. To restore the default value, please use **no service dhcp relay hops** command.

Syntax

ip dhcp relay hops *hops*

no ip dhcp relay hops

Parameter

hops——Specify the maximum hops (DHCP Relay agent) that the DHCP packets can be relayed. If a packet's hop count is more than the value you set here, the packet will be dropped. The valid value ranges from the 1 to 16, and the default value is 4.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum number of relay hops as 6:

Switch(config)# ip dhcp relay hops 6

53.3 ip dhcp relay time

Description

The **ip dhcp relay time** command is used to specify the DHCP relay time threshold. DHCP relay time is the time elapsed since client began address acquisition or renewal process. When the elapsed time of the DHCP packet is greater than the value set here, the DHCP packet will be dropped by the switch. To restore the default value, please use **no service dhcp relay time** command.

Syntax

ip dhcp relay time *time*

no ip dhcp relay time

Parameter

time——Specify the DHCP relay time threshold. The valid value ranges from 1 to 65535. The default value is 0, which means the switch will not examine this field of the DHCP packets.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the DHCP Relay time as 30 seconds:

```
Switch(config)# ip dhcp relay time 30
```

53.4 ip helper-address

Description

The **ip helper-address** command is used to add DHCP Server address to the Layer 3 interface. To delete the server address, please use **no ip helper-address** command. When the command includes a VRF name, it indicates that the server address belongs to that specific VRF instance.

Syntax

ip helper-adress {*ip-address*} [*vrf-name*]

no ip helper-address [*ip-address*] [*vrf-name*]

Parameter

vrf-name —— vrf-name.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add DHCP Server address 192.168.2.1 to interface VLAN 1:

```
Switch(config)# interface vlan 1

Switch(config-if)# ip helper-address 192.168.2.1 vrf1
```

53.5 ip dhcp relay information option

Description

The **ip dhcp relay information option** command is used to enable option 82 support in DHCP Relay. To disable this function, please use **no ip dhcp relay information option** command.

Syntax

ip dhcp relay information option

no ip dhcp relay information option

Command Mode

Interface Configuration Mode (interface gigabitEthernet/interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable option 82 support in DHCP Relay for port 2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)#ip dhcp relay information option
```

53.6 ip dhcp relay information strategy

Description

The **ip dhcp relay information strategy** command is used to specify the operation for the Option 82 field of the DHCP request packets from the Host. To restore to the default option, please use **no ip dhcp relay information strategy** command.

Syntax

ip dhcp relay information strategy { drop | keep | replace }

no ip dhcp relay information strategy

Parameter

drop | keep | replace ——The operations for Option 82 field of the DHCP request packets from the Host. The default operation is keep.

drop: Discard the packet with the Option 82 field.

keep: Keep the Option 82 field in the packet.

replace: Replace the option 82 field with the system option defined by the switch.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the option 82 strategy as replace to replace the Option 82 field with the local parameter on receiving the DHCP request packet for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)# ip dhcp relay information strategy replace

53.7 ip dhcp relay information format

Description

The **ip dhcp relay information format** command is used to select the format of option 82 sub-option value field. To restore to the default option, please use **no ip dhcp relay information format** command.

Syntax

ip dhcp relay information format { normal | private }

no ip dhcp relay information format

Parameter

normal | private —— The format type of option 82 sub-option value field.

normal: Indicates that the format of sub-option value field is TLV (type-length-value).

private: Indicates that the format of sub-option value field is the value you configure for the related sub-option.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Select the format of option 82 sub-option value field as TLV (type-length-value) for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#ip dhcp relay information format normal

53.8 ip dhcp relay information circuit-id

Description

The **ip dhcp relay information circuit-id** command is used to specify the custom circuit ID when option 82 customization is enabled. To clear the circuit ID, please use **no ip dhcp relay information circuit-id** command.

Syntax

ip dhcp relay information circuit-id *circuitID*

no ip dhcp relay information circuit-id

Parameter

circuitID—— Specify the circuit ID, ranging from 1 to 64 characters.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the circuit ID as "TP-Link" for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)# ip dhcp relay information circuit-id TP-Link

53.9 ip dhcp relay information remote-id

Description

The **ip dhcp relay information remote-id** command is used to specify the custom remote ID when option 82 customization is enabled. To clear the remote ID, please use **no ip dhcp relay information remote-id** command.

Syntax

ip dhcp relay information remote-id *remoteID*

no ip dhcp relay information remote-id

Parameter

remoteID —— Specify the remote ID, ranging from 1 to 64 characters.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the remote ID as "TP-Link" for port 2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)# ip dhcp relay information remote-id TP-Link
```

53.10 ip dhcp relay default-interface

Description

The **ip dhcp relay default-interface** command is used to configure default relay agent interface. When the switch works at DHCP VLAN Relay mode and there is no IP interface in the VLAN, the switch uses the IP of default relay agent interface to fill in the relay agent IP address field of DHCP packets. To delete the default relay agent interface use **no ip dhcp relay default-interface.**

Syntax

ip dhcp relay default-interface

no ip dhcp relay default-interface

Command mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure interface VLAN 1 as the default relay agent interface:

```
Switch(config)# interface vlan 1
Switch(config-if)# ip dhcp relay default-interface
```

53.11 ip dhcp relay vlan

Description

The **ip dhcp relay vlan** command is used to add DHCP server address to specified VLAN. If there is an IP interface in the VLAN and it has configured a DHCP server address at the interface level, then the configuration at the interface level has higher priority. In this case, the DHCP server configured on the VLAN will not be used to forward the DHCP packets. To delete the DHCP server address use **no ip dhcp relay vlan.** When the command includes a VRF name, it indicates that the server address belongs to that specific VRF instance.

Syntax

ip dhcp relay vlan {*vid*} **helper-adress** {*ip-address*} [*vrf-name*]

no ip dhcp relay vlan {*vid***} helper-address** *[ip-address]* [*vrf-name*]

Parameter

vid—— VLAN ID.

ip-address—— DHCP Server address.

vrf-name—— VRF instance name.

Command mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add DHCP server address 192.168.2.1 to VLAN 1:

```
Switch(config)# ip dhcp relay vlan 1 helper-address 192.168.2.1 vrf1
```

53.12 show ip dhcp relay

Description

The **show ip dhcp relay** command is used to display the global status and Option 82 configuration of DHCP Relay.

Syntax

show ip dhcp relay

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of DHCP Relay:

```
Switch(config)# show ip dhcp relay
```

Chapter 54 DHCPV6 Relay Commands

A DHCPV6 Relay agent is a Layer 3 device that forwards DHCPV6 packets between clients and servers. DHCPV6 Relay forward requests and replies between clients and servers when they are not on the same physical subnet.

54.1 ipv6 dhcp relay

Description

The **ipv6 dhcp relay** command is used to enable DHCPV6 Relay function globally. To disable DHCPV6 Relay function, please use **no ipv6 dhcp relay** command.

Syntax

ipv6 dhcp relay

no ipv6 dhcp relay

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable DHCPV6 Relay function globally:

```
Switch(config)# ipv6 dhcp relay
```

54.2 ipv6 dhcp relay vlan 1 helper-address

Description

The **ipv6 dhcp relay vlan 1 helper-address** command is used to add DHCPV6 Server address to the Layer 3 interface. To delete the server address, please use **no ipv6 dhcp relay vlan 1 helper-address** command. When the command includes a VRF name, it indicates that the server address belongs to that specific VRF instance.

Syntax

Ipv6 dhcp relay vlan {*vlan-id*}**helper-adress** {*ip-address*} [*vrf-name*]

no ipv6 dhcp relay vlan {*vlan-id*}**helper-address** [*ip-address*]

Parameter

vlan-id—— VLAN ID.

ip-address—— DHCPv6 Server address.

vrf-name—— VRF instance name.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add DHCPV6 Server address 2019:2020::21D:FFF:FE61:2005 to interface VLAN 1:

```
Switch(config)# ipv6 dhcp relay vlan 1 helper-address
2019:2020::21D:FFF:FE61:2005 vrf1
```

54.3 ipv6 dhcp relay information option 18

Description

The **ipv6 dhcp relay information option18** command is used to enable option 18 support of a specified port in DHCPV6 Relay. To disable this function, please use **no ipv6 dhcp relay information option18** command.

Syntax

ipv6 dhcp relay information option18

no ipv6 dhcp relay information option18

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable option18 support in DHCPV6 Relay for port 2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)# ipv6 dhcp relay information option18
```

54.4 ipv6 dhcp relay information option37

Description

The **ipv6 dhcp relay information option37** command is used to enable option37 support of a specified port in DHCPV6 Relay. To disable this function, please use **no ipv6 dhcp relay information option37** command.

Syntax

ipv6 dhcp relay information option37

no ipv6 dhcp relay information option37

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable option37 support in DHCPV6 Relay for port 2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)# ipv6 dhcp relay information option37
```

54.5 ipv6 dhcp relay information remote-id

Description

The **ipv6 dhcp relay information remote-id** command is used to specify the custom remote ID when option37 customization is enabled. To clear the remote ID, please use **no ipv6 dhcp relay information remote-id** command.

Syntax

Ipv6 dhcp relay information remote-id *remoteID*

no ipv6 dhcp relay information remote-id

Parameter

remoteID—— Specify the remote ID, ranging from 1 to 64 characters.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the remote ID as "tplink192.168.0.3" for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)# ipv6 dhcp relay information remote-id tplink 192.168.0.

54.6 show ipv6 dhcp relay

Description

The **show ipv6 dhcp relay** command is used to display the global status and Option 18\37 configuration of DHCPV6 Relay.

Syntax

show ipv6 dhcp relay

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of DHCPV6 Relay:

```
Switch(config)# show ipv6 dhcp relay
```

54.7 show ipv6 dhcp relay counters

Description

The **show ipv6 dhcp relay counters** command is used to display the packet counter of the DHCPV6 relay.

Syntax

show ipv6 dhcp relay counters

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the packet counter of the DHCPV6 relay:

```
Switch# show ipv6 dhcp relay counters
```

Chapter 55 DHCP L2 Relay Commands

55.1 ip dhcp l2relay

Description

The **ip dhcp l2relay** command is used to enable DHCP L2 Relay function globally. To disable DHCP L2 Relay function, please use **no ip dhcp l2relay** command.

Syntax

ip dhcp l2relay

no ip dhcp l2relay

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable DHCP L2 Relay function globally:

```
Switch(config)# ip dhcp l2relay
```

55.2 ip dhcp l2relay vlan

Description

The **ip dhcp l2relay vlan** command is used to enable DHCP L2 relay in the specified VLAN. To disable DHCP L2 Relay in the specific vlan, please use **no ip dhcp l2relay vlan** command.

Syntax

ip dhcp l2relay vlan *vlan-range*

no ip dhcp l2relay vlan *vlan-range*

Parameter

vlan-range —— Specify the vlan to be enabled with DHCP L2 relay.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable DHCP L2 Relay for VLAN 2:

Switch(config)# ip dhcp l2relay vlan 2

55.3 ip dhcp l2relay information option

Description

The **ip dhcp l2relay information option** command is used to enable option82 support in DHCP Relay. To disable this function, please use **no ip dhcp l2relay information option** command.

Syntax

ip dhcp l2relay information option

no ip dhcp l2relay information option

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable option82 support in DHCP Relay for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)# ip dhcp l2relay information option

55.4 ip dhcp l2relay information strategy

Description

The **ip dhcp l2relay information strategy** command is used to specify the operation for the Option 82 field of the DHCP request packets from the Host. To restore to the default option, please use **no ip dhcp l2relay information strategy** command.

Syntax

ip dhcp l2relay information strategy { drop | keep | replace }

no ip dhcp l2relay information strategy

Parameter

drop | keep | replace —— The operations for Option 82 field of the DHCP request packets from the Host. The default operation is keep.

drop: Discard the packet with the Option 82 field.

keep: Keep the Option 82 field in the packet.

replace: Replace the option 82 field with the system option defined by the switch.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the option 82 strategy as replace to replace the Option 82 field with the local parameter on receiving the DHCP request packet for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)# ip dhcp l2relay information strategy replace

55.5 ip dhcp l2relay information format

Description

The **ip dhcp l2relay information format** command is used to select the format of option 82 sub-option value field. To restore to the default option, please use **no ip dhcp l2relay information format** command.

Syntax

ip dhcp l2relay information format { normal | private }

no ip dhcp l2relay information format

Parameter

normal | private —— The format type of option 82 sub-option value field.

normal: Indicates that the format of sub-option value field is TLV (type-length-value).

private: Indicates that the format of sub-option value field is the value you configure for the related sub-option.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Select the format of option 82 sub-option value field as TLV (type-length-value) for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#ip dhcp l2relay information format normal

55.6 ip dhcp l2relay information circuit-id

Description

The **ip dhcp l2relay information circuit-id** command is used to specify the custom circuit ID when option 82 customization is enabled. To clear the circuit ID, please use **no ip dhcp l2relay information circuit-id** command.

Syntax

ip dhcp l2relay information circuit-id *circuitID*

no ip dhcp l2relay information circuit-id

Parameter

circuitID—— Specify the circuit ID, ranging from 1 to 64 characters.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the circuit ID as "TP-Link" for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)# ip dhcp l2relay information circuit-id TP-Link

55.7 ip dhcp l2relay information remote-id

Description

The **ip dhcp l2relay information remote-id** command is used to specify the custom remote ID when option 82 customization is enabled. To clear the remote ID, please use **no ip dhcp l2relay information remote-id** command.

Syntax

ip dhcp l2relay information remote-id *remoteID*

no ip dhcp l2relay information remote-id

Parameter

remoteID —— Specify the remote ID, ranging from 1 to 64 characters.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the remote ID as "TP-Link" for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)# ip dhcp l2relay information remote-id TP-Link

55.8 show ip dhcp l2relay

Description

The **show ip dhcp l2relay** command is used to display the global status and Option 82 configuration of DHCP Relay.

Syntax

show ip dhcp l2relay

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of DHCP Relay:

Switch(config)# show ip dhcp l2relay

55.9 show ip dhcp l2relay interface

Description

The **show ip dhcp l2relay interface** command is used to display the DHCP L2 Relay status for the ports.

Syntax

show ip dhcp l2relay interface [**gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DHCP L2 Relay configuration of port 1/0/2:

Switch(config)# show ip dhcp l2relay interface gigabitEthernet 1/0/2

Chapter 56 DHCPV6 L2 Relay Commands

56.1 ipv6 dhcp l2relay

Description

The **ipv6 dhcp l2relay** command is used to enable DHCPV6 L2 Relay function globally. To disable DHCPV6 L2 Relay function, please use **no ipv6 dhcp l2relay** command.

Syntax

ipv6 dhcp l2relay

no ipv6 dhcp l2relay

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable DHCPV6 L2 Relay function globally:

```
Switch(config)# ipv6 dhcp l2relay
```

56.2 ipv6 dhcp l2relay vlan

Description

The **ipv6 dhcp l2relay vlan** command is used to enable DHCPV6 L2 relay in the specified VLAN. To disable DHCPV6 L2 Relay in the specific vlan, please use **no ipv6 dhcp l2relay vlan** command.

Syntax

Ipv6 dhcp l2relay vlan *vlan-id*

no ipv6 dhcp l2relay vlan *vlan-id*

Parameter

vlan-id—— Specify the vlan to be enabled with DHCPV6 L2 relay.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable DHCP L2 Relay for VLAN 1:

```
Switch(config)# ipv6 dhcp l2relay vlan 1
```

56.3 ipv6 dhcp l2relay information option18

Description

The **ipv6 dhcp l2relay information** command is used to enable option18 support of a specified port in DHCPV6 L2Relay. To disable this function, please use **no ipv6 dhcp l2relay information** command.

Syntax

ipv6 dhcp l2relay information option18

no ipv6 dhcp l2relay information option18

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable option18 support in DHCPV6 L2Relay for port 2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)# ipv6 dhcp l2relay information option18
```

56.4 ipv6 dhcp l2relay information option37

Description

The **ipv6 dhcp l2relay information option37** command is used to enable option37 support of a specified port in DHCPV6 L2Relay. To disable this function, please use **no ipv6 dhcp l2relay information option37** command.

Syntax

ipv6 dhcp l2relay information option37

no ipv6 dhcp l2relay information option37

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable option37 support in DHCPV6 L2Relay for port 2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)# ipv6 dhcp l2relay information option37
```

56.5 ipv6 dhcp l2relay information remote-id

Description

The **ipv6 dhcp l2relay information remote-id** command is used to specify the custom remote ID when option 37 customization is enabled. To clear the remote ID, please use **no ipv6 dhcp l2relay information remote-id** command.

Syntax

Ipv6 dhcp l2relay information remote-id *remoteID*

no ipv6 dhcp l2relay information remote-id

Parameter

remoteID —— Specify the remote ID, ranging from 1 to 64 characters.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the remote ID as “tplink192.168.0.3” for port 2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)# ipv6 dhcp l2relay information remote-id tplink

192.168.0.3

56.6 show ipv6 dhcp l2relay interface

Description

The **show ipv6 dhcp l2relay** command is used to display the global status and Option 18\37 configuration of DHCPV6 L2Relay.

Syntax

show ipv6 dhcp l2relay interface

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of DHCPV6 L2Relay:

Switch(config)# show ipv6 dhcp l2relay interface

Chapter 57 QoS Commands

QoS (Quality of Service) function is used to optimize the network performance. It provides you with network service experience of a better quality. The switch implements three priority modes based on port, on 802.1p and on DSCP.

57.1 qos trust mode

Description

The **qos trust mode** command is used to configure the trust mode of CoS (Class of Service) function for the ports. The default trust mode is trust port priority.

Syntax

qos trust mode { dot1p | dscp | untrust }

Parameter

dot1p—— Trust 802.1p mode. In this mode, data will be classified into different services based on the 802.1p priority.

dscp—— Trust dscp mode. In this mode, data will be classified into different services based on the dscp priority.

untrust—— Trust port mode. In this mode, data will be classified into different services based on the based on the port priority.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the trust mode of port 1/0/3 as dscp:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# qos trust mode dscp
```

57.2 qos port-priority

Description

The **qos port-priority** command is used to configure the port to 802.1p priority mapping for the desired port. To return to the default configuration, please use **no qos port-priority** command. When Port Priority is enabled, the packets will be mapped to different priority queues based on the ingress ports.

Syntax

qos port-priority { *dot1p-priority*}

no qos port-priority

Parameter

dot1p-priority—— The 802.1p priority that the packets will be mapped to from the desired port. It ranges from 0 to 7, which represent 802.1p priority 0–7 respectively. By default, the priority is 0.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the priority of port 5 as 3:

```
Switch(config)# interface gigabitEthernet 1/0/5
Switch(config-if)# qos port-priority 3
```

57.3 qos cos-map

Description

The **qos cos-map** command is used to configure 802.1p to queue mapping globally. To return to the default configuration, please use **no qos cos-map** command. When 802.1P Priority is enabled, the packets with 802.1Q tag are mapped to different priority levels based on 802.1P priority.

Syntax

qos cos-map { *dot1p-priority* } { *tc-queue* }

no qos cos-map

Parameter

dot1p-priority —— The value of 802.1p priority. It ranges from 0 to 7, which represent 802.1p priority 0–7 respectively.

tc-queue—— The number of TC queue that the 80.1p priority will be mapped to. It ranges from 0 to 7.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Map the 802.1p priority 5 to TC-2:

```
Switch (config)# qos cos-map 5 2
```

57.4 qos dot1p-remap

Description

The **qos dot1p-remap** command is used to configure the 802.1p to 802.1p mappings. To return to the default configuration, please use **no qos dot1p-remap** command. When 802.1p remap is configured, the packets with the specific 802.1p priority will tagged with the desired new 802.1p priority.

Syntax

qos dot1p-remap { *dot1p-priority* } { *new-dot1p-priority* }

no qos dot1p-remap

Parameter

dot1p-priority —— The original 802.1p priority. It ranges from 0 to 7, which represent 802.1p priority 0–7 respectively.

new-dot1p-priority—— The new 802.1p priority. It ranges from 0 to 7.

Command Mode

For some devices:

Global Configuration Mode

For other devices:

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

For some devices:

Remap 802.1p priority 5 to 802.1p priority 6:

```
Switch(config)#qos dot1p-remap 5 6
```

For other devices:

Remap 802.1p priority 5 to 802.1p priority 6 for port 1/0/1:

```
Switch(config)# interface gigabitEthernet 1/0/1
Switch(config-if)#qos dot1p-remap 5 6
```

57.5 qos dscp-map

Description

The **qos dscp-map** command is used to configure the DSCP to 802.1p mapping. To return to the default configuration, please use **no qos dscp-map** command. DSCP (DiffServ Code Point) is a new definition to IP ToS field given by IEEE. This field is used to divide IP datagram into 64 priorities. When DSCP Priority is enabled, IP datagram are mapped to different priority levels based on DSCP priority.

Syntax

qos dscp-map { *dscp-value-list* } { *dot1p-priority* }

no qos dscp-map

Parameter

dscp-value-list —— The DSCP value list in the format of "1-3,5,7". The valid values are from 0 to 63.

dot1p-priority ——The 802.1p priority to which the DSCP priority will be mapped. It ranges from 0 to 7, which represent 802.1p priority 0–7 respectively. By default, the priority is 0.

Command Mode

For some devices:

Global Configuration Mode

For other devices:

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

For some devices:

Map DSCP Priority 5 to 802.1p priority 2:

```
Switch(config)#qos dscp-map 5 2
```

For other devices:

Map DSCP Priority 5 to 802.1p priority 2 for port 1/0/1:

```
Switch(config)# interface gigabitEthernet 1/0/1
Switch(config-if)#qos dscp-map 5 2
```

57.6 qos dscp-remap

Description

The **qos dscp-remap** command is used to configure the DSCP to DSCP mappings. To return to the default configuration, please use **no qos dscp-remap** command. When DSCP remap is configured, the packets with the specific DSCP priority will be changed to the desired new DSCP priority.

Syntax

qos queue dscp-map { *dscp-value-list* } { *dscp-remap-value* }

no qos queue dscp-map

Parameter

Dscp-value-list——The original DSCP value list in the format of "1-3,5,7". The valid values are from 0 to 63.

Dscp-remap-value—— The new DSCP value, which ranges from 0 to 63.

Command Mode

For some devices:

Global Configuration Mode

For other devices:

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

For some devices:

Map DSCP values 10-12 to DSCP value 2:

```
Switch(config)# qos dscp-remap 10-12 2
```

For other devices:

Map DSCP values 10-12 to DSCP value 2 for port 1/0/2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# qos dscp-remap 10-12 2
```

57.7 qos queue bandwidth

Note: This command is only available on certain devices

Description

The **qos queue bandwidth** command is used to configure the minimum guaranteed bandwidth allocated to the specified queue. A value of 0 means there is no guaranteed minimum bandwidth in effect (best-effort service). The default value is 0. The sum of all bandwidth values for the queues must not exceed 100%. To return to the default configuration, please use **no qos bandwidth** command.

Syntax

qos queue { *tc-queue* } **bandwidth** { *rate* }

no qos queue { *tc-queue* } **bandwidth**

Parameter

tc-queue —— The egress queue ID. It ranges from 0 to 7, which represents TC queue from TC0 to TC7 respectively.

rate ——The minimum bandwidth percentage for queue, ranging from 1 to 100 in increments of 1. By default, it is 0.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the minimum bandwidth of TC5 as 10% for port 1/0/1:

```
Switch(config)# interface gigabitEthernet 1/0/1
Switch(config-if)# qos queue 5 bandwidth 10
```

57.8 qos queue mode

Description

The **qos queue mode** command is used to configure the Scheduler Mode. When the network is congested, the program that many packets complete for resources must be solved, usually in the way of queue scheduling. The switch will control the forwarding sequence of the packets according to the priority queues and scheduling algorithms you set. On this switch, the priority levels are labeled as TC0, TC1, TC2 ... TC7.

Syntax

qos queue { *tc-queue* } **mode** { sp | wrr } [**weight** *weight*]

Parameter

tc-queue —— The egress queue ID. It ranges from 0 to 7, which represents TC queue from TC0 to TC7 respectively.

sp —— Strict-Priority Mode. In this mode, the queue with higher priority will occupy the whole bandwidth. Packets in the queue with lower priority are sent only when the queue with higher priority is empty.

wrr —— Weight Round Robin Mode. In this mode, packets in all the queues are sent in order based on the weight value for each queue. If you select this mode, you need to specify the queue weight at the same time.

weight —— Configure the weight value of the specified TC queue. When the scheduler mode is specified as WRR, the weight value ranges from 1 to 127. The 8 queues will take up the bandwidth according to their ratio.

Command Mode

For some devices:

Global Configuration Mode

For other devices:

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

For some devices:

Specify the Scheduler Mode of TC1 as WRR and set the queue weight as 10:

```
Switch(config)# qos queue 1 mode wrr weight 10
```

For other devices:

Specify the Scheduler Mode of TC1 as WRR and set the queue weight as 10 for port 1/0/1:

```
Switch(config)# interface gigabitEthernet 1/0/1
Switch(config-if)# qos queue 1 mode wrr weight 10
```

57.9 qos localPri

Description

The **qos localPri** command is used to configure the egress queue of packets. After configuration, the packets of the corresponding VLAN will be assigned to the specified egress queue.

Syntax

qos localPri queue

Parameter

queue: The egress queue of the packets.

Command Mode

VLAN Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the egress queue for VLAN 2:

```
Switch(config)#vlan 2
Switch(config-vlan)#qos localPri 3
```

57.10 qos cosPri

Description

The **qos cosPri** command is used to configure the 802.1P priority carried by packets when they leave. After configuration, the packets of the corresponding VLAN will be assigned to the specified egress queue.

Syntax

qos cosPri priority

Parameter

priority: 802.1P priority specified for the packets.

Command Mode

VLAN Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the 802.1P priority for VLAN 2:

```
Switch(config)#vlan 2
Switch(config-vlan)#qos cosPri 4
```

57.11 qos dscpPri

Description

The **qos dscpPri** command is used to configure the egress queue of packets. After configuration, the packets of the corresponding VLAN will be assigned to the specified egress queue.

Syntax

qos dscpPri dscp

Parameter

dscp: DSCP priority specified for the packets.

Command Mode

VLAN Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the DSCP priority for VLAN 2:

```
Switch(config)#vlan 2
Switch(config-vlan)#dscp localPri 10
```

57.12 qos wred-profile

Description

The **qos wred-profile** command is used to configure the parameters of the WRED drop profile, including the lower threshold, upper threshold, and maximum drop percentage. To delete the corresponding WRED drop profile, please use the **no qos wred-profile** command.

Syntax

qos wred-profile name low high drop-percentage

no qos wred-profile [name**]**

Parameter

name: WRED drop profile name.

low: Drop threshold lower limit.

high: Drop threshold upper limit.

drop-percentage: Maximum drop percentage.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a WRED drop profile:

Switch(config)#qos wred-profile test 40 80 500

57.13 qos wred-bind

Description

The **qos wred-bind** command is used to bind the WRED drop template to the specified port. When traffic exits the port, the WRED policy will be implemented. To unbind the WRED drop profile, please use the **no qos wred-bind** command.

Syntax

qos wred-bind name

no qos wred-bind

Parameter

name: WRED drop profile name.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Bind the WRED drop profile to ports 1/0/1-4:

Switch(config)# interface range gigabitEthernet 1/0/1-4

Switch(config-if-range)#qos wred-bind test

57.14 show qos wred-profile

Description

The **show qos wred-profile** command is used to view the WRED profile info.

Syntax

show qos wred-profile [name**]**

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the WRED profile configuration:

```
Switch#show qos wred-profile
```

57.15 show qos wred-bind interface

Description

The **show qos wred-bind interface** command is used to view the binding information of the WRED template.

Syntax

show qos wred-bind interface [{fastEthernet | gigabitEthernet | hundred-gigabitEthernet | port-channel | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet} *interface-value***]**

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

View the information of the WRED template bound to bound to ports 1/0/1-3:

```
Switch#show qos wred-bind interface gigabitEthernet 1/0/1-3
```

57.16 show qos cos-map

Description

The **show qos cos-msp** command is used to display the 802.1p priority to TC queue mappings.

Syntax

show qos cos-map

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the 802.1p to queue mappings:

```
Switch# show qos cos-map
```

57.17 show qos dot1p-remap interface

Note: This command is only available on certain devices.

Description

The **show qos dot1p-remap interface** command is used to display the 802.1p priority to 802.1p priority mappings.

Syntax

show qos dot1p-remap interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IEEE 802.1P remap configuration of all the ports:

```
Switch# show qos dot1p-remap interface
```

57.18 show qos dot1p-remap

Note: This command is only available on certain devices.

Description

The **show qos dot1p-remap interface** command is used to display the 802.1p priority to 802.1p priority mappings.

Syntax

show qos dot1p-remap

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IEEE 802.1P remap configuration:

```
Switch# show qos dot1p-remap
```

57.19 show qos dscp-map interface

Note: This command is only available on certain devices.

Description

The **show qos dscp-map interface** command is used to display the DSCP priority configuration of the ports.

Syntax

show qos dscp-map interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The port number.

port-channel-id—— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display theDSCP priority configuration of all the ports:

```
Switch# show qos dscp-map interface
```

57.20 show qos dscp-map

Note: This command is only available on certain devices.

Description

The **show qos dscp-map** command is used to display the DSCP priority configuration.

Syntax

show qos dscp-map

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DSCP priority configuration:

```
Switch# show qos dscp-map
```

57.21 show qos dscp-remap interface

Note: This command is only available on certain devices.

Description

The **show qos dscp-remap interface** command is used to display the DSCP priority to DSCP priority mappings of the ports.

Syntax

show qos dscp-remap interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DSCP to DSCP mappings for all the ports:

```
Switch# show qos dscp-remap interface
```

57.22 show qos dscp-remap

Note: This command is only available on certain devices.

Description

The **show qos dscp-remap** command is used to display the DSCP priority to DSCP priority mappings.

Syntax

show qos dscp-remap

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DSCP to DSCP mappings:

```
Switch# show qos dscp-remap
```

57.23 show qos port-priority interface

Description

The **show qos port-priority interface** command is used to display the port to 802.1p priority mappings for the ports.

Syntax

show qos port-priority interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the port to 802.1p priority mappings for all the ports:

```
Switch# show qos port-priority interface
```

57.24 show qos trust interface

Description

The **show qos trust interface** command is used to display the trust mode of the ports.

Syntax

show qos trust interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the trust mode of all the ports:

```
Switch# show qos trust interface
```

57.25 show qos queue interface

Description

The **show qos queue interface** command is used to display the scheduler settings of the ports.

Syntax

show qos queue interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameter

port —— The port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the scheduler settings of all the ports:

```
Switch# show qos queue interface
```

Chapter 58 Bandwidth Control Commands

Bandwidth Control functions to control the traffic rate and traffic threshold on each port to ensure network performance. Rate limit functions to limit the ingress/egress traffic rate on each port. Storm Control function allows the switch to monitor broadcast packets, multicast packets and Unknown unicast frames in the network.

58.1 storm-control rate-mode

Description

The **storm-control rate-mode** command is used to configure the storm control mode of the interface. To return to the default configuration, please use **no storm-control rate-mode** command.

Syntax

storm-control rate-mode { kbps | ratio | pps }

no storm-control rate-mode

Parameter

kbps —— Select the storm control mode of the interface as kbps. The switch will limit the maximum speed of the specific kinds of traffic in kilo-bits per second.

ratio ——Select the storm control mode of the interface as ratio. The switch will limit the percentage of bandwidth utilization for specific kinds of traffic.

pps —— The switch will limit the maximum number of packets per second for specific kinds of traffic.

Note: pps is only available on certain devices.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

This command should be used along with the storm-control command to enable the storm control function and specify the detailed parameters.

Example

Set the storm control mode as kbps on port 1/0/5:

```
Switch(config)# interface gigabitEthernet 1/0/5
Switch(config-if)# storm-control rate-mode kbps
```

58.2 storm-control

Description

The **storm-control** command is used to enable the broadcast, multicast, or unknown unicast strom control function and to set threshold levels on an interface. To return to the default configuration, please use **no storm-control** command.

Syntax

storm-control { broadcast | multicast | unicast } { *rate* }
no storm-control { broadcast | multicast | unicast }

Parameter

broadcast | multicast | unicast —— Select the mode of the storm control on the interface.
rate —— Specify the bandwidth for receiving packets on the port. The specified type of packet traffic exceeding the bandwidth will be processed according to the configuration of **storm-control exceed** command. For kbps, the rate ranges from 1 to 1000000 kbps, and is rounded off to the nearest multiple of 64. For ratio, the rate ranges from 1 to 100 percent. For pps, the rate ranges from 1 to 1488000 packets per second.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

Before you configure the storm-control type as kbps or ratio, pelease ensure that the port is not in pps mode.

Example

Configure the broadcast storm control rate as 1024 kbps on port 1/0/5:

```
Switch(config)# interface gigabitEthernet 1/0/5
Switch(config-if)# storm-control rate-mode kbps
Switch(config-if)# storm-control broadcast 1024
```

58.3 storm-control exceed

Description

The **storm-control exceed** command is used to configure the action that the switch will perform when the storm exceeds the defined limit on an interface.

Syntax

storm-control exceed { drop | shutdown } [**revocer-time** *time*]

Parameter

drop —— Set the Action as Drop. The port will drop the subsequent packets when the traffic exceeds the limit.

shutdown —— Set the Action as Shutdown. The port will be shutdown when the traffic exceeds the limit.

time ——Specify the recover time for the port. It takes effect only when the action is set as shutdown. The valid values are from 0 to 3600 and the default value is 0. When the port is shutdown, it can recover to its normal state after the recover time passed. If the recover time is specified as 0, which means the port will not recover to its normal state automatically and you can recover the port manually using **storm-control recover** command.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the action as drop on port 1/0/5:

```
Switch(config)# interface gigabitEthernet 1/0/5
Switch(config-if)# storm-control exceed drop
```

58.4 storm-control recover

Description

The **storm-control recover** command is used to recover the port manually after the port is shutdown because of the storm. When the recover time is specified as 0, the port will not recover to its normal state automatically. In this condition, you need to use this command to recover the port manually.

Syntax

storm-control recover

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Recover port 1/0/5 manually:

```
Switch(config)# interface gigabitEthernet 1/0/5
Switch(config-if)# storm-control recover
```

58.5 bandwidth

Description

The **bandwidth** command is used to configure the bandwidth limit for an Ethernet port. To disable the bandwidth limit, please use **no bandwidth** command.

Syntax

bandwidth {[**ingress** *ingress-rate*] [**egress** *egress-rate*]}

no bandwidth { all | ingress | egress }

Parameter

ingress-rate —— Specify the upper rate limit for receiving packets. The rate ranges from 1 to 1000000 kbps for the gigaport and 1 to 100000 kbps for the fast port, and is rounded off to the nearest multiple of 64.

egress-rate —— Specify the upper rate limit for sending packets. The rate ranges from 1 to 1000000 kbps for the gigaport and 1 to 100000 kbps for the fast port, and is rounded off to the nearest multiple of 64.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the ingress-rate as 5120Kbps and egress-rate as 1024Kbps for port 1/0/5:

```
Switch(config)# interface gigabitEthernet 1/0/5
Switch(config-if)# bandwidth ingress 5120 egress 1024
```

58.6 show storm-control

Description

The **show storm-control** command is used to display the storm-control information of Ethernet ports.

Syntax

show storm-control interface [**fastEthernet** *port* | **gigabitEthernet** *port-list* ***ten-gigabitEthernet*** *port* | **port-channel** *port-channel-id-list*]

Parameter

port-list ——The list of Ethernet ports.

port-channel-id-list —— The list of port channels.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the storm-control information of port 4, 5, 6, and 7:

```
Switch(config)# show storm-control interface gigabitEthernet 1/0/4-7
```

58.7 show bandwidth

Description

The **show bandwidth** command is used to display the bandwidth-limit information of Ethernet ports.

Syntax

show bandwidth interface [**fastEthernet** *port* | **gigabitEthernet** *port-list* **ten-gigabitEthernet** *port* | **port-channel** *port-channel-id-list*]

Parameter

port-list ——The list of Ethernet ports.

port-channel-id-list —— The list of port channels.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the bandwidth-limit information of port 1/0/4:

```
Switch(config)# show bandwidth interface gigabitEthernet 1/0/4
```

Chapter 59 OUI-Based VLAN Commands (Only for Certain Devices)

OUI-Based VLAN (Organizationally Unique Identifier-Based Virtual Local Area Network) is a functionality that transmits and modifies the 802.p priority of packets within a specified VLAN based on the source MAC address of the packets. Similar to Voice VLAN, OUI-Based VLAN differs in the following ways: (1) OUI-Based VLAN does not provide users with default templates for OUI entries; users can configure them themselves; (2) Voice VLAN can only specify one VLAN as the Voice VLAN, whereas OUI-Based VLAN can assign different VLANs to different OUI entries; (3) The mask length for Voice VLAN is fixed, while OUI-Based VLAN allows for variable-length masks to be set for MAC addresses during configuration; (4) For each OUI entry, OUI-Based VLAN can specify which port the entry applies to.

59.1 voice vlan

Description

This command is used to configure OUI-Based VLAN entries. After the entries are configured, the system will automatically number each entry. Users can add ports when configuring entries, or add ports in port view after configuring entries. To delete the configured entries, please use the **no voice-vlan** command.

Syntax

voice-vlan mac-addr *mac-address* **oui-mask** *oui-mask* **vlan** *vlan-id* **priority** *priority* **oui-desc** *oui-description* **[interface** {**fastEthernet | gigabitEthernet | hundred-gigabitEthernet | port-channel | ten-gigabitEthernet | twentyFive-gigabitEthernet | two-gigabitEthernet**} *interface-value***]**

no voice-vlan *index*

Parameter

mac-address: MAC address, formatted as 00:0a:eb:00:13:86, represents the source MAC address that needs to be matched.

oui-mask: MAC address mask, formatted as ff:ff:ff:00:00:00, where the final match is the result of performing a bitwise AND operation between mac-address and oui-mask.

vlan-id: 802.1q VLAN ID, ranging from 2 to 4094.

priority: 802.1p priority, ranging from 0 to 7.

oui-description: Description information for the OUI entry, with a string length not exceeding 16 characters.

interface-value: Port number.

index: Automatically generated entry index number by the system.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add OUI-based VLAN entries:

Switch(config)#voice-vlan mac-addr 00:01:00:00:00:00 **oui-mask** ff:ff:00:00:00:00 **vlan** 100 **priority** 4 **oui-desc oui**1

59.2 voice-vlan(interface)

Description

This command is used to enable the OUI-Based VLAN function on the interface. To disable this function, please use the **no voice-vlan entry** command.

Syntax

voice-vlan entry *index*

no voice-vlan entry *index*

Parameter

index: The entry index number generated by the system is used to specify which OUI entry applies to a port through the index.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable OUI-based VLAN on interfaces 1/0/2-6:

```
Switch(config)#interface range gigabitEthernet 1/0/2-6
Switch(config-if-range)#voice-vlan entry 1
```

59.3 show voice-vlan

Description

This command is used to view the OUI-Based VLAN configuration.

Syntax

show voice-vlan

Parameter

None

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None

Example

View the OUI-Based VLAN:

```
Switch# show voice-vlan
```

Chapter 60 Voice VLAN Commands

Voice VLANs are configured specially for voice data stream. By configuring Voice VLANs and adding the ports with voice devices attached to voice VLANs, you can perform QoS-related configuration for voice data, ensuring the transmission priority of voice data stream and voice quality.

60.1 voice vlan

Description

The **voice vlan** command is used to enable Voice VLAN function. To disable Voice VLAN function, please use **no voice vlan** command.

Syntax

voice vlan *vlan-id*

no voice vlan

Parameter

vlan-id—— Specify IEEE 802.1Q VLAN ID, ranging from 2 to 4094.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the Voice VLAN function for VLAN 10:

```
Switch(config)# voice vlan 10
```

60.2 voice vlan (interface)

Description

The **voice vlan** command is used to enable Voice VLAN function on the desired ports. To disable Voice VLAN function on ports, please use **no voice vlan** command.

Syntax

voice vlan

no voice vlan

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the Voice VLAN function for port 1/0/1:

```
Switch(config)# interface gigabitEthernet 1/0/1
Switch(config-if)#voice vlan
```

60.3 voice vlan priority

Description

The **voice vlan priority** command is used to configure the priority for the Voice VLAN. To restore to the default priority, please use **no voice vlan priority** command.

Syntax

voice vlan priority *pri*

no voice vlan priority

Parameter

pri—— Priority, ranging from 0 to 7, and the default value is 7.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the priority of the Voice VLAN as 5:

Switch(config)# voice vlan priority 5

60.4 voice vlan oui

Description

The **voice vlan oui** command is used to create Voice VLAN OUI. To delete the specified Voice VLAN OUI, please use **no voice vlan oui** command.

Syntax

voice vlan oui *oui-prefix* **oui-desc** *string*

no voice vlan mac-address *oui-prefix*

Parameter

oui-prefix—— The OUI address of the voice device, in the format of XX:XX:XX.

string—— Give a description to the OUI for identification which contains 16 characters at most.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a Voice VLAN OUI described as TP-Phone with the OUI address 00:11:11:11:11:11 and the mask address FF:FF:FF:00:00:00:

Switch(config)#voice vlan oui 00:11:11 **oui-desc** TP-Phone

60.5 show voice vlan

Description

The **show voice vlan** command is used to display the global configuration information of Voice VLAN.

Syntax

show voice vlan

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Display the configuration information of Voice VLAN globally:

```
Switch(config)# show voice vlan
```

60.6 show voice vlan oui-table

Description

The **show voice vlan oui** command is used to display the configuration information of Voice VLAN OUI.

Syntax

show voice vlan oui

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Display the configuration information of Voice VLAN OUI:

```
Switch(config)# show voice vlan oui-table
```

60.7 show voice vlan interface

Description

The **show voice vlan interface** command is used to display the Voice VLAN configuration information of all ports.

Syntax

show voice vlan interface

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Display the Voice VLAN configuration information of all ports and port channels:

```
Switch(config)# show voice vlan interface
```

Chapter 61 Auto VoIP Commands

The Auto VoIP feature is used to prioritize the transmission of voice traffic. Voice over Internet Protocol (VoIP) enables telephone calls over a data network, and the Auto VoIP feature helps provide a classification mechanism for voice packets. When Auto VoIP is configured on a port that receives both voice and data traffic, this feature can help ensure that the sound quality of an IP phone does not deteriorate when data traffic on the port is heavy.

61.1 auto-voip

Description

The **auto-voip** command is used to enable the Auto VoIP function globally.

To disable the Auto VoIP function, use **no auto-voip** command.

Syntax

auto-voip

no auto-voip

Command Mode

Global Configuration Mode

Example

Enable the Auto VoIP function globally:

```
Switch(config)# auto-voip
```

61.2 auto-voip (interface)

Description

The **auto-voip** command is used to specify the interface mode as VLAN ID for the ports. In this mode, the voice devices will send voice packets with desired VLAN tag.

Syntax

auto-voip *vlan-id*

Parameter

vlan-id——Specify the Auto VoIP VLAN ID. The valid values are from 2 to 4094.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Set Auto VoIP VLAN 3 for port 3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# auto-voip 3
```

61.3 auto-voip dot1p

Description

The **auto-voip dot1p** command is used to specify the interface mode as dat1p for the ports. In this mode, the voice devices will send voice packets with desired 802.1p priority.

Syntax

auto-voip dot1p *dot1p*

Parameter

dot1p——Set the 802.1p priority of Auto VoIP on specified ports. It ranges from 0 to 7.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Set the 802.1p priority as 5 for the port:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# auto-voip dot1p 5
```

61.4 auto-voip untagged

Description

The **auto-voip untagged** command is used to specify the interface mode as untagged for the ports. In this mode, the voice devices will send untagged voice packets.

Syntax

auto-voip untagged

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Set the interface mode as untagged for port 1/0/3:

Switch(config)# interface gigabitEthernet 1/0/3

Switch(config-if)# auto-voip untagged

61.5 auto-voip none

Description

The **auto-voip none** command is used to specify the interface mode as none for the ports. In this mode, the switch allows the voice devices to use its own configuration to send voice traffic.

Syntax

auto-voip none

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Instruct voice devices that are connected to port 3 to send the packets according to its own configuration:

Switch(config)# interface gigabitEthernet 1/0/3

Switch(config-if)# auto-voip none

61.6 no auto-voip (interface)

Description

The **no auto-voip** command is used to specify the interface mode as disabled for the ports, which means the Auto VoIP function is disabled on the corresponding port.

Syntax

no auto-voip

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Disable the Auto VoIP function on port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# no auto-voip
```

61.7 auto-voip dscp

Description

The **auto-voip dscp** command is used to set the DSCP value of Auto VoIP on specified ports.

Syntax

auto-voip dscp *value*

Parameter

value——Set the DSCP value of Auto VoIP on specified ports. It ranges from 0 to 63. By default, it is 0.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Set DSCP value of Auto VoIP on port 3 as 33:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# auto-voip dscp 33
```

61.8 auto-voip data priority

Description

The **auto-voip data priority** command is used to enable or disable the CoS Override Mode on specified ports.

Syntax

auto-voip data priority { trust | untrust }

Parameter

trust——In this mode, the switch will then put the voice packets in the corresponding TC queue according to the 802.1p priority of the packets.

untrust——In this mode, the switch will ignore the 802.1p priority in the voice packets and put the packets in TC-5 directly.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Example

Set the CoS Override Mode as trust for port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# auto-voip data priority trust
```

61.9 show auto-voip

Description

The **show auto-voip** command is used to display the Auto VoIP configuration information.

Syntax

show auto-voip [interface]

Parameter

interface —— Displays the Auto VoIP configuration information of ports. When no parameter is entered, displays the global Auto VoIP configuration information.

Command Mode

Privileged EXEC Mode and any Configuration Mode

Example

Displays the global Auto VoIP configuration information:

```
Switch (config)# show auto-voip
```

Chapter 62 Access Control Commands

62.1 user access-control ip-based enable

Description

The **user access-control ip-based enable** command is used to configure the access control mode IP-based. To disable the access control feature, please use **no user access-control** command.

Syntax

user access-control ip-based enable

no user access-control

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the access control mode as IP-based:

```
Switch(config)# user access-control ip-based enable
```

62.2 user access-control ip-based

Description

The **user access-control ip-based** command is used to limit the IP-range of the users for login. Only the users within the IP-range you set here are allowed to login. You can add up to 30 IP-based entries. To cancel the user access limit, please use **no user access-control ip-based** command.

Syntax

user access-control ip-based { *ip-addr ip-mask* } [snmp] [telnet] [ssh] [http] [https] [ping] [all]

no user access-control ip-based index *id*

Parameter

ip-addr —— The source IP address. Only the users within the IP-range you set here are allowed for login. 5 IP-based entries can be configured at most.

ip-mask —— The subnet mask of the IP address.

[snmp] [telnet] [ssh] [http] [https] [ping] [all] —— Specify the access interface. These interfaces are enabled by default.

id —— Delete the specified IP-based entry.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the access-control of the user whose IP address is 192.168.0.148:

Switch(config)# user access-control ip-based 192.168.0.148 255.255.255.255

62.3 user access-control mac-based enable

Description

The **user access-control mac-based enable** command is used to configure the access control mode MAC-based. To disable the access control feature, please use **no user access-control** command.

Syntax

user access-control mac-based enable

no user access-control

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the access control mode as MAC-based:

```
Switch(config)# user access-control mac-based enable
```

62.4 user access-control mac-based

Description

The **user access-control mac-based** command is used to limit the MAC address of the users for login. Only the user with this MAC address you set here is allowed to login. You can add up to 30 mac-based control entries. To delete the mac-based access control entry, please use **no user access-control mac-based** command.

Syntax

user access-control mac-based { *mac-addr* } [snmp] [telnet] [ssh] [http] [https] [ping] [all]

no user access-control mac-based index *id*

Parameter

mac-addr —— The source MAC address. Only the user with this MAC address is allowed to login.

[snmp] [telnet] [ssh] [http] [https] [ping] [all] —— Specify the access interface. These interfaces are enabled by default.

id—— Specify the ID of the mac-based entry to be deleted.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure that only the user whose MAC address is 00:00:13:0A:00:01 is allowed to login:

```
Switch(config)# user access-control mac-based 00:00:13:0A:00:01
```

62.5 user access-control port-based enable

Description

The **user access-control port-based enable** command is used to configure the access control mode Port-based. To disable the access control feature, please use **no user access-control** command.

Syntax

user access-control port-based enable

no user access-control

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the access control mode as Port-based:

```
Switch(config)# user access-control port-based enable
```

62.6 user access-control port-based

Description

The **user access-control port-based** command is used to limit the ports for login. Only the users connected to these ports you set here are allowed to login. You can add up to 30 port-based control entries. To delete the port-based access control entry, please use **no user access-control port-based** command.

Syntax

user access-control port-based interface { **gigabitEthernet** *port-list*} [snmp] [telnet] [ssh] [http] [https] [ping] [all]

no user access-control port-based index *id*

Parameter

port-list——The list group of Ethernet ports, in the format of 1/0/1-4. You can appoint 5 ports at most.

[snmp] [telnet] [ssh] [http] [https] [ping] [all] —— Specify the access interface. These interfaces are enabled by default.

id—— Specify the ID of the port-based entry to be deleted.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure that only the users connected to ports 2-6 are allowed to login:

```
Switch(config)# user access-control port-based interface gigabitEthernet
1/0/2-6
```

62.7 user access-control ipv6-based enable

Description

The **user access-control ipv6-based enable** command is used to configure the access control mode IPV6-based. To disable the access control feature, please use **no user access-control** command.

Syntax

user access-control ipv6-based enable

no user access-control

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the access control mode as IPV6-based:

Switch(config)# user access-control ipv6-based enable

62.8 user access-control ipv6-based

Description

The **user access-control ipv6-based** command is used to limit the IPV6-range of the users for login. Only the users within the IPV6-range you set here are allowed to login. You can add up to 30 IPV6-based entries. To cancel the user access limit, please use **no user access-control ipv6-based** command.

Syntax

user access-control ipv6-based { *ipv6-addr* } [snmp] [telnet] [ssh] [http] [https] [ping] [all]

no user access-control ipv6-based index *id*

Parameter

Ipv6-addr —— The source IP address. Only the users within the IPV6-range you set here are allowed for login.

[snmp] [telnet] [ssh] [http] [https] [ping] [all] —— Specify the access interface. These interfaces are enabled by default.

id —— Delete the specified IP-based entry that ranges from 1 to 30.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the access-control of the user whose IP address is fe80::1234 :

Switch(config)# user access-control ipv6-based fe80::1234

Chapter 63 HTTP and HTTPS Commands

With the help of HTTP (HyperText Transfer Protocol) or HTTPS (Hyper Text Transfer Protocol over Secure Socket Layer), you can manage the switch through a standard browser.
HTTP is the protocol to exchange or transfer hypertext.
SSL (Secure Sockets Layer), a security protocol, is to provide a secure connection for the application layer protocol (e.g. HTTP) based on TCP. Adopting asymmetrical encryption technology, SSL uses key pair to encrypt/decrypt information. A key pair refers to a public key (contained in the certificate) and its corresponding private key. By default the switch has a certificate (self-signed certificate) and a corresponding private key. The Certificate/Key Download function enables the user to replace the default key pair.

63.1 ip http server

Description

The **ip http server** command is used to enable the HTTP server within the switch. To disable the HTTP function, please use **no ip http server** command. This function is enabled by default. The HTTP and HTTPS server function can be disabled at the same time.

Syntax

ip http server

no ip http server

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Disable the HTTP function:

```
Switch(config)# no ip http server
```

63.2 ip http port

Description

The **ip http port** command is used to configure the port number of the HTTP server within the switch. To set the number to the default value, please use **no ip http port** command.

Syntax

ip http port *port-num*

no ip http port

Parameter

port-num —— Enter the port number. This value ranges from 1 to 65535.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the port number of HTTP server as 1800:

```
Switch(config)# ip http port 1800
```

63.3 ip http max-users

Description

The **ip http max-users** command is used to configure the maximum number of users that are allowed to connect to the HTTP server. To cancel this limitation, please use **no ip http max-users** command.

Syntax

ip http max-users *admin-num operator-num poweruser-num user-num*

no ip http max-users

Parameter

admin-num —— The maximum number of the users logging on to the HTTP server as Admin, ranging from 1 to 16. The total number of users should be no more than 16.

operator-num —— The maximum number of the users logging on to the HTTP server as operator, ranging from 0 to 15. The total number of users should be no more than 16.

poweruser-num —— The maximum number of the users logging on to the HTTP server as Power User, ranging from 0 to 15. The total number of users should be no more than 16.

user-num —— The maximum number of the users logging on to the HTTP server as User, ranging from 0 to 15. The total number of users should be no more than 16.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the maximum number of the Admin, Operator, Power User and User as 5, 1, 1, 1 for HTTP:

Switch(config)# ip http max-users 5 1 1 1

63.4 ip http session timeout

Description

The **ip http session timeout** command is used to configure the connection timeout of the HTTP server. To restore to the default timeout time, please use **no ip http session timeout** command.

Syntax

ip http session timeout *time*

no ip http session timeout

Parameter

time ——The timeout time, ranging from 5 to 30 in minutes. By default, the value is 10.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the timeout time of the HTTP connection as 15 minutes:

```
Switch(config)# ip http session timeout 15
```

63.5 ip http secure-server

Description

The **ip http secure-server** command is used to enable the HTTPS server within the switch. To disable the HTTPS function, please use **no ip http secure-server** command. This function is enabled by default. The HTTP and HTTPS server function can be disabled at the same time.

Syntax

ip http secure-server

no ip http secure-server

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable the HTTP function:

```
Switch(config)# no ip http secure-server
```

63.6 ip http secure-port

Description

The **ip http secure-port** command is used to configure the port number of the HTTPS server within the switch. To set the number to the default value, please use **no ip http secure-port** command.

Syntax

ip http secure-port *port-num*

no ip http secure-port

Parameter

port-num —— Enter the port number. This value ranges from 1 to 65535.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the port number of HTTPS server as 2800:

Switch(config)# ip http secure-port 2800

63.7 ip http secure-protocol

Description

The **ip http secure-protocol** command is used to configure the SSL protocol version. To restore to the default SSL version, please use **no ip http secure-protocol** command. By default, the switch supports all the protocol versions, including SSL 3.0, TLS 1.0, TLS 1.1 and TLS 1.2.

Syntax

ip http secure-protocol { ssl3 | tls1 | tls11 | tls12 | all }

no ip http secure-protocol

Parameter

ssl3 —— Select SSL Version 3.0 as the protocol for HTTPS.

tls1 —— Select TLS Version 1.0 as the protocol for HTTPS.

tls11 —— Select TLS Version 1.1 as the protocol for HTTPS.

tls12 —— Select TLS Version 1.2 as the protocol for HTTPS.

all —— Enable all the above protocols for HTTPS. The HTTPS server and client will negotiate the protocol each time.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the protocol of SSL connection as SSL 3.0:

Switch(config)# ip http secure-protocol ssl3

63.8 ip http secure-ciphersuite

Description

The **ip http secure-ciphersuite** command is used to configure the cipherSuites over the SSL connection supported by the switch. To restore to the default ciphersuite types, please use **no ip http secure-ciphersuite** command.

Syntax

ip http secure-ciphersuite { [rc4-128-md5] [rc4-128-sha] [des-cbc-sha] [3des-ede-cbc-sha] [ecdhe-a128-g-s256] [ecdhe-a256-g-s384] }

no ip http secure-ciphersuite

Parameter

[rc4-128-md5] [rc4-128-sha] [des-cbc-sha] [3des-ede-cbc-sha] [ecdhe-a128-g-s256] [ecdhe-a256-g-s384] —— Specify the encryption algorithm and the digest algorithm to use on an SSL connection. By default, the switch supports all these ciphersuites.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the ciphersuite to be used for encryption over the SSL connection as 3des-ede-cbc-sha:

Switch(config)# ip http secure-ciphersuite 3des-ede-cbc-sha

63.9 ip http secure-max-users

Description

The **ip http secure-max-users** command is used to configure the maximum number of users that are allowed to connect to the HTTPs server. To cancel this limitation, please use **no ip http secure-max-users** command.

Syntax

ip http secure-max-users *admin-num operator-num poweruser-num user-num*

no ip secure-max-users

Parameter

admin-num —— The maximum number of the users logging on to the HTTPs server as Admin, ranging from 1 to 16. The total number of users should be less than 16.

Operator-num —— The maximum number of the users logging on to the HTTPs server as operator, ranging from 0 to 15. The total number of users should be less than 16.

poweruser-num —— The maximum number of the users logging on to the HTTP server as Power User, ranging from 0 to 15. The total number of users should be less than 16.

user-num —— The maximum number of the users logging on to the HTTP server as User, ranging from 0 to 15. The total number of users should be less than 16.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum number of the Admin, Operator, Power User and User as 5, 1, 1, 1 for HTTPs:

```
Switch(config)# ip http secure-max-users 5 1 1 1
```

63.10 ip http secure-session timeout

Description

The **ip http secure-session timeout** command is used to configure the connection timeout of the HTTPS server. To restore to the default timeout time, please use **no ip http secure-session timeout** command.

Syntax

ip http secure-session timeout *time*

no ip http secure-session timeout

Parameter

time —— The timeout time, ranging from 5 to 30 in minutes. By default, the value is 10.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the timeout time of the HTTPs connection as 15 minutes:

```
Switch(config)# ip http secure-session timeout 15
```

63.11 ip http secure-server download certificate

Description

The **ip http secure-server download certificate** command is used to download a certificate to the switch from TFTP server.

Syntax

ip http secure-server download certificate *ssl-cert* **ip-address** *ip-addr*

Parameter

ssl-cert —— The name of the SSL certificate which is selected to download to the switch. The length of the name ranges from 1 to 25 characters. The Certificate must be BASE64 encoded.

ip-addr —— The IP address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Download an SSL Certificate named ssl-cert from TFTP server with the IP address of 192.168.0.146:

Switch(config)# ip http secure-server download certificate ssl-cert **ip-address** 192.168.0.146

Download an SSL Certificate named ssl-cert from TFTP server with the IP address of fe80::1234

Switch(config)# ip http secure-server download certificate ssl-cert **ip-address** fe80::1234

63.12 ip http secure-server download key

Description

The **ip http secure-server download key** command is used to download an SSL key to the switch from TFTP server.

Syntax

ip http secure-server download key *ssl-key* **ip-address** *ip-addr*

Parameter

ssl-key —— The name of the SSL key which is selected to download to the switch. The length of the name ranges from 1 to 25 characters. The Key must be BASE64 encoded.

ip-addr —— The IP address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Download an SSL key named ssl-key from TFTP server with the IP address of 192.168.0.146:

Switch(config)# ip http secure-server download key ssl-key **ip-address** 192.168.0.146

Download an SSL key named ssl-key from TFTP server with the IP address of fe80::1234

Switch(config)# ip http secure-server download key ssl-key **ip-address** fe80::1234

63.13 show ip http configuration

Description

The **show ip http configuration** command is used to display the configuration information of the HTTP server, including status, session timeout, access-control, max-user number and the idle-timeout, etc.

Syntax

show ip http configuration

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration information of the HTTP server:

```
Switch(config)# show ip http configuration
```

63.14 show ip http secure-server

Description

The **show ip http secure-server** command is used to display the global configuration of SSL.

Syntax

show ip http secure-server

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of SSL:

```
Switch(config)# show ip http secure-server
```

Chapter 64 SSH Commands

SSH (Security Shell) can provide the unsecured remote management with security and powerful authentication to ensure the security of the management information.

64.1 ip ssh server

Description

The **ip ssh server** command is used to enable SSH function. To disable the SSH function, please use **no ip ssh server** command.

Syntax

ip ssh server

no ip ssh server

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the SSH function:

```
Switch(config)# ip ssh server
```

64.2 ip ssh port

Description

The **ip ssh port** command is used to configure the port for SSH service. To set the value to the default, please use **no ip ssh port** command.

Syntax

ip ssh port *port*

no ip ssh port

Parameter

port —— Set the port number. It ranges from 1 to 65535. The default value is 22.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the SSH port number as 22:

Switch(config)# ip ssh port 22

64.3 ip ssh algorithm

Description

The **ip ssh algorithm** command is used to configure the algorithm in SSH function. To disable the specified algorithm, please use **no ip ssh algorithm** command.

Syntax

ip ssh algorithm { AES-CBC | 3DES-CBC | AES-GCM | AES-CTR | HMAC-SHA1 | HMAC-SHA2 | HMAC-MD5 | UMAC }

no ip ssh algorithm

Parameter

AES-CBC | 3DES-CBC | AES-GCM | AES-CTR | HMAC-SHA1 | HMAC-SHA2 | HMAC-MD5 | UMAC —— Specify the SSH algorithm.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the SSH algorithm as AES-CBC:

Switch(config)# ip ssh algorithm AES-CBC

64.4 ip ssh algorithm compatibility

Description

The **ip ssh algorithm compatibility** command is used to configure enable compatibility configuration to allow SSH to use unsafe encryption algorithms.

Syntax

ip ssh algorithm compatibility

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable compatibility configuration to allow SSH to use unsafe encryption algorithms:

```
Switch#ip ssh algorithm compatibility
This command will synchronously enable unsafe algorithms such as
AES-CBC, 3DES-CBC, HMAC-SHA1, HMAC-MD5, etc. (yes/no)
```

64.5 ip ssh timeout

Description

The **ip ssh timeout** command is used to specify the idle-timeout time of SSH. To restore to the factory defaults, please use **ip ssh timeout** command.

Syntax

ip ssh timeout *value*

no ip ssh timeout

Parameter

value —— The Idle-timeout time. During this period, the system will automatically release the connection if there is no operation from the client. It ranges from 1 to 120 in seconds. By default, this value is 120 seconds.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the idle-timeout time of SSH as 30 seconds:

Switch(config)# ip ssh timeout 30

64.6 ip ssh max-client

Description

The **ip ssh max-client** command is used to specify the maximum number of the connections to the SSH server. To return to the default configuration, please use **no ip ssh max-client** command.

Syntax

ip ssh max-client *num*

no ip ssh max-client

Parameter

num —— The maximum number of the connections to the SSH server. It ranges from 1 to 5. By default, this value is 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the maximum number of the connections to the SSH server as 3:

Switch(config)# ip ssh max-client 3

64.7 ip ssh download

Description

The **ip ssh download** command is used to download the SSH key file from TFTP server.

Syntax

ip ssh download { v2 } *key-file* **ip-address** *ip-addr* [**vrf** *vrf-name*]

Parameter

v2 —— Select the type of SSH public key as SSH-2.

key-file —— The name of the key-file which is selected to download. The length of the name ranges from 1 to 25 characters. The key length of the downloaded file must be in the range of 512 to 3072 bits.

ip-addr —— The IP address of the TFTP server. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.1 or fe80::1234.

vrf-name —— VRF instance name (1-15 characters).

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Download an SSH-2 type key file named ssh-key from TFTP server with the IP address 192.168.0.148:

```
Switch(config)# ip ssh download v2 ssh-key ip-address 192.168.0.148
```

Download an SSH-2 type key file named ssh-key from TFTP server with the IP address fe80::1234:

```
Switch(config)# ip ssh download v2 ssh-key ip-address fe80::1234
```

64.8 remove public-key

Description

The **remove public-key** command is used to remove the SSH public key from the switch.

Syntax

remove public-key { v2 }

Parameter

v2 —— Select the type of SSH public key as SSH-2.

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Remove the SSH-2 type public key from the switch:

```
Switch# remove public-key v2
```

64.9 show ip ssh

Description

The **show ip ssh** command is used to display the global configuration of SSH.

Syntax

show ip ssh

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of SSH:

```
Switch(config)# show ip ssh
```

Chapter 65 Telnet Commands

65.1 telnet

Description

The **telnet** command is used to log in and manage other devices via telnet.

Syntax

telnet *ip-addr*

Parameter

ip-addr——The IP address of the device you want to log in.

Command Mode

Privileged EXEC Mode

Privilege Requirement

None.

User Guidelines

Make sure the switch can access the device, and the device can be logged in via telnet.

Example

Log in to a device with the IP address of 192.168.0.10:

Switch# telnet 192.168.0.10

65.2 telnet enable

Description

The **telnet enable** command is used to enable the Telnet function. To disable the Telnet function, please use the **telnet disable** command. This function is enabled by default.

Syntax

telnet enable

telnet disable

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Disable the Telnet function:

```
Switch(config)# telnet disable
```

65.3 telnet port

Description

The **telnet port** command is used to configure the telent port number. To restore the setting, please use the **no telnet port** command.

Syntax

telnet port *port*

no telnet port

Parameter

port——The number of telnet port.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the telnet port number as 566:

```
Switch(config)# telnet port 566
```

65.4 show telnet-status

Description

The **show telnet-status** command is used to display the configuration information of the Telnet function.

Syntax

show telnet-status

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display whether the Telnet function is enabled:

```
Switch(config)# show telnet-status
```

Chapter 66 Serial Port Commands

Note: Serial Port commands are only available on certain devices.

66.1 serial_port baud-rate

Description

The **serial_port baud-rate** command is used to configure the communication baud rate on the console port. To return to the default baud rate, please use **no serial_port** command.

Syntax

serial_port baud-rate { 9600 | 19200 | 38400 | 57600 | 115200 }

no serial_port

Parameter

9600 | 19200 | 38400 | 57600 | 115200 ——Specify the communication baud rate on the console port. The default baul rate is 38400 bps.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Specify the communication baud rate on the console port to the default value:

```
Switch(config)# no serial_port
```

Chapter 67 AAA Commands

AAA stands for authentication, authorization and accounting. This feature is used to authenticate users trying to log in to the switch or trying to access the administrative level privilege.

- **Applicable Access Application**

The authentication can be applied on the following access applications: Telnet, SSH and HTTP.

- **Authentication Method List**

A method list describes the authentication methods and their sequence to authenticate a user. The switch supports Login List for users to gain access to the switch, and Enable List for normal users to gain administrative privileges.

- **RADIUS/TACACS+ Server**

User can configure the RADIUS/TACACS+ servers for the connection between the switch and the server.

- **Server Group**

User can define the authentication server group with up to several servers running the same secure protocols, either RADIUS or TACACS+. Users can set these servers in a preferable order, which is called the server group list. When a user tries to access the switch, the switch will ask the first server in the server group list for authentication. If no response is received, the second server will be queried, and so on.

67.1 tacacs-server host

Description

The **tacacs-server host** command is used to configure a new TACACS+ server. To delete the specified TACACS+ server, please use **no tacacs-server host** command. When the command includes a VRF name, it indicates that the server address belongs to that specific VRF instance.

Syntax

tacacs-server host *ip-address* [**port** *port-id*] [**timeout** *time*] [**vrfName** *vrf-name*] [**key** { [0] *string* | 7 *encryped-string*}]

no tacacs-server host *ip-address*

Parameter

ip-address —— Specify the IP address of the TACACS+ server.

port-id —— Specify the server's port number for AAA. By default it is 49.

time —— Specify the time in seconds the switch waits for the server's response before it times out. The time ranges from 1 to 9 seconds. The default is 5 seconds.

vrf-name——Specify the vrf name of the TACACS server. By the default it is default.

[0] *string* | 7 *encrypted-string* —— 0 and 7 are the encryption type. 0 indicates that an unencrypted key will follow. 7 indicates that a symmetric encrypted key with a fixed length will follow. By default, the encryption type is 0. "*string*" is the shared key for the switch and the authentication servers to exchange messages. "*encrypted-string*" is a symmetric encrypted key with a fixed length, which you can copy from another switch's configuration file. The key or encrypted-key you configured here will be displayed in the encrypted form. Always configure the key as the last item of this command.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

The TACACS+ servers you configured are added in the server group "tacacs" by default.

Example

Configure a TACACS+ server with the IP address as 1.1.1.1, TCP port as 1500, timeout as 6 seconds, VRF instance asv1, and the unencrypted key string as 12345.

```
Switch(config)# tacacs-server host 1.1.1.1 port 1500 timeout 6 vrfName
v1 key 12345
```

67.2 show tacacs-server

Description

This **show tacacs-server** command is used to display the summary information of the TACACS+ servers.

Syntax

show tacacs-server

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the information of all the TACACS+ servers:

```
Switch(config)# show tacacs-server
```

67.3 radius-server host

Description

The **radius-server host** command is used to configure a new RADIUS server. To delete the specified RADIUS server, please use **no radius-server host** command. When the command includes a VRF name, it indicates that the server address belongs to that specific VRF instance.

Syntax

radius-server host *ip-address* [**auth-port** *port-id*] [**acct-port** *port-id*] [**timeout** *time*] [**retransmit** *number*] [**nas-id** *nas-id*] [**vrfName** *vrf-name*] [**key** { [0] *string* | 7 *encrypted-string* }]

no radius-server host *ip-address*

Parameter

ip-address —— Specify the IP address of the RADIUS server.

auth-port *port-id* —— Specify the UDP destination port for authentication requests. By default it is 1812.

acct-port *port-id* —— Specify the UDP destination port for accouting requests. By deault it is 1813.

time —— Specify the time in seconds the switch waits for the server's response before it times out. The time ranges from 1 to 9 seconds. The default is 5 seconds.

number —— Specify the number of times a RADIUS request is resent to a server if the server is not responding in time. By default it is 2 times.

nas-id ——Specify the name of the NAS (Network Access Server) to be contained in RADIUS packets for identification. It ranges from 1 to 31

characters. The default value is the MAC address of the switch. Generally, the NAS indicates the switch itself.

vrf-name——Specify the vrf name of the RADIUS server. By the default it is default.

[0] *string* | 7 *encrypted-string*—— 0 and 7 are the encryption type. 0 indicates that an unencrypted key will follow. 7 indicates that a symmetric encrypted key with a fixed length will follow. By default, the encryption type is 0. "*string*" is the shared key for the switch and the authentication servers to exchange messages. "*encrypted-string*" is a symmetric encrypted key with a fixed length, which you can copy from another switch's configuration file. The key or encrypted-key you configured here will be displayed in the encrypted form. Always configure the key as the last item of this command.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

The RADIUS servers you configured are added in the server group "radius" by default.

Example

Configure a RADIUS server with an IP address of 1.1.1.1, an auth-port of 1200, a timeout of 6, a retransmit of 3, a VRF instance of v1, and a key of 12345.

```
Switch(config)# radius-server host 1.1.1.1 auth-port 1200 timeout 6
retransmit 3 vrfName v1 key 12345
```

67.4 radius-server radsec-profile

Description

The **radius-server radsec-profile** command is used to create a RADSEC template with a specified name and enter its configuration mode. To delete the RADSEC template with the corresponding name, please use the **no radius-server radsec-profile** command.

Syntax

radius-server radsec-profile *name*

no radius-server radsec-profile *name*

Parameter

name: The name of the radsec-profile.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Create a RADSEC template named test:

Switch(config)#radius-server radsec-profile test

67.5 download ca-certificate

Description

The **download ca-certificate** command is used to download the CA certificate.

Syntax

download ca-certificate *filename* **ip** *ipaddress*

Parameter

filename: The name of the certificate file to be imported, which should be a PEM file.

ipaddress: TFTP server IP address.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Import the certificate file named clntcert.pem as the CA certificate, with the TFTP server address as 192.168.0.146:

Switch(config)#radius-server radsec-profile test

Switch(radsec-certificate)#download ca-certificate clntcert.pem **ip** 192.168.0.146

67.6 download client-certificate

Description

The **download client-certificate** command is used to download the client certificate provided by the user.

Syntax

download client-certificate *filename* **ip** *ipaddress*

Parameter

filename: The name of the certificate file to be imported, which should be a PEM file.

ipaddress: TFTP server IP address.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Import the certificate file named clntcert.pem as the client certificate, with the TFTP server address set to 192.168.0.146:

Switch(config)#radius-server radsec-profile test

Switch(radsec-certificate)#download client-certificate clntcert.pem **ip** 192.168.0.146

67.7 download client-key

Description

The **download client-key** command is used to download the private key file provided by the user.

Syntax

download client-certificate *filename* **ip** *ipaddress* **password** *password*

Parameter

filename: The name of the certificate file to be imported, which should be a PEM file.

ipaddress: TFTP server IP address.

password: Private key file password.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Import the file named clntkey.pem as the private key, the TFTP server address is 192.168.0.146, and the private key file password is key123:

Switch(config)#radius-server radsec-profile test

Switch(radsec-certificate)#download client-certificate clntcert.pem **ip** 192.168.0.146 **password** key123

67.8 radius-server host

Description

The **radius-server host** command is used to create a RADIUS-server. To delete the RADIUS-server, please use the **no radius-server host** command.

Syntax

radius-server host *ipaddress* **[radsec-enable** *radsec-enable***] [verify-enable** *verify-enable***] [tls-port** *port***] [tls-idletimeout** *idletimeout***]**

[tls-connectiontimeout *connectiontimeout*] **[tls-retrys** *retrys*] **[certificate** *profilename*] **key {***key* **| 0** *key* **| 7** *key*}

no radius-server host *ipaddress*

Parameter

ipaddress: RADIUS server IP address.

radsec-enable: RADSEC state (enabled/disabled).

verify-enable: State of validating RADIUS server certificate (enabled/disabled).

port: RADIUS server listening port, ranging from 1 to 65535.

idletimeout: TLS tunnel idle timeout, ranging from 10 to 60.

connectiontimeout: TLS connection timeout, ranging from 1 to 9.

retrys: Number of send attempts, ranging from 1 to 5.

certificate: Certificate template name.

key: Shared key for the RADIUS server.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Ceate a RADIUS-server with the address 192.168.0.100, the RADSEC enabled, and the shared key of the server is key123:

```
Switch(config)#radius-server host 192.168.0.100 radsec enable key
key123
```

67.9 show radius-server

Description

This **show radius-server** command is used to display the summary information of the RADIUS servers.

Syntax

show radius-server

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the information of all the RADIUS servers:

Switch(config)# show radius-server

67.10 radius-server load-balance algorithm

Description

The **radius-server load-balance algorithm** command is used to configure the load-balancing algorithm.

Syntax

radius-server load-balance algorithm *method*

Parameter

method: RADIUS server load balancing algorithm (message-based/user-based).

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the load balancing algorithm of the RADIUS server group to message-based:

Switch(config)#radius-server load-balance algorithm message-based

67.11 radius-server load-balance least-outstading

Description

The **radius-server load-balance least-outstading** command is used to configure the load balancing batch of the RADIUS server.

Syntax

radius-server load-balance least-outstading *Batch_size*

Parameter

Batch_size: RADIUS server batch, ranging from 1 to 100, and the default value is 30.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the RADIUS server load balancing batch size to 50:

```
Switch(config)#radius-server load-balance least-outstading 50
```

67.12 radius-server dead-count

Description

The **radius-server dead-count** command is used to configure the maximum number of consecutive non-responses during the RADIUS server status detection process.

Syntax

radius-server dead-count *dead-count*

Parameter

dead-count: Maximum number of consecutive non-responses during the RADIUS server status detection process, ranging from 1 to 6, and the default value is 2.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the maximum number of consecutive non-responses during the RADIUS server status detection process to 3:

Switch(config)#radius-server dead-count 3

67.13 radius-server dead-cycle

Description

The **radius-server dead-cycle** command is used to configure the number of cycles in the detection period during the RADIUS server status detection process.

Syntax

radius-server dead-cycle *dead-cycle*

Parameter

dead-cycle: Maximum number of consecutive non-responses during the RADIUS server status detection process, ranging from 1 to 6, and the default value is 2.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the number of cycles in the detection period during the RADIUS server status detection process to 3:

Switch(config)#radius-server dead-cycle 3

67.14 radius-server dead-interval

Description

The **radius-server dead-interval** command is used to configure the detection period of the RADIUS server status detection process.

Syntax

radius-server dead-interval *dead-interval*

Parameter

dead-interval: Maximum number of consecutive non-responses during the RADIUS server status detection process, ranging from 1 to 15s, and the default value is 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the detection period of the RADIUS server status detection process to 10s:

```
Switch(config)#radius-server dead-interval 10
```

67.15 radius-server dead-time

Description

The **radius-server dead-time** command is used to configure the duration that the RADIUS server remains in the down state.

Syntax

radius-server dead-time *dead-time*

Parameter

dead-time: After the device marks the RADIUS server status as Down, it will set the server status to Force-up within the set dead-time. The range is 1~900s, and the default value is 300.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the duration for the RADIUS server in the down state to 600s:

Switch(config)#radius-server dead-time 600

67.16 radius-server max-unresponsiveinterval

Description

The **radius-server max-unresponsiveinterval** command is used to configure the maximum unresponsive interval of the RADIUS server.

Syntax

radius-server max-unresponsiveinterval *interval*

Parameter

interval: The maximum unresponsive interval of the RADIUS server. The range is 1~900s, and the default value is 300.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the maximum unresponsive interval of the RADIUS server to 600s:

Switch(config)#radius-server max-unresponsiveinterval 600

67.17 radius-server testuser

Description

The **radius-server testuser** command is used to configure the user name and password used by the automatic detection function.

Syntax

radius-server testuser *username password*

Parameter

username: Username used by the automatic detection function, 64 characters/numbers at most.

password: Password used by the automatic detection function, 64 characters/numbers at most.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Set the user name used for the automatic detection function to test and the password to key123:

Switch(config)#radius-server testuser test key123

67.18 radius-server detect-server

Description

The **radius-server detect-server** command is used to configure the interval and timeout used by the automatic detection function. To disable this feature, please use the **no radius-server detect-server** command.

Syntax

radius-server detect-server { interval *interval* **| timeout** *timeout* **}**

Parameter

interval: The automatic detection interval of the RADIUS server in the down state, ranging from 1-200s, and the default value is 60.

timeout: The automatic detection timeout, ranging from 1-9s, the default value is 3.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the interval and timeout used by the automatic detection function to 6s:

Switch(config)# radius-server detect-server timeout 6

67.19 aaa group

Description

This **aaa group** command is used to create AAA server groups to group existing TACACS+/RADIUS servers for authentication. This command puts the switch in the server group subconfiguration mode.

To delete the corresponding AAA group, please use the **no aaa group** command.

Syntax

aaa group { radius | tacacs } *group-name*
no aaa group { radius | tacacs } *group-name*

Parameter

radius | tacacs —— Specify the server group type as RADIUS or TACACS+.

group-name —— Specify the server group name.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Create a RADIUS server group with the name radius1:

```
Switch(config)# aaa group radius radius1
```

67.20 server

Description

This **server** command is used to add the existing server in the defined server group. To remove the specified server from the server group, please use the **no server** command. When the command includes a VRF name, it indicates that the server address belongs to that specific VRF instance.

Syntax

server *ip-address* [**vrfName** *vrf-name*]

no server *ip-address* [**vrfName** *vrf-name*]

Parameter

ip-address —— Specify the server's IP address.

vrf-name——Specify the vrf name of the server. By the default it is default.

Command Mode

Server Group Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Create the RADIUS server 1.1.1.1 and VRF address v1 to RADIUS server group "rad copy startup-config tftp command is used to backup the configuration file to TFTP server ius1":

```
Switch(config)# aaa group radius radius1
Switch(aaa-group)# server 1.1.1.1 vrfName v1
```

67.21 show aaa group

Description

This **show aaa group** command is used to display the summary information of the AAA groups. All the servers in this group will be listed if you specify the group name.

Syntax

show aaa group [*group-name*]

Parameter

group-name —— Specify the server group name.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the information of all the server groups:

```
Switch(config)# show aaa group
```

67.22 aaa authentication login

Description

This **aaa authentication login** command is used to configure a login authentication method list. A method list describes the authentication methods and their sequence to authenticate a user. To delete the specified authentication method list, please use the **no aaa authentication login** command.

Syntax

aaa authentication login { *method-list* } { *method1* } [*method2*] [*method3*] [*method4*]

no authentication login *method-list*

Parameter

method-list —— Specify the method list name.

method1, method2, method3, method4 —— Specify the authentication methods in order. The next authentication method is tried only if the previous method does not respond, not if it fails.

The preset methods include radius, tacacs, local and none. “radius” means the RADIUS server group “radius”; “tacacs” means the RACACS+ server group “tacacs”; “local” means local username database are used; “none” means no authentication is used for login.

Users can aslo define new method with the aaa group command.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

By default the login authentication method list is “default” with “local” as method1.

Example

Configure a login authentication method list “list1” with the priority1 method as radius and priority2 method as local:

Switch(config)# aaa authenticaiton login list1 radius local

67.23 aaa authentication enable

Description

This **aaa authentication enable** command is used to configure a privilege authentication method list. A method list describes the authentication methods and their sequence to elevate a user’s privilege. To delete the specified authentication method list, please use the **no aaa authentication enable** command.

Syntax

aaa authentication enable { *method-list* } { *method1* } [*method2*] [*method3*] [*method4*]

no authentication enable *method-list*

Parameter

method-list —— Specify the method list name.

method1, method2, method3, method4 —— Specify the authentication methods in order. The next authentication method is tried only if the previous method does not respond, not if it fails.

The preset methods include radius, tacacs, local and none. “radius” means the RADIUS server group “radius”; “tacacs” means the RACACS+ server

group “tacacs”; “local” means local username database are used; “none” means no authentication is used for privilege elevation.

Users can aslo define new method with the aaa group command.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

By default the enable authentication method is “default” with “none” as method1.

Example

Configure a privilege authentication method list “list2” with the priority1 method as radius and priority2 method as local:

Switch(config)# aaa authenticaiton enable list2 radius local

67.24 aaa authentication dot1x default

Description

This **aaa authentication dot1x default** command is used to configure an 802.1x authentication method list. A method list describes the authentication methods for users’ login in 802.1x. To delete the default authentication method list, please use the **no aaa authentication dot1x default** command.

Syntax

aaa authentication dot1x default { *method*}

no aaa authentication dot1x default

Parameter

method—— Specify the method name. Only RADIUS server group is supported, and the default method is server group “radius”.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the default 802.1x authentication method as “radius1”:

Switch(config)# aaa authentication dot1x default radius1

67.25 aaa accounting dot1x default

Description

This **aaa accounting dot1x default** command is used to configure an 802.1x accounting method list. To delete the default accounting method list, please use the **no aaa accounting dot1x default** command.

Syntax

aaa accounting dot1x default { *method*}

no aaa accounting dot1x default

Parameter

method—— Sp+ecify the method name. Only RADIUS server group is supported, and the default method is server group “radius”.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the default 802.1x accounting method as “radius1”:

Switch(config)# aaa accounting dot1x default radius1

67.26 show aaa authentication

Description

This **show aaa authentication** command is used to display the summary information of the authentication login, enable and dot1x metheod list.

Syntax

show aaa authentication [login | enable | dot1x]

Parameter

login | enable | dot1x —— Specify the method list type.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the information of all the authentication method lists:

```
Switch(config)# show aaa authentication
```

67.27 show aaa accounting

Description

This **show aaa accounting** command is used to display the summary information of the accounting metheod list.

Syntax

show aaa accounting [dot1x]

Parameter

dot1x —— Specify the method list type.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the information of the default 802.1x accounting method list:

```
Switch(config)# show aaa accounting
```

67.28 line telnet

Description

The **line telnet** command is used to enter the Line Configuration Mode to configure the telnet terminal line to which you want to apply the authentication list.

Syntax

line telnet

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enter the telnet terminal line configuration mode:

```
Switch(config)#line telnet
```

67.29 login authentication (telnet)

Description

The **login authentication** command is used to apply the login authentication method list to the telnet terminal line. To restore to the default authentication method list, please use the **no login authentication** command.

Syntax

login authentication { *method-list* }

no login authentication

Parameter

method-list —— Specify the login method list on the telnet terminal line. It is "default" by default, which contains the method "local".

Command Mode

Line Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the login authentication method list on the telnet terminal line as "list1":

Switch(config)#line telnet

Switch(config-line)# login authentication list1

67.30 line ssh

Description

The **line ssh** command is used to enter the Line Configuration Mode to configure the ssh terminal line to which you want to apply the authentication list.

Syntax

line ssh

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enter the ssh terminal line configuration mode:

Switch(config)#line ssh

67.31 login authentication (ssh)

Description

The **login authentication** command is used to apply the login authentication method list to the ssh terminal line. To restore to the default authentication method list, please use the **no login authentication** command.

Syntax

login authentication { *method-list* }

no login authentication

Parameter

method-list —— Specify the login method list on the ssh terminal line. It is "default" by default, which contains the method "local".

Command Mode

Line Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the login authentication method list on the ssh terminal line as "list1":

Switch(config)# line ssh

Switch(config-line)# login authentication list1

67.32 line console

Note: This command is only available on certain devices.

Description

The **line console** command is used to enter the Line Configuration Mode to configure the console terminal line to which you want to apply the authentication list.

Syntax

line console *line-number*

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enter the console 0 terminal line configuration mode:

Switch(config)#line console 0

67.33 login authentication (console)

Note: This command is only available on certain devices.

Description

The **login authentication** command is used to apply the login authentication method list to the console terminal line. To restore to the default authentication method list, please use the **no login authentication** command.

Syntax

login authentication { *method-list* }

no login authentication

Parameter

method-list —— Specify the login method list on the console terminal line. It is "default" by default, which contains the method "local".

Command Mode

Line Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the login authentication method list on the console 0 terminal line as "list1":

```
Switch(config)# line console 0
Switch(config-line)# login authentication list1
```

67.34 enable authentication (telnet)

Description

The **enable authentication** command is used to apply the privilege authentication method list to the telnet terminal line. To restore to the default

authentication method list, please use the **no enable authentication** command.

Syntax

enable authentication { *method-list* }

no enable authentication

Parameter

method-list —— Specify the enable method list on the telnet terminal line. It is "default" by default, which contains the method "none".

Command Mode

Line Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the enable authentication method list on the telnet terminal line as "list2":

Switch(config)#line telnet

Switch(config-line)# enable authentication list2

67.35 enable authentication (ssh)

Description

The **enable authentication** command is used to apply the privilege authentication method list to the ssh terminal line. To restore to the default authentication method list, please use the **no enable authentication** command.

Syntax

enable authentication { *method-list* }

no enable authentication

Parameter

method-list —— Specify the enable method list on the ssh terminal line. It is "default" by default, which contains the method "none".

Command Mode

Line Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the enable authentication method list on the ssh terminal line as "list2":

Switch(config)# line ssh

Switch(config-line)# enable authentication list2

67.36 enable authentication (console)

Note: This command is only available on certain devices.

Description

The **enable authentication** command is used to apply the privilege authentication method list to the console terminal line. To restore to the default authentication method list, please use the **no enable authentication** command.

Syntax

enable authentication { *method-list* }

no enable authentication

Parameter

method-list —— Specify the enable method list on the console terminal line. It is "default" by default, which contains the method "none".

Command Mode

Line Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the enable authentication method list on the console 0 terminal line as “list2”:

```
Switch(config)# line console 0
Switch(config-line)# enable authentication list2
```

67.37 ip http login authentication

Description

The **ip http login authentication** command is used to apply the login authentication method list to users accessing through HTTP. To restore to the default authentication method list, please use the **no ip http login authentication** command.

Syntax

ip http login authentication { *method-list* }

no ip http login authentication

Parameter

method-list —— Specify the login method list on the HTTP access. It is “default” by default, which contains the method “local”.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the login authentication method list on the HTTP access as “list1”:

```
Switch(config)# ip http login authentication list1
```

67.38 ip http enable authentication

Description

The **ip http enable authentication** command is used to apply the privilege authentication method list to users accessing through HTTP. To restore to the default authentication method list, please use the **no ip http enable authentication** command.

Syntax

ip http enable authentication { *method-list* }

no ip http enable authentication

Parameter

method-list —— Specify the enable method list on the HTTP access. It is "default" by default, which contains the method "none".

Command Mode

Line Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the enable authentication method list on the HTTP access as "list2":

```
Switch(config)# ip http enable authentication list2
```

67.39 show aaa global

Description

This **show aaa global** command is used to display global status of AAA function and the login/enable method lists of different application modules: telnet, ssh and HTTP.

Syntax

show aaa global

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the AAA function's global status and each application's method list:

```
Switch(config)# show aaa global
```

67.40 enable admin password

Description

The **enable admin password** command is used to set or change the Enable password for users to change the access level to admin. To remove the Enable password, please use **no enable admin** command. This command uses the symmetric encryption.

Syntax

enable admin password { [0] *password* | 7 *encrypted-password*}

no enable admin

Parameter

0 —— Specify the encryption type. 0 indicates that an unencrypted password will follow. By default, the encryption type is 0.

password —— Enable password, a string with 31 characters at most, which can contain only English letters (case-sensitive), digits and 17 kinds of special characters. The special characters are **!$%'()*,-./[]_{|}**. By default, it is empty. By default, it is empty.

7 —— Indicates a symmetric encrypted password with fixed length will follow.

encrypted-password —— A symmetric encrypted password with fixed length, which you can copy from another switch's configuration file. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

If the password you configured here is unencrypted and the global encryption function is enabled in service password-encryption, the password in the configuration file will be displayed in the symmetric encrypted form.

If both the **enable admin password** and **enable admin secret** are defined, only the latest configured password will take effect.

Example

Set the Enable password as "abc123" and unencrypted for users to change the access level to admin:

```
Switch(config)#enable admin password 0 abc123
```

67.41 enable admin secret

Description

The **enable admin secret** command is used to set or change the Enable password for users to change the access level to admin. To remove the Enable password, please use **no enable admin** command. This command uses the MD5 encryption.

Syntax

enable admin secret { [0] *password* | 5 *encrypted-password* | 8 *encrypted-password* | 9 *encrypted-password*}

no enable admin

Parameter

0 ——Specify the encryption type. 0 indicates that an unencrypted password will follow. the password will be encrypted by MD5. By default, the encryption type is 0.

password —— A string with 31 characters at most, which can contain only English letters (case-sensitive), digits and 17 kinds of special characters. The special characters are !$%'()*,-./[]_{|}. By default, it is empty.

5 ——Indicates an MD5 encrypted password with fixed length will follow.

8 ——Indicates an PBKDF2 encrypted password with fixed length will follow.

9 —— Indicates a SCRYPT encrypted password with fixed length will follow.

encrypted-password —— An/A MD5/SCRYPT/PBKDF2 encrypted password with fixed length, which you can copy from another switch's configuration file. After the encrypted password is configured, you should use the corresponding unencrypted password if you re-enter this mode.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

User Guidelines

If both the **enable admin password** and **enable admin secret** are defined, only the latest configured password will take effect.

Example

Set the Enable password as "abc123" and unencrypted for users to change the access level to admin. The password will be displayed in the encrypted form.

```
Switch(config)#enable admin secret 0 abc123
```

67.42 enable-admin

Description

The **enable-admin** command is used to get the administrative privelges by a non-admin user.

Syntax

enable-admin

Command Mode

Privileged EXEC Mode

Privilege Requirement

Only User, Power User and Operator level users have access to these commands.

Example

Get the administrative privelges (the Enable password is “123456”):

Switch# enable-admin

Password: 123456

Chapter 68 IEEE 802.1x Commands

IEEE 802.1x function is to provide an access control for LAN ports via the authentication. An 802.1x system include three entities: supplicant, authenticator and authentication server.

- Supplicant: the device that requests access to the LAN.
- Authentication server: performs the actual authentication of the supplicant. It validates the identity of the supplicant and notifies the authenticator whether or not the supplicant is authorized to access the LAN.
- Authenticator: controls the physical access to the network based on the authentication status of the supplicant. It is usually an 802.1x-supported network device, such as this TP-Link switch. It acts as an intermediary (proxy) between the supplicant and the authentication server, requesting identity information from the supplicant, verifying that information with the authentication server, and relaying a response to the supplicant.

This chapter handles with the authentication process between the supplicant and the switch. To realize the authentication and accounting function, you should also enbable the AAA function and configure the RADIUS server. Go to Chapter 42 AAA Commands for more details.

68.1 dot1x system-auth-control

Description

The **dot1x system-auth-control** command is used to enable the IEEE 802.1x function globally. To disable the IEEE 802.1x function, please use **no dot1x system-auth-control** command.

Syntax

dot1x system-auth-control

no dot1x system-auth-control

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IEEE 802.1x function:

```
Switch(config)#dot1x system-auth-control
```

68.2 dot1x handshake

Description

The **dot1x handshake** command is used enable the handshake feature. The handshake feature is used to detect the connection status between the TP-Link 802.1x supplicant and the switch. Please disable the handshake feature if you are using a non-TP-Link 802.1x-compliant client software. This feature is enabled by default.

Syntax

dot1x handshake

no dot1x handshake

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Disable the 802.1x handshake function:

```
Switch(config)# no dot1x handshake
```

68.3 dot1x auth-protocol

Description

The **dot1x auth-protocol** command is used to configure the authentication protocol of IEEE 802.1x and the default 802.1x authentication method is “eap”. To restore to the default 802.1x authentication protocol, please use **no dot1x auth-protocol** command.

Syntax

dot1x auth-protocol { pap | eap }

no dot1x auth-protocol

Parameter

pap | eap ——Authentication protocols.

pap: EAP termination mode. IEEE 802.1x authentication system uses extensible authentication protocol (EAP) to exchange information between the switch and the client. The EAP packets are terminated at the switch and repackaged in the Password Authentication Protocol (PAP) packets, and then transferred to the RADIUS server.

eap: EAP relay mode. IEEE 802.1x authentication system uses extensible authentication protocol (EAP) to exchange information between the switch and the client. The EAP protocol packets with authentication data are encapsulated in the advanced protocol (such as RADIUS) packets and transmitted to the authentication server.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the Authentication protocol of IEEE 802.1x as “pap”:

Switch(config)#dot1x auth-protocol pap

68.4 dot1x vlan-assignment

Description

The **dot1x vlan-assignment** command is used to enable the VLAN assignment feature.To disable this feature, please use **no dot1x vlan-assignment** command.

802.1x VLAN assignment is a technology allowing the RADIUS server to send the VLAN assignment to the port when the port is authenticated.

If the assigned VLAN does not exist on the switch, the switch will create the related VLAN automatically, add the authenticated port to the VLAN and change the PVID based on the assigned VLAN.

If the assigned VLAN exists on the switch, the switch will directly add the authenticated port to the related VLAN and change the PVID instead of creating a new VLAN.

If no VLAN is supplied by the RADIUS server or if 802.1x authentication is disabled, the port will be in its original VLAN after successful authentication.

Syntax

dot1x vlan-assignment

no dot1x vlan-assignment

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the VLAN assignment feature:

```
Switch(config)#dot1x vlan-assignment
```

68.5 dot1x accounting

Description

The **dot1x accounting** command is used to enable the IEEE 802.1x accounting function globally. To disable the IEEE 802.1x accounting function, please use **no dot1x accounting** command.

Syntax

dot1x accounting

no dot1x accounting

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the enable the IEEE 802.1x accounting function globally:

```
Switch(config)#dot1x accounting
```

68.6 dot1x mab

Description

The **dot1x mab** command is used to enable the MAB feature on the port.To disable this feature, please use **no dot1x mab** command.

With MAB (MAC-Based Authentication Bypass) feature enabled, the switch automatically sends the authentication server a RADIUS access request frame with the client's MAC address as the username and password. It is also necessary to configure the RADIUS server with the client's information for authentication. You can enable this feature on IEEE 802.1x ports connected to devices without 802.1x capability. For example, most printers, IP phones and fax machines do not have 802.1x capability.

Syntax

dot1x mab

no dot1x mab

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the MAB feature on the Gigabit Ethernet port 1/0/1:

```
Switch(config)#interface gigabitEthernet 1/0/1
Switch(config-if)#dot1x mab
```

68.7 dot1x guest-vlan

Description

The **dot1x guest-vlan** command is used to configure the Guest VLAN function on the port. To disable the Guest VLAN function, please use **no dot1x guest-vlan** command.

Syntax

dot1x guest-vlan *vid*

no dot1x guest-vlan

Parameter

vid—— The VLAN ID needed to enable the Guest VLAN function, ranging from 0 to 4094. 0 means that Guest VLAN is disabled. The supplicants in the Guest VLAN can access the specified network source.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the Guest VLAN function for VLAN 5 and set the VLAN ID as 20 on the Gigabit Ethernet port 1/0/1::

```
Switch(config)#interface gigabitEthernet 1/0/1
Switch(config-if)#dot1x guest-vlan 5
```

68.8 dot1x timeout quiet-period

Description

The **dot1x timeout quiet-period** command is used to enable the quiet-period function on the port. To disable the function, please use **no dot1x timeout quiet-period** command.

Syntax

dot1x timeout quiet-period [*time*]

no dot1x timeout quiet-period

Parameter

time—— The length of the quiet-period time. If one user's authentication fails, its subsequent IEEE 802.1x authentication requests will not be processed during the quiet-period time. It ranges from 1 to 999 seconds and the default value is 10 seconds.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the quiet-period function and set the quiet-period as 5 seconds on the Gigabit Ethernet port 1/0/1:

Switch(config)#interface gigabitEthernet 1/0/1

Switch(config-if)#dot1x quiet-period 5

68.9 dot1x timeout supp-timeout

Description

The **dot1x timeout supp-timeout** command is used to configure the supplicant timeout on the port. To restore to the default, please use **no dot1x timeout supp-timeout** command.

Syntax

dot1x timeout supp-timeout *time*

no dot1x timeout supp-timeout

Parameter

time——The maximum time for the switch to wait for the response from supplicant before resending a request to the supplicant, ranging from 1 to 60 in second. By default, it is 30 seconds.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the supplicant timeout value as 5 seconds on the Gigabit Ethernet pot 1/0/1:

```
Switch(config)#interface gigabitEthernet 1/0/1
Switch(config-if)#dot1x timeout supp-timeout 5
```

68.10 dot1x max- req

Description

The **dot1x max-req** command is used to configure the maximum transfer times of the repeated authentication request when the server cannot be connected. To restore to the default value, please use **no dot1x max-req** command.

Syntax

dot1x max-req *times*

no dot1x max-req

Parameter

times —— The maximum transfer times of the repeated authentication request, ranging from 1 to 9 in times. By default, the value is 3.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum transfer times of the repeated authentication request as 5 on the Gigabit Ethernet port 1/0/1:

```
Switch(config)#interface gigabitEthernet 1/0/1
Switch(config-if)#dot1x max-req 5
```

68.11 dot1x

Description

The **dot1x** command is used to enable the IEEE 802.1x function for a specified port. To disable the IEEE 802.1x function for a specified port, please use **no dot1x** command.

Syntax

dot1x

no dot1x

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IEEE 802.1x function for the Gigabit Ethernet port 1:

Switch(config)#interface gigabitEthernet 1/0/1

Switch(config-if)#dot1x

68.12 dot1x port-control

Description

The **dot1x port-control** command is used to configure the Control Mode of IEEE 802.1x for the specified port. By default, the control mode is “auto”. To restore to the default configuration, please use **no dot1x port-control** command.

Syntax

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

no dot1x port-control

Parameter

auto | authorized-force | unauthorized-force —— The Control Mode for the port.

auto: In this mode, the port will normally work only after passing the 802.1x Authentication.

authorized-force: In this mode, the port can work normally without passing the 802.1x Authentication.

unauthorized-force: In this mode, the port is forbidden working for its fixed unauthorized status.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the Control Mode for Gigabit Ethernet port 20 as "authorized-force":

Switch(config)#interface gigabitEthernet 1/0/20

Switch(config-if)#dot1x port-control authorized-force

68.13 dot1x port-method

Description

The **dot1x port-method** command is used to configure the control type of IEEE 802.1x for the specified port. By default, the control type is "mac-based". To restore to the default configuration, please use **no dot1x port-method** command.

Syntax

dot1x port-method { mac-based | port-based }

no dot1x port-method

Parameter

mac-based | port-based ——The control type for the port.

mac-based: Any client connected to the port should pass the 802.1x authentication for access.

port-based: All the clients connected to the port can access the network on the condition that any one of the clients has passed the 802.1x Authentication.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the Control Type for Gigabit Ethernet port 20 as “port-based”:

Switch(config)#interface gigabitEthernet 1/0/20

Switch(config-if)#dot1x port-method port-based

68.14 dot1x auth-init

Description

The **dot1x auth-init** command is used to initialize the specific client.

Syntax

dot1x auth-init [mac *mac-address* **]**

Parameter

mac-address: Enter the MAC address of the client that will be unauthorized.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

None.

Example

Initialize the client whose MAC address is a 00:02:58:4f:6c:23 on port 1:

Switch(Config)# interface gigabitEthernet 1/0/1

Switch(Config-if)#dot1x auth-init mac 00:02:58:4f:6c:23

68.15 dot1x auth-reauth

Description

The **dot1x auth-reauth** command is used to reauthenticate the specific client.

Syntax

dot1x auth-reauth [**mac** *mac-address*]

Parameter

mac-address: Enter the MAC address of the client that will be reauthenticated.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

None.

Example

Reauthenticate the client whose MAC address is a 00:02:58:4f:6c:23 on port 1:

```
Switch(Config)# interface gigabitEthernet 1/0/1
Switch(Config-if)#dot1x auth-reauth mac 00:02:58:4f:6c:23
```

68.16 show dot1x global

Description

The **show dot1x global** command is used to display the global configuration of 801.X.

Syntax

show dot1x global

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of 801.X globally:

```
Switch(config)#show dot1x global
```

68.17 show dot1x interface

Description

The **show dot1x interface** command is used to display all ports or the specified port's configuration information of 801.X.

Syntax

show dot1x interface [**gigabitEthernet** *port*]

Parameter

port —— The Ethernet port number. If not specified, the information of all the ports will be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration information of 801.X for Gigabit Ethernet port 20:

```
Switch(config)#show dot1x interface gigabitEthernet 1/0/20
```

Display the configuration information of 801.X for all Ethernet ports:

```
Switch(config)#show dot1x interface
```

68.18 show dot1x auth-state interface

Description

The **show dot1x auth-state interface** command is used to display the authentication status of each port.

Syntax

show dot1x auth-state interface [**fastEthernet** *port* **| gigabitEthernet** *port* **| ten-gigabitEthernet** *port*]

Parameter

port —— The Ethernet port number. If not specified, the information of all the ports will be displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the authentication status of each port:

```
Switch(config)#show dot1x auth-state interface
```

Chapter 69 Port Security Commands (Only for Certain Devices)

You can use the Port Security feature to limit the number of MAC addresses that can be learned on each port, thus preventing the MAC address table from being exhausted by the attack packets. In addtion, the switch can send a notification if the number of learned MAC addresses on the port exceeds the limit.

69.1 mac address-table max-mac count

Description

The **mac address-table max-mac-count** command is used to enable the port security feature of the port and configure the related parameters. To disable the feature and restore the parameters to defaults on the port, please use **no mac address-table max-mac-count** command.

Syntax

mac address-table max-mac-count { [max-number *num* **]**
[exceed-max-learned enable | disable **] [mode {** dynamic | static | permanent **}] [status {** forward | drop | disable **}] }**

no mac address-table max-mac-count [max-number | mode | status]

Parameter

num: The maximum number of MAC addresses that can be learned on a port, ranging from 0 ~ 64. The default value is 64.

status: Select the action to be taken when the number of MAC addresses reaches the maximum number of MAC addresses learned on the port. By default, this function is disabled.

forward: Forward but not learn packets after reaching the upper limit of secure addresses.

drop: Discard packets after reaching the upper limit of secure addresses.

disable: Disable port security.

exceed-max-learned {enable | disable}: When the upper limit is reached, an SNMP message will be generated and sent to the network administrator.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the maximum number of MAC addresses that can be learned on port 1/0/1 as 30, enable exceed-max-leaned feature and configure the mode as permanent and the status as drop:

Switch (config)#interface gigabitEthernet 1/0/1

Switch(config-if)#mac address-table max-mac-count max-number 30 **exceed-max-learned** enable **mode** permanent **status** drop

69.2 mac address-table sticky mac

Description

The **mac address-table sticky mac** command is used to configure sticky MAC mannually. To delete the specified sticky MAC entry, please use the **no mac address-table sticky mac** command.

Syntax

mac address-table sticky mac *mac-address* **vip** *vlan-id* **interface** { **fastEthernet** *port* | **gigabitEthernet** *port* | **hundred-gigabitEthernet** *port* | **ten-gigabitEthernet** *port* | **twentyFive-gigabitEthernet** *port* | **two-gigabitEthernet** *port* }

no mac address-table sticky mac *mac-address* **vip** *vlan-id*

Parameter

mac-address: The MAC address of the entry to be added.

vlan-id: The VLAN ID of the entry to be added. The range is 1 to 4094.

port: The port of the entry to be added.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Add a sticky address 00:02:58:4f:6c:23 and bind it to sticky mode port 1, VLAN 1:

Switch(config)#mac address-table sticky mac 00:02:58:4f:6c:23 **vid** 1

interface gigabitEthernet 1/0/1

69.3 mac address-table sticky save-time

Description

The **mac address-table sticky save-time** command is used to configure the interval for saving sticky MAC. To restore the default configuration, please use the **no mac address-table sticky save-time** command.

Syntax

mac address-table sticky save-time *time*

no mac address-table sticky save-time

Parameter

time: The interval for saving sticky MAC, which is 600s by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the save-time to 50S:

Switch(config)# mac address-table sticky save-time 50

Chapter 70 MACsec Commands (Only for Certain Devices)

Media Access Control Security (MACsec) defines a method for secure data communication on IEEE 802 local area networks. MACsec provides users with secure MAC layer data transmission and reception services, including user data encryption, data frame integrity verification, and data source authenticity validation.

70.1 macsec mka-policy

Description

This command is used to configure a macsec policy template. When users configure the macsec function of a specific port, they can apply the corresponding template to simplify the configuration process. To delete the template, please use the **no** command.

Syntax

macsec mka-policy policy-name [**confidentiality-offset** offset | **replay-protection** [**window-size** window-size] **| validation-mode** mode]

no macsec mka-policy policy-name [**confidentiality-offset** | **replay-protection** [**window-size**] **| validation-mode**]

Parameter

policy-name: MACsec policy template name.

offset: MACsec message encryption position offset. The value range is {0 | 30 | 50}, and the default value is 0.

window-size: The window size of the replay-protection function, ranging from 0 to 4294967295, and the default value is 0

mode: MACsec key matching mode, the value range is {check | strict}, and the default value is check

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a MACsec policy configuration template named test and set the validation-mode of the template to strict mode:

Switch(config)#macsec mka-policy test

Switch(config)#macsec mka-policy test **validation-mode** strict

70.2 macsec apply-policy

Description

This command is used to apply the MACsec policy template configuration to the corresponding interface. To delete the policy, please use the **no macsec apply-policy** command.

Syntax

macsec apply-policy policyName

no macsec apply-policy

Parameter

policy-name: MACsec policy template name.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MACsec function on port 1/0/2, and apply the MACsec policy template named test:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#macsec apply-policy test

70.3 macsec cipher_suite

Description

This command is used to configure the MACsec packet encryption algorithm. To disable this function, please use the no macsec cipher_suite command.

Syntax

macsec cipher_suite type

no macsec cipher_suite

Parameter

type: The encryption algorithm type used, the value is {gcm-aes-128 | gcm-aes-256}, the default value is gcm-aes-128.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MACsec function on port 1/0/2, and set the cipher_suite to the gcm-aes-128 algorithm:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#macsec cipher_suite gcm-aes-128

70.4 macsec confidentiality-offset

Description

This command is used to configure the cheap byte count when the macsec function encrypts packets, that is, the number of bytes after which the encryption of the packet data begins. To disable this function, please use the **no macsec confidentiality-offset** command.

Syntax

macsec confidentiality-offset offset

no macsec confidentiality-offset

Parameter

offset: The MACsec message encryption position offset. The value is {0 | 30 | 50}, and the default value is 0

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MACsec function on port 1/0/2, and set the encryption offset to 30:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)#macsec confidentiality-offset 30
```

70.5 macsec desire

Description

This command is used to enable the packet encryption function. To disable this function, please use the **no macsec desire** command.

Syntax

macsec desire

no macsec desire

Parameter

None

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the MACsec packet encryption function on port 1/0/2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)#macsec desire
```

70.6 macsec mka

Description

This command is used to enable the MKA negotiation function. To disable this function, please use the **no macsec mka** command.

Syntax

macsec mka

no macsec mka

Parameter

None

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the MKA negotiation function on port 1/0/2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)#macsec mka
```

70.7 macsec mka priority

Description

This command is used to configure the weight of the local end in the mka negotiation. During the MKA session establishment process, the one with the lower priority value will be elected as the key server. To restore the default value, please use the **no macsec mka priority** command.

Syntax

macsec mka priority priority

no macsec mka priority

Parameter

priority: The priority of the local end in the MKA negotiation, ranging from 0 to 255. The default value is 255

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MACsec function on port 1/0/2, and set the MKA negotiation priority to 20:

```
Switch(config)#interface gigabitEthernet 1/0/2
```

Switch(config-if)#macsec mka priority 20

70.8 macsec mka psk

Description

This command is used to configure the local pre-configured security connection associated key information in the MKA negotiation. To disable this function, please use the **no macsec mka psk ckn cak** command.

Syntax

macsec mka psk ckn name **cak** string

no macsec mka psk ckn cak

Parameter

name: The name of the local pre-configured security connection association key used for MKA negotiation.

string: The value of the local pre-configured security connection association key used for MKA negotiation

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MACsec function on port 1/0/2, and set the pre-configured security connection association key name to “test” and its value to “abcdefg”:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#macsec mka psk ckn test **cak** abcdefg

70.9 macsec mka timer

Description

This command is used to configure the mka session keepalive time that times out due to failure to receive mka messages from the peer. To disable this function, please use the **no macsec mka timer mka-life** command.

Syntax

macsec mka timer mka-life seconds

no macsec mka timer mka-life

Parameter

seconds: MKA session timeout keepalive time, ranging from 6-60s. The default value is 21s.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MACsec function on port 1/0/2, and set the timeout keepalive time to 6s:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#macsec mka timer mka-life 6

70.10 macsec replay-protection

Description

This command is used to enable replay-protection and the window range for allowing packets to pass. When replay-protection is disabled, out-of-order packets will not be received; when it is enabled, out-of-order packets within the window range will be received. To disable this function, please use the **no macsec replay-protection [window-size]** command.

Syntax

macsec replay-protection [**window-size** size-value]

no macsec replay-protection [**window-size**]

Parameter

size-value: Window size, ranging from 0 to 4294967295. The default value is 0.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MACsec function on port 1/0/2, enable replay-protection and

set the window size to 10:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)#macsec replay-protection
Switch(config-if)#macsec replay-protection window-size 10
```

70.11 macsec validation-mode

Description

This command is used to set the validation mode of ick information in the MKA negotiation process. When configured in strict mode, the ICK information will be strictly matched. When the ICK information carried in the received MKA message is inconsistent with that of the local end, the message will be discarded; when configured in check mode, only the ICK information is checked. When the ICK information carried in the received MKA message is inconsistent with that of the local end, it will still be parsed normally, but the MKA session will not be established. To disable this function, please use the **no macsec validation-mode** command.

Syntax

macsec validation-mode mode

no macsec validation-mode

Parameter

mode: The matching mode of ICK information in the MKA negotiation, the value range is {check | strict}, and the default value is check.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the MACsec function on port 1/0/2, and set validation-mode to strict mode:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)#macsec validation-mode strict
```

Chapter 71 Port Mirroring Commands

Port Mirroring allows the switch to send a copy of the traffic that passes through specified sources (ports, LAGs or the CPU) to a destination port. It does not affect the switching of network traffic on source ports, LAGs or the CPU. Usually, the monitoring port is connected to data diagnose device, which is used to analyze the monitored packets for monitoring and troubleshooting the network.

71.1 monitor session destination interface

Description

The **monitor session destination interface** command is used to configure the monitoring port. Each monitor session has only one monitoring port. To change the monitoring port, please use the **monitor session destination interface** command by changing the port value. The **no monitor session** command is used to delete the corresponding monitoring port or monitor session.

Syntax

monitor session *session_num* **destination interface gigabitEthernet** *port*

no monitor session *session_num* **destination interface gigabitEthernet** *port*

no monitor session *session_num*

Parameter

session_num —— The monitor session number, can only be specified as 1.

port ——The monitoring port number.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create monitor session 1 and configure port 1/0/1 as the monitoring port:

Switch(config)# monitor session 1 **destination interface gigabitEthernet** 1/0/1

Delete the monitoring port 1/0/2 from monitor session 1:

Switch(config)# no monitor session 1 **destination interface gigabitEthernet** 1/0/2

Delete the monitor session 1:

Switch(config)# no monitor session 1

71.2 monitor session source

Description

The **monitor session source** command is used to configure the monitored interface. To delete the corresponding monitored interface, please use **no monitor session source** command.

Syntax

monitor session *session_num* **source { cpu** *cpu_number* **| interface gigabitEthernet** *port-list* **| interface port-channel** *port-channel-id***}** *mode*

no monitor session *session_num* **source { cpu** *cpu_number* **| interface gigabitEthernet** *port-list* **| interface port-channel** *port-channel-id***}** *mode*

Parameter

session_num —— The monitor session number. It can only be specified as 1.

cpu_number —— The CPU number. It can only be specified as 1.

port-list —— List of the Ethernet port number. It is multi-optional.

lag-list —— List of LAG interfaces. It is multi-optional.

mode —— The monitor mode. There are three options: rx, tx and both. Rx (ingress monitoring mode), means the incoming packets received by the monitored interface will be copied to the monitoring port. Tx (egress monitoring mode), indicates the outgoing packets sent by the monitored interface will be copied to the monitoring port. Both (ingress and egress monitoring), presents the incoming packets received and the outgoing packets sent by the monitored interface will both be copied to the monitoring port.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

1. The monitoring port is corresponding to current interface configuration mode.
2. Monitored ports number is not limited, but it can't be the monitoring port at the same time.
3. Whether the monitoring port and monitored ports are in the same VLAN or not is not demanded strictly.
4. The monitoring port and monitored ports cannot be link-aggregation member.

Example

Create monitor session 1, then configure port 4, 5, 7 as monitored port and enable ingress monitoring:

```
Switch(config)# monitor session 1 source interface gigabitEthernet
1/0/4-5,1/0/7 rx
```

Delete port 4 in monitor session 1 and its configuration:

```
Switch(config)# no monitor session 1 source interface gigabitEthernet
1/0/4 rx
```

71.3 monitor session 1 destination remote vlan

Description

The **monitor session 1 destination remote vlan** command is used to configure the RSPAN VLAN for remote port monitoring of egress packets. Please set the destination port before using this command. To disable this function, please use the **no monitor session 1 destination remote vlan** command.

Syntax

monitor session 1 destination remote vlan vlanid

no monitor session 1 destination remote vlan vlanid

Parameter

vlanid —— Remote port monitoring export message VLAN. The value ranges from 2 to 4094 and is mutually exclusive with voice VLAN and internal VLAN.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the RSPAN VLAN for remote port monitoring of egress packets:

```
Switch(config)#monitor session 1 destination remote vlan 4094
```

71.4 monitor session 1 source remote vlan

Description

The **monitor session 1 source remote vlan** command is used to monitor the packets added to the RSPAN VLAN port. To disable this function, use the **no monitor session 1 source remote vlan** command.

Syntax

monitor session 1 source remote vlan vlanid

no monitor session 1 source remote vlan vlanid

Parameter

vlanid —— Remote port monitoring export message VLAN. The value ranges from 2 to 4094 and is mutually exclusive with voice VLAN and internal VLAN.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Monitor the packets added to the RSPAN VLAN port:

```
Switch(config)#monitor session 1 source remote vlan 4094
```

71.5 show monitor session

Description

The **show monitor session** command is used to display the configuration of port monitoring.

Syntax

show monitor session [*session_num*]

Parameter

session_num —— The monitor session number, can only be specified as 1. It is optional.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the monitoring configuration of monitor session 1:

```
Switch(config)# show monitor session 1
```

Chapter 72 ACL Commands

ACL (Access Control List) is used to filter data packets by configuring a series of match conditions, operations and time ranges. It provides a flexible and secured access control policy and facilitates you to control the network security.

72.1 access-list create

Description

The **access-list create** command is used to create an ACL.

Syntax

access-list create *acl-id* [**name** *acl-name*]

no access-list create { *acl-id***}**

Parameter

acl-id ——Enter an ACL ID. The IDs for MAC ACL are from 0 to 499. The IDs for IP ACL are from 500 to 999. The IDs for Combined ACL are from 1000 to 1499. The IDs for IPv6 ACL are from 1500 to 1999. The IDs for Packet Content ACL are from 2000 to 2499.

Note: Packet Content ACL is only available on certain devices.

acl-name —— Enter a name to identify the ACL.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create an IP ACL whose ID is 523:

```
Switch(config)# access-list create 523
```

72.2 access-list packet-content profile

Note: This command is only available on certain devices.

Description

The **access-list packet-content profile** command is used to specify the offset of each chunk. There are four chunks to be configured. They must be configured before you configure the chunk value&mask.

Syntax

access-list packet-content profile chunk-offset0 *offset0* **chunk-offset1** *offset1* **chunk-offset2** *offset2* **chunk-offset3** *offset3*

Parameter

offset0 -offset3: Specify the offset of each chunk. The value ranges from 0 to 31. When the offset is set as 31, it matches the first 127,128, 1, 2 bytes of the packet; when the offset is set as 0, it matches the 3, 4, 5, 6 bytes, and so on, for the rest of the offset value.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure a packet content profile with offset 0,1,2,3:

```
Switch(config)# access-list packet-content profile chunk-offset0 0
chunk-offset1 1 chunk-offset2 2 chunk-offset3 3
```

72.3 access-list resequence

Description

The **access-list resequence** command is used to resequence the rules by providing a Start Rule ID and Step value.

Syntax

access-list resequence *acl-id-or-name* **start** *start-rule-id* **step** *rule-id-step-value*

Parameter

acl-id-or-name —— The ACL ID or name.

start-rule-id —— The start rule ID.

rule-id-step-value —— The step value.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Resequence the rules of ACL 12 with the start ID as 1 and step value as 5:

```
Switch(config)# access-list resequence 12 start 1 step 5
```

72.4 access-list mac

Description

The **access-list mac** command is used to create MAC ACL. To delete the MAC ACL, please use **no access-list mac**.

Syntax

access-list mac *acl-id-or-name* **rule {** auto | *rule-id***} {** deny | permit **} logging {**enable | disable**} [smac** *source-mac* **smask** *source-mac-mask* **] [dmac** *destination-mac* **dmask** *destination-mac-mask* **] [type** *ether-type***] [pri** *dot1p-priority***] [vid** *vlan-id***] [tseg** *time-range-name***]**

no access-list mac *acl-id-or-name* **rule** *rule-id*

Parameter

acl-id-or-name —— Enter the ID or name of the ACL that you want to add a rule for.

auto —— The rule ID will be assigned automatically and the interval between rule IDs is 5.

rule-id —— Assign an ID to the rule.

deny | permit —— Specify the action to be taken with the packets that match the rule. By default, it is set to permit. The packets will be discarded if “deny” is selected and forwarded if “permit” is selected.

enable | disable —— Enable or disable Logging function for the ACL rule. If "enable " is selected, the times that the rule is matched will be logged every 5 minutes. With ACL Counter trap enabled, a related trap will be generated if the matching times changes.

source-mac —— Enter the source MAC address. The format is FF:FF:FF:FF:FF:FF.

source-mac-mask —— Enter the mask of the source MAC address. This is required if a source MAC address is entered. The format is FF:FF:FF:FF:FF:FF.

destination-mac —— Enter the destination MAC address. The format is FF:FF:FF:FF:FF:FF.

destination-mac-mask —— Enter the mask of the destination MAC address. This is required if a destination MAC address is entered. The format is FF:FF:FF:FF:FF:FF.

ether-type —— Specify an Ethernet-type with 4 hexadecimal numbers.

dot1p-priority: The user priority ranges from 0 to 7. The default is No Limit.

vlan-id —— The VLAN ID ranges from 1 to 4094.

time-range-name —— The name of the time-range. The default is No Limit.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create MAC ACL 50 and configure Rule 5 to permit packets with source MAC address 00:34:a2:d4:34:b5:

Switch (config)#access-list create 50

Switch (config-mac-acl)#access-list mac 50 **rule** 5 **permit logging disable smac** 00:34:a2:d4:34:b5 **smask** ff:ff:ff:ff:ff:ff

72.5 access-list ip

Description

The **access-list ip** command is used to add IP ACL rule. To delete the corresponding rule, please use **no access-list ip** command. IP ACLs analyze and process data packets based on a series of match conditions, which can be the source IP addresses and destination IP addresses carried in the packets.

Syntax

access-list ip *acl-id-or-name* **rule {**auto **|** *rule-id***} {**deny | permit**} logging {**enable | disable**} [sip** *sip-address* **sip-mask** *sip-address-mask* **] [dip** *dip-address* **dip-mask** *dip-address-mask* **] [dscp** *dscp-value***] [tos** *tos-value***]**

[pre *pre-value***] [frag** enable | disable**] [protocol** *protocol***/[s-port** *s-port-number***] [s-port-mask** *s-port-mask***] [d-port** *d-port-number***] [d-port-mask** *d-port-mask***] [tcpflag** *tcpflag***]] [tseg** *time-range-name***] [vrf** *vrf-name***]**

no access-list ip *acl-id-or-name* **rule** *rule-id*

Parameter

acl-id-or-name —— Enter the ID or name of the ACL that you want to add a rule for.

auto —— The rule ID will be assigned automatically and the interval between rule IDs is 5.

rule-id —— Assign an ID to the rule.

deny | permit —— Specify the action to be taken with the packets that match the rule. By default, it is set to permit. The packets will be discarded if “deny” is selected and forwarded if “permit” is selected.

logging {enable | disable**}** —— Enable or disable Logging function for the ACL rule. If "enable " is selected, the times that the rule is matched will be logged every 5 minutes. With ACL Counter trap enabled, a related trap will be generated if the matching times changes.

sip-address —— Enter the source IP address.

sip-address-mask —— Enter the mask of the source IP address. This is required if a source IP address is entered.

dip-address —— Enter the destination IP address.

dip-address-mask —— Enter the mask of the destination IP address. This is required if a destination IP address is entered.

dscp-value —— Specify the DSCP value between 0 and 63.

tos-value ——Specify an IP ToS value to be matched between 0 and 15.

pre-value ——Specify an IP Precedence value to be matched between 0 and 7.

frag {enable | disable} —— Enable or disable matching of fragmented packets. The default is disable. When enabled, the rule will apply to all fragmented packets and always permit to forward the last fragment of a packet.

Note: frag {enable | disable} is only available on certain devices.

protocol —— Specify a protocol type.

s-port-number —— Specify the source port number.

s-port-mask —— Specify the source port mask with 4 hexadecimal numbers.

d-port-number —— Specify the destination port number.

d-port-mask —— Specify the destination port mask with 4 hexadacimal numbers.

tcpflag —— For TCP protocol, specify the flag value using either binary numbers or * (for example, 01*010*). The default is *, which indicates that the flag will not be matched. The flags are URG (Urgent flag), ACK (acknowledge flag), PSH(push flag), RST(reset flag),SYN(synchronize flag), and FIN(finish flag).

time-range-name —— The name of the time-range. The default is No Limit.

vrf-name —— VRF instance name.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create IP ACL 600, and configure Rule 1 to permit packets with source IP address 192.168.1.100 and VRF v1:

Switch (config)#access-list create 600

Switch (config)#access-list ip 600 **rule** 1 permit **logging** disable **vrf** v1 **sip** 192.168.1.100 **sip-mask** 255.255.255.255

72.6 access-list combined

Description

The **access-list combined** command is used to add Combined ACL rule. To delete the corresponding rule, please use **no access-list extended** command.

Syntax

access-list combined *acl-id-or-name* **rule** {auto | *rule-id*} {deny | permit} **logging** {enable | disable} [**smac** *source-mac-address* **smask** *source-mac-mask*] [**dmac** *dest-mac-address* **dmask** *dest-mac-mask*] [**vid** *vlan-id*] [**type** *ether-type*] [**pri** *priority*] [**sip** *source-ip-address* **sip-mask** *source-ip-mask*]] [**dip** *destination-ip-address* **dip-mask** *destination-ip-mask*] **[dscp** *dscp-value***] [tos** *tos-value***] [pre** *pre-value***] [protocol** *protocol***/[s-port** *s-port-number* **s-port-mask** *s-port-mask***] [d-port** *d-port-number*

d-port-mask *d-port-mask*] **[tcpflag** *tcpflag*]] **[tseg** *time-range-name*] **[vrf** *vrf-name*]

no access-list combined *acl-id-or-name* **rule** *rule-id*

Parameter

acl-id-or-name —— Enter the ID or name of the ACL that you want to add a rule for.

auto —— The rule ID will be assigned automatically and the interval between rule IDs is 5.

rule-id —— Assign an ID to the rule.

deny | permit —— Specify the action to be taken with the packets that match the rule. By default, it is set to permit. The packets will be discarded if “deny” is selected and forwarded if “permit” is selected.

logging {enable | disable} —— Enable or disable Logging function for the ACL rule. If "enable " is selected, the times that the rule is matched will be logged every 5 minutes. With ACL Counter trap enabled, a related trap will be generated if the matching times changes.

source-mac-address —— Enter the source MAC address.

source-mac-mask —— Enter the source MAC address mask.

dest-mac-address —— Enter the destination MAC address.

dest-mac-mask —— Enter the destination MAC address mask. This is required if a destination MAC address is entered.

vlan-id: The VLAN ID ranges from 1 to 4094.

ether-type —— Specify the Ethernet-type with 4 hexadecimal numbers.

priority —— The user priority ranges from 0 to 7. The default is No Limit.

source-ip: Enter the source IP address.

source-ip-mask —— Enter the mask of the source IP address. It is required if source IP address is entered.

destination-ip —— This is required if a source IP address is entered.

destination-ip-mask —— Enter the destination IP address mask. This is required if a destination IP address is entered.

dscp-value —— Specify the DSCP value between 0 and 63.

tos-value ——Specify an IP ToS value to be matched between 0 and 15.

pre-value ——Specify an IP Precedence value to be matched between 0 and 7.

protocol —— Specify a protocol type.

s-port-number —— Specify the source port number.

s-port-mask —— Specify the source port mask with 4 hexadecimal numbers.

d-port-number —— Specify the destination port number.

d-port-mask —— Specify the destination port mask with 4 hexadecimal numbers.

tcpflag —— For TCP protocol, specify the flag value using either binary numbers or * (for example, 01*010*). The default is *, which indicates that the flag will not be matched. The flags are URG (Urgent flag), ACK (acknowledge flag), PSH(push flag), RST(reset flag),SYN(synchronize flag), and FIN(finish flag).

time-range-name —— The name of the time-range. The default is No Limit.

vrf-name—— VRF instance name.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create Combined ACL 1100 and configure Rule 1 to deny packets with source IP address 192.168.3.100 and VRF v1 in VLAN 2:

Switch(config)# access-list create 1100

Switch(config)# access-list combined 1100 **rule** 1 permit **logging** disable

vid 2 **vrf** v1 **sip** 192.168.3.100 **sip-mask** 255.255.255.255

72.7 access-list ipv6

Description

The **access-list ipv6** command is used to add IPv6 ACL rule. To delete the corresponding rule, please use **no access-list ipv6** command. IPv6 ACLs analyze and process data packets based on a series of match conditions, which can be the source IP addresses and destination IP addresses carried in the packets, the DSCP and flow-label value, etc.

Syntax

access-list ipv6 *acl-id-or-name* **rule** {auto | *rule-id*} {deny | permit} **logging** {enable | disable} [**class** *class-value*] [**flow-label** *flow-label-value*] [**sip**

source-ip-address **sip-mask** *source-ip-mask*] [**dip** *destination-ip-address* **dip-mask** *destination-ip-mask*] [**s-port** *source-port-number*] [**d-port** *destination-port-number*] [**tseg** *time-range-name*] **[vrf** *vrf-name***]**

no access-list ipv6 *acl-id-or-name* **rule** *rule-id*

Parameter

acl-id-or-name —— Enter the ID or name of the ACL that you want to add a rule for.

auto —— The rule ID will be assigned automatically and the interval between rule IDs is 5.

rule-id —— Assign an ID to the rule.

deny | permit —— Specify the action to be taken with the packets that match the rule. By default, it is set to permit. The packets will be discarded if “deny” is selected and forwarded if “permit” is selected.

logging {enable | disable} —— Enable or disable Logging function for the ACL rule. If "enable " is selected, the times that the rule is matched will be logged every 5 minutes. With ACL Counter trap enabled, a related trap will be generated if the matching times changes.

class-value —— Specify a class value to be matched. It ranges from 0 to 63.

flow-label-value —— Specify a Flow Label value to be matched.

source-ip-address —— Enter the source IP address. Enter the destination IPv6 address to be matched. All types of IPv6 address will be checked. You may enter a complete 128-bit IPv6 address but only the first 64 bits will be valid.

source-ip-mask —— Enter the source IP address mask. The mask is required if the source IPv6 address is entered. Enter the mask in complete format (for example, ffff:ffff:0000:ffff). The mask specifies which bits in the source IPv6 address to match the rule.

destination-ip-address —— Enter the destination IPv6 address to be matched. All types of IPv6 address will be checked. You may enter a complete 128-bit IPv6 addresses but only the first 64 bits will be valid.

destination-ip-mask: Enter the source IP address mask. The mask is required if the source IPv6 address is entered. Enter the mask in complete format (for example, ffff:ffff:0000:ffff). The mask specifies which bits in the source IPv6 address to match the rule.

source-port-number —— Enter the TCP/UDP source port if TCP/UDP protocol is selected.

destination-port-number —— Enter the TCP/UDP destination port if TCP/UDP protocol is selected.

time-range-name —— The name of the time-range. The default is No Limit.

vrf-name —— VRF instance name.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

User Guidelines

Before binding an IPv6 ACL to a VLAN or interface, you should configure the SDM template as "enterpriseV6" and save your configurations.

Example

Create IPv6 ACL 1600 and configure Rule 1 to deny packets with source IPv6 address CDCD:910A:2222:5498:8475:1111:3900:2020 and VRF v1:

Switch(config)# access-list create 1600

Switch(config)# access-list ipv6 1600 **rule** 1 deny **logging** disable **vrf** v1 **sip** CDCD:910A:2222:5498:8475:1111:3900:2020 **sip-mask** ffff:ffff:ffff:ffff

72.8 access-list packet-content config

Note: This command is only available on certain devices.

Description

The **access-list packet-content config** command is used to add Packet Content ACL rule. To delete the corresponding rule, please use **no access-list packet-content config** command. Packet content ACLs analyze and process data packets based on 4 chunk match conditions, each chunk can specify a user-defined 4-byte segment carried in the packet's first 128 bytes.

Syntax

access-list packet-content config *acl-id-or-name* **rule {**auto / *rule-id***} {**deny | permit**} logging {**enable | disable**}** [**chunk0** *value* **mask0** *mask*] [**chunk1** *value*

mask1 *mask*] [**chunk2** *value* **mask2** *mask*] [**chunk3** *value* **mask3** *mask*] [**tseg** *time-segment*]

no access-list packet-content config *acl-id-or-name* **rule** *rule-id*

Parameter

acl-id-or-name —— Enter the ID or name of the ACL that you want to add a rule for.

auto —— The rule ID will be assigned automatically and the interval between rule IDs is 5.

rule-id —— Assign an ID to the rule.

deny | permit —— Specify the action to be taken with the packets that match the rule. Deny means to discard; permit means to forward. By default, it is set to permit.

logging {enable | disable} —— Enable or disable Logging function for the ACL rule. If "enable" is selected, the times that the rule is matched will be logged every 5 minutes. With ACL Counter trap enabled, a related trap will be generated if the matching times changes.

value —— Specify the chunk value, ranging from 0-ffffffff.

mask ——Specify the chunk mask, ranging from 0-ffffffff. Chunk mask here must be written completely in 4-byte hex mode, like '0000ffff'.

time-segment —— The name of the time-range. The default is No Limit.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create a packet-content ACL rule with all 4 chunks configured, the rule id is 1 and the default action is permit:

SwitchSwitch(config)# access-list packet-content config rule 1 permit **logging** disable **chunk0** 45ea **mask0** 0000ffff **chunk1** 1111ffff **mask1** ffffffff **chunk2** ee34 **mask2** ffff0000 **chunk3** 7878 **mask3** 000ffae3

72.9 access-list action

Description

The **access-list action** command is used to specify a rule to be configured with policies and enter Action Configuration mode. To delete the corresponding policies, please use **no access-list action** command.

Syntax

access-list action *acl-id-or-name* **rule** *rule-id*

no access-list action *acl-id-or-name* **rule** *rule-id*

Parameter

acl-id-or-name —— Enter the ID or name of the ACL.

rule-id —— Enter the ID of the ACL rule.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the rule 1 of ACL 200 to be configured with policies:

```
Switch(config)# access-list action 200 rule 1
```

72.10 redirect

Description

This command is used to configure the operation of the action for ACL. For packets matched by the ACL, they are rerouted to a specified next-hop exit according to the policy routing rules. If the next hop VRF of the redirect is not specified, the public network is used by default.

Syntax

redirect { nexthop | ipv6nexthop} *ip-address* [**vrf** *vrf-name*]

Parameter

nexthop: Indicates that the next hop address for the matched packet in policy routing is an IPv4 address.

ipv6nexthop: Indicates that the next hop address for the matched packet in policy routing is an IPv6 address.

ip-address: IP address.

vrf-name: The VRF instance to which the next hop of redirect belongs.

Command Mode

Action Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the PBR rule and redirect the next hop to VRF instance v1:

```
Switch (config-action)#redirect ipv6nexthop 4200::99 vrf v1
Switch(config-action)#redirect nexthop 1.1.1.1 vrf v1
```

72.11 s-condition

Description

The **s-condition** command is used to limit the rate of the matched packets. To restore the settings to the defaults, please use **no s-condition**.

Syntax

s-condition rate *rate* **burst** *burst-size* **osd { none | discard | remark dscp** *dscp* **}**

no s-condition

Parameter

rate —— Specify a rate, ranging from 0 to 1000000kbps.

burst-size —— Specify the number of bytes allowed in one second ranging from 1 to 128.

osd ——Select either “none” or “discard” as the action to be taken for the packets whose rate is beyond the specified rate. The default is None. When “remark dscp” is selected, you also need to specify the DSCP value for the matched packets. The DSCP value ranges from 0 to 63.

Note: Remark DSCP is only available on certain devices.

Command Mode

Action Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure a policy for rule 1 of ACL 6: limit the transmission rate of the matched packets as 1000 Kbps and if the number of bytes per second is beyond 100, the packets will be discarded by the switch:

Switch(config)#access-list action 6 **rule** 1

Switch(config-action)# s-condition rate 1000 **burst** 100 **osd** discard

72.12 s-mirror

Description

The **s-mirror** command is used to define the policy to mirror the matched packets to the desired port. To disable this policy, please use **no s-mirror** command.

Syntax

s-mirror interface { **fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port* }

Parameter

port—— The destination port to which the packets will be mirrored.

Command Mode

Action Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure a policy for rule 1 of ACL 6: specify the mirror port as Gigabit Ethernet port 1/0/2 for the data packets matching this rule:

Switch(config)#access-list action 6 **rule** 1

Switch(config-action)#s-mirror interface gigabitEthernet 1/0/2

72.13 qos-remark

Description

The **qos-remark** command is used to configure QoS Remark function of policy action. To restore the settings to the default, please use no **qos-remark**.

Syntax

qos-remark [**dscp** *dscp*] [**priority** *pri*] [**dot1p** dot1p-pri]

no qos-remark

Parameter

dscp —— DSCP of QoS Remark. Specify the DSCP region for the data packets matching the corresponding ACL. DSCP ranges from 0 to 63. By default, it is not limited.

pri —— Local Priority of QoS Remark. Specify the local priority for the data packets matching the corresponding ACL. Local Priority ranges from 0 to 7.

dot1p-pri —— 802.1P priority of QoS Remark. This remark configuration will change the data packet's 802.1P priority field to the dot1p-pri you set. 802.1P priority ranges from 0 to 7.

Note: The DSCP and dot1p cannot be configured at the same time.

Command Mode

Action Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure a policy for rule 1 of ACL 6: specify the DSCP region as 30 and local priority 2 for the packets matching this rule:

```
Switch(config)#access-list action 6 rule 1
Switch(config-action)# qos-remark dscp 30 priority 2
```

72.14 access bind

Description

The **access-list policy name** command is used to add Policy. To delete the corresponding Policy, please use **no access-list policy name** command. A Policy is used to control the data packets those match the corresponding ACL rules.

Syntax

access-list bind *acl-id-or-name* **interface { [vlan** *vlan-list* **] | [fastEthernet** *port-list* **] | [gigabitEthernet** *port-list* **] | [ten-gigabitEthernet** *port-list* **] }**

no access-list bind *acl-id-or-name* **interface { [vlan** *vlan-list* **] | [fastEthernet** *port-list* **] | [gigabitEthernet** *port-list* **] | [ten-gigabitEthernet** *port-list* **] }**

Parameter

acl-id-or-name —— Enter the ID or name of the ACL that you want to add a rule for.

vlan-list —— Specify the ID or the ID list of the VLAN(s) that you want to bind the ACL to. The valid values are from 1 to 4094, for example, 2-3,5.

port-list —— Specify the number or the list of the Ethernet port that you want to bind the ACL to.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Bind ACL 1 to port 3 and VLAN 4:

```
Switch(config)#access-list bind 1 interface vlan 4 gigabitEthernet 1/0/3
```

72.15 show access-list

Description

The **show access-list** command is used to display configuration of ACL.

Syntax

show access-list *acl-id-or-name*

Parameter

acl-id-or-name —— The ID or name of the ACL selected to display the configuration.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of the MAC ACL whose ID is 20:

```
Switch(config)# show access-list 20
```

72.16 show access-list bind

Description

The **show access-list bind** command is used to display the configuration of ACL binding.

Syntax

show access-list bind

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of Policy bind:

```
Switch(config)# show access-list bind
```

72.17 show access-list status

Description

The **show access-list status** command is used to display usage status of ACL entry resource.

Syntax

show access-list status

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the usage status of ACL entry resource:

```
Switch(config)# show access-list status
```

72.18 show access-list counter

Description

The **show access-list counter** command is used to display the packet counter of a specified ACL.

Syntax

show access-list *acl-id-or-name* **counter**

Parameter

acl-id-or-name —— The ID or name of the ACL to display.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the packet counter of ACL 100:

```
Switch(config)# show access-list 100 counter
```

72.19 clear access-list

Description

The **clear access-list** command is used to clear the counter of matched packets of a specified ACL or rule.

Syntax

clear access-list *acl-id-or-name* **[rule** *rule-id***]**

Parameter

acl-id-or-name —— The ID or name of the ACL.

rule-id—— The ID of the rule.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Clear the packet counter of ACL 100:

```
Switch(config)# clear access-list 100
```

Chapter 73 IPv4 IMPB Commands

You can bind the IP address, MAC address, VLAN and the connected Port number of the Host together, which can be the condition for the ARP Inspection and IP verify source to filter the packets.

73.1 ip source binding

Description

The **ip source binding** command is used to bind the IP address, MAC address, VLAN ID and the Port number together manually. You can manually bind the IP address, MAC address, VLAN ID and the Port number together in the condition that you have got the related information of the Hosts in the LAN. To delete the IP-MAC–VID-PORT entry from the binding table, please use **no ip source binding index** command.

Syntax

ip source binding *hostname ip-addr mac-addr* **vlan** *vlan-id* **interface** { **fastEthernet** *port* **| gigabitEthernet** *port* **| ten-gigabitEthernet** *port* **| port-channel** *port-channel-id*} { none | arp-detection | ip-verify-source | both }

no ip source binding index *ip-addr*

Parameter

hostname——The Host Name, which contains 20 characters at most.

ip-addr—— The IP address of the Host.

mac-addr—— The MAC address of the Host.

vlan-id——The VLAN ID needed to be bound, ranging from 1 to 4094.

port—— The number of port connected to the Host.

none | arp-detection | ip-verify-source | both ——The protect type for the entry. “arp-detection” indicates ARP detection; “ip-verify-source” indicates IP source filter; “none” indicates applying none; “both” indicates applying both.

ip-addr—— The IP address of the entry to be deleted.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Bind an ACL entry with the IP 192.168.0.1, MAC 00:00:00:00:00:01, VLAN ID 2 and the Port number 5 manually. And then enable the entry for the ARP detection:

Switch(config)#ip source binding host1 192.168.0.1 00:00:00:00:00:01 **vlan** 2 **interface gigabitEthernet** 1/0/5 arp-detection

Delete the IP-MAC–VID-PORT entry with the index 5:

Switch(config)#no ip source binding index 5

73.2 ip dhcp snooping

Description

The **ip dhcp snooping** command is used to enable DHCP Snooping function globally. To disable DHCP Snooping function globally, please use **no ip dhcp snooping** command. DHCP Snooping functions to monitor the process of the Host obtaining the IP address from DHCP server, and record the IP address, MAC address, VLAN and the connected Port number of the Host for automatic binding.

Syntax

ip dhcp snooping

no ip dhcp snooping

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCP Snooping function globally:

Switch(config)#ip dhcp snooping

73.3 ip dhcp snooping vlan

Description

The **ip dhcp snooping vlan** command is used to enable DHCP Snooping function on a specified VLAN. To disable DHCP Snooping function on this VLAN, please use **no ip dhcp snooping vlan** command.

Syntax

ip dhcp snooping vlan *vlan-range*

no ip dhcp snooping vlan *vlan-range*

Parameter

vlan-range —— Specify the VLANs to enable the DHCP snooping function, in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCP Snooping function on VLAN 1,4,6-7:

```
Switch(config)#ip dhcp snooping vlan 1,4,6-7
```

73.4 ip dhcp snooping max-entries

Description

The **ip dhcp snooping max-entries** command is used to configure the maximum number of entries that can be learned on a port via DHCP Snooping. To restore to the default setting, please use **no ip dhcp snooping max-entries** command.

Syntax

ip dhcp snooping max-entries *value*

no ip dhcp snooping max-entries

Syntax

value —— Enter the value of maximum number of entries that can be learned on the port via DHCP Snooping.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum number of entries that can be learned on port 1 as 100:

Switch(config)#interface gigabitEthernet 1/0/1

Switch(config-if)#ip dhcp snooping max-entries 100

73.5 ip dhcp snooping trust

Description

The **ip dhcp snooping trust** command is used to configure the trust status of a specified interface, and only DHCP Server connected to a trusted port can assign packets to clients. To delete the status, please use **no ip dhcp snooping trust** command.

Syntax

ip dhcp snooping trust

no ip dhcp snooping trust

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable DHCP Snooping trust function for port 1/0/3:

```
Switch(config)#interface gigabitEthernet 1/0/3
Switch(config-if)#ip dhcp snooping trust
```

73.6 show ip source binding

Description

The **show ip source binding** command is used to display the IP-MAC-VID-PORT binding table.

Syntax

show ip source binding

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IP-MAC-VID-PORT binding table:

```
Switch(config)#show ip source binding
```

73.7 show ip dhcp snooping

Description

The **show ip dhcp snooping** command is used to display the running status of DHCP Snooping.

Syntax

show ip dhcp snooping

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the running status of DHCP Snooping:

Switch#show ip dhcp snooping

73.8 show ip dhcp snooping interface

Description

The **show ip dhcp snooping interface** command is used to display the DHCP Snooping configuration of a desired Gigabit Ethernet port/port channel or of all Ethernet ports/port channels.

Syntax

show ip dhcp snooping interface [**gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameters

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DHCP Snooping configuration of all Ethernet ports and port channels:

Switch#show ip dhcp snooping interface

Display the DHCP Snooping configuration of Gigabit Ethernet port 1/0/5:

Switch#show ip dhcp snooping interface gigabitEthernet 1/0/5

Chapter 74 IPv6 IMPB Commands

You can bind the IPv6 address, MAC address, VLAN and the connected Port number of the Host together, which can be the condition for the ARP Inspection and IP verify source to filter the packets.

74.1 ipv6 source binding

Description

The **ipv6 source binding** command is used to bind the IPv6 address, MAC address, VLAN ID and the Port number together manually. You can manually bind the IPv6 address, MAC address, VLAN ID and the Port number together in the condition that you have got the related information of the Hosts in the LAN. To delete the IPv6-MAC–VID-PORT entry from the binding table, please use **no ipv6 source binding index** command.

Syntax

ipv6 source binding *hostname ipv6-addr mac-addr* **vlan** *vlan-id* **interface** { **fastEthernet** *port* **| gigabitEthernet** *port* **| ten-gigabitEthernet** *port* **| port-channel** *port-channel-id*} { none | nd-detection | ipv6-verify-source | both }

no ipv6 source binding index *ipv6-addr*

Parameter

hostname ——The Host Name, which contains 20 characters at most.

Ipv6-addr —— The IP address of the Host.

mac-addr —— The MAC address of the Host.

vlan-id ——The VLAN ID needed to be bound, ranging from 1 to 4094.

port —— The number of port connected to the Host.

none | nd-detection | ipv6-verify-source | both ——The protect type for the entry. “nd-detection” indicates ND detection; “ipv6-verify-source” indicates IPv6 source filter; “none” indicates applying none; “both” indicates applying both.

Ipv6-addr —— The IPv6 address of the entry to be deleted.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

The following example shows how to bind an entry with the hostname host1, IPv6 address 2001:0:9d38:90d5::34, MAC address AA-BB-CC-DD-EE-FF, VLAN ID 10, port number 1/0/5, and enable this entry for ND Detection.

Switch(config)# ipv6 source binding host1 2001:0:9d38:90d5::34 aa:bb:cc:dd:ee:ff **vlan** 10 **interface gigabitEthernet** 1/0/5 nd-detection

74.2 ipv6 dhcp snooping

Description

The **ipv6 dhcp snooping** command is used to enable DHCPv6 Snooping function globally. To disable DHCPv6 Snooping function globally, please use **no ipv6 dhcp snooping** command. DHCPv6 Snooping functions to monitor the process of the Host obtaining the IP address from DHCPv6 server, and record the IPv6 address, MAC address, VLAN and the connected Port number of the Host for automatic binding.

Syntax

ipv6 dhcp snooping

no ipv6 dhcp snooping

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCPv6 Snooping function globally:

Switch(config)#ipv6 dhcp snooping

74.3 ipv6 dhcp snooping vlan

Description

The **ipv6 dhcp snooping vlan** command is used to enable DHCP Snooping function on a specified VLAN. To disable DHCP Snooping function on this VLAN, please use **no ipv6 dhcp snooping vlan** command.

Syntax

ipv6 dhcp snooping vlan *vlan-range*

no ipv6 dhcp snooping vlan *vlan-range*

Parameter

vlan-range —— Specify the VLANs to enable the DHCP snooping function, in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCPv6 Snooping function on VLAN 1,4,6-7:

```
Switch(config)#ipv6 dhcp snooping vlan 1,4,6-7
```

74.4 ipv6 dhcp snooping max-entries

Description

The **ipv6 dhcp snooping max-entries** command is used to configure the maximum number of entries that can be learned on a port via DHCPv6 Snooping. To restore to the default setting, please use **no ipv6 dhcp snooping max-entries** command.

Syntax

Ipv6 dhcp snooping max-entries *value*

no ipv6 dhcp snooping max-entries

Syntax

value: Enter the value of maximum number of entries that can be learned on the port via DHCPv6 Snooping.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum number of entries that can be learned on port 1 as 100:

Switch(config)#interface gigabitEthernet 1/0/1

Switch(config-if)#ipv6 dhcp snooping max-entries 100

74.5 ipv6 nd snooping

Description

The **ipv6 nd snooping** command is used to enable ND snooping function globally. To disable ND Snooping function globally, please use **no ipv6 nd snooping** command. ND Snooping functions to monitor the process of the duplication address detection, and record the IPv6 address, MAC address, VLAN and the connected Port number of the Host for automatic binding.

Syntax

ipv6 nd snooping

no ipv6 nd snooping

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the ND snooping function globally:

```
T160G-28TS(config)#ipv6 nd snooping
```

74.6 ipv6 nd snooping vlan

Description

The **ipv6 nd snooping vlan** command is used to enable ND snooping function on a specified VLAN. To disable ND Snooping function on this VLAN, please use **no ipv6 nd snooping vlan** command.

Syntax

ipv6 nd snooping vlan *vlan-range*

no ipv6 nd snooping vlan *vlan-range*

Parameter

vlan-range —— Specify the VLANs to enable the ND snooping function, in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the ND snooping function on VLAN 1,4,6-7:

```
Switch(config)#ipv6 nd snooping vlan 1,4,6-7
```

74.7 ipv6 nd snooping max-entries

Description

The **ipv6 nd snooping max-entries** command is used to specify the maximum number of binding entries that are allow to be bound to a port. To return the default, please use **no ipv6 nd snooping max-entries** command.

Syntax

ipv6 nd snooping max-entries *value*

no ipv6 nd snooping max-entries

Parameter

value —— Specify the maximum number of ND snooping entries on this interface.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum number of binding entries from ND Snooping of Gigabit Ethernet port 1/0/2 is 100:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#ipv6 nd snooping max-entries 100

74.8 show ipv6 source binding

Description

The **show ipv6 source binding** command is used to display the IPv6-MAC-VID- PORT binding table.

Syntax

show ipv6 source binding

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IPv6-MAC-VID-PORT binding table:

```
Switch(config)#show ipv6 source binding
```

74.9 show ipv6 dhcp snooping

Description

The **show ipv6 dhcp snooping** command is used to display the running status of DHCPv6 Snooping.

Syntax

show ipv6 dhcp snooping

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the running status of DHCPv6 Snooping:

```
Switch#show ipv6 dhcp snooping
```

74.10 show ipv6 dhcp snooping interface

Description

The **show ipv6 dhcp snooping interface** command is used to display the DHCPv6 Snooping configuration of a desired Gigabit Ethernet port/port channel or of all Ethernet ports/port channels.

Syntax

show ipv6 dhcp snooping interface [**gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameters

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DHCPv6 Snooping configuration of all Ethernet ports and port channels:

```
Switch#show ipv6 dhcp snooping interface
```

Display the DHCPv6 Snooping configuration of Gigabit Ethernet port 1/0/5:

```
Switch#show ipv6 dhcp snooping interface gigabitEthernet 1/0/5
```

74.11 show ipv6 nd snooping

Description

The **show ipv6 nd snooping** command is used to display the running status of ND Snooping.

Syntax

show ipv6 nd snooping

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the running status of ND Snooping:

```
Switch#show ipv6 nd snooping
```

74.12 show ipv6 nd snooping interface

Note: This command is only available on certain devices.

Description

The **show ipv6 nd snooping interface** command is used to display the ND Snooping configuration of a desired Gigabit Ethernet port/port channel or of all Ethernet ports/port channels.

Syntax

show ipv6 nd snooping interface [**gigabitEthernet** *port* | **port-channel** *port-channel-id*]

Parameters

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the ND Snooping configuration of all Ethernet ports and port channels:

Switch#show ipv6 nd snooping interface

Display the ND Snooping configuration of Gigabit Ethernet port 1/0/5:

Switch#show ipv6 nd snooping interface gigabitEthernet 1/0/5

Chapter 75 IP Verify Source Commands

IP Verify Source is to filter the IP packets based on the IP-MAC Binding entries. Only the packets matched to the IP-MAC Binding rules can be processed, which can enhance the bandwidth utility.

75.1 ip verify source

Description

The **ip verify source** command is used to configure the IP Verify Source mode for a specified port. To disable the IP Verify Source function, please use **no ip verify source** command.

Syntax

ip verify source { sip+mac | sip }

no ip verify source

Parameter

sip+mac —— Security type. "sip+mac" indicates that only the packets with its source IP address, source MAC address and port number matched to the IP-MAC binding rules can be processed.

sip —— Security type. "sip" indicates that only the packets with its source IP address and port number matched to the IP-MAC binding rules can be processed.

Note: sip is only available on certain devices.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IP Verify Source function for Gigabit Ethernet ports 5-10. Configure that only the packets with its source IP address, source MAC

address and port number matched to the IP-MAC binding rules can be processed:

```
Switch(config)#interface range gigabitEthernet 1/0/5-10
Switch(config-if-range)#ip verify source sip+mac
```

75.2 ip verify source logging

Description

The **ip verify source logging** command is used to enable the log feature. With this feature enabled, the switch will generate a log when illegal packets are received. To disable the log feature, please use **no ip verify source logging** command.

Syntax

ip verify source logging

no ip verify source logging

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the log feature to make the switch generate logs when receiving illegal packets:

```
Switch(config)#ip verify source logging
```

75.3 show ip verify source

Description

The **show ip verify source** command is used to display the IP Verify Source configuration information.

Syntax

show ip verify source

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IP Verify Source configuration information:

```
Switch(config)#show ip verify source
```

75.4 show ip verify source interface

Description

The **show ip verify source interface** command is used to display the IP verify source configuration of a desired Gigabit Ethernet port.

Syntax

show ip verify source interface [fastEthernet *port* **| gigabitEthernet** *port* **| ten-gigabitEthernet** *port* **| port-channel** *port-channel-id***]**

Parameters

port —— The Ethernet port number.

port-channel-id —— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IP verify source configuration of Gigabit Ethernet port 1/0/5:

```
Switch#show ip verify source interface gigabitEthernet 1/0/5
```

Chapter 76 IPv6 Verify Source Commands

IPv6 Verify Source is to filter the IPv6 packets based on the IPv6-MAC Binding entries. Only the packets matched to the IPv6-MAC Binding rules can be processed, which can enhance the bandwidth utility.

Before configuring IPv6 Verify Source feature, you should configure the SDM template as "enterpriseV6" and save your configurations.

76.1 ipv6 verify source

Description

The **ipv6 verify source** command is used to configure the IPv6 Verify Source mode for a specified port. To disable the IPv6 Verify Source function, please use **no ipv6 verify source** command.

Syntax

ipv6 verify source { sipv6+mac | sipv6 }

no ipv6 verify source

Parameter

sipv6+mac —— Security type. "sipv6+mac" indicates that only the packets with its source IPv6 address, source MAC address and port number matched to the IPv6-MAC binding rules can be processed.

sipv6 —— Security type. "sipv6" indicates that only the packets with its source IPv6 address and port number matched to the IPv6-MAC binding rules can be processed.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the IPv6 Verify Source function for Gigabit Ethernet ports 5-10. Configure that only the packets with its source IPv6 address, source MAC

address and port number matched to the IPv6-MAC binding rules can be processed:

```
Switch(config)#interface range gigabitEthernet 1/0/5-10
Switch(config-if-range)#ipv6 verify source sipv6+mac
```

76.2 show ipv6 verify source

Description

The **show ipv6 verify source** command is used to display the IPv6 Verify Source configuration information.

Syntax

show ipv6 verify source

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IPv6 Verify Source configuration information:

```
Switch(config)#show ipv6 verify source
```

76.3 show ipv6 verify source interface

Description

The **show ipv6 verify source interface** command is used to display the IPv6 verify source configuration of a desired Gigabit Ethernet port.

Syntax

show ipv6 verify source interface gigabitEthernet *port*

Parameters

port—— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the IPv6 verify source configuration of Gigabit Ethernet port 1/0/5:

Switch#show ipv6 verify source interface gigabitEthernet 1/0/5

Chapter 77 DHCPv4 Filter Commands

DHCPv4 Filter function allows the user to not only to restrict all DHCP Server packets but also to receive any specified DHCP server packet by any specified DHCP client, it is useful when one or more DHCP servers are present on the network and both provide DHCP services to different distinct groups of clients.

77.1 ip dhcp filter

Description

The **ip dhcp filter** command is used to enable DHCP Filter function globally. To disable DHCP Filter function globally, please use **no ip dhcp filter** command.

Syntax

ip dhcp filter

no ip dhcp filter

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCP Filter function globally:

```
Switch(config)#ip dhcp filter
```

77.2 ip dhcp filter (interface)

Description

The **ip dhcp filter (interface)** command is used to enable DHCP Filter function on a specified port. To disable DHCP Filter function on this port, please use **no ip dhcp filter (interface)** command.

Syntax

ip dhcp filter

no ip dhcp filter

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCP Filter on port 1/0/1

```
Switch(config)#interface gigabitEthernet 1/0/1
Switch(Config-if)#ip dhcp filter
```

77.3 ip dhcp filter mac-verify

Description

The **ip dhcp filter mac-verify** command is used to enable the MAC Verify feature. To disable the MAC Verify feature, please use **no ip dhcp filter mac-verify** command. There are two fields of the DHCP packet containing the MAC address of the Host. The MAC Verify feature is to compare the two fields and discard the packet if the two fields are different.

Syntax

ip dhcp filter mac-verify

no ip dhcp filter mac-verify

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the MAC Verify feature for the Gigabit Ethernet port 10/2:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#ip dhcp filter mac-verify

77.4 ip dhcp filter limit rate

Description

The **ip dhcp filter limit rate** command is used to enable the Flow Control feature for the DHCP packets. The excessive DHCP packets will be discarded. To restore to the default configuration, please use **no ip dhcp filter limit rate** command.

Syntax

ip dhcp filter limit rate *value*

no ip dhcp filter limit rate

Parameter

value —— The value of Flow Control. The options are 5/10/15/20/25/30 (packet/second). The default value is 0, which stands for "disable".

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the Flow Control of GigabitEthernet port 2 as 20 pps:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#ip dhcp filter limit rate 20

77.5 ip dhcp filter decline rate

Description

The **ip dhcp filter decline rate** command is used to enable the Decline Protect feature and configure the rate limit on DHCP Decine packets. The excessive DHCP Decline packets will be discarded. To disable the Decline Protect feature, please use **no ip dhcp filter decline rate** command.

Syntax

ip dhcp filter decline rate *value*

no ip dhcp filter decline rate

Parameter

value —— Specify the rate limit of DHCP Decline packets, and the optional values are 0, 5, 10, 15, 20, 25 and 30 (units:packet/second). It default value is 0, which stands for “disable”.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the rate limit of DHCP Decline packets as 20 packets per second on Gigabit Ethernet port 1/0/2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)#ip dhcp filter decline rate 20
```

77.6 ip dhcp filter server permit-entry

Description

The **ip dhcp filter server permit-entry** command is used to add entry for the legal DHCP server. To restore to the default option, please use **no ip dhcp snooping information strategy** command.

Syntax

ip dhcp filter server permit-entry server-ip *ipAddr* **client-mac** *macAddr* **interface { fastEthernet** *port* **| gigabitEthernet port | ten-gigabitEthernet** *port* **| interface port-channel** *port-channel-id***}**

no ip dhcp filter server permit-entry server-ip *ipAddr* **client-mac** *macAddr* **interface { fastEthernet** *port* **| gigabitEthernet port | ten-gigabitEthernet** *port* **| interface port-channel** *port-channel-id***}**

Parameter

ipAddr —— Specify the IP address of the legal DHCPv4 server.

macAddr —— Specify the MAC address of the DHCP Client. The value "all" means all client mac addresses.

port-list / *port-channel-id* —— Specify the port that the legal DHCPv4 server is connected to.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create an entry for the legal DHCPv4 server whose IP address is 192.168.0.100 and connected port number is 1/0/1 without client MAC address restricted:

```
Switch(config)#ip dhcp filter server permit-entry server-ip 192.168.0.100
client-mac all interface gigabitEthernet 1/0/1
```

77.7 show ip dhcp filter

Description

The **show ip dhcp filter** command is used to display the configuration of DHCP Filter.

Syntax

show ip dhcp filter

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DHCP Filter configuration:

Switch#show ip dhcp filter

77.8 show ip dhcp filter interface

Description

The **show ip dhcp filter interface** command is used to display the configuration of DHCP Filter on ports.

Syntax

show ip dhcp filter interface [fastEthernet *port* **| gigabitEthernet** *port* **| ten-gigabitEthernet** *port* **| port-channel** *port-channel-id* **]**

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DHCP Filter configuration on port 1/0/3:

Switch#show ip dhcp filter interface gigabitEthernet 1/0/3

77.9 show ip dhcp filter server permit-entry

Description

The **show ip dhcp filter server permit-entry** command is used to display the legal server configuration.

Syntax

show ip dhcp filter server permit-entry

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the legal DHCP server configuration:

```
Switch#show ip dhcp filter server permit-entry
```

Chapter 78 DHCPv6 Filter Commands

DHCPv6 Filter function allows the user to not only to restrict all DHCPv6 Server packets but also to receive any specified DHCPv6 server packet by any specified DHCPv6 client, it is useful when one or more DHCPv6 servers are present on the network and both provide DHCPv6 services to different distinct groups of clients.

78.1 ipv6 dhcp filter

Description

The **ipv6 dhcp filter** command is used to enable DHCP Filter function globally. To disable DHCPv6 Filter function globally, please use **no ipv6 dhcp filter** command.

Syntax

ipv6 dhcp filter

no ipv6 dhcp filter

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCPv6 Filter function globally:

```
Switch(config)#ipv6 dhcp filter
```

78.2 ipv6 dhcp filter (interface)

Description

The **ipv6 dhcp filter (interface)** command is used to enable DHCPv6 Filter function on a specified port. To disable DHCPv6v Filter function on this port, please use **no ipv6 dhcp filter (interface)** command.

Syntax

ipv6 dhcp filter

no ipv6 dhcp filter

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DHCPv6 Filter on port 1/0/1

```
Switch(config)#interface gigabitEthernet 1/0/1
Switch(Config-if)#ipv6 dhcp filter
```

78.3 ipv6 dhcp filter limit rate

Description

The **ipv6 dhcp filter limit rate** command is used to enable the Flow Control feature for the DHCPv6 packets. The excessive DHCPv6 packets will be discarded. To restore to the default configuration, please use **no ipv6 dhcp filter limit rate** command.

Syntax

ipv6 dhcp filter limit rate *value*

no ipv6 dhcp filter limit rate

Parameter

value —— The value of Flow Control. The options are 5/10/15/20/25/30 (packet/second). The default value is 0, which stands for “disable”.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Set the Flow Control of GigabitEthernet port 2 as 20 pps:

Switch(config)#interface gigabitEthernet 1/0/2

Switch(config-if)#ipv6 dhcp filter limit rate 20

78.4 ipv6 dhcp filter decline rate

Description

The **ipv6 dhcp filter decline rate** command is used to enable the Decline Protect feature and configure the rate limit on DHCP Decine packets. The excessive DHCPv6 Decline packets will be discarded. To disable the Decline Protect feature, please use **no ipv6 dhcp filter decline rate** command.

Syntax

ipv6 dhcp filter decline rate *value*

no ipv6 dhcp filter decline rate

Parameter

value —— Specify the rate limit of DHCPv6 Decline packets, and the optional values are 0, 5, 10, 15, 20, 25 and 30 (units:packet/second). It default value is 0, which stands for “disable”.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the rate limit of DHCPv6 Decline packets as 20 packets per second on Gigabit Ethernet port 1/0/2:

```
Switch(config)#interface gigabitEthernet 1/0/2
Switch(config-if)#ipv6 dhcp filter decline 20
```

78.5 ipv6 dhcp filter server permit-entry

Description

The **ipv6 dhcp filter server permit-entry** command is used to add entry for the legal DHCPv6 server. To restore to the default option, please use **no ipv6 dhcp snooping information strategy** command.

Syntax

ipv6 dhcp filter server permit-entry server-ip *ipAddr* **interface { fastEthernet** *port* **| gigabitEthernet port | ten-gigabitEthernet** *port* **| interface port-channel** *port-channel-id***}**

no ipv6 dhcp filter server permit-entry server-ip *ipAddr* **interface { fastEthernet** *port* **| gigabitEthernet port | ten-gigabitEthernet** *port* **| interface port-channel** *port-channel-id***}**

Parameter

ipAddr —— Specify the IPv6 address of the legal DHCPv6 server.

port-list | *port-channel-id* —— Specify the port that the legal DHCPv6 server is connected to.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Create an entry for the legal DHCPv6 server whose IP address is 192.168.0.100 and connected port number is 1/0/1:

```
Switch(config)#ipv6 dhcp filter server permit-entry server-ip 2003::1
interface gigabitEthernet 1/0/1
```

78.6 show ipv6 dhcp filter

Description

The **show ipv6 dhcp filter** command is used to display the configuration of DHCPv6 Filter.

Syntax

show ipv6 dhcp filter

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DHCPv6 Filter configuration:

```
Switch#show ipv6 dhcp filter
```

78.7 show ipv6 dhcp filter interface

Description

The **show ipv6 dhcp filter interface** command is used to display the configuration of DHCPv6 Filter on ports.

Syntax

show ipv6 dhcp filter interface [fastEthernet *port* **| gigabitEthernet** *port* **| ten-gigabitEthernet** *port* **| port-channel** *port-channel-id***]**

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DHCPv6 Filter configuration on port 1/0/3:

```
Switch#show ipv6 dhcp filter interface gigabitEthernet 1/0/3
```

78.8 show ip dhcp filter server permit-entry

Description

The **show ipv6 dhcp filter server permit-entry** command is used to display the legal server configuration.

Syntax

show ipv6 dhcp filter server permit-entry

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the legal DHCPv6 server configuration:

```
Switch#show ipv6 dhcp filter server permit-entry
```

Chapter 79 DoS Defend Commands

DoS (Denial of Service) Attack is to occupy the network bandwidth maliciously by the network attackers or the evil programs sending a lot of service requests to the Host. With the DoS Defend enabled, the switch can analyze the specific field of the received packets and provide the defend measures to ensure the normal working of the local network.

79.1 ip dos-prevent

Description

The **ip dos-prevent** command is used to enable the DoS defend function globally. To disable the DoS defend function, please use **no ip dos-prevent** command.

Syntax

ip dos-prevent

no ip dos-prevent

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DoS defend function globally:

```
Switch(config)#ip dos-prevent
```

79.2 ip dos-prevent type

Description

The **ip dos-prevent type** command is used to select the DoS Defend Type. To disable the corresponding Defend Type, please use **no ip dos-prevent type** command.

Syntax

ip dos-prevent type { land | scan-synfin | xma-scan | null-scan | port-less-1024 | blat | ping-flood | syn-flood | win-nuke | ping-of-death | smurf }

no ip dos-prevent type { land | scan-synfin | xma-scan | null-scan | port-less-1024 | blat | ping-flood | syn-flood | win-nuke | ping-of-death | smurf }

Parameter

land ——The attacker sends a specific fake SYN (synchronous) packet to the destination host. Because both of the source IP address and the destination IP address of the SYN packet are set to be the IP address of the host, the host will be trapped in an endless circle of building the initial connection.

scan-synfin ——The attacker sends the packet with its SYN field and the FIN field set to 1. The SYN field is used to request initial connection whereas the FIN field is used to request disconnection. Therefore, the packet of this type is illegal.

xma-scan ——The attacker sends the illegal packet with its TCP index, FIN, URG and PSH field set to 1.

null-scan ——The attacker sends the illegal packet with its TCP index and all the control fields set to 0. During the TCP connection and data transmission, the packets with all control fields set to 0 are considered illegal.

port-less-1024 ——The attacker sends the illegal packet with its TCP SYN field set to 1 and source port smaller than 1024.

blat ——The attacker sends the illegal packet with the same source port and destination port on Layer 4 and with its URG field set to 1. Similar to the Land Attack, the system performance of the attacked host is reduced because the Host circularly attempts to build a connection with the attacker.

ping-flood ——The attacker floods the destination system with Ping packets, creating a broadcast storm that makes it impossible for the system to respond to legal communication.

syn-flood ——The attacker uses a fake IP address to send TCP request packets to the server. Upon receiving the request packets, the server responds with SYN-ACK packets. Since the IP address is fake, no response will be returned. The server will keep on sending SYN-ACK packets. If the attacker sends overflowing fake request packets, the network resource will be occupied maliciously and the requests of the legal clients will be denied.

win-nuke ——Because the Operation System with bugs cannot correctly process the URG (Urgent Pointer) of TCP packets, the attacker sends this

type of packets to the TCP port139 (NetBIOS) of the host with the Operation System bugs, which will cause the host with a blue screen.

ping-of-death ——Ping of Death attack means that the attacker sends abnormal ping packets larger than 65535 bytes to cause system crash on the target computer.

Note: ping-of-death is only available on certain devices.

smurf ——Smurf attack is a distributed denial-of-service attack in which large numbers of Internet Control Message Protocol (ICMP) packets with the intended victim's spoofed source IP are broadcast to a computer network using an IP broadcast address. Most devices on a network will, by default, respond to this by sending a reply to the source IP address. If the number of machines on the network that receive and respond to these packets is very large, the victim's computer will be flooded with traffic.

Note: smurf is only available on certain devices.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the DoS Defend Type named Land attack:

```
Switch(config)#ip dos-prevent type land
```

79.3 show ip dos-prevent

Description

The **show ip dos-prevent** command is used to display the DoS information of the detected DoS attack, including enable/disable status, the DoS Defend Type, the count of the attack, etc.

Syntax

show ip dos-prevent

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the DoS information of the detected DoS attack globally:

```
Switch(config)#show ip dos-prevent
```

Chapter 80 sFlow Commands (Only for Certain Devices)

Note: sFlow commands are only available on certain devices.

sFlow (Sampled Flow) is a technology for accurately monitoring network traffic at high speeds. The sFlow monitoring system consists of a sFlow agent (embedded in a switch or router or in a standalone probe) and a central sFlow collector. The sFlow agent is a virtual entity using sampling technology to capture traffic statistics from the device it is monitoring. The sFlow collector can be a host receiving sFlow datagrams from the sFlow agent.

The sFlow feature is implemented as follows: the sFlow sampler take samples of traffic statistics and send sFlow datagrams to the sFlow agent for processing. The sFlow agent will forward sFlow datagrams to the sFlow collector for analysis. The analytic results can be displayed on the sFlow collector.

80.1 sflow address

Description

The **sflow address** command is used to configure the sFlow agent's IP address. To delete the configured address, please use **no sflow address** command.

Syntax

sflow address { *ipv4-addr* }

no sflow address { *ipv4-addr* }

Parameter

ipv4-addr ——The IP address of the sFlow agent. The type of the IP address should be IPv4. For example, you can set the switch's management IP as the IP address of the sFlow agent.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the sFlow agent with the IP address as 192.168.0.1:

Switch(config)#sflow address 192.168.0.1

80.2 sflow enable

Description

The **sflow enable** command is used to enable sFlow function. To disable the sFlow function, please use **no sflow enable** command.

Syntax

sflow enable

no sflow enable

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

User Guidelines

A valid agent address should be assigned to the sFlow agent embedded in the switch before you enable the sFlow function.

Example

Enable sFlow function globally:

```
Switch(config)#sflow enable
```

80.3 sflow collector collector-ID

Description

The **sflow collector collector-ID** command is used to configure the parameters about the sFlow collector.

Syntax

sflow collector collector-ID *value* { [**descript** *descript*] | [**ip** *ip*] | [**port** *port*] | [**maxData** *maxData*] | [**timeout** *timeout*] }

Parameter

value —— The ID of the sFlow collector you desire to configure. The value ranges from 1 to 4.

descript ——Give a Description to the sFlow collector, which contains 16 characters at most.

ip ——The IP address of the sFlow collector. The type of the IP address should be IPv4, for example 192.168.0.100.

port——The number of the udp port which is selected for the sFlow collector.

maxData——Specify the maximum number of data bytes that can be sent in a single sample datagram. The value ranges from 300 to 1400 and the default value is 300 bytes.

timeout——Specify the aging time of the sFlow collector, ranging from 0 to 2000000 seconds. When the timeout is set to 0, it means the life cycle of the collector is infinite.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Specify the ip of the sFlow collector 1 as 192.168.0.100, the port as 3000:

```
Switch(config)# sflow collector collector-ID 1 ip 192.168.0.100
Switch(config)# sflow collector collector-ID 1 port 3000
```

80.4 sflow sampler

Description

The **sflow sampler** command is used to configure the parameters about the sFlow sampler.

Syntax

sflow sampler { [**collector-ID** *value*] | [**ingRate** *ingress-rate*] [**egRate** *egress-rate*] | [**maxHeader** *maxHeader*] }

Parameter

value—— The ID of the sFlow collector which the sFlow sampler will send sFlow datagrams to. The value ranges from 0 to 4. When the value is zero, it means no collector is selected.

ingress-rate——Specify the ingress sampling frequency of the sFlow sampler. When a sample is taken, the value indicates how many packets to skip before the next sample is taken. The value ranges from 1024 to 65535 and the default value is 0 which means no packets will be sampled.

egress-rate——Specify the egress sampling frequency of the sFlow sampler. When a sample is taken, the value indicates how many packets to skip before

the next sample is taken. The value ranges from 1024 to 65535 and the default value is 0 which means no packets will be sampled.

maxHeader——Specify the maximum number of bytes that should be copied from a sampled packet. The value ranges from 18 to 256 and the default value is 128 bytes.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure Gigabit Ethernet port 1 as the sFlow sampler: specify the Collector-ID as 1, the ingress rate as 1024:

Switch(config)#interface gigabitEthernet 1/0/1

Switch(config-if)#sflow sampler collector-ID 1

For L2/L2+ switches:

Switch(config-if)#sflow sampler ingRate 1024

For L3 switches:

Switch(config)#sflow sampler ingRate 1024

80.5 show sflow global

Description

The **show sflow global** command is used to display the global configuration of sFlow.

Syntax

show sflow global

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of sFlow:

```
Switch#show sflow global
```

80.6 show sflow collector

Description

The **show sflow collector** command is used to display the global configuration of the sFlow collector.

Syntax

show sflow collector

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of the sFlow collector:

```
Switch#show sflow collector
```

80.7 show sflow sampler

Description

The **show sflow sampler** command is used to display the global configuration of the sFlow sampler.

Syntax

show sflow sampler

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of the sFlow sampler:

```
Switch#show sflow sampler
```

Chapter 81 Ethernet OAM Commands (Only for Certain Devices)

Note: Ethernet OAM commands are only available on certain devices.

Ethernet OAM (standing for Operation, Administration, and Maintenance) is Layer 2 protocol that is used for monitoring and troubleshooting Ethernet networks. It can report the network status to network administrators through the OAMPDUs exchanged between two OAM entities. The operation of OAM on an Ethernet interface does not adversely affect data traffic as OAM is a slow protocol with very limited bandwidth potential.

81.1 ethernet-oam

Description

The **ethernet-oam** command is used to enable the Ethernet OAM function for the desired port. To disable the Ethernet OAM function, please use **no ethernet-oam** command.

Syntax

ethernet-oam

no ethernet-oam

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the Ethernet OAM function for Gigabit Ethernet port 1/0/2:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)#ethernet-oam

81.2 ethernet-oam mode

Description

The **ethernet-oam mode** command is used to configure the OAM mode for the desired port. To return to the default configurations, please use **no ethernet-oam mode** command. The default mode is active.

Syntax

ethernet-oam mode { passive | active }

no ethernet-oam mode

Parameter

passive —— Specify the OAM mode as passive.

active ——Specify the OAM mode as active.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure Ethernet OAM client to operate in passive mode for Gigabit Ethernet port 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)#ethernet-oam mode passive
```

81.3 ethernet-oam link-monitor symbol-period

Description

The **ethernet-oam link-monitor symbol-period** command is used to configure the parameters about one of the link events, error symbol period event. To return to the default configurations, please use **no ethernet-oam link-monitor symbol-period** command.

Syntax

ethernet-oam link-monitor symbol-period { **threshold** *threshold* | **window** *window* | **notify** { disable | enable }}

no ethernet-oam link-monitor symbol-period { threshold | window | notify }

Parameter

threshold—— Configure the error threshold for generating error symbol-period event. The range is from 1 to 4294967295 and the default value is 1.

window—— Configure the error symbol-period event detection interval. The range is from 10 to 600, in terms of 100 ms intervals. The default value is 10.

notify —— Enable/Disable the event notification. By default, it is enabled.

threshold | window | notify —— The parameter that you want to return to the default configuration.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

For error symbol-period event, configure the error threshold as 5 and the event detection interval as 3 seconds on Gigabit Ethernet port 1/0/2:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# ethernet-oam link-monitor symbol-period threshold 5 **window** 30

81.4 ethernet-oam link-monitor frame

Description

The **ethernet-oam link-monitor frame** command is used to configure the parameters about one of the link events, error frame event. To return to the

default configurations, please use **no ethernet-oam link-monitor frame** command.

Syntax

ethernet-oam link-monitor frame { [**threshold** *threshold*] [**window** *window*] [**notify** { disable | enable }] }

no ethernet-oam link-monitor frame { threshold | window | notify }

Parameter

threshold —— Configure the error threshold for generating error frame event. The range is from 1 to 4294967295 and the default value is 1.

window —— Configure the error symbol-period event detection interval. The range is from 10 to 600, in terms of 100 ms intervals. The default value is 10.

notify —— Enable/Disable the event notification. By default, it is enabled.

threshold | window | notify —— The parameter that you want to return to the default configuration.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

For error frame event, configure the error threshold as 6 and the event detection interval as 9 seconds on Gigabit Ethernet port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# ethernet-oam link-monitor frame threshold 6 window
90
```

81.5 ethernet-oam link-monitor frame-period

Description

The **ethernet-oam link-monitor frame-period** command is used to configure the parameters about one of the link events, error frame period

event. To return to the default configurations, please use **no ethernet-oam link-monitor frame-period** command.

Syntax

ethernet-oam link-monitor frame-period { [**threshold** *threshold*] [**window** *window*] [**notify** { disable | enable }] }

no ethernet-oam link-monitor frame-period { threshold | window | notify }

Parameter

threshold—— Configure the error threshold for generating error frame period event. The range is from 1 to 4294967295 and the default value is 1.

window—— Configure the error frame period event detection interval. The range is from 148810 to 89286000. The default value is 148810 for Fast Ethernet port and 1488100 for Gigabit Ethernet port.

notify —— Enable/Disable the event notification. By default, it is enabled.

threshold | window | notify —— The parameter that you want to return to the default configuration.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

For error frame period event, configure the error threshold as 6 and the event detection interval as 150000 frames on Gigabit Ethernet port 1/0/4:

Switch(config)# interface gigabitEthernet 1/0/4

Switch(config-if)# ethernet-oam link-monitor frame-period threshold 6

window 150000

81.6 ethernet-oam link-monitor frame-seconds

Description

The **ethernet-oam link-monitor frame-seconds** command is used to configure the parameters about one of the link events, error frame seconds event. To return to the default configurations, please use **no ethernet-oam link-monitor frame-seconds** command.

Syntax

ethernet-oam link-monitor frame-seconds { [**threshold** *threshold*] [**window** *window*] [**notify** { disable | enable }] }

no ethernet-oam link-monitor frame-seconds { threshold | window | notify }

Parameter

threshold—— Configure the error threshold for generating error frame seconds event. The range is from 1 to 900 and the default value is 1.

window—— Configure the error frame seconds event detection interval. The range is from 100 to 9000, in terms of 100 ms intervals. The default value is 600.

notify —— Enable/Disable the event notification. By default, it is enabled.

threshold | window | notify —— The parameter that you want to return to the default configuration.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

For error frame seconds event, configure the error threshold as 8 and the event detection interval as 30 seconds on Gigabit Ethernet port 5:

```
Switch(config)# interface gigabitEthernet 1/0/5
Switch(config-if)# ethernet-oam link-monitor frame-seconds threshold 8
window 300
```

81.7 ethernet-oam remote-failure

Description

The ethernet-oam remote-failure command is used to configure whether to notify the link faults or not. The link faults include dying gasp and critical event. To return to the default configurations, please use **no ethernet-oam remote-failure** command.

Syntax

ethernet-oam remote-failure { dying-gasp | critical-event } **notify** { disable | enable }

no ethernet-oam remote-failure { dying-gasp | critical-event } **notify**

Parameter

dying-gasp —— Dying Gasp link event. Dying gasp means an unrecoverable fault, such as power failure, occurs.

critical-event —— Critical Event. Critical-event means unspecified critical event occurs.

notify ——Enable/Disable the event notification. By default, it is enabled.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Disable the Dying Gasp link event notification on Gigabit Ethernet port 1/0/7:

Switch(config)# interface gigabitEthernet 1/0/7

Switch(config-if)# ethernet-oam remote-failure dying-gasp **notify** disable

81.8 ethernet-oam remote-loopback received-remote- loopback

Description

The **ethernet-oam remote-loopback received-remote-loopback** command is used to configure the client to process or to ignore the received remote loopback request. To return to the default configurations, please use **no ethernet-oam remote-loopback received-remote-loopback** command.

Syntax

ethernet-oam remote-loopback received-remote-loopback { process | ignore }

no ethernet-oam remote-loopback received-remote-loopback

Parameter

process —— Process the received remote loopback request.

ignore —— Ignore the received remote loopback request.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the client to process the received remote loopback request on Gigabit Ethernet port 1:

Switch(config)# interface gigabitEthernet 1/0/1

Switch(config-if)# ethernet-oam remote-loopback received

-remote-loopback process

81.9 ethernet-oam remote-loopback

Description

The **ethernet-oam remote-loopback** command is used to request the remote peer to start or stop the Ethernet OAM remote loopback mode.

Syntax

ethernet-oam remote-loopback { start | stop }

Parameter

start —— Request the remote peer to start the Ethernet OAM remote loopback mode.

stop —— Request the remote peer to stop the Ethernet OAM remote loopback mode.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Request the remote peer to start the Ethernet OAM remote loopback mode on Gigabit Ethernet port 1/0/3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# ethernet-oam remote-loopback start
```

81.10 clear ethernet-oam statistics

Description

The **clear ethernet-oam statistics** command is used to clear Ethernet OAM statistics.

Syntax

clear ethernet-oam statistics [**interface gigabitEthernet** *port*]

Parameter

port —— The Gigabit Ethernet port number. By default, the Ethernet OAM statistics of all ports are cleared.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Clear Ethernet OAM statistics of Gigabit Ethernet port 1/0/3:

```
Switch(config)# clear ethernet-oam statistics interface gigabit Ethernet
1/0/3
```

81.11 clear ethernet-oam event-log

Description

The **clear ethernet-oam event-log** command is used to clear the Ethernet OAM event log.

Syntax

clear ethernet-oam event-log [**interface gigabitEthernet** *port*]

Parameter

port ——The Gigabit Ethernet port number. By default, the Ethernet OAM event logs of all ports are cleared.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Clear Ethernet OAM event log of Gigabit Ethernet port 1/0/3:

Switch(config)# clear ethernet-oam event-log interface gigabitEthernet 1/0/3

81.12 show ethernet-oam configuration

Description

The **show ethernet-oam configuration** command is used to display Ethernet OAM configuration information.

Syntax

show ethernet-oam configuration [**interface gigabitEthernet** *port*]

Parameter

port —— The Gigabit Ethernet port number. By default, the Ethernet OAM configuration information of all ports is displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Display Ethernet OAM configuration information of Gigabit Ethernet port 1/0/2:

Switch(config)# show ethernet-oam configuration interface gigabitEthernet 1/0/2

81.13 show ethernet-oam event-log

Description

The **show ethernet-oam event-log** command is used to display the Ethernet OAM event log.

Syntax

show ethernet-oam event-log [**interface gigabitEthernet** *port*]

Parameter

port —— The Gigabit Ethernet port number. By default, the Ethernet OAM event logs of all ports are displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Display Ethernet OAM event log of Gigabit Ethernet port 1/0/2:

```
Switch(config)# show ethernet-oam event-log interface gigabitEthernet
1/0/2
```

81.14 show ethernet-oam statistics

Description

The **show ethernet-oam statistics** command is used to display the Ethernet OAM statistics.

Syntax

show ethernet-oam statistics [**interface gigabitEthernet** *port*]

Parameter

port—— The Gigabit Ethernet port number. By default, the Ethernet OAM statistics of all ports are displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Display Ethernet OAM statistics of Gigabit Ethernet port 1/0/2:

Switch(config)# show ethernet-oam statistics interface gigabitEthernet 1/0/2

81.15 show ethernet-oam status

Description

The **show ethernet-oam status** command is used to display the Ethernet OAM status of both the local and the remote client.

Syntax

show ethernet-oam status [**interface gigabitEthernet** *port*]

Parameter

port—— The Gigabit Ethernet port number. By default, the Ethernet OAM status of all ports is displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Display Ethernet OAM status of Gigabit Ethernet port 1/0/2:

Switch(config)# show ethernet-oam status interface gigabitEthernet 1/0/2

Chapter 82 DLDP Commands (Only for Certain Devices)

DLDP (Device Link Detection Protocol) is used to monitor the link state of fiber-optic or twisted-pair Ethernet cables. When a unidirectional link is detected, the corresponding port will be shut down automatically or manually (depending on the shut mode configured).

82.1 dldp (global)

Description

The **dldp** command is used to enable the DLDP function globally. To disable it, please use **no dldp** command.

Syntax

dldp

no dldp

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the DLDP function globally:

```
Switch(config)# dldp
```

82.2 dldp interval

Description

The **dldp interval** command is used to define the interval of sending advertisement packets on ports that are in the advertisement state.

Syntax

dldp interval *interval-time*

Parameter

interval-time —— The interval of sending advertisement packets. It ranges from 1 to 30 seconds. By default, it is 5 seconds.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Specify the interval of sending advertisement packets as 10 seconds:

```
Switch(config)# dldp interval 10
```

82.3 dldp shut-mode

Description

The **dldp shut-mode** command is used to configure the shutdown mode when a unidirectional link is detected.

Syntax

dldp shut-mode { auto /manual }

Parameter

auto —— The switch automatically shuts down ports when a unidirectional link is detected. By default, the shut-mode is auto.

manual ——The switch displays an alert when a unidirectional link is detected. The operation to shut down the unidirectional link ports is accomplished by the users.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the shut-mode as manual:

```
Switch(config)# dldp shut-mode manual
```

82.4 dldp reset (global)

Note: This command is only available on certain devices

Description

The **dldp reset** command is used to reset all the unidirectional links and restart the link detect process.

Syntax

dldp reset

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Reset the DLDP function globally:

```
Switch(config)# dldp reset
```

82.5 dldp(interface)

Description

The **dldp** command is used to enable the DLDP function of the specified port. To disable it, please use **no dldp** command.

Syntax

dldp

no dldp

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the DLDP function of ports 1/0/2-4:

Switch (config)# interface range gigabitEthernet 1/0/2-4

Switch (config-if-range)# dldp

82.6 dldp reset (interface)

Note: This command is only available on certain devices

Description

The **dldp reset** command is used to reset the specified port and restart the link detect process.

Syntax

dldp reset

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Reset the DLDP function of ports 2-4:

Switch (config)# interface range gigabitEthernet 1/0/2-4

Switch (config-if-range)# dldp reset

82.7 show dldp

Description

The **show dldp** command is used to display the global configuration of DLDP function such as DLDP global state, DLDP interval and shut mode.

Syntax

show dldp

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the global configuration of DLDP function:

```
Switch# show dldp
```

82.8 show dldp interface

Description

The **show dldp interface** command is used to display the configuration and state of all ports. By default, the configuration and state of all the ports will be displayed.

Syntax

show dldp interface

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration and state of all ports:

```
Switch# show dldp interface
```

Chapter 83 SNMP Commands

SNMP (Simple Network Management Protocol) functions are used to manage the network devices for a smooth communication, which can facilitate the network administrators to monitor the network nodes and implement the proper operation.

83.1 snmp-server

Description

The **snmp-server user** command is used to add User. To delete the corresponding User, please use **no snmp-server user** command. The User in an SNMP Group can manage the switch via the management station software. The User and its Group have the same security level and access right.

Syntax

snmp-server user *name* **{** local | remote **}** *group-name* **[smode** v3 **] [slev** noAuthNoPriv **] [cmode** none **] [cpwd** *confirm-pwd***] [emode** none **] [epwd** *encrypt-pwd***]**

snmp-server user *name* **{** local | remote **}** *group-name* **[smode** v3 **] slev** authNoPriv **cmode {** MD5 | SHA **} cpwd** *confirm-pwd* **[emode** none**] [epwd** *encrypt-pwd***]**

snmp-server user *name* **{** local | remote **}** *group-name* **[smode** v3 **] slev** authPriv **cmode {** MD5 | SHA **} cpwd** *confirm-pwd* **emode {** DES | AES-128 **} epwd** *encrypt-pwd*

Parameter

name —— User Name, ranging from 1 to 16 characters.

local | remote —— User Type, with local and remote options. Local indicates that the user is connected to a local SNMP engine, while remote means that the user is connected to a remote SNMP engine. As the remote engine ID and user password are used to compute the authentication and privacy digests, before configuring a remote user, you need to set the remote engine ID first.

group-name —— The Group Name of the User. The User is classified to the corresponding Group according to its Group Name, Security Model and Security Level.

v3 ——The security mode for the user. v3 indicates SNMPv3, the most secure model.

slev —— The Security Level of SNMP v3 User. There are three options, including noAuthNoPriv (No authentication algorithm but a user name match is applied to check packets, and no privacy algorithm is applied to encrypt them), authNoPriv (An authentication algorithm is applied to check packets, but no privacy algorithm is applied to encrypt them) and authPriv (An authentication algorithm and a privacy algorithm are applied to check and encrypt packets). The security level from lowest to highest is: noAuthNoPriv, authNoPriv, authPriv, and the default is noAuthNoPriv. The security level of the user should not be lower than the group it belongs to.

cmode —— The Authentication Mode of the SNMP v3 User, with none, MD5 and SHA options. None indicates no authentication method is used, MD5 indicates the port authentication is performed via HMAC-MD5 algorithm and SHA indicates the port authentication is performed via SHA (Secure Hash Algorithm). SHA authentication mode has a higher security than MD5 mode. By default, the Authentication Mode is "none".

confirm-pwd—— Authentication Password, ranging from 1 to 32 characters. The question marks and spaces are not allowed. This password in the configuration file will be displayed in the symmetric encrypted form.

emode —— The Privacy Mode of the SNMP v3 User, with none, DES and AES-128 options. None indicates no privacy method is used, and DES indicates DES encryption method is used, and AES-128 indicates AES-128 encryption method is used. By default, the Privacy Mode is "none".

encrypt-pwd—— Privacy Password, ranging from 1 to 32 characters. The question marks and spaces are not allowed. This password in the configuration file will be displayed in the symmetric encrypted form.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Add Local User admin to Group group2, and configure the Security Model of the user as v3, the Security Level of the group as authPriv, the Authentication Mode of the user as MD5, the Authentication Password as 11111, the Privacy Mode as DES, and the Privacy Password as 22222:

Switch(config)# snmp-server user admin local group2 **smode** v3 **slev** authPriv **cmode** MD5 **cpwd** 11111 **emode** DES **epwd** 22222

83.2 snmp-server view

Description

The **snmp-server view** command is used to add View. To delete the corresponding View, please use **no snmp-server view** command. The OID (Object Identifier) of the SNMP packets is used to describe the managed objects of the switch, and the MIB (Management Information Base) is the set of the OIDs. The SNMP View is created for the SNMP management station to manage MIB objects.

Syntax

snmp-server view *name mib-oid* { include | exclude }

no snmp-server view *name mib-oid*

Parameter

name —— The entry name of View, ranging from 1 to 16 characters. Each View includes several entries with the same name.

mib-oid —— MIB Object ID. It is the Object Identifier (OID) for the entry of View, ranging from 1 to 61 characters.

include | exclude —— View Type, with include and exclude options. They represent the view entry can/cannot be managed by the SNMP management station individually.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Add a View named view1, configuring the OID as 1.3.6.1.6.3.20, and this OID can be managed by the SNMP management station:

```
Switch(config)# snmp-server view view1 1.3.6.1.6.3.20 include
```

83.3 snmp-server group

Description

The **snmp-server group** command is used to manage and configure the SNMP group. To delete the corresponding SNMP group, please use **no snmp-server group** command. SNMP v3 provides the VACM (View-based Access Control Model) and USM (User-Based Security Model) mechanisms

for authentication. The users in the SNMP Group can manage the device via the Read View, Write View and Notify View. And the authentication mode and the privacy mode guarantee the high security for the communication between the management station and the managed device.

Syntax

snmp-server group *name* [**smode** v3] [**slev** { noAuthNoPriv | authNoPriv | authPriv }] [**read** *read-view*] [**write** *write-view*] [**notify** *notify-view*]

no snmp-server group *name* **smode** v3 **slev** { noAuthNoPriv | authNoPriv | authPriv }

Parameter

name ——The SNMP Group name, ranging from 1 to 16 characters. The Group Name, Security Model and Security Level compose the identifier of the SNMP Group. These three items of the Users in one group should be the same.

v3 —— The security mode for the group, v3 indicates SNMPv3, the most secure level.

slev —— The Security Level of SNMP v3 Group. There are three options, including noAuthNoPriv (No authentication algorithm but a user name match is applied to check packets, and no privacy algorithm is applied to encrypt them), authNoPriv (An authentication algorithm is applied to check packets, but no privacy algorithm is applied to encrypt them) and authPriv (An authentication algorithm and a privacy algorithm are applied to check and encrypt packets). By default, the Security Level is noAuthNoPriv. There is no need to configure this in SNMP v1 Mode and SNMP v2c Mode.

read-view —— Select the View to be the Read View. The management access is restricted to read-only, and changes cannot be made to the assigned SNMP View.

write-view —— Select the View to be the Write View. The management access is writing only and changes can be made to the assigned SNMP View. The View defined both as the Read View and the Write View can be read and modified.

notify-view —— Select the View to be the Notify View. The management station can receive notification messages of the assigned SNMP view generated by the switch's SNMP agent.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Add a group, and configure the name as group 1, the Security Model as SNMP v3, the security level as authNoPriv, the management access to the assigned View viewDefault as read-write, besides the notification messages sent by View viewDefault can be received by Management station:

Switch(config)# snmp-server group group1 **smode** v3 **slev** authNoPriv **read** viewDefault **write** viewDefault **notify** viewDefault

Delete group 1:

Switch(config)# no snmp-server group group1 **smode** v3 **slev** authNoPriv

83.4 snmp-server user

Description

The **snmp-server user** command is used to add User. To delete the corresponding User, please use **no snmp-server user** command. The User in an SNMP Group can manage the switch via the management station software. The User and its Group have the same security level and access right.

Syntax

For L2/L2+ switches:

snmp-server user *name* **{** local | remote **}** *group-name* **[smode** v3 **] [slev** noAuthNoPriv **] [cmode** none **] [cpwd** *confirm-pwd***] [emode** none **] [epwd** *encrypt-pwd***]**

snmp-server user *name* **{** local | remote **}** *group-name* **[smode** v3 **] slev** authNoPriv **cmode {** MD5 | SHA **} cpwd** *confirm-pwd* **[emode** none**] [epwd** *encrypt-pwd***]**

snmp-server user *name* **{** local | remote **}** *group-name* **[smode** v3 **] slev** authPriv **cmode {** MD5 | SHA **} cpwd** *confirm-pwd* **emode {** DES | AES-128 } **epwd** *encrypt-pwd*

no snmp-server user *name*

For L3 switches:

snmp-server user *name* **{** local | remote **}** *group-name* **[smode** v3 **] [slev** noAuthNoPriv **]**

snmp-server user *name* **{** local | remote **}** *group-name* **[smode** v3 **] slev** authNoPriv **cmode {** MD5 | SHA **} cpwd** *confirm-pwd*

snmp-server user *name* **{** local | remote **}** *group-name* **[smode** v3 **] slev** authPriv **cmode {** MD5 | SHA **} cpwd** *confirm-pwd* **emode {** DES | AES-128 } **epwd** *encrypt-pwd*

no snmp-server user *name*

Parameter

name —— User Name, ranging from 1 to 16 characters.

local | remote —— User Type, with local and remote options. Local indicates that the user is connected to a local SNMP engine, while remote means that the user is connected to a remote SNMP engine. As the remote engine ID and user password are used to compute the authentication and privacy digests, before configuring a remote user, you need to set the remote engine ID first.

group-name —— The Group Name of the User. The User is classified to the corresponding Group according to its Group Name, Security Model and Security Level.

v3 ——The security mode for the user. v3 indicates SNMPv3, the most secure model.

slev —— The Security Level of SNMP v3 User. There are three options, including noAuthNoPriv (No authentication algorithm but a user name match is applied to check packets, and no privacy algorithm is applied to encrypt them), authNoPriv (An authentication algorithm is applied to check packets, but no privacy algorithm is applied to encrypt them) and authPriv (An authentication algorithm and a privacy algorithm are applied to check and encrypt packets). The security level from lowest to highest is: noAuthNoPriv, authNoPriv, authPriv, and the default is noAuthNoPriv. The security level of the user should not be lower than the group it belongs to.

cmode —— The Authentication Mode of the SNMP v3 User, with none, MD5 and SHA options. None indicates no authentication method is used, MD5 indicates the port authentication is performed via HMAC-MD5 algorithm and SHA indicates the port authentication is performed via SHA (Secure Hash Algorithm). SHA authentication mode has a higher security than MD5 mode. By default, the Authentication Mode is “none”.

confirm-pwd —— Authentication Password, ranging from 1 to 16 characters. The question marks and spaces are not allowed. This password in the configuration file will be displayed in the symmetric encrypted form.

emode —— The Privacy Mode of the SNMP v3 User, with none DES and AES-128 options. None indicates no privacy method is used, and DES indicates DES encryption method is used, and AES-128 indicates AES-128

encryption method is used, AES-128 privacy mode has a higher security than DES mode.By default, the Privacy Mode is “none”.

encrypt-pwd—— Privacy Password, ranging from 1 to 32 characters. The question marks and spaces are not allowed. This password in the configuration file will be displayed in the symmetric encrypted form.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Add Local User admin to Group group2, and configure the Security Model of the user as v3, the Security Level of the group as authPriv, the Authentication Mode of the user as MD5, the Authentication Password as 11111, the Privacy Mode as DES, and the Privacy Password as 22222:

Switch(config)# snmp-server user admin local group2 **smode** v3 **slev** authPriv **cmode** MD5 **cpwd** 11111 **emode** AES-128 **epwd** 2222

83.5 snmp-server community

Description

The **snmp-server community** command is used to add Community. To delete the corresponding Community, please use **no snmp-server community** command. SNMP v1 and SNMP v2c adopt community name authentication. The community name can limit access to the SNMP agent from SNMP network management station, functioning as a password.

Syntax

snmp-server community *name* { read-only | read-write } *mib-view*

no snmp-server community *name*

Parameter

name —— Community Name, ranging from 1 to 16 characters.

read-only | read-write —— The access rights of the community, with read-only and read-write options.

mib-view—— The MIB View for the community to access.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Add community public, and the community has read-write management right to View viewDefault:

Switch(config)# snmp-server community public read-write viewDefault

83.6 snmp-server host

Description

The **snmp-server host** command is used to add Notification. To delete the corresponding Notification, please use **no snmp-server host** command.

Syntax

snmp-server host *ip udp-port user-name* [**vrf** *vrfName*] [**smode** { v1 | v2c | v3 }] [**slev** { noAuthNoPriv | authNoPriv | authPriv }] [**type** { trap | inform }] [**retries** *retries*] [**timeout** *timeout*]

no snmp-server host *ip user-name*

Parameter

ip —— The IP Address of the management Host. Both IPv4 and IPv6 addresses are supported, for example 192.168.0.100 or fe80::1234.

udp-port —— UDP port, which is used to send notifications. The UDP port functions with the IP address for the notification sending. It ranges from 1 to 65535.

user-name —— The User name of the management station.

vrfName ——The name of the VRF instance where the administrator is located.

smode —— The Security Model of the management station, with v1, v2c and v3 options. By default, the option is v1.

slev —— The Security Level of SNMP v3 User. There are three options, including noAuthNoPriv (No authentication algorithm but a user name match is applied to check packets, and no privacy algorithm is applied to encrypt them), authNoPriv (An authentication algorithm is applied to check packets, but no privacy algorithm is applied to encrypt them) and authPriv (An authentication algorithm and a privacy algorithm are applied to check and encrypt packets). By default, the Security Level is noAuthNoPriv.

type —— The type of the notifications, with trap and inform options. Trap indicates traps are sent, while inform indicates informs are sent. The inform type has a higher security than the trap type and resend and timeout need to be configured if you select this option. You can only select the trap type in Security Model v1. By default, the type of the notifications is “trap”.

retries —— The amount of times the switch retries an inform request, ranging from 1 to 255. The switch will resend the inform request if it doesn’t get the response from the management station during the Timeout interval, and it will terminate resending the inform request if the resending times reach the specified Retry times.

timeout —— The maximum time for the switch to wait for the response from the management station before resending a request, ranging from 1 to 3600 in seconds.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Add a Notification entry, and configure the IP address of the management Host as 192.168.0.146, the UDP port as 162, the User name of the management station as admin, the Security Model of the management station as v2c, the type of the notifications as inform, the maximum time for the switch to wait as 1000 seconds, and the retries time as 100:

For L2/L2+ switches:

Switch(config)#snmp-server host 192.168.0.146 162 admin **smode** v2c **type** inform **retries** 100 **timeout** 1000

For L3 switches:

Switch(config)#snmp-server host 192.168.0.146 162 admin **smode** v2c **slev** noAuthNoPriv **type** inform retries 100 **timeout** 1000

Switch(config)#snmp-server host fe80::1234 162 admin **smode** v2c **slev** noAuthNoPriv **type** inform retries 100 **timeout** 1000

Add a Notification entry, and configure the IP Address of the management Host as fe80::1234, the UDP port as 162, the User name of the management station as admin, the Security Model of the management station as v2c, the

type of the notifications as inform, the maximum time for the switch to wait as 1000 seconds, and the retries time as 100:

Switch(config)# snmp-server host fe80::1234 162 admin **smode** v2c **type** inform **retries** 100 **timeout** 1000

83.7 snmp-server source-interface

Description

The **snmp-server source-interface** command is used to configure the source interface for sending SNMP trap messages. By default, no source interface is specified for sending traps. After specifying a source interface, the IP address of the source interface will be used as the source IP address of trap messages, helping network management systems identify the alarm source. The source interface for sending traps must be a Layer 3 interface with a configured IP address; otherwise, the command will not take effect. For device security, it is recommended to configure the loopback address as the source interface. To remove this configuration, please use the **no snmp-server source-interface** command.

Syntax

snmp-server source-interface [**gigabitEthernet** port | **port-channel** port-channel-id |**loopback** id | **vlan** vlan-id]

no snmp-server source-interface

Parameter

port——The port number.

port-channel-id——The ID of the port channel. Member ports in this port channel should all be routed ports.

id——The loopback interface ID.

vlan-id——The VLAN interface ID.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the source interface for SNMP traps as the IP address of loopback 1:

Switch(config)# snmp-server source-interface loopback 1

83.8 snmp-server engineID

Description

The **snmp-server engineID** command is used to configure the local and remote engineID of the switch. To restore to the default setting, please use **no snmp-server engineID** command.

Syntax

snmp-server engineID { [**local** *local-engineID*] [**remote** *remote-engineID*] }

no snmp-server engineID

Parameter

local-engineID—— Local Engine ID for local clients. The Engine ID is a unique alphanumeric string used to identify the SNMP engine on the switch. Its length ranges from 10 to 64 hexadecimal characters, which must be even number meanwhile.

remote-engineID—— Remote Engine ID for the switch. The Engine ID is a unique alphanumeric string used to identify the SNMP engine on the remote device which receives informs from the switch. Its length ranges from 10 to 64 hexadecimal characters, which must be even number meanwhile. The **snmp-server engineID** will be disabled if the **local** and **remote** are both not configured.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Specify the local engineID as 1234567890, and the remote engineID as abcdef123456:

Switch(config)# snmp-server engineID local 1234567890

Switch(config)# snmp-server engineID remote abcdef123456

83.9 snmp-server traps snmp

Description

The **snmp-server traps snmp** command is used to enable SNMP standard traps which include four types: linkup, linkdown, warmstart and coldstart. The command without parameter enables all SNMP standard traps. All SNMP standard traps are enabled by default. To disable the sending of SNMP standard traps, please use **no snmp-server traps snmp** command.

Syntax

snmp-server traps snmp [linkup | linkdown | warmstart | coldstart | auth-failure]

no snmp-server traps snmp [linkup | linkdown | warmstart | coldstart | auth-failure]

Parameter

linkup —— Indicates a port status changes from linkdown to linkup, and can be triggered when you connect a device to a port.

linkdown —— Indicates a port status changes from linkup to linkdown, and can be triggered when you disconnect a device to a port.

warmstart —— Indicates the SNMP feature on the switch is reinitialized with the physical configuration unchanged. The trap can be triggered if you disable and then enable SNMP after the SNMP is completely configured and enabled.

coldstart —— Indicates an SNMP initialization caused by the reinitialization of the switch system. The trap can be triggered when you reboot the switch.

auth-failure —— Triggered when a received SNMP request fails the authentication.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable SNMP standard linkup trap for the switch:

```
Switch(config)# snmp-server traps snmp linkup
```

83.10 snmp-server traps

Description

The **snmp-server traps** command is used to enable SNMP extended traps. To disable the sending of SNMP extended traps, please use **no snmp-server traps** command. All SNMP extended traps are disabled by default.

Syntax

snmp-server traps { rate-limit | cpu | flash | lldp remtableschange | lldp topologychange | loopback-detection | storm-control | spanning-tree | memory }

no snmp-server traps { rate-limit | cpu | flash | lldp remtableschange | lldp topologychange | loopback-detection | storm-control | spanning-tree | memory }

Parameter

rate-limit ——Monitors whether the bandwidth has reached the limit you have set. The trap can be triggered when the Rate Limit feature is enabled and packets are sent to the port with a rate higher than what you have set.

cpu ——Monitors the load status of the switch CPU. The trap can be triggered when the utilization rate of the CPU has exceeded the limit that you have set. The limit of CPU utilization rate for the switch is 80% by default.

flash ——Triggered when flash is modified during operations such as backup, reset, firmware upgrade, configuration import, and so on.

lldp remtableschange ——An lldp RemTablesChange notification is sent when the value of lldp StatsRemTableLastChangeTime changes. It can be utilized by an NMS host to trigger LLDP remote systems table maintenance polls.

lldp topologychange ——A notification generated by the local device to sense the change in the topology that indicates a new remote device attached to a local port, or a remote device disconnected or moved from one port to another.

loopback-detection ——The feature is used to detect loopbacks. And the trap is disabled by default. The system will generate the trap when a loopback is detected or cleared.

storm-control ——The feature is used to monitor network storms. And the trap is disabled by default. The system will generate the trap when the rate of broadcast or multicast reaches the limit of storm control.

spanning-tree ——The feature is used to monitor the spanning tree status. And the trap is disabled by default. The system will generate the trap in the following situations: a port changes from non-forwarding state to forwarding state or the other way round; a port receives a packet with TC flag or a TCN packet.

memory ——The feature is used to monitor the memory. And the trap is disabled by default. The system will generate the trap when the memory utilization exceeds 80%.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable SNMP extended rate-limit trap for the switch:

Switch(config)# snmp-server traps rate-limit

83.11 snmp-server traps ddm

Note: This command is only available on certain devices.

Description

The **snmp-server traps ddm** command is used to enable the corresponding DDM traps. DDM function is used to monitor the status of the SFP modules inserted into the SFP ports on the switch. The command without parameter enables all SNMP DDM traps. To disable the sending of SNMP DDM traps, use **no snmp-server traps ddm** command. All DDM traps are disabled by default.

Syntax

snmp-server traps ddm [temperature | voltage | bias_current | tx_power | rx_power]

no snmp-server traps ddm [temperature | voltage | bias_current | tx_power | rx_power]

Parameter

temperature ——Monitors the temperature of SFP modules inserted into the SFP ports on the switch. The trap can be triggered when the temperature of any SFP module has reached the warning or alarm threshold.

voltage ——Monitors the voltage of SFP modules inserted into the SFP ports on the switch. The trap can be triggered when the voltage of any SFP module has reached the warning or alarm threshold.

bias_current ——Monitors the bias current of SFP modules inserted into the SFP ports on the switch. The trap can be triggered when the bias current of any SFP module has reached the warning or alarm threshold.

tx_power ——Monitors the TX Power of SFP modules inserted into the SFP ports on the switch. The trap can be triggered when the TX Power of any SFP module has reached the warning or alarm threshold.

rx_power ——Monitors the RX Power of SFP modules inserted into the SFP ports on the switch. The trap can be triggered when the RX Power of any SFP module has reached the warning or alarm threshold.

User guidelines

The **snmp-server traps ddm** command without any parameter is used to enable all the types of DDM traps. And the **no snmp-server traps ddm** command without any parameter is used to disable all the types of DDM traps.

For more instructions about the alarm threshold or warning threshold, refer to Chapter 11 DDM Commands.

Command Mode

Global Configuration Mode

Example

Enable all the SNMP DDM traps for the switch:

```
Switch(config)# snmp-server traps ddm
```

83.12 snmp-server traps vlan

Description

The **snmp-server traps vlan** command is used to enable the corresponding VLAN traps. The command without parameter enables all SNMP VLAN traps. To disable this function, please use **no snmp-server traps vlan** command. All VLAN traps are disabled by default.

Syntax

snmp-server traps vlan [create | delete]

no snmp-server traps vlan [create | delete]

Parameter

create ——Triggered when certain VLANs are created successfully.

delete ——Triggered when certain VLANs are deleted successfully.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable all SNMP extended VLAN-related traps for the switch:

Switch(config)# snmp-server traps vlan

Enable VLAN-created trap only for the switch:

Switch(config)# snmp-server traps vlan create

83.13 snmp-server traps security

Description

The **snmp-server traps security** command is used to enable the corresponding security traps. To disable this feature, please use **no snmp-server traps security** command. All security traps are disabled by default.

Syntax

snmp-server traps security { dhcp-filter | ip-mac-binding **}**

no snmp-server traps security { dhcp-filter | ip-mac-binding **}**

Parameter

dhcp-filter —— Triggered when the DHCPv4 Filter feature is enabled and the switch receives DHCP packets from an illegal DHCP server.

ip-mac-binding —— Triggered when the ARP Inspection feature is enabled and the switch receives an illegal ARP packet, or the IPv4 Source Guard feature is enabled and the switch receives an illegal IP packet.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable the DHCP filter trap for the switch:

Switch(config)# snmp-server traps security dhcp-filter

83.14 snmp-server traps security dhcp6-filter

Description

The **snmp-server traps security dhcp6-filter** command is used to enable the IPv6 DHCP Filter illegal message snmp trap and log function. To disable this function, please use **no snmp-server traps security dhcp6-filter** command. All security traps are disabled by default.

Syntax

snmp-server traps security dhcp6-filter

no snmp-server traps security dhcp6-filter

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable the IPv6 DHCP Filter illegal message snmp trap and log function:

Switch(config)# snmp-server traps security dhcp6-filter

83.15 snmp-server traps acl

Description

The **snmp-server traps acl** command is used to enable the ACL trap. To disable this feature, please use **no snmp-server traps acl** command. It is disabled by default.

The trap monitors matched ACL information, including the matched ACL ID, rule ID and the number of the matched packets. With both this trap and the Logging feature in ACL rule settings enabled, the switch will check the matched ACL information every five minutes and send SNMP traps if there is any updated information.

Syntax

snmp-server traps acl

no snmp-server traps acl

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable the ACL trap for the switch:

```
Switch(config)# snmp-server traps acl
```

83.16 snmp-server traps ip

Description

The **snmp-server traps ip** command is used to enable IP traps. To disable this feature, please use **no snmp-server traps ip** command. All IP traps are disabled by default.

Syntax

snmp-server traps ip { change | duplicate **}**

no snmp-server traps ip { change | duplicate **}**

Parameter

change —— Enable SNMP IP change traps. The trap monitors the IP changed of each interface. The trap can be triggered when the IP address of any interface is changed.

duplicate —— Enable SNMP IP duplicate traps. The trap can be triggered when the switch detects an IP conflict event.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable the IP-Change trap for the switch:

```
Switch(config)# snmp-server traps ip change
```

83.17 snmp-server traps power

(Only for Certain Devices)

Note: This command is only available on certain devices

Description

The **snmp-server traps power** command is used to enable PoE traps. The command without parameter enables all PoE traps. To disable this feature, please use **no snmp-server traps power** command. All PoE traps are disabled by default.

Syntax

snmp-server traps power [over-max-pwr-budget | port-pwr-change | port-pwr-deny | port-pwr-over-30w | port-pwr-overload | port-short-circuit | thermal-shutdown **]**

no snmp-server traps power [over-max-pwr-budget | port-pwr-change | port-pwr-deny | port-pwr-over-30w | port-pwr-overload | port-short-circuit | thermal-shutdown **]**

Parameter

over-max-pwr-budget ——Triggered when the total power required by the connected PDs exceeds the maximum power the PoE switch can supply.

port-pwr-change ——Triggered when the total power required by the connected PDs exceeds the maximum power the PoE switch can supply.

port-pwr-deny ——Triggered when the switch powers off PDs on low-priority PoE ports. When the total power required by the connected PDs exceeds the system power limit, the switch will power off PDs on low-priority PoE ports to ensure stable running of the other PDs.

port-pwr-over-30w ——Triggered when the power required by the connected PD exceeds 30 watts.

port-pwr-overload ——Triggered when the power required by the connected PD exceeds the maximum power the port can supply.

port-short-circuit ——Triggered when a short circuit is detected on a port.

thermal-shutdown ——Triggered when the PSE chip overheats. The switch will stop supplying power in this case.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable all PoE traps for the switch:

```
Switch(config)# snmp-server traps power
```

83.18 snmp-server traps link-status

Description

The **snmp-server traps link-status** command is used to enable SNMP link status trap for the specified port. To disable the sending of SNMP link status trap, please use **no snmp-server traps link-status** command. By default, it is enabled.

Syntax

snmp-server traps link-status

no snmp-server traps link-status

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin level users have access to these commands.

Example

Enable SNMP link status trap for port 3:

```
Switch(config)# interface gigabitEthernet 1/0/3
Switch(config-if)# snmp-server traps link-status
```

83.19 rmon history

Description

The **rmon history** command is used to configure the history sample entry. To return to the default configuration, please use **no rmon history** command. RMON (Remote Monitoring), basing on SNMP architecture, functions to monitor the network. History Group is one of the commonly used RMON Groups. After a history group is configured, the switch collects network statistics information periodically, based on which the management station can monitor network effectively.

Syntax

rmon history *index* **interface gigabitEthernet** *port* [**interval** *interval*] [**owner** *owner-name*] [**buckets** *number*]

no rmon history *index*

Parameter

index —— The index number of the entry, ranging from 1 to 12, in the format of 1-3,5.

port ——The Ethernet port number.

interval —— The interval to take samplings from the port, ranging from 10 to 3600 in seconds. By default, it is 1800.

owner-name —— The owner of the history sample entry, ranging from 1 to 16 characters. By default, it is "monitor".

number —— The maximum number of buckets desired for the RMON history group of statistics, ranging from 1 to 130. The default is 50 buckets.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the sample port as Gi1/0/2 and the sample interval as 100 seconds for the entry 1-3:

Switch(config)# rmon history 1-3 **interface gigabitEthernet** 1/0/2 **interval** 100 **owner** owner1

83.20 rmon event

Description

The **rmon event** command is used to configure the entries of SNMP-RMON Event. To return to the default configuration, please use **no rmon event** command. Event Group, as one of the commonly used RMON Groups, is used to define RMON events. Alarms occur when an event is detected.

Syntax

rmon event *index* [**user** *user-name*] [**description** *descript*] [**type** { none | log | notify | log-notify }] [**owner** *owner-name*]

no rmon event *index*

Parameter

index —— The index number of the event entry, ranging from 1 to 12. You can only select one entry for each command.

user-name —— The name of the User to which the event belongs, ranging from 1 to 16 characters. By default, it is "public".

descript —— The description of the event, ranging from 1 to 16 characters. By default, it is empty.

type —— The event type, with none, log, notify and both options. None indicates no processing, log indicates logging the event, notify indicates sending trap messages to the management station, and both indicates logging the event and sending trap messages to the management station.

owner-name —— The owner of the event entry, ranging from 1 to 16 characters. By default, it is "monitor".

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the user name of entry 1, 2, 3 and 4 as user1, the description of the event as description1, the type of event as log and the owner of the event as owner1:

Switch(config)# rmon event 1-4 **user** user1 **description** description1 **type** log **owner** owner1

83.21 rmon alarm

Description

The **rmon alarm** command is used to configure SNMP-RMON Alarm Management. To return to the default configuration, please use **no rmon alarm** command. Alarm Group is one of the commonly used RMON Groups. RMON alarm management allows monitoring the specific alarm variables. When the value of a monitored variable exceeds the threshold, an alarm event is generated, which triggers the switch to act in the set way.

Syntax

rmon alarm *index* { **stats-index** *sindex* } [**alarm-variable** { revbyte | revpkt | bpkt | mpkt | crc-lign | undersize | oversize | jabber | collision | 64 | 65-127 | 128-511 | 512-1023 | 1024-10240 }] [**s-type** { absolute | delta}] [**rising-threshold** *r-hold*] [**rising-event-index** *r-event*] [**falling-threshold**

f-hold] [**falling-event-index** *f-event*] [**a-type** {rise | fall | all}] [**owner** *owner-name*] [**interval** *interval*]

no rmon alarm *index*

Parameter

index —— The index number of the Alarm Management entry, ranging from 1 to 12, in the format of 1-3,5.

sindex —— Specify the statistics index.

alarm-variable —— The alarm variable. By default, the option is revbyte.

s-type —— Sample Type, which is the sampling method for the selected variable and comparing the value against the thresholds. There are two options, absolute and delta. Absolute indicates comparing the values directly with the thresholds at the end of the sampling interval. Delta indicates subtracting the last sampled value from the current value, and then comparing the difference in the values with the threshold. By default, the Sample Type is absolute.

r-hold —— The rising counter value that triggers the Rising Threshold alarm, ranging from 1 to 2147483647. By default, it is 100.

r-event —— Rise Event, which is the index of the corresponding event which will be triggered if the sampled value is larger than the Rising Threshold. It ranges from 1 to 12.

f-hold —— The falling counter value that triggers the Falling Threshold alarm, ranging from 1 to 2147483647. By default, it is 100.

f-event —— Fall Event, which is the index of the corresponding event which will be triggered if the sampled value is lower than the Falling Threshold. It ranges from 1 to 12.

a-type —— Alarm Type, with rise, fall and all options. Rise indicates that the alarm event will be triggered when the sampled value exceeds the Rising Threshold, fall indicates that the alarm event will be triggered when the sampled value is under the Falling Threshold, and all indicates that the alarm event will be triggered either the sampled value exceeds the Rising Threshold or is under the Falling Threshold. By default, the Alarm Type is all.

owner-name —— The owner of the entry, ranging from 1 to 16 characters. By default, it is monitor.

interval —— The alarm interval time, ranging from 10 to 3600 in seconds. By default, it is 1800.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure rmon alarm entries 1-3 binding with statistics entry 2, the owners as owner1 and the alarm intervals as 100 seconds:

Switch(config)#rmon alarm 1-3 **stats-index** 2 **owner** owner1 **interval** 100

83.22 rmon statistics

Description

The **rmon statistics** command is used to configure the entries of SNMP-RMON statistics. To delete the corresponding entry, please use **no rmon statistics** command. The maximum supported entries are 1000.

Syntax

rmon statistics *index* **interface gigabitEtherne**t *port* [**owner** *owner-name*] [**status** { underCreation | valid }]

no rmon statistics *index*

Parameter

index —— The index number of the statistics entry, ranging from 1 to 65535, in the format of 1-3,5.

port —— The statistics port number, in the format of 1/0/1.

owner-name —— The creator of the event entry, ranging from 1 to 16 characters. By default, it is "monitor".

status —— The status of the statistics entry, either "underCreation" or "valid". "underCreation" means this entry won't take effect until it is modified to "valid"; "valid" means this entry takes effect immediately after it is created.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Configure the statistics entries 1-3 with the statistics port as 1/0/1, owner as owner1 and status as valid:

```
Switch(config)#rmon statistics 1-3 interface gigabitEthernet 1/0/1 owner
owner1 status valid
```

83.23 show snmp-server

Description

The **show snmp-server** command is used to display SNMP configuration globally.

Syntax

show snmp-server

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display SNMP configuration globally:

```
Switch# show snmp-server
```

83.24 show snmp-server view

Description

The **show snmp-server view** command is used to display the View table.

Syntax

show snmp-server view

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the View table:

```
Switch# show snmp-server view
```

83.25 show snmp-server group

Description

The **show snmp-server group** command is used to display the Group table.

Syntax

show snmp-server group

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the Group table:

```
Switch# show snmp-server group
```

83.26 show snmp-server user

Description

The **show snmp-server user** command is used to display the User table.

Syntax

show snmp-server user

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the User table:

```
Switch# show snmp-server user
```

83.27 show snmp-server community

Description

The **show snmp-server community** command is used to display the Community table.

Syntax

show snmp-server community

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the Community table:

```
Switch# show snmp-server community
```

83.28 show snmp-server host

Description

The **show snmp-server host** command is used to display the Host table.

Syntax

show snmp-server host

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the Host table:

```
Switch# show snmp-server host
```

83.29 show snmp-server engineID

Description

The **show snmp-server engineID** command is used to display the engineID of the SNMP.

Syntax

show snmp-server engineID

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the engineID:

```
Switch# show snmp-server engineID
```

83.30 show rmon history

Description

The **show rmon history** command is used to display the configuration of the history sample entry.

Syntax

show rmon history [*index*]

Parameter

index —— The index number of the entry selected to display the configuration, ranging from 1 to 12, in the format of 1-3, 5. You can select more than one entry for each command. By default, the configuration of all history sample entries is displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the configuration of all history sample entries:

```
Switch# show rmon history
```

83.31 show rmon event

Description

The **show rmon event** command is used to display the configuration of SNMP-RMON Event.

Syntax

show rmon event [*index*]

Parameter

index —— The index number of the entry selected to display the configuration, ranging from 1 to 12, in the format of 1-3, 5. You can select more than one entry for each command. By default, the configuration of all SNMP-RMON enabled entries is displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the Event configuration of entry1-4:

```
Switch# show rmon event 1-4
```

83.32 show rmon alarm

Description

The **show rmon alarm** command is used to display the configuration of the Alarm Management entry.

Syntax

show rmon alarm [*index*]

Parameter

index —— The index number of the entry selected to display the configuration, ranging from 1 to 12, in the format of 1-3, 5. You can select more than one entry for each command. By default, the configuration of all Alarm Management entries is displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the configuration of the Alarm Management entry 1-2:

```
Switch# show rmon alarm 1-2
```

83.33 show rmon statistics

Description

The **show rmon statistics** command is used to display the configuration of the specified statistics entry.

Syntax

show rmon statistics [*index*]

Parameter

index —— The index number of the statistics entry selected to display the configuration, ranging from 1 to 65535. By default, the configuration of all statistics entries is displayed.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin level users have access to these commands.

Example

Display the configuration of the statistics entry 1:

```
Switch#show rmon statistics 1
```

Chapter 84 NETCONF Commands (Only for Certain Devices)

Note: NETCONF commands are only available on certain devices.

The Network Configuration Protocol (NETCONF) defines a simple mechanism for managing network devices by allowing the retrieval of configuration data information and enabling the uploading and manipulation of new configuration data. This protocol permits devices to expose a full-fledged formal Application Programming Interface (API). Applications can utilize this straightforward API to send and receive complete or partial sets of configuration.

84.1 netconf ssh

Description

The **netconf ssh** command is used to enable the NETCONF SSH connection function. Only when the NETCONF SSH connection function is enabled can the network administrator configure and manage the switch through NETCONF through port 830. To disable NETCONF SSH connection, please use the **no netconf ssh** command.

Syntax

netconf ssh

no netconf ssh

Parameter

None

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the NETCONF SSH connection on the switch:

```
Switch(config)#netconf ssh
```

Chapter 85 PoE Commands (Only for Certain Devices)

Note: PoE commands are only available on certain devices.

PoE (Power over Ethernet) technology describes a system to transmit electrical power along with data to remote devices over standard twisted-pair cable in an Ethernet network. It is especially useful for supplying power to IP telephones, wireless LAN access points, cameras and so on.

85.1 power inline consumption (global)

Description

The **power inline consumption** command is used to configure the max power the PoE switch can supply globally.

Syntax

power inline consumption *power-limit*

Parameter

power-limit——The max power the PoE switch can supply.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the max power the PoE switch can supply as 160 W:

Switch(config)# power inline consumption 160

85.2 power profile

Description

The **power profile** command is used to create a PoE profile for the switch. To delete the configured PoE profile configuration, please use **no power profile**

command. PoE Profile is a short cut for the configuration of the PoE port. In a PoE profile, the PoE status, PoE priority and power limit are configured. You can specify a PoE profile for each PoE port individually.

Syntax

power profile *name* [**supply** {enable | disable} [**priority** {low | middle | high} [**consumption** { *power-limit* | auto | class1 | class2 | class3 | class4 }]]]

no power profile *name*

Parameter

name —— The PoE profile name, ranging from 1 to 16 characters. If the name being assigned contains spaces then put it inside double quotes.

supply —— The PoE status of the port in the profile. By default, the PoE status is "enable".

priority —— The PoE priority of the port in the profile. The priority levels include "high", "middle" and "low" in descending order. When the supply power exceeds the system power limit, the PD linked to the port with lower priority will be disconnected. By default, the PoE priority is "low".

consumption —— The max power the port in the profile can supply, with five options: "power-limit", "auto", "class1", "class2", "class3" and "class4". "Power-limit" indicates you can manually enter a value ranging from 1 to 300. The value is in the unit of 0.1 watt. For instance, if you want to configure the max power as 5w, you should enter 50. "Auto" indicates the value is assigned automatically by the PoE switch. "Class1" represents 4w. "Class2" represents 7w. "Class3" represents 15.4w. "Class4" represents 30w.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Create a PoE profile named "IP Camera" whose PoE status is "enable", PoE priority is "low" and the power limit is "5w":

Switch(config)# power profile "IP Camera" **supply** enable **priority** low **consumption** 50

85.3 power inline consumption (interface)

Description

The **power inline consumption** command is used to configure the power limit the corresponding port can supply.

Syntax

power inline consumption { *power-limit* | auto | class1 | class2 | class3 | class4 }

Parameter

power-limit —— The max power the port in the profile can supply, with five options: "power-limit", "auto", "class1", "class2", "class3" and "class4". "Power-limit" indicates you can manually enter a value ranging from 1 to 300. The value is in the unit of 0.1 watt. For instance, if you want to configure the max power as 5w, you should enter 50. "Auto" indicates the value is assigned automatically by the PoE switch. "Class1" represents 4w. "Class2" represents 7w. "Class3" represents 15.4w. "Class4" represents 30w.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the power limit as "5w" for port 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# power inline consumption 50
```

85.4 power inline consumption (unit)

Description

The **power inline unit consumption** command is used to specify the maximum power a stack unit can supply.

Syntax

power inline unit {*unit id*} **consumption** {power-limit}

Parameter

unit id—— Stack unit ID, ranging from 1-4

power-limit —— Specify the maximum power the PoE switch can supply, which depends on actual power usage.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Specify the maximum power unit 1 can supply to 402W:

```
Switch(config)#power inline unit 1 consumption 402
```

85.5 power inline priority

Description

The **power inline priority** command is used to configure the PoE priority for the corresponding port

Syntax

power inline priority { low | middle | high }

Parameter

priority —— The PoE priority of the port. The priority levels include “high”, “middle” and “low” in descending order. When the supply power exceeds the system power limit, the PD linked to the port with lower priority will be disconnected. By default, the priority level is “low”.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Configure the PoE priority as “low” for port 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# power inline priority low
```

85.6 power inline supply

Description

The **power inline supply** command is used to configure the PoE status of the corresponding port.

Syntax

power inline supply { enable | disable }

Parameter

enable | disable —— The PoE status of the port. By default, the PoE status is "enable".

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the PoE feature for port 2:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# power inline supply enable
```

85.7 power inline profile

Description

The **power inline profile** command is used to bind a PoE profile to the corresponding port. To cancel the bind relation, please use **no power inline profile** command.

Syntax

power inline profile *name*

no power inline profile

Parameter

name —— The name of the PoE profile to be bound to the port. If the name

being assigned contains spaces then put it inside double quotes.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Bind the PoE profile named “IP Camera” to port 2:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# power inline profile “IP Camera”

85.8 power inline time-range

Description

The **power inline time-range** command is used to bind a PoE time-range to the corresponding port. To cancel the bind relation, please use **no power inline time-range** command.

Syntax

power inline time-range *name*

no power inline time-range

Parameter

name —— The name of the PoE time-range to be bound to the port.

Command Mode

Interface Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Bind the PoE time-range named “tRange2" to port 2:

Switch(config)# interface gigabitEthernet 1/0/2

Switch(config-if)# power inline time-range tRange2

85.9 show power inline

Description

The **show power inline** command is used to display the global PoE information of the system.

Syntax

show power inline

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Display the PoE information of the system:

```
Switch# show power inline
```

85.10 show power inline configuration interface

Description

The **show power inline configuration interface** command is used to display the PoE configuration of the certain port.

Syntax

show power inline configuration interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port*]

Parameter

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Display the PoE configuration of all ports:

```
Switch# show power inline configuration interface
```

85.11 show power inline information interface

Description

The **show power inline information** command is used to display the PoE information of the certain port.

Syntax

show power inline information interface [**fastEthernet** *port* | **gigabitEthernet** *port* | **ten-gigabitEthernet** *port*]

Parameter

port —— The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the PoE information of all ports:

```
Switch# show power inline information interface
```

85.12 show power profile

Description

The **show power profile** command is used to display the defined PoE profile.

Syntax

show power profile

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the defined PoE profile:

```
Switch# show power profile
```

85.13 power recovery ststus enable

Description

The **power recovery ststus enable** command is used to enable the power auto recovery function globally. To disable this function, please use **power recovery ststus disable** command

Syntax

power recovery ststus enable

power recovery ststus disable

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the power auto recovery function globally:

```
Switch(config)# power recovery ststus enable
```

85.14 power recovery status

Description

The **power recovery ststus** command is used to configure the power recovery status and parameters of a specified port..

Syntax

power recovery ststus {disable|enable} ip *ipv4_addr* **startup** *startup delay* **interval** *ping interval* **retry** *failure threshold* **break** *break time*

Parameter

ipv4_addr —— Ipv4 address, in string format, for example, 192.168.0.1.

startup delay —— Feature startup delay(S), ranging from 30 to 600.

ping interval —— Ping package interval(S), ranging from 10 to 120.

failure threshold —— Number of ping failures, ranging from 1 to 10.

break time —— Break time after detecting abnormal POE status(S), ranging from 3 to 120.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the power recovery status of port 2 and configure relevant parameters:

```
Switch(config)# interface gigabitEthernet 1/0/2
Switch(config-if)# power recovery status enable ip 192.168.0.1 startup 60
interval 60 retry 5 break 60
```

85.15 show power recovery

Description

The **show power recovery** command is used to display all POE auto recovery configurations.

Syntax

show power recovery

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Display all POE auto recovery configurations:

```
Switch(config)#show power recovery
```

85.16 show power recovery interface

Description

The **show power recovery interface** command is used to display power auto recovery configurations of the selected port.

Syntax

show power recovery *interface* [**fastEthernet | gigabitEthernet | two-gigabitEthernet | ten-gigabitEthernet**] *port list*

Parameter

interface —— Port type.

port list—— Port number list.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Display power auto recovery configurations of:

```
Switch(config)#show power recovery
```

Chapter 86 ARP Inspection Commands

ARP (Address Resolution Protocol) Detect function is to protect the switch from the ARP cheating, such as the Network Gateway Spoofing and Man-In-The-Middle Attack, etc.

86.1 ip arp inspection

Description

The **ip arp inspection** command is used to enable the ARP Detection function globally. To disable the ARP Detection function, please use **no ip arp detection** command.

Syntax

ip arp inspection

no ip arp inspection

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the ARP Detection function globally:

```
Switch(config)#ip arp inspection
```

86.2 ip arp inspection validate

Description

The **ip arp inspection validate** command is used to enable the switch to check whether the reveided ARP packet is illegal. To disable,the feature please use **no ip arp detection validate** command.

Syntax

ip arp inspection validate { src-mac | dst-mac | ip **}**

no ip arp inspection validate { src-mac | dst-mac | ip **}**

Syntax

src-mac —— Enable the switch to check whether the source MAC address and the sender MAC address are the same when receiving an ARP packet. If not, the ARP packet will be discarded.

dst-mac —— Enable the switch to check whether the sender IP address of all ARP packets and the target IP address of ARP reply packets are legal. The illegal packets will be discarded.

ip —— Enable or disable the switch to check whether the sender IP address of all ARP packets and the target IP address of ARP reply packets are legal. The illegal packets will be discarded.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the switch to check whether the source MAC address and the sender MAC address are the same when receiving an ARP packet

```
Switch(config)#ip arp inspection validate src-mac
```

86.3 ip arp inspection vlan

Description

The **ip arp inspection vlan** command is used to enable the ARP Detection function on VLANs. To disable the ARP Detection function on VLANs, please use **no ip arp detection vlan** command.

Syntax

ip arp inspection vlan *vlan-list*

no ip arp inspection vlan *vlan-list*

Syntax

vlan-list —— Enter the VLAN ID. The format is 1,5-9.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the ARP Detection function on VLAN 2:

Switch(config)#ip arp inspection vlan 2

86.4 ip arp inspection vlan logging

Description

The **ip arp inspection vlan logging** command is used to enable the Log function on the specific VLAN. To disable the Log function on the VLAN, please use **no ip arp detection vlan logging** command.

Syntax

ip arp inspection vlan *vlan-list* **logging**

no ip arp inspection vlan *vlan-list* **logging**

Syntax

vlan-list —— Enter the VLAN ID. The format is 1,5-9.

logging —— Enable the Log feature to make the switch generate a log when an ARP packet is discarded.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Enable the log feature on VLAN 2:

Switch(config)#ip arp inspection vlan 2 **logging**

86.5 ip arp inspection trust

Description

The **ip arp inspection trust** command is used to configure the port for which the ARP Detect function is unnecessary as the Trusted Port. To clear the Trusted Port list, please use **no ip arp detection trust** command .The specific ports, such as up-linked port and routing port and LAG port, should be set as Trusted Port. To ensure the normal communication of the switch, please configure the ARP Trusted Port before enabling the ARP Detect function.

Syntax

ip arp inspection trust

no ip arp inspection trust

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the Gigabit Ethernet ports 1/0/2-5 as the Trusted Port:

Switch(config)#interface range gigabitEthernet 1/0/2-5

Switch(config-if-range)#ip arp inspection trust

86.6 ip arp inspection limit-rate

Description

The **ip arp inspection limit-rate** command is used to configure the ARP speed of a specified port. To restore to the default speed, please use **no ip arp inspection limit-rate** command.

Syntax

ip arp inspection limit-rate *value*

no ip arp inspection limit-rate

Parameter

value——The value to specify the maximum amount of the received ARP packets per second, ranging from 1 to 300 in pps(packet/second). By default, the value is 100.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the maximum amount of the received ARP packets per second as 50 pps for Gigabit Ethernet port 5:

Switch(config)#interface gigabitEthernet 1/0/5

Switch(config-if)#ip arp inspection limit-rate 50

86.7 ip arp inspection burst-interval

Description

The **ip arp inspection burst-interval** command is used to configure the burst interval of a specified port. To restore to the default speed, please use **no ip arp inspection burst-interval** command.

Syntax

ip arp inspection burst-interval *value*

no ip arp inspection burst-interval

Parameter

value—— Specify a time range. If the speed of received ARP packets in this time range reaches the limit for this time range, the port will be shut down. The valid values are from 1 to 15 seconds, and the default value is 1 second.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the burst interval as 2 seconds for Gigabit Ethernet port 5:

```
Switch(config)#interface gigabitEthernet 1/0/5
Switch(config-if)#ip arp inspection burst-interval 2
```

86.8 ip arp inspection recover

Description

The **ip arp inspection recover** command is used to restore a port to the ARP transmit status from the ARP filter status.

Syntax

ip arp inspection recover

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Restore Gigabit Ethernet port 1/0/5 to the ARP transmit status:

```
Switch(config)#interface gigabitEthernet 1/0/5
Switch(config-if)#ip arp inspection recover
```

86.9 ip arp inspection exceed

Description

The **ip arp inspection exceed** command is used to configure the overspeed action. To delete this action, please use **no ip arp inspection exceed** command.

Syntax

ip arp inspection exceed [**drop | shutdown**] *recover-time*

no ip arp inspection exceed

Parameter

drop —— Drop messages when speeding.

shutdown —— Shut ports down when speeding.

recover-time —— Configure self-recovery time.

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet)

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Configure the overspeed action as dropping messages when speeding and self-recovery time as 2 seconds for Gigabit Ethernet port 5:

```
Switch(config)#interface gigabitEthernet 1/0/5
Switch(config-if)#ip arp inspection exceed drop 2
```

86.10 show ip arp inspection

Description

The **show ip arp inspection** command is used to display the ARP detection global configuration including the enable/disable status and the Trusted Port list.

Syntax

show ip arp inspection

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the ARP detection configuration globally:

```
Switch(config)#show ip arp inspection
```

86.11 show ip arp inspection interface

Description

The **show ip arp inspection interface** command is used to display the interface configuration of ARP detection.

Syntax

show ip arp inspection interface [**gigabitEthernet** *port*]

Parameter

port——The Ethernet port number.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of Gigabit Ethernet port 1/0/1:

```
Switch(config)#show ip arp inspection interface gigabitEthernet 1/0/1
```

Display the configuration of all Ethernet ports:

```
Switch(config)#show ip arp inspection interface
```

86.12 show ip arp inspection vlan

Description

The **show ip arp inspection vlan** command is used to display the VLAN configuration of ARP detection.

Syntax

show ip arp inspection vlan

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the ARP Inspection configuration of VLAN:

```
Switch(config)#show ip arp inspection vlan
```

86.13 show ip arp inspection statistics

Description

The **show ip arp inspection statistics** command is used to display the number of the illegal ARP packets received.

Syntax

show ip arp inspection statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the number of the illegal ARP packets received:

```
Switch(config)#show ip arp inspection statistics
```

86.14 clear ip arp inspection statistics

Description

The **clear ip arp inspection statistics** command is used to clear the statistic of the illegal ARP packets received.

Syntax

clear ip arp inspection statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

Only Admin, Operator and Power User level users have access to these commands.

Example

Clear the statistic of the illegal ARP packets received:

```
Switch(config)#clear ip arp inspection statistics
```

Chapter 87 ND Detection Commands

The ND Detection feature allows the switch to detect the ND packets based on the binding entries in the IPv6-MAC Binding Table and filter out the illegal ND packets. Before configuring ND Detection, complete IPv6-MAC Binding configuration. For details, refer to IPv6-MAC Binding Configurations.

87.1 ipv6 nd detection

Description

The **ipv6 nd detection** command is used to enable the ND Detection function globally. To disable the ND Detection function, please use **no ipv6 nd detection** command.

Syntax

ipv6 nd detection

no ipv6 nd detection

Command Mode

Global Configuration Mode

Example

Enable the ND Detection function globally:

```
Switch(config)#ipv6 nd detection
```

87.2 ipv6 nd detection vlan

Description

The **ipv6 nd detection vlan** command is used to enable ND Detection function on a specified VLAN. To disable ND Detection function on this VLAN, please use **no ipv6 nd detection vlan** command.

Syntax

ipv6 nd detection vlan *vlan-range*

no ipv6 nd detection vlan *vlan-range*

Parameter

vlan-range——Enter the vlan range in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Example

Enable the ND Detection function on VLAN 1,4,6-7:

Switch(config)#ipv6 nd detection vlan 1,4,6-7

87.3 ipv6 nd detection vlan logging

Description

The **ipv6 nd detection vlan logging** command is used to enable Log function on a specified VLAN. To disable Log function on this VLAN, please use **no ipv6 nd detection vlan logging** command.

Syntax

ipv6 nd detection vlan *vlan-range* **logging**

no ipv6 nd detection vlan *vlan-range* **logging**

Parameter

vlan-range——Enter the vlan range in the format of 1-3, 5.

Command Mode

Global Configuration Mode

Example

Enable the Log function on VLAN 1,4,6-7:

Switch(config)#ipv6 nd detection vlan 1,4,6-7 **logging**

87.4 ipv6 nd detection trust

Description

The **ipv6 nd detection trust** command is used to configure the port for which the ND Detection function is unnecessary as the Trusted Port. To clear the

Trusted Port list, please use **no ipv6 nd detection trust** command .The specific port, such as up-linked port, routing port and LAG port, should be set as Trusted Port. To ensure the normal communication of the switch, please configure the ND Detection Trusted Port before enabling the ND Detection function.

Syntax

Ipv6 nd detection trust

no ipv6 nd detection trust

Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet/ interface port-channel / interface range port-channel)

Example

Configure the Gigabit Ethernet ports 1/0/2-5 as the Trusted Port:

```
Switch(config)#interface range gigabitEthernet 1/0/2-5
Switch(config-if-range)#ipv6 nd detection trust
```

87.5 show ipv6 nd detection

Description

The **show ipv6 nd detection** command is used to display the ND detection global configuration including the enable/disable status.

Syntax

show ipv6 nd detection

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the ND Detection configuration globally:

```
Switch(config)#show ipv6 nd detection
```

87.6 show ipv6 nd detection interface

Description

The **show ipv6 nd detection interface** command is used to display the interface configuration of ND Detection.

Syntax

show ipv6 nd detection interface[**fastEthernet** *port*| **gigabitEthernet** *port*| **ten-gigabitEthernet** *port*| **port-channel** *port-channel-id*]

Parameter

port——The Ethernet port number.

port-channel-id—— The ID of the port channel.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the configuration of Gigabit Ethernet port 1/0/1:

Switch(config)#show ipv6 nd detection interface gigabitEthernet 1/0/1

Display the configuration of all Ethernet ports:

Switch(config)#show ipv6 nd detection interface

87.7 show ipv6 nd detection statistics

Note: This command is only available on certain devices.

Description

The **show ipv6 nd detection statistics** command is used to display the ND statistics of each VLAN, including the number of forwarded and dropped ND packets.

Syntax

show ipv6 nd detection statistics

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the ipv6 ND Detection statistics of each VLAN.

```
Switch(config)#show ipv6 nd detection statistics
```

87.8 show ipv6 nd detection vlan

Description

The **show ipv6 nd detection vlan** command is used to display the VLAN configuration of ND Detection.

Syntax

show ipv6 nd detection vlan

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Example

Display the ipv6 ND Detection configuration of VLAN.

```
Switch(config)#show ipv6 nd detection vlan
```

Chapter 88 System Log Commands

The log information will record the settings and operation of the switch respectively for you to monitor operation status and diagnose malfunction.

88.1 logging buffer

Description

The **logging buffer** command is used to store the system log messages to an internal buffer. To disable the log buffer function, please use the **no logging buffer** command. Local Log is the system log information saved in the switch. It has two output channels, that is, it can be saved to two different positions, log buffer and log flash memory. The log buffer indicates the RAM for saving system log and the information in the log buffer can be got by show logging buffer command. It will be lost when the switch is restarted.

Syntax

logging buffer

no logging buffer

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the system log buffer:

```
Switch(config)#logging buffer
```

88.2 logging buffer level

Description

The **logging buffer level** command is used to configure the severity level and the status of the configuration input to the log buffer. To return to the default configuration, please use **no logging buffer level** command.

Syntax

logging buffer level *level*

no logging buffer level

Parameter

level—— Severity level of the log information output to each channel. There are 8 severity levels marked with values 0-7. The smaller value has the higher priority. Only the log with the same or smaller severity level value will be output. By default, it is 6 indicating that the log information with level 0-6 will be saved in the log buffer.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Set the severity level as 5:

Switch(config)#logging buffer level 5

88.3 logging file flash

Description

The **logging file flash** command is used to store the log messages in a file in the flash on the switch. To disable the log file flash function, please use **no logging file flash** command. This function is disabled by default. The log file flash indicates the flash sector for saving system log. The information in the log file of the flash will not be lost after the switch is restarted and can be got by the show logging flash command.

Syntax

logging file flash

no logging file flash

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable the log file flash function:

```
Switch(config)#logging file flash
```

88.4 logging file flash frequency

Description

The **logging file flash frequency** command is used to specify the frequency to synchronize the system log file in the log buffer to the flash. To resume the default synchronizing frequency, please use the **no logging file flash frequency** command.

Syntax

logging file flash frequency { **periodic** *periodic* | **immediate** }

no logging file flash frequency

Parameter

periodic —— The frequency to synchronize the system log file in the log buffer to the flash, ranging from 1 to 48 hours. By default, the synchronization process takes place every 24 hours.

immediate —— The system log file in the buffer will be synchronized to the flash immediately. This option will reduce the life of the flash and is not recommended.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Specify the log file synchronization frequency as 10 hours:

```
Switch(config)#logging file flash frequency periodic10
```

88.5 logging file flash level

Description

The **logging file flash level** command is used to specify the system log message severity level. Messages will a severity level equal to or higher than this value will be stored to the flash. To restore to the default level, please use **no logging file flash level** command.

Syntax

logging file flash level *level*

no logging file flash level

Parameter

level—— Severity level of the log message. There are 8 severity levels marked with values 0–7. The smaller value has the higher priority. Only the log with the same or smaller severity level value will be saved to the flash. By default, it is 3 indicating that the log message marked with 0–3 will be saved in the log flash.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Save the log messages with their severities equal or higher than 7 to the flash :

```
Switch(config)#logging file flash level 7
```

88.6 logging host index

Description

The **logging host index** command is used to configure the Log Host. To clear the configuration of the specified Log Host, please use **no logging host index** command. Log Host is to receive the system log from other devices. You can remotely monitor the settings and operation status of other devices through the log host.

Syntax

logging host index *idx host-ip* **protocol** {udp | tcp | tls | dtls} **level** *level* **[vrf** *vrf-name***]**

logging host index *idx host-ip* **protocol** {udp | tcp | tls | dtls} **port** *port-number* **level** *level* **[vrf** *vrf-name***]**

no logging host index *idx*

Parameter

idx —— The index of the log host. The switch supports 4 log hosts at most.

host-ip —— The IP for the log host.

level —— The severity level of the log information sent to each log host. There are 8 severity levels marked with values 0-7. The smaller value has the higher priority. Only the log with the same or smaller severity level value will be sent to the corresponding log host. By default, it is 6 indicating that the log information marked with 0–6 will be sent to the log host.

protocol —— The transport layer protocol type used by the log host, including UDP, TCP, TLS, and DTLS. If security is required, TLS and DTLS can be used, because these two transport layer protocol types will encrypt data when sending syslog.

port-number —— The four-layer port number used by the transport layer protocol, ranging from 1 to 65535. The default port number used by UDP and TCP is 514, and the default port number used by TLS and DTLS is 6514. If the user does not configure it, the default port number is used. The user can configure the port number to be used by himself, but it is necessary to pay attention to whether the port used is already in use or whether the port number is used by a certain protocol. *vrf-name* —— VRF name, default VRF is used by default, and the name length is 1-15.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable log host 2 and set its IP address as 192.168.0.148, the level 5:

Configure the log host, set the IP address to 192.168.0.2, the port number to 1234, use the TCP protocol, and use the VRF named vrf1 (make sure the corresponding VRF has been created):

Switch (config)# logging host index *1 192.168.0.2* **protocol** *tcp* **port** *1234* **level** *6* **vrf** *vrf1*

88.7 logging host download

Description

The **logging host download** command is used to download the root certificate, device certificate, and client private key to the device through TFTP.

Syntax

logging host download ca-cert *ca-cert-filename* **client-cert** *client-cert-filename* **client-key** *client-key-filename*

Parameter

ca-cert-filename —— Root certificate file name.

client-cert-filename —— Client certificate file name.

client-key-filename —— Client private key file name.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Download the root certificate, client certificate, and client private key to the device:

Switch (config)# logging host download ca-cert *root.crt* **client-cert** *client.crt* **client-key** *client.key*

88.8 logging console

Description

The **logging console** command is used to send the system logs to the console port. To disable logging to the console, please use **no logging console** command. This function is enabled by default.

Syntax

logging console

no logging console

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Enable logging to the console port:

```
Switch(config)# logging console
```

88.9 logging console level

Description

The **logging console level** command is used to limit messages logged to the console port. System logs no higher than the set threshold level will be displayed on the console port. To restore the threshold level to default value, please use **no logging console level** command.

Syntax

logging console level *level*

no logging monitor level

Parameter

level—— Severity level of the log information output to the console port. There are 8 severity levels marked with values 0–7. The smaller value has the higher priority. Only the log with the same or smaller severity level value will

be output to the terminal devices. By default, it is 5 indicating that all the log information between level 0–5 will be output to the terminal devices.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Output the log information with severity levels between 0–7 to the console port:

```
Switch(config)# logging console level 7
```

88.10 logging monitor

Description

The **logging monitor** command is used to display the system logs on the terminal devices. To disable logging to the terminal, please use **no logging monitor** command. This function is enabled by default.

Syntax

logging monitor

no logging monitor

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Disable logging to the terminal devices:

```
Switch(config)# no logging monitor
```

88.11 logging monitor level

Description

The **logging monitor level** command is used to limit messages logged to the terminal devices. System logs no higher than the set threshold level will be displayed on the terminal devices. To restore the threshold level to default value, please use **no logging monitor level** command.

Syntax

logging monitor level *level*

no logging monitor level

Parameter

level—— Severity level of the log information output to the terminal devices. There are 8 severity levels marked with values 0–7. The smaller value has the higher priority. Only the log with the same or smaller severity level value will be output to the terminal devices. By default, it is 5 indicating that all the log information between level 0–5 will be output to the terminal devices.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Output the log information with severity levels between 0–7 to the terminal devices:

```
Switch(config)# logging monitor level 7
```

88.12 clear logging

Description

The **clear logging** command is used to clear the information in the log buffer and log file.

Syntax

clear logging [buffer | flash]

Parameter

buffer | flash —The output channels: buffer and flash. Clear the information of the two channels, by default.

Command Mode

Global Configuration Mode

Privilege Requirement

Only Admin and Operator level users have access to these commands.

Example

Clear the information in the log file:

```
Switch(config)# clear logging buffer
```

88.13 show logging local-config

Description

The **show logging local-config** command is used to display the configuration of the Local Log output to the console, the terminal, the log buffer and the log file.

Syntax

show logging local-config

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of the Local Log:

```
Switch(config)# show logging local-config
```

88.14 show logging loghost

Description

The **show logging loghost** command is used to display the configuration of the log host.

Syntax

show logging loghost [*index*]

Parameter

index——The index of the log host whose configuration will be displayed, ranging from 1 to 4. Display the configuration of all the log hosts by default.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the configuration of the log host 2:

```
Switch(config)# show logging loghost 2
```

88.15 show logging buffer

Description

The **show logging buffer** command is used to display the log information in the log buffer according to the severity level.

Syntax

show logging buffer [**level** *level*]

Parameter

level—— Severity level. There are 8 severity levels marked with values 0–7. The information of levels with priority not lower than the select level will display. Display all the log information in the log buffer by default.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the log information from level 0 to level 5 in the log buffer:

Switch(config)# show logging buffer level 5

88.16 show logging flash

Description

The **show logging flash** command is used to display the log information in the log file according to the severity level.

Syntax

show logging flash [**level** *level*]

Parameter

level—— Severity level. There are 8 severity levels marked with values 0–7. The information of levels with priority not lower than the select level will display. Display all the log information in the log file by default.

Command Mode

Privileged EXEC Mode and Any Configuration Mode

Privilege Requirement

None.

Example

Display the log information with the level marked 0-3 in the log file:

Switch(config)# show logging flash level 3