



# CLI Reference Guide

DeltaStream GPON Optical Line Terminal

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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 DeltaStream GPON Optical Line Terminal without any explanation. Some models featured in this guide may be unavailable in your country or region. For local sales information, visit <https://www.tp-link.com>.

# Chapter 1 Using the CLI

## 1.1 Accessing the CLI

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

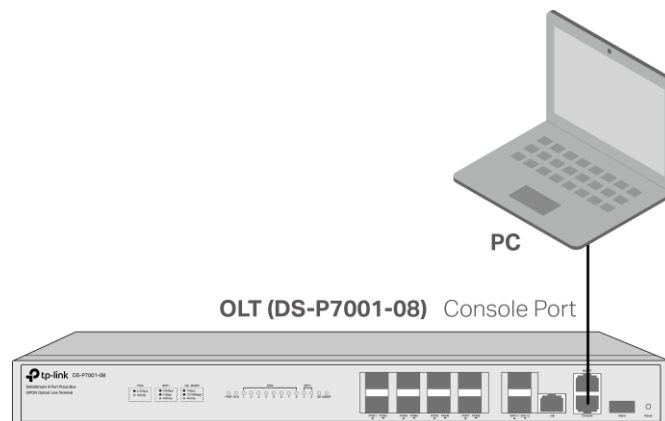
1. Logon Via the Console Port.
2. Logon By Telnet.
3. Logon By SSH.

 **Note:** We take DS-P7001-08 as an example of OLT devices in the following figures.

### 1.1.1 Via the Console Port

Take the following steps to log on to the device via the Console Port.

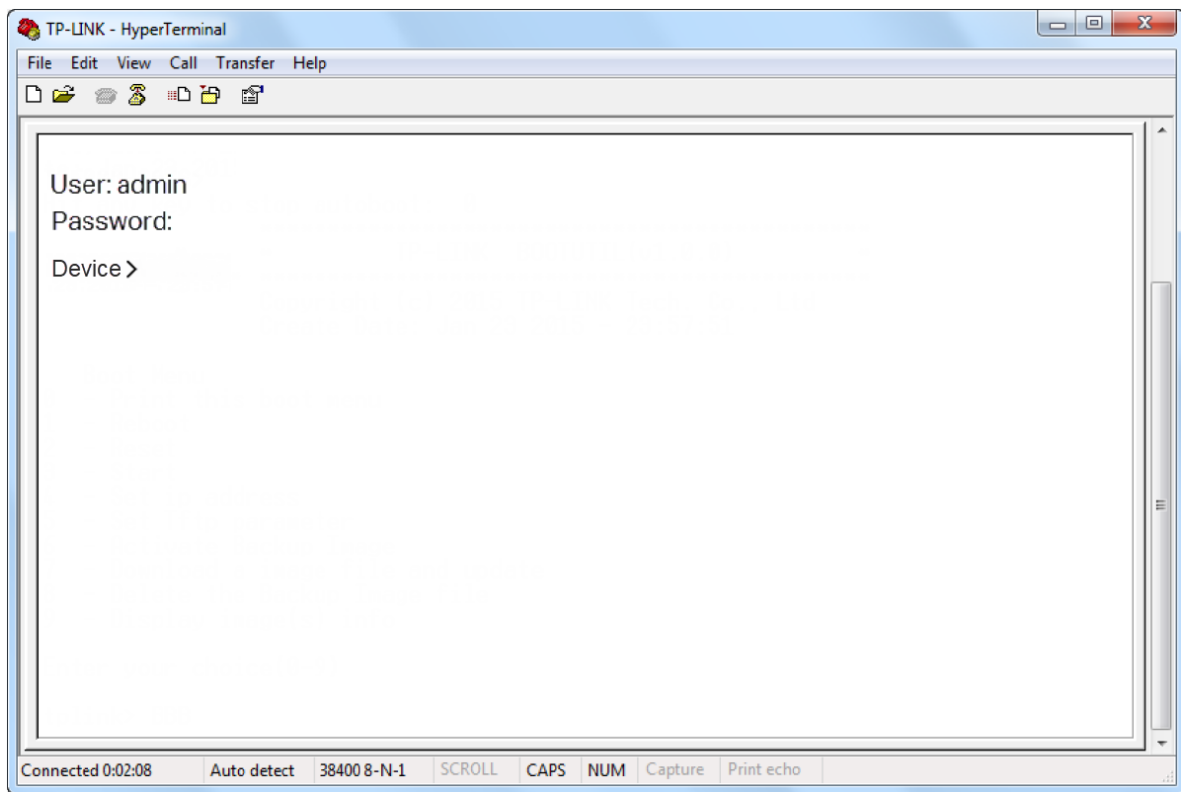
1. Connect the Console port of OLT to the management PC using an RJ45 console cable.




2. Start the terminal emulation program (such as the Hyper Terminal) on the PC and configure the terminal emulation program as follows:
  - Baud rate: 38400 bps
  - Data bits: 8
  - Parity: none
  - Stop bits: 1
  - Flow control: none



3. 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 "Device>" will appear indicating that you have successfully logged in to the device and you can use the CLI now.



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

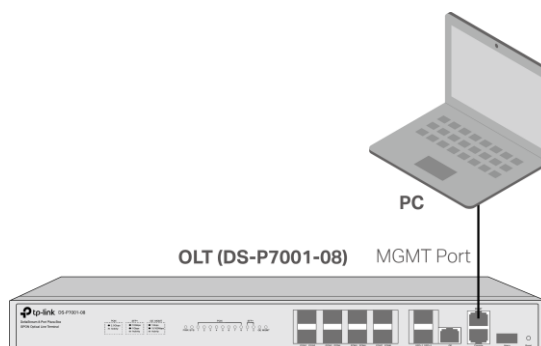
### 1.1.2 Logon by Telnet

To log on to the device via a Telnet connection, please take the following steps:

1. Connect the OLT to the management PC. Choose from the following options:

- **Via the MGMT Port**

Connect the MGMT port of OLT to the management PC using an Ethernet cable. Set the IP address of the PC as 192.168.1.x/24 (x is a number between 2 and 254). Open the terminal on the PC. Then type in "telnet 192.168.1.1" and press **Enter**.

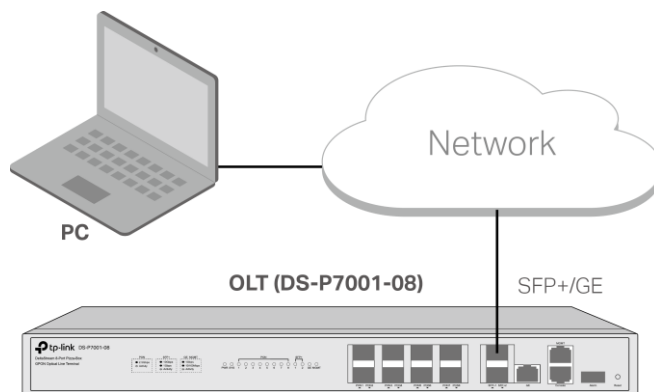


```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Admin>telnet 192.168.1.1
```

■ **Via the SFP+/GE Port**

Make sure your PC has network access to the SFP+/GE port of OLT. Set the IP address of the PC as 192.168.0.x/24 (x is a number between 2 and 254). Open the terminal on the PC. Then type in "telnet 192.168.0.1" and press **Enter**.



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Admin>telnet 192.168.0.1
```


2. Enter the username and password (both **admin** by default) and you will enter User EXEC Mode. Enter **enable** and you will enter Privileged EXEC Mode.

```
C:\ Telnet 192.168.0.1


***** User Access Login *****

User:admin
Password:

#2021-06-03 20:01:52, [User]/5/Login the CLI by admin on vty0 (192.168.0.66).
DS-P7001-08_000000>enable
DS-P7001-08_000000#_
```

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

### 1.1.3 Logon by SSH

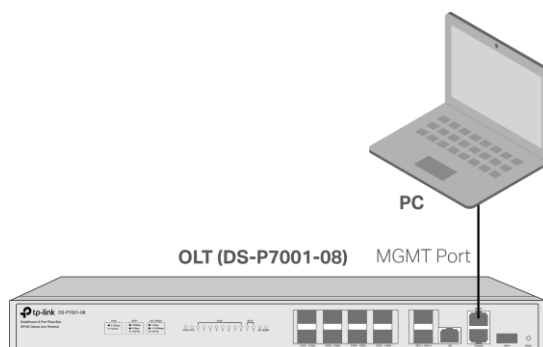
 **Note:** The SSH feature is disabled by default. Before you log on the device by SSH, you need to enable the SSH feature using the Web UI, via the Console Port or using Telnet.

To log on to the device via an SSH connection, please take the following steps:

1. Connect the OLT to the management PC. Choose from the following options:

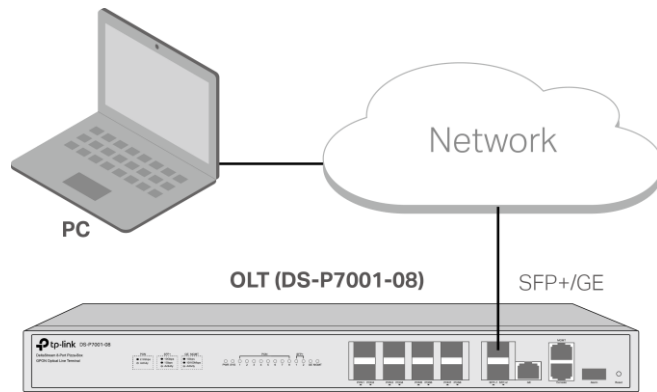
- **Via the MGMT Port**

Connect the MGMT port of OLT to the management PC using an Ethernet cable. Set the IP address of the PC as 192.168.1.x/24 (x is a number between 2 and 254).



- **Via the SFP+/GE Port**

Make sure your PC has network access to the SFP+/GE port of OLT. Set the IP address of the PC as 192.168.0.x/24 (x is a number between 2 and 254).

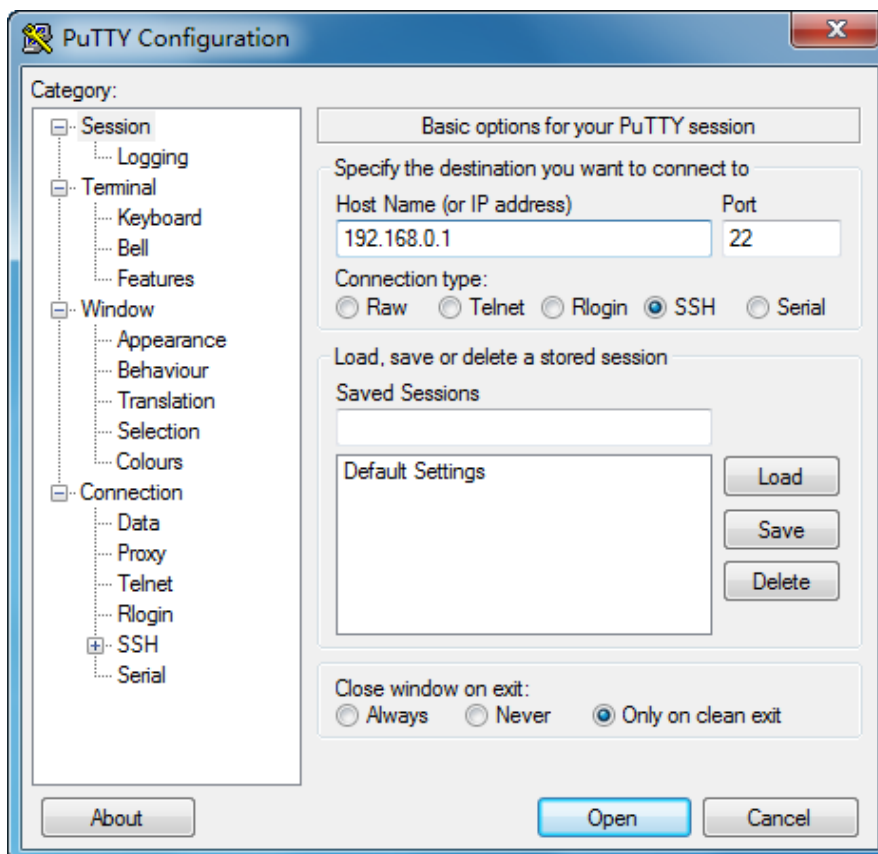


2. To log on by SSH, a Putty client software is recommended. There are two authentication modes to set up an SSH connection:

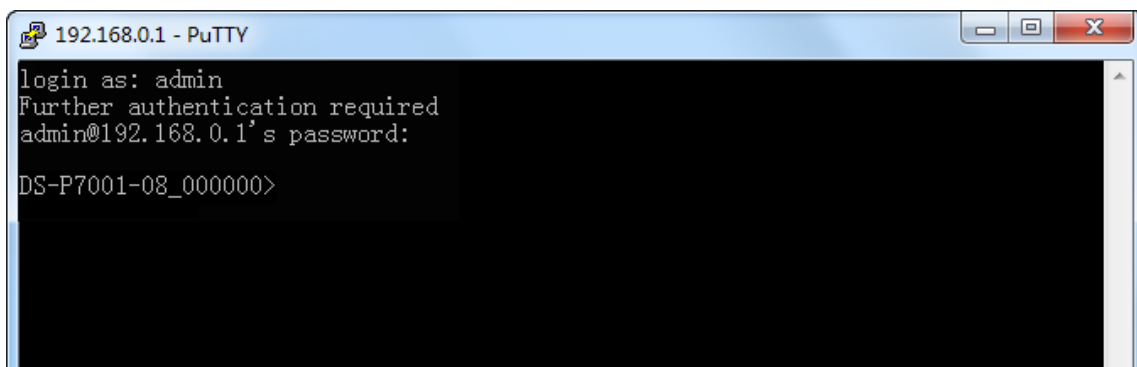
- **Password Authentication Mode**

It requires username and password, which are both **admin** by default.

Open the software to log on to the interface of PuTTY. Enter the IP address of the device into **Host Name** field (192.168.1.1 for MGMT Port; 192.168.0.1 for SFP+/GE Port). Keep the default value 22 in the **Port** field. Select **SSH** as the Connection type.



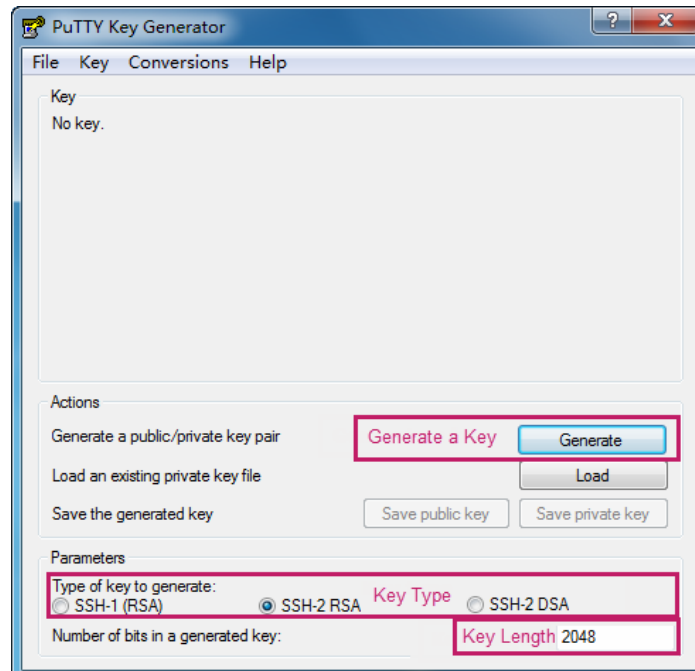
Click **Open** to log on to the device. Enter the username and password (both **admin** by default) and you will enter User EXEC Mode. Enter **enable** and you will enter Privileged EXEC Mode.



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

### ■ Key Authentication Mode

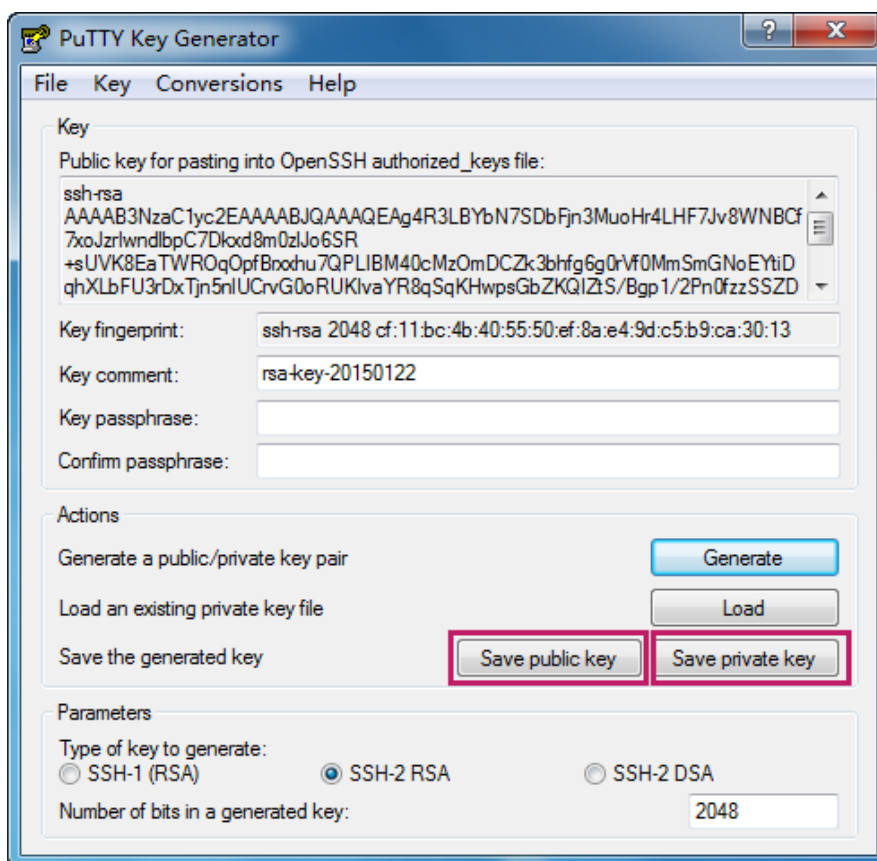
It requires a public key for the device and a private key for the SSH client software. You can generate the public key and the private key through Putty Key Generator. Select the key type and key length, and generate SSH key.



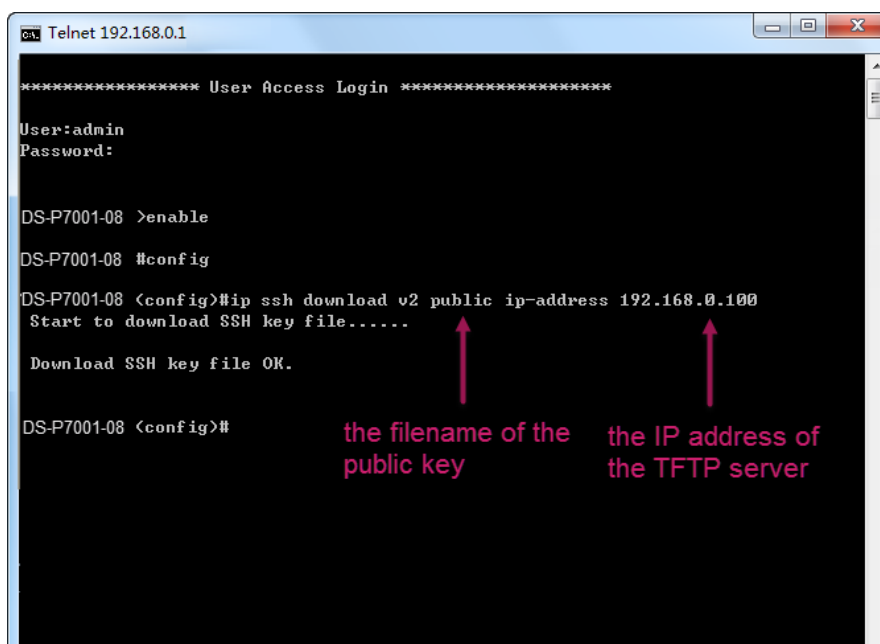
**Note:**

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 process.

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



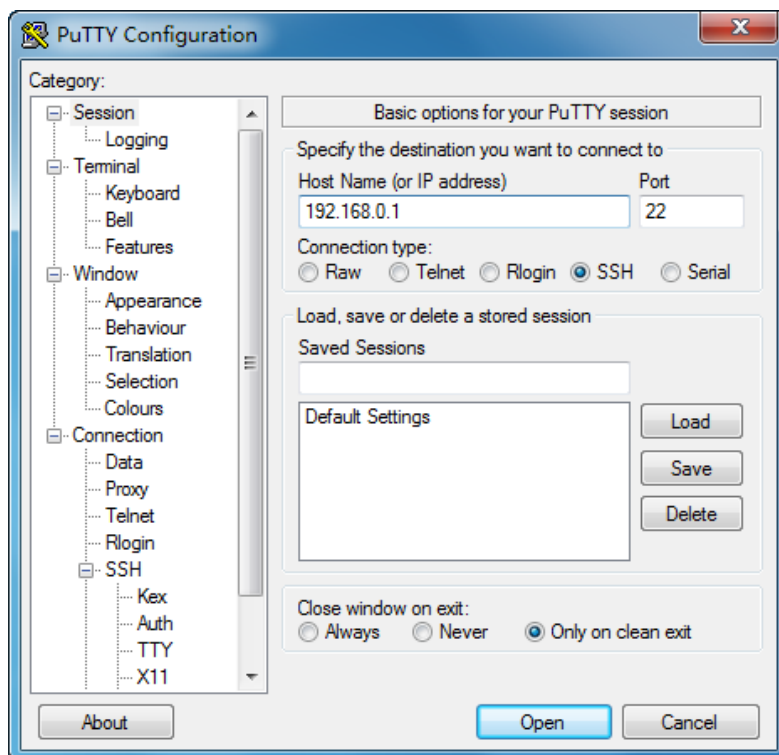
Log on to the device via the Console Port or using Telnet to download the public key file from the TFTP server, as the following figure shows:



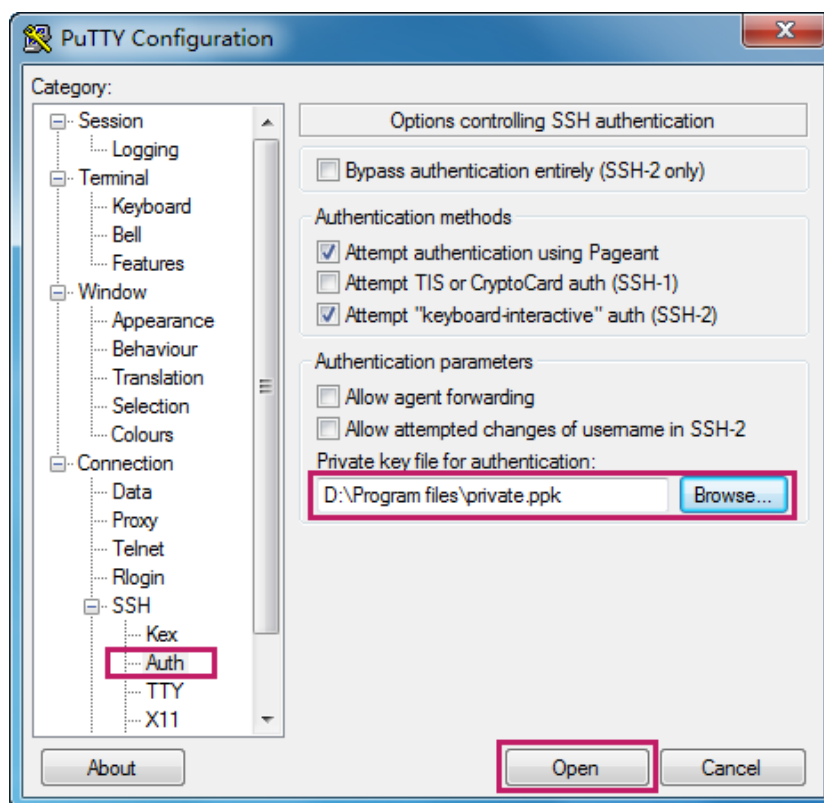
**Note:**

3. The key type should accord with the type of the key file.
4. The SSH key downloading can not be interrupted.

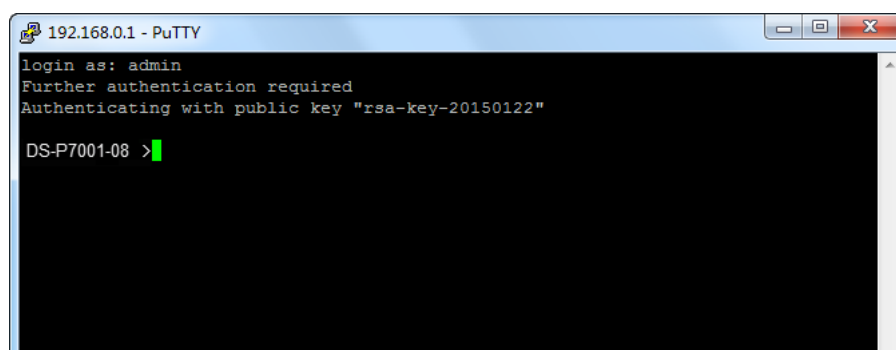
After the public key is downloaded, please log on to the interface of PuTTY and enter the IP address for login (192.168.1.1 for MGMT Port; 192.168.0.1 for SFP+/GE Port).



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



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



## 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.

The following table gives detailed information about the Accessing path, Prompt of the 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 device.	<b>Device&gt;</b>	Use the <b>exit</b> command to disconnect the device. Use the <b>enable</b> command to access Privileged EXEC mode.
Privileged EXEC Mode	Use the <b>enable</b> command to enter this mode from User EXEC mode.	<b>Device #</b>	Enter the <b>exit</b> command to return to User EXEC mode. Enter <b>configure</b> command to access Global Configuration mode.
Global Configuration Mode	Use the <b>configure</b> command to enter this mode from Privileged EXEC mode.	<b>Device (config)#</b>	Use the <b>exit</b> or the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode. Use the <b>interface gigabitEthernet port</b> or <b>interface range gigabitEthernet port-list</b> command to access interface Configuration mode. Use the <b>vlan vlan-list</b> to access VLAN Configuration mode.



Mode	Accessing Path	Prompt	Logout or Access the next mode
Interface Configuration Mode	<p>Layer 2 Interface:</p> <p>Use the <b>interface</b> <b>gigabitEthernet</b> <i>port</i>, <b>interface</b> <b>port-channel</b> <i>port-channel-id</i> or <b>interface</b> <b>range</b> <b>gigabitEthernet</b> <i>port-list</i> command to enter this mode from Global Configuration mode.</p>	<p><b>Device (config-if)#</b></p> <p>or</p> <p><b>Device (config-if-range)#</b></p>	<p>Use the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode.</p> <p>Enter the <b>exit</b> or the <b>#</b> command to return to Global Configuration mode.</p> <p>A port number must be specified in the <b>interface</b> command.</p>
Interface Configuration Mode	<p>Layer 3 Interface:</p> <p>Use the <b>no</b> <b>switchport</b> command to enter Routed Port mode from Interface Configuration mode.</p> <p>Use the <b>interface</b> <b>vlan</b> <i>vlan-id</i> command to enter VLAN Interface mode from Global Configuration mode.</p> <p>Use the <b>interface</b> <b>loopback</b> <i>id</i> command to enter Loopback Interface mode from Global Configuration mode.</p>	<p><b>Device (config-if)#</b></p> <p>or</p> <p><b>Device (config-if-range)#</b></p>	<p>Use the <b>switchport</b> command to switch to the Layer 2 interface mode.</p> <p>Use the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode.</p> <p>Enter the <b>exit</b> or the <b>#</b> command to return to Global Configuration mode.</p>
VLAN Configuration Mode	<p>Use the <b>vlan</b> <i>vlan-list</i> command to enter this mode from Global Configuration mode.</p>	<p><b>Device (config-vlan)#</b></p>	<p>Use the <b>end</b> command or press <b>Ctrl+Z</b> to return to Privileged EXEC mode.</p> <p>Enter the <b>exit</b> command or the <b>#</b> command to return to Global configuration mode.</p>

 **Note:**

1. The user is automatically in User EXEC Mode after the connection between the PC and the

device is established by a Telnet/SSH connection.

2. 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 gigabitEthernet: Configure parameters for an Ethernet port, such as Duplex-mode, flow control status.
    - b). Interface range gigabitEthernet: Configure parameters for several Ethernet 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.
3. Some commands are global, that means they can be performed in all modes:
  - **show:** Display all information of device, for example: statistic information, port information, VLAN information.
  - **history:** Display the commands history.

## 1.3 Privilege Restrictions

This device'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 username 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. By default, 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 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*

### 1.4.2 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.

### 1.4.3 Parameter Format

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

- MAC address must be entered 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 User Interface

### 2.1 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:

```
Device>enable
Enter password:
Device#
```

### 2.2 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:

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

## 2.3 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 Device'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:

```
Device(config)#enable password 0 admin
```

## 2.4 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}  
no enable secret
```

### 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. The password in the configuration file will be displayed in the MD5 encrypted form.

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 Device'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.

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

## 2.5 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:

```
Device# configure  
Device (config)#
```

## 2.6 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:

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

## 2.7 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:

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



## 2.8 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 Device 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:

```
Device (config)#no clipaging
```

## 2.9 history

### Description

The **history** command is used to show the latest 20 commands you entered in the current mode since the Device 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:

```
Device (config)# history  
  
1 history
```

## 2.10 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:

```
Device (config)#history clear
```

## Chapter 3 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 Device from being randomly changed.

### 3.1 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 Device'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:

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

## 3.2 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 }
```

```
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 Device'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.

```
Device (config)#user name tplink privilege admin secret 0 admin
```

## 3.3 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:

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

# 3.4 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:

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

# Chapter 4 Management Port Configuration

## Commands

### 4.1 description

#### Description

The **description** command is used to specify management interface description.

#### Syntax

**description** *description*

#### Parameter

*description*— Up to 16 characters describing this interface.

#### Command Mode

Interface Configuration Mode (interface Management)

#### Privilege Requirement

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

#### Example

Specify management interface description:

```
Device (config-if)# description desc1
```

### 4.2 ip

#### Description

The **ip** command is used to configure interface address.

#### Syntax

**ip** {address *address mask* [gateway *gateway* | secondary] | address-alloc {bootp | dhcp} | dhcp option12 *hostname*}

#### Parameter

*address*— Specify the static IP address.

*mask*— Specify the IP subnet mask.

*gateway*— Specify the gateway.

*secondary*— Secondary IP address.

*bootp*— Set IP address by bootp.

*dhcp*— Set IP address by dhcp.

*hostname*— Host name string.

## Command Mode

Interface Configuration Mode (interface Management)

## Privilege Requirement

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

## Example

Configure interface address:

```
Device (config-if)# ip address 192.168.0.1 255.255.255.0 gateway 10.0.0.1
```

## 4.3 ipv6

### Description

The **ipv6** command is for the IPv6 interface subcommands.

### Syntax

```
ipv6 {address {address [eui-64] | global-address [eui-64] | autoconfig | dhcp} |  
enable | gateway [gateway] }
```

### Parameter

*address*— IPv6 link-local address.

*global-address*— Config global IPv6 address manually.

autoconfig— Obtain link-local address using autoconfiguration.

*dhcp*— Obtain a ipv6 address using dhcp.

*enable*— Enable IPv6 on interface.

*gateway*— Config IPv6 gateway.

## Command Mode

Interface Configuration Mode (interface Management)

## Privilege Requirement

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



## Example

The IPv6 interface subcommands:

```
Device (config-if)# ipv6 address fe80::192.168.0.1 eui-64
```

## 4.4 shutdown

### Description

The **shutdown** command is used to shutdown the specified interface.

### Syntax

```
shutdown
```

### Command Mode

Interface Configuration Mode (interface Management)

### Privilege Requirement

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

### Example

Shutdown the specified interface:

```
Device (config-if)# shutdown
```

## 4.5 clear

### Description

The **clear** command is used to reset functions.

### Syntax

```
clear { access-list acl-id [rule] | arp-chche | counters [interface [ fastEthernet list | gigabitEthernet list | port-channel list | ten-gigabitEthernet list ] ] | ethernet-oam {event-log [interface [fastEthernet list | gigabitEthernet list]] | statistics [interface [fastEthernet list | gigabitEthernet list]]} | ip {dhcp server [binding [ipadd] | statistics] | igmp snooping statistics} | ipv6 {mld snooping statistics | nd detection statistics} | line tid | lldp statistics | logging [buffer | flash] | mac address-table {dynamic | filtering | static} | service-port id }
```

### Parameter

*acl-id*—Specify the ACL ID or name.

*rule*— Specify the ACL rule ID.

fastEthernet— FastEthernet interface number list.  
gigabitEthernet— GigabitEthernet interface number list.  
port-channel— Port-channel interface number.  
ten-gigabitEthernet— Ten-gigabitEthernet interface number list.  
Binding— Clear all DHCP Server bindings.  
statistics— Clear DHCP Server statistics.  
*idaddr*— IP address.  
snooping— Clear all statistics for IGMP Snooping.  
*tid*— The ID of the reset terminal line.  
statistics— Clear LLDP statistics.  
buffer— Clear log in buffer.  
flash— Clear log in flash.  
dynamic— Clear all the dynamic address.  
filtering— Clear all the filtering MAC address.  
static— Clear all the static MAC address.  
*id*— Service virtual port ID.

## Command Mode

Interface Configuration Mode (interface Management)

## Privilege Requirement

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

## Example

Reset functions:

```
Device (config-if)# clear access-list 1 rule 1
```

# 4.6 end

## Description

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

## Syntax

**end**

## Command Mode

Interface Configuration Mode (interface Management)

## Privilege Requirement

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

## Example

Return to Privileged EXEC Mode:

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

## 4.7 exit

### Description

The **exit** command is used to exit current mode.

### Syntax

```
exit
```

### Command Mode

Interface Configuration Mode (interface Management)

### Privilege Requirement

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

### Example

Exit current mode:

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

## 4.8 history

### Description

The **history** command is used to display command history.

### Syntax

```
history
```

### Command Mode

Interface Configuration Mode (interface Management)

### Privilege Requirement

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

## Example

Display command history:

```
Device (config-if)# history
```

## 4.9 no

### Description

The **no** command is used to negate system information.

### Syntax

```
no{description | ip {address address mask [gateway gateway] | dhcp option12}  
| ipv6 {address {address [eui-64] | global-address [eui-64] | dhcp} | enable |  
gateway gateway} | shutdown}
```

### Parameter

*address*— Specify the static IP address.

*mask*— Specify the IP subnet mask.

*gateway*— Specify the gateway.

*global-address*— Config global IPv6 address manually.

enable— Enable IPv6 on interface.

Shutdown— shutdown the specified interface.

### Command Mode

Interface Configuration Mode (interface Management)

### Privilege Requirement

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

## Example

Negate system information:

```
Device (config-if)# no ip address 192.168.0.1 255.255.255.0 gateway  
10.0.0.1
```

## Chapter 5 System Configuration Commands

System Commands can be used to configure the System information and System IP, reboot and reset the Device, upgrade the Device 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

```
Device (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 for the NTP Server. The Device will get UTC automatically if it has connected to an NTP Server.

#### Syntax

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

#### 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 Novosibirsk, 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 for the Primary NTP Server.

*backup-ntp-server*—— The IP address for the Secondary NTP Server.

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

## 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:

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

## 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:

```
Device(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:

```
Device(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} {eweeek} {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.

*eweeek*—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:

```
Device(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 "T1600G-28TS".

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Configure the system name as TPLINK:

```
Device(config)# hostname TPLINK
```

## 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 "SHENZHEN" 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 SHENZHEN:

```
Device(config)# location SHENZHEN
```

## 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](http://www.tp-link.com):

```
Device(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:

```
Device(config)# led off
```

## 5.10 ip address

### Description

This **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:

```
Device (config)# interface vlan 2
Device (config-if)# ip address 192.168.1.1 255.255.255.0
Device (config-if)# ip address 192.168.2.1 255.255.255.0 secondary
```

# 5.11 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 Layer 3 routed port 1/0/1:

```
Device (config)# interface gigabitEthernet 1/0/1
Device (config-if)# no switchport
Device (config-if)# ip address-alloc dhcp
```

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

```
Device (config)# interface vlan 2
Device (config-if)# no ip address
```

## 5.12 reset

### Description

The **reset** command is used to reset the device's software. After resetting, all configuration of the device 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 device.

### Command Mode

Privileged EXEC Mode

### Privilege Requirement

Only Admin level users have access to these commands.

### Example

Reset all settings of the device except its IP address:

```
Device # reset except-ip
```

## 5.13 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:

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

## 5.14 reboot

### Description

The **reboot** command is used to reboot the device. 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 device:

```
Device # reboot
```

## 5.15 reboot-schedule

### Description

This **reboot-schedule** command is used to configure the device 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 device to reboot, in the format of hh:mm.

*date* — Specify the date for the device 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 device reboots.

*interval* — Specify a time period after which the device 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 device will reboot later that day; otherwise the device will reboot at the time point the next day.

### Example

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

```
Device (config)# reboot-schedule in 200 save_before_reboot
```



## 5.16 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:

```
Device # copy running-config startup-config
```

## 5.17 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
```

### 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.

### 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 and name this file config.cfg:

```
Device # copy startup-config tftp ip-address 192.168.0.148 filename config
```

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

```
Device # copy startup-config tftp ip-address fe80::1234 filename config
```

## 5.18 copy tftp startup-config

### Description

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

### Syntax

```
copy tftp startup-config ip-address ip-addr filename 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.

### 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 device from TFTP server with the IP 192.168.0.148:

```
Device # copy tftp startup-config ip-address 192.168.0.148 filename config
```

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

```
Device # copy tftp startup-config ip-address fe80::1234 filename config
```

## 5.19 copy backup-config tftp

### Description

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

## Syntax

**copy backup-config tftp ip-address *ip-addr* filename *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.

## Command Mode

Privileged EXEC Mode

## Privilege Requirement

Only Admin level users have access to these commands.

## Example

Export the backup configuration file of the device to the TFTP server with the IP 192.168.0.148 and name the file config.cfg:

```
Device # copy backup-config tftp ip-address 192.168.0.148 filename config
```

## 5.20 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.:

```
Device # copy backup-config startup-config
```

## 5.21 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.

```
Device # copy running-config backup-config
```

## 5.22 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
```

### 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.

### 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:

```
Device # copy tftp backup-config ip-address 192.168.0.148 filename config
```

## 5.23 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:

```
Device (config)# boot application filename image2 startup
```

## 5.24 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:

```
Device (config)# boot config filename config2 startup
```

# 5.25 firmware upgrade

## Description

The **firmware upgrade** command is used to upgrade the device'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 device with the Backup Image.

## Syntax

```
firmware upgrade tftp ip-address ip-addr filename 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 firmware file.

## Command Mode

Privileged EXEC Mode

## Privilege Requirement

Only Admin level users have access to these commands.

## Example

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

```
Device # 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 device's backup image file with the file `firmware.bin` in the TFTP server with the IP address `fe80::1234`, but do not reboot the device:

```
Device # 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
```

## 5.26 ping

### Description

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

### Syntax

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

### 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.

### Command Mode

Privileged EXEC Mode

### Privilege Requirement

None.

### Example

To test the connectivity between the device 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 device and the network device is failed to establish:

```
Device # ping 192.168.0.131 -n 8 -l 512
```

To test the connectivity between the device 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 device and the network device is failed to establish:

```
Device # ping fe80::1234 -n 8 -l 512
```

## 5.27 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 ]
```

### 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.

### 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 device 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 device and the destination device is failed to establish:

```
Device # tracert 192.168.0.131 20
```

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

```
Device # tracert fe80::1234 20
```

## 5.28 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:

```
Device # show system-info
```

## 5.29 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:

```
Device# show image-info
```

## 5.30 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:

```
Device# show boot
```

## 5.31 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 device 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:

```
Device# show running-config | include user
```

## 5.32 show startup-config

### Description

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

### 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:

```
Device# show startup-config
```

## 5.33 show system-time

### Description

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

### Syntax

```
show system-time
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the time information of the device

```
Device# show system-time
```

## 5.34 show system-time dst

### Description

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

### Syntax

```
show system-time dst
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the DST information of the device

```
Device# show system-time dst
```

## 5.35 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 device:

```
Device# show system-time ntp
```

## 5.36 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 device:

```
Device# show cpu-utilization
```

## 5.37 show memory-utilization

### Description

The **show memory-utilization** command is used to display the current memory usage.

### Syntax

```
show memory-utilization
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the memory utilization information of the device:

```
Device# show memory-utilization
```

## 5.38 dpms remote-address

### Description

The **The dpms remote-address** command is used to select the interface you created in L3 Features and configure it as the interface to communicate with DPMS. This command is commonly used for the device to be managed by the DPMS in the same LAN or VLAN.

### Syntax

```
dpms remote-address {address ip-address} [port port-num]
```

```
no dpms remote-address
```

### Parameter

*ip-address*— The IP address of the DPMS server.

*port-num*— The listening port specified by the DPMS server, if not filled in, the default is 19810.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

The OLT advertises the existence of the machine to the DPMS through the discovery message:

```
Device(config)# dpms remote-address address 192.168.0.1 port 19810
```

## 5.39 dpms interface-id

### Description

The **dpms interface-id** command is used to enter the remote IP address of your DPMS to tell the device where to discover the DPMS. This command is commonly used for the device to be managed by the DPMS in Layer 3 deployments.

### Syntax

```
dpms interface-id id
```

### Parameter

*id*— Sets the current L3 interface to the specified port number through which the OLT sends Discovery message. This L3 interface is used by DPMS.

### Command Mode

Interface Configuration Mode

### Privilege Requirement

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

## Example

The OLT advertises the existence of the machine to the DPMS through the discovery message:

```
Device(config-if)# dpms interface-id 2
```

## 5.40 show dpms remote-address

### Description

The **show dpms remote-address** command is used to display the configured remote DPMS information, including IP and port number.

### Syntax

```
show dpms remote-address
```

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Display the configured remote DPMS information, including IP and port number:

```
Device(config)# show dpms remote-address
```

## 5.41 show dpms interface

### Description

The **show dpms interface** command is used to display the OLT Layer 3 interface where the configured near-end DPMS is located.

### Syntax

```
show dpms interface
```

### Command Mode

Global Configuration Mode



## Privilege Requirement

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

## Example

Display the OLT Layer 3 interface where the configured near-end DPMS is located:

```
Device(config)# show dpms interface
```

# Chapter 6 Time Range Commands

With this feature, you can configure a time range and bind it to an ACL rule.

## 6.1 time-range

### Description

The **time-range** command is used to create time-range entry for the device 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 device:

```
Device(config)# time-range tRange1
```

## 6.2 absolute

### Description

The **absolute** command is used to create an absolute time-range for the time-range of the device. 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 device and specify the date extending from May 5th, 2017 through Oct. 5th, 2017:

```
Device(config)#time-range tRange1
```

```
Device(config-time-range)#absolute from 05/05/2017 to 10/05/2017
```

## 6.3 periodic

### Description

The **periodic** command is used to create a periodic mode time-range for the time-range of the device. 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:

```
Device(config)#time-range tSeg1
Device(config-time-range)#periodic start 08:30 end 12:00
day-of-the-week 6-7
```

## 6.4 holiday (time-range mode)

### Description

The **holiday** command is used to create holiday mode time-range for the time-range of the device. When the holiday which is excluded from time-range occurs, the device 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:

```
Device(config)#time-range tRange3
Device(config-time-range)#holiday exclude
```

## 6.5 holiday

### Description

The **holiday** command is used to create holiday for the device. 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:

```
Device(config)# holiday holiday1 start-date 10/01 end-date 10/03
```

## 6.6 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:

```
Device# show holiday
```

## 6.7 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:

```
Device# show time-range
```

# Chapter 7 PON Port Configuration Commands

PON Port Configuration Commands can be used to configure the features for PON ports.

## 7.1 shutdown

### Description

The **shutdown** command is used to disable a PON port. To enable this port again, please use **no shutdown** command.

### Syntax

**shutdown**

**no shutdown**

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Disable the PON port 1/0/3:

```
Device(config)# interface gpon 1/0/3
```

```
Device(config-if-gpon)# shutdown
```

Disable the PON ports 1/0/2-7:

```
Device(config)# interface range gpon 1/0/2-7
```

```
Device(config-if-range)# shutdown
```

## 7.2 downstream-fec

### Description

The **downstream-fec** command is used to enable the FEC (Forward Error Correction) feature of a PON port. FEC enhances the reliability of downstream traffic by inserting redundant data into the packets. It is recommended that you enable FEC only when there is sufficient bandwidth. To disable FEC, please use **no downstream-fec** command.

## Syntax

**downstream-fec**  
**no downstream-fec**

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Enable the FEC feature of PON port 1/0/3:

```
Device(config)# interface gpon 1/0/3
Device(config-if-gpon)# downstream-fec
```

# 7.3 key-exchange

## Description

The **key-exchange** command is used to configure the interval between each time when the encryption keys are updated by the ONUs connected to the GPON port.

## Syntax

**key-exchange** { *exchange\_interval* | no\_renew }

## Parameter

*exchange\_interval*—— The interval between each time when the encryption keys are updated by the ONUs connected to the GPON port. This value should be between 1 and 60 (min).

no\_renew —— The encryption keys used by the ONUs are not updated.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)}

## Privilege Requirement

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

## Example

Set the key-exchange interval of PON port 1/0/3 as 50:



```
Device(config)# interface gpon 1/0/3
Device(config-if-gpon)# key-exchange 50
```

## 7.4 dba-calculate-mode

### Description

The **dba-calculate-mode** command is used to set the DBA (dynamic bandwidth allocation) mode of a GPON port. Users can configure different DBA modes to meet different delay and bandwidth requirements.

### Syntax

```
dba-calculate-mode { min-delay | max-bw }
```

### Parameter

**min-delay** — Indicates the minimum bandwidth delay. In this mode, the bandwidth is issued in DBA calculation period which increases with the number of the transmission container (T-CONT). Therefore, the delay is short. This mode must be used for TDM (Time Division Multiplexing) services.

**max-bw** — Indicates the maximum bandwidth delay. In this mode, the bandwidth is issued in DBA calculation period which is fixed to eight frames. Each frame is 125 us. This mode is used for services that are not sensitive to delay.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)}

### Privilege Requirement

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

### Example

Set the dba-calculate-mode of PON port 1/0/3 as min-delay:

```
Device(config)# interface gpon 1/0/3
Device(config-if-gpon)# dba-calculate-mode min-delay
```

## 7.5 range

### Description

The **range** command is used to set the maximum and minimum distance of the ONUs which are connected to the PON port. To disable the range configuration, please use **no range** command.

### Syntax

**range max-distance** *max-distance* **min-distance** *min-distance*

### Parameter

*max-distance*—— Set the maximum distance of the ONUs which are connected to the PON port. This value should be between 1 and 60 (km).

*min-distance*—— Set the minimum distance of the ONUs which are connected to the PON port. This value should be between 0 and 40 (km).

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)}

### Privilege Requirement

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

### Example

Set the max-distance of PON port 1/0/3 as 50 and the min-distance as 20:

```
Device(config)# interface gpon 1/0/3
```

```
Device(config-if-gpon)# range max-distance 50 min-distance 20
```

## 7.6 long-laseront auto-detect

### Description

The **long-laseront auto-detect** command is used to enable the auto-detection of rogue ONUs which are connected to the PON port. When there are rogue ONUs, the system can detect them and send a log. To disable this feature, please use **no long-laseront auto-detect** command.

### Syntax

**long-laseront auto-detect**

**no long-laseront auto-detect**

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Enable the long-laseront auto-detect feature of PON port 1/0/3:

```
Device(config)# interface gpon 1/0/3
Device(config-if-gpon)# long-laseront auto-detect
```

# 7.7 long-laseront auto-detect-interval

## Description

The **long-laseront auto-detect-interval** command is used to configure the interval between each time when the GPON port auto-detects rogue ONUs.

## Syntax

**long-laseront auto-detect-interval** *interval*

## Parameter

*interval*—— The interval between each time when the GPON port auto-detects rogue ONUs. This value should be between 1 and 100 (min).

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)}

## Privilege Requirement

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

## Example

Set the long-laseront auto-detect-interval of PON port 1/0/3 as 50:

```
Device(config)# interface gpon 1/0/3
Device(config-if-gpon)# long-laseront auto-detect-interval 50
```

## 7.8 long-laseront auto-isolate

### Description

The **long-laseront auto-isolate** command is used to enable the auto-isolation of rogue ONUs which are connected to the PON port when the rogue ONUs are detected. To disable this feature, please use **no long-laseront auto-isolate** command.

### Syntax

**long-laseront auto-isolate**

**no long-laseront auto-isolate**

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Enable the long-laseront auto-isolate feature of PON port 1/0/3:

```
Device(config)# interface gpon 1/0/3
Device(config-if-gpon)# long-laseront auto-isolate
```

## 7.9 onu-isolate

### Description

The **onu-isolate** command is used to enable or disable the communication function between ONUs under the port. When the **no onu-isolate** function under the port is enabled, the ONUs under the port will be able to communicate with each other. By default it is **onu-isolate** state.

### Syntax

**onu-isolate**

**no onu-isolate**

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

## Example

Enable the onu-isolate feature of PON port 1/0/3:

```
Device(config)# interface gpon 1/0/3
Device(config)# onu-isolate
```

## 7.10 port-isolate

### Description

The **port-isolate** command is used to enable or disable the function of isolating a PON port from other PON ports. When **port-isolate** is enabled, the PON port will not be able to communicate with other isolated PON ports. By default it is the **port-isolate** state.

### Syntax

```
port-isolate
no port-isolate
```

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Enable the port-isolate feature of PON port 1/0/3:

```
Device(config)# interface gpon 1/0/3
Device(config)# port-isolate
```

## 7.11 show interface gpon

### Description

The **show interface gpon** command is used to display the information of the GPON port.

### Syntax

```
show interface gpon pon-id
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the information of the GPON port 1/0/3:

```
Device(config)# show interface gpon 1/0/3
```

## Chapter 8 DBA Profile Configuration Commands

DBA (Dynamically Bandwidth Allocation) improves the efficiency of GPON upstream bandwidth by dynamically adjusting the bandwidth among the ONUs. DBA profiles are applied to T-CONTs, which are created in a line profile, to determine the desired bandwidth allocation for certain GPON lines.

When the default DBA profile cannot meet the service requirements, you can add DBA profiles according to the service requirements.

### 8.1 dba-profile

#### Description

The **dba-profile** command is used to create a DBA profile. To delete the DBA profile, please use **no dba-profile** command.

#### Syntax

```
dba-profile [profile-id profile-id] [profile-name profile-name] {type1 fix fixed_bandwidth_value | type2 assure assure_bandwidth_value | type3 assure assure_bandwidth_value max max_bandwidth_value | type4 max max_bandwidth_value | type5 fix fixed_bandwidth_value assure assure_bandwidth_value max max_bandwidth_value}
```

```
no dba-profile {[profile-id profile-id] | [profile-name profile-name]}
```

#### Parameter

*profile-id*—— The profile ID of the DBA profile. The profile ID is the unique identifier for the DBA profile. If you leave the profile ID as blank, the system automatically assigns the profile ID.

*profile-name*—— The profile name of the DBA profile. If you leave the profile name as blank, the system automatically assigns the profile name.

**type1 fix *fixed\_bandwidth\_value***—— Indicates a DBA profile of the fixed bandwidth type. The fixed bandwidth is reserved for a specified ONU or certain services of the ONU. It cannot be used for other ONUs even when the upstream service stream is not transmitted on the ONU. This type of bandwidth is mainly used for services, such as TDM and VoIP, that have a high QoS requirement. ( *fixed\_bandwidth\_value*: 128-1310720 (kbps) )

**type2 assure *assure\_bandwidth\_value***—— Indicates a DBA profile of the assured bandwidth type. The assured bandwidth is the available bandwidth of

an ONU when the ONU requires the bandwidth. When the actual service stream does not reach the assured bandwidth, the DBA mechanism of the device is used to allocate the remaining bandwidth to services of other ONUs. Because of the DBA mechanism that allocates the remaining bandwidth to services of other ONUs, the assured bandwidth has a poorer real-time performance than fixed bandwidth does. ( *assure\_bandwidth\_value*: 128-1310720 (kbps) )

**type3 assure** *assure\_bandwidth\_value* **max** *max\_bandwidth\_value*—— Indicates a DBA profile of the assured bandwidth + maximum bandwidth type. This type of bandwidth is the bandwidth of the combined type. When it is used, the user is allocated with a certain bandwidth and at the same time occupies certain bandwidths. The total bandwidth, however, cannot exceed the maximum bandwidth configured for the user. This type of bandwidth is mainly used for VoIP and IPTV service. ( *assure\_bandwidth\_value*: 128-1310720 (kbps); *max\_bandwidth\_value*: 128-1310720 (kbps); *max\_bandwidth\_value* >= *assure\_bandwidth\_value* )

**type4 max** *max\_bandwidth\_value*—— Indicates a DBA profile of the maximum bandwidth type. This type of bandwidth is the maximum bandwidth that can be used by an ONU to meet the ONU bandwidth requirement to the greatest extent. It is used for services such as Internet access service. ( *max\_bandwidth\_value*: 128-1310720 (kbps) )

**type5 fix** *fixed\_bandwidth\_value* **assure** *assure\_bandwidth\_value* **max** *max\_bandwidth\_value*—— Indicates a DBA profile of the fixed bandwidth + assured bandwidth + maximum bandwidth type. This type of bandwidth is the bandwidth of the combined type. When it is used, the user is allocated with the fixed bandwidth that cannot be used by other users. In addition, the user can use the assured bandwidth when necessary and can occupy certain bandwidths. The total bandwidth, however, cannot exceed the maximum bandwidth configured for the user. ( *fixed\_bandwidth\_value*: 128-1310720 (kbps); *assure\_bandwidth\_value*: 128-1310720 (kbps); *max\_bandwidth\_value*: 128-1310720 (kbps); *max\_bandwidth\_value* >= *fixed\_bandwidth\_value* + *assure\_bandwidth\_value* )

## Command Mode

Global Configuration Mode

## Privilege Requirement

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



## Example

Add a DBA profile named TP-Link with a type-1 fixed bandwidth of 1024kbit/s:

```
Device(config)# dba-profile profile-name TP-Link type1 fix 1024
```

## 8.2 show dba-profile

### Description

The **show dba-profile** command is used to display the information of the DBA profile.

### Syntax

```
show dba-profile { profile-id profile-id | profile-name profile-name | all  
[detail] }
```

### Parameter

*profile-id* — The profile ID of the DBA profile. The profile ID is the unique identifier for the DBA profile.

*profile-name* — The profile name of the DBA profile.

all — Display all the DBA profiles.

detail — Display the configuration of all the DBA profiles in detail.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the DBA profile of profile-id 1:

```
Device(config)# show dba-profile profile-id 1
```

## Chapter 9 Line Profile Configuration Commands

A line profile is used to configure the DBA (Dynamic Bandwidth Allocation), T-CONT (Transmission Container), GEM (GPON encapsulation mode) ports, and GEM mapping rules about a GPON ONU line.

GEM (GPON Encapsulation Mode) ports are the basic transmission units in the GPON network. Different types of traffic from the ONU are mapped to different GEM ports according to the GEM Mapping rules. The T-CONT (Transmission Container) functions as a tunnel which contains several GEM ports. A DBA profile is applied to the T-CONT to control the bandwidth allocation among different T-CONTs.

When the ONU is registered, a line profile is applied to the ONU to control the GPON ONU line. When the default line profile cannot meet the service requirements, you can add line profiles according to the service requirements.dba-profile.

### 9.1 ont-lineprofile gpon

#### Description

The **ont-lineprofile gpon** command is used to create a line profile. To disable the line profile, please use **no ont-lineprofile gpon** command.

#### Syntax

```
ont-lineprofile gpon {[profile-id profile-id] [profile-name profile-name]}  
no ont-lineprofile gpon {[profile-id profile-id] | [profile-name profile-name]}
```

#### Parameter

*profile-id*—— The profile ID of the line profile. The profile ID is the unique identifier for the line profile. If you leave the profile ID as blank, the system automatically assigns the profile ID.

*profile-name*—— The profile name of the line profile. If you leave the profile name as blank, the system automatically assigns the profile name.

#### Command Mode

Global Configuration Mode

#### Privilege Requirement

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

## Example

Add a line profile named TP-Link:

```
Device(config)# ont-lineprofile gpon profile-name TP-Link
```

## 9.2 tcont

### Description

The **tcont** command is used to add T-CONTs to a line profile. To disable the T-CONT, please use **no tcont** command.

### Syntax

```
tcont tcont-list {dba-profile-id profile-id | dba-profile-name profile-name}
```

```
no tcont tcont-id
```

### Parameter

*tcont-list*—— The list of T-CONT ID. This value should be between 1-127

*profile-id*—— The profile ID of the DBA profile which is bound to the T-CONTs.

*profile-name*—— The profile name of the DBA profile which is bound to the T-CONTs.

### Command Mode

ONT Line Profile Configuration Mode

### Privilege Requirement

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

### Example

Add T-CONT 2 to the line profile 1, and the DBA profile 3 is bound to the T-CONT:

```
Device(config)# ont-lineprofile 1
```

```
Device(config-ont-lineprofile)# tcont 2 dba-profile-id 3
```

## 9.3 mapping mode

### Description

The **mapping mode** command is used to set the GEM mapping mode of a line profile.

## Syntax

**mapping mode** { vlan | priority | port | vlan-priority | port-vlan | port-vlan-priority | port-priority }

## Parameter

vlan — Indicates that user services are mapped to GEM ports based on VLANs.

priority — Indicates that user services are mapped to GEM ports based on priorities.

vlan-priority — Indicates that user services are mapped to GEM ports based on VLANs and priorities.

port — Indicates that user services are mapped to GEM ports based on ONU ports.

port-vlan — Indicates that user services are mapped to GEM ports based on ONU ports and VLANs.

port-priority — Indicates that user services are mapped to GEM ports based on ONU ports and priorities.

port-vlan-prioriity — Indicates that user services are mapped to GEM ports based on ONU ports, VLANs, and priorities.

## Command Mode

ONT Line Profile Configuration Mode

## Privilege Requirement

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

## Example

Set the GEM mapping mode of line profile 1 as vlan-priority:

```
Device(config)# ont-lineprofile gpon profile-id 1
Device(config-ont-lineprofile)# mapping mode vlan-priority
```

## 9.4 gem add

### Description

The **gem add** command is used to add the GEM port to the T-CONT in the line profile. To delete the GEM port, please use **gem delete** command.

## Syntax

```
gem add gem-port-id tcont tcont-id [encrypt {enable | disable}]  
gem delete gem-port-id
```

## Parameter

*gem-port-id*——The GEM port ID. This value should be between 1 and 1023.

*tcont-id*——The T-CONT ID which the GEM port is bound to.

**encrypt** {enable | disable} —— Enable or disable the encryption feature of the GEM port.

## Command Mode

ONT Line Profile Configuration Mode

## Privilege Requirement

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

## Example

Add GEM Port 3 to the T-CONT 2 in line profile 1 and enable the encryption feature of the GEM port

```
Device(config)# ont-lineprofile gpon profile-id 1
```

```
Device(config-ont-lineprofile)# gem add 3 tcont 2 encrypt enable
```

# 9.5 gem mapping

## Description

The **gem mapping** command is used to add the GEM mapping rule in the line profile. The user service traffic is mapped to the GEM port based on the GEM mapping rule. To delete the GEM mapping rule, please use **no gem mapping** command.

## Syntax

- If the mapping mode is vlan:

```
gem mapping gem-port-id mapping-id vlan-transparent
```

- If the mapping mode is vlan / priority / vlan-priority:

```
gem mapping gem-port-id mapping-id {vlan vlan-id | priority priority}
```

```
gem mapping gem-port-id mapping-id vlan-untag
```

- If the mapping mode is port / port-vlan / port-priority / port-vlan-priority:

**gem mapping** *gem-port-id mapping-id eth ont-port-id* [vlan *vlan-id*] priority *priority*]

**gem mapping** *gem-port-id mapping-id pots* [vlan *vlan-id*] [priority *priority*]

**no gem mapping** *gem-port-id mapping-id*

## Parameter

*gem-port-id*——The GEM port ID.

*mapping-id*—— The GEM mapping ID. This value should be between 1 and 8.

*vlan-id*—— The VLAN ID which is mapped to the GEM port.

*vlan*

*priority*—— The priority which is mapped to the GEM port.

*vlan-untag*—— Indicates that untagged traffic is mapped to the GEM port

**eth ont-port-id**—— Indicates that the traffic from the ETH port is mapped to the GEM port.

**pots**—— Indicates that the traffic from POTS port is mapped to the GEM port.

**vlan-transparent**—— When configuring the mapping relationship as VLAN mapping using the "mapping-mode" command, this parameter is used to map all service flows to specific GEM Index. This mapping is globally unique, and no other types of GEM mapping mappings are allowed when this mapping exists.

## Command Mode

ONT Line Profile Configuration Mode

## Privilege Requirement

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

## Example

Add GEM mapping rule 3 to the line profile 1, and service traffic in VLAN 2 with priority 3 is mapped to GEM port 2 based on this GEM mapping rule.

```
Device(config)# ont-lineprofile gpon profile-id 1
```

```
Device(config-ont-lineprofile)# gem mapping 2 3 vlan 2 priority 3
```

## 9.6 fec-upstream

### Description

The **fec-upstream** command is used to enable the FEC (Forward Error Correction) feature of the ONT line profile. FEC enhances the reliability of

upstream traffic by inserting redundant data into the packets. It is recommended that you enable FEC only when there is sufficient bandwidth. To disable FEC, please use **no fec-upstream** command.

### Syntax

**fec-upstream**

**no fec-upstream**

### Command Mode

ONT Line Profile Configuration Mode

### Privilege Requirement

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

### Example

Enable the fec-upstream feature of the line profile 1

```
Device(config)# ont-lineprofile gpon profile-id 1
```

```
Device(config-ont-lineprofile)# fec-upstream
```

## 9.7 omcc encrypt

### Description

The **omcc encrypt** command is used to enable the OMCC (ONT Management and Control Channel) encryption feature of the ONT line profile. When OMCC encryption is enabled, the OMCI traffic is encrypted. To disable this feature, please use **no omcc encrypt** command. By default, OMCC encryption is disabled.

### Syntax

**omcc encrypt**

**no omcc encrypt**

### Command Mode

ONT Line Profile Configuration Mode

### Privilege Requirement

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

### Example

Enable the OMCC encryption feature of the line profile 1

```
Device(config)# ont-lineprofile gpon profile-id 1
```

```
Device(config-ont-lineprofile)# omcc encrypt
```

## 9.8 show ont-lineprofile gpon

### Description

The **show ont-lineprofile gpon** command is used to display the information of the GPON ONT line profile.

### Syntax

```
show ont-lineprofile gpon {all | profile-id profile-id | profile-name  
profile-name}
```

### Parameter

*all* — Display all the line profiles.

*profile-id* — The profile ID of the line profile. The profile ID is the unique identifier for the line profile.

*profile-name* — The profile name of the line profile.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the line profile of profile-id 1:

```
Device(config)# show ont-lineprofile gpon profile-id 1
```

## 9.9 show ont-lineprofile gpon bound-info

### Description

The **show ont-lineprofile gpon bound-info** command is used to display the ONUs which the line profile is bound to.

### Syntax

```
show ont-lineprofile gpon bound-info {profile-id profile-id | profile-name  
profile-name}
```

### Parameter

*profile-id* — The profile ID of the line profile.



*profile-name* — The profile name of the line profile.

### **Command Mode**

Privileged EXEC Mode and Any Configuration Mode

### **Privilege Requirement**

None.

### **Example**

Display the bound-info of line profile 1:

```
Device(config)# show ont-lineprofile gpon bound-info profile-id 1
```

## Chapter 10 Service Profile Configuration Commands

Service profiles determines parameter settings for services on an ONU managed by an OLT via OMCI (ONU Management Control Interface), including ONU port numbers of different types, multicast settings, port settings for transmitting user services, and so on.

When the default service profile cannot meet the service requirements, you can add service profiles according to the service requirements.

### 10.1 ont-srvprofile gpon

#### Description

The **ont-srvprofile gpon** command is used to create a service profile. To disable the service profile, please use **no ont-srvprofile gpon** command.

#### Syntax

```
ont-srvprofile gpon {[profile-id profile-id] [profile-name profile-name]}  
no ont-srvprofile gpon {[profile-id profile-id] | [profile-name profile-name]}
```

#### Parameter

*profile-id*—— The profile ID of the service profile. The profile ID is the unique identifier for the service profile. If you leave the profile ID as blank, the system automatically assigns the profile ID.

*profile-name*—— The profile name of the service profile. If you leave the profile name as blank, the system automatically assigns the profile name.

#### Command Mode

Global Configuration Mode

#### Privilege Requirement

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

#### Example

Add a service profile named TP-Link:

```
Device(config)# ont-srvprofile gpon profile-name TP-Link
```

## 10.2 ont-port

### Description

The **ont-port** command is used to configure how many ports of different types are supported by the ONT bound with this service profile. By default, the port number of each type is 0.

### Syntax

**ont-port eth** {*eth-port-num*| adaptive *max-eth-number*}

**ont-port pots** {*pots-port-num*| adaptive *max-pots-number*}

### Parameter

*eth-port-num*—— The number of ONT Ethernet ports. This value should be between 0 and 24.

**adaptive** *max-eth-number*—— The number of ONT Ethernet ports is adaptive to the actual ONU but should not exceed the maximum number. This value should be between 0 and 24.

*pots-port-num*—— The number of ONT POTS ports. This value should be between 0 and 4.

**adaptive** *max-pots-number*—— The number of ONT POTS ports is adaptive to the actual ONU but should not exceed the maximum number. This value should be between 0 and 4.

### Command Mode

ONT Service Profile Configuration Mode

### Privilege Requirement

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

### Example

Set the eth-port-number of service profile 1 as adaptive, and the maximum number as 24:

```
Device(config)# ont-srvprofile gpon profile-id 1
```

```
Device(config-ont-srvprofile)# ont-port eth adaptive 24
```

## 10.3 mac-learning

### Description

The **mac-learning** command is used to enable the MAC learning feature of the ONT. By default, MAC learning is enabled. To disable this feature, please use **no mac-learning** command.

### Syntax

**mac-learning**

**no mac-learning**

### Command Mode

ONT Service Profile Configuration Mode

### Privilege Requirement

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

### Example

Enable the MAC learning feature of service profile 1:

```
Device(config)# ont-srvprofile gpon profile-id 1
```

```
Device(config-ont-srvprofile)# mac-learning
```

## 10.4 native-vlan

### Description

The **native-vlan** command is used to configure whether the native VLAN is concerned by the ONU which is bound with this service profile. If the native-vlan is concern, the untagged packets from the user's side are tagged with the native VLAN. By default, the native-vlan is set as concern.

### Syntax

**native-vlan** { concern | unconcern }

### Parameter

concern —— The native VLAN is concerned by the ONU.

unconcern —— The native VLAN is not concerned by the ONU.

### Command Mode

ONT Service Profile Configuration Mode

## Privilege Requirement

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

## Example

Set the native-vlan as concern in service profile 1:

```
Device(config)# ont-srvprofile gpon profile-id 1
Device(config-ont-srvprofile)# native-vlan concern
```

# 10.5 multicast-mode

## Description

The **multicast-mode** command is used to configure the mode of multicast traffic in the service profile. By default, the multicast-mode is set as unconcern.

## Syntax

```
multicast-mode { unconcern | igmp-snooping | olt-control }
```

## Parameter

unconcern — The multicast mode is not determined by the service profile, but by the settings of the ONU.

igmp-snooping — The ONU is required to maintain multicast forwarding tables.

olt-control — The OLT is required to maintain multicast forwarding tables.

## Command Mode

ONT Service Profile Configuration Mode

## Privilege Requirement

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

## Example

Set the multicast-mode as igmp-snooping in service profile 1:

```
Device(config)# ont-srvprofile gpon profile-id 1
Device(config-ont-srvprofile)# multicast-mode igmp-snooping
```

## 10.6 multicast-forward

### Description

The **multicast-forward** command is used to configure the mode of multicast forwarding in the service profile. By default, the multicast-forward is set as unconcern.

### Syntax

**multicast-forward** {unconcern | untagged | tagged {transparent | translation *vlan-id*}}

### Parameter

unconcern — The mode of multicast forwarding is not determined by the service profile, but by the settings of the ONU.

untagged — The downlink traffic forwarded by the ONU is untagged. Select the untagged mode if the ONU is directly connected to the STB (set-top box) or PC.

tagged — The downlink traffic forwarded by the ONU is tagged. Select the tagged mode if the ONU is directly connected to the home gateway. If multicast-forward is set as tagged, you need to set the VLAN parameters.

transparent — The multicast VLAN on the ISP's side is the same as that on the user's side.

translation *vlan-id* — The multicast VLAN on the ISP's side is translated to the specified *vlan-id* on the user's side. The value of *vlan-id* should be between 1 and 4094.

### Command Mode

ONT Service Profile Configuration Mode

### Privilege Requirement

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

### Example

Set the multicast-forward as untagged in service profile 1:

```
Device(config)# ont-srvprofile gpon profile-id 1
Device(config-ont-srvprofile)# multicast-forward untagged
```

## 10.7 priority-policy

### Description

The **priority-policy** command is used to configure the priority of the uplink traffic of the ONU which is bound with the service profile. By default, the priority-policy is unconcern.

### Syntax

```
port priority-policy eth ont-port-id{ unconcern | assigned | copy-cos }
```

### Parameter

*ont-port-id*—— The ONU port where the priority-policy is set.

unconcern —— The priority-policy is not determined by the service profile, but by the settings of the ONU.

assigned——The priority is assigned by the OLT.

copy-cos—— The priority of the uplink traffic is the same as the COS priority of the packets from the user.

### Command Mode

ONT Service Profile Configuration Mode

### Privilege Requirement

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

### Example

Set the priority-policy of port 2 as copy-cos in service profile 1:

```
Device(config)# ont-srvprofile gpon profile-id 1
Device(config-ont-srvprofile)# port priority-policy eth 2 copy-cos
```

### Example

Set the priority-policy of port 2 as copy-cos in service profile 1:

```
Device(config)# ont-srvprofile gpon profile-id 1
Device(config-ont-srvprofile)# port priority-policy eth 2 copy-cos
```

## 10.8 port igmp-forward

### Description

The **port igmp-forward** command is used to configure the mode of IGMP forwarding in the service profile. By default, the igmp-forward is set as unconcern.

### Syntax

```
port igmp-forward eth ont-port-list {{{translation | default} vlan-id[priority]} | transparent | unconcern}
```

### Parameter

*ont-port-id*—— The ONU port where the igmp-forward is set.

unconcern —— The mode of IGMP forwarding is not determined by the service profile, but by the settings of the ONU.

translation *vlan-id*[*priority*] —— The IGMP VLAN and priority on the user's side is translated to the specified *vlan-id* and priority on the ISP's side. The value of *vlan-id* should be between 1 and 4094. The priority should be between 0 and 7, and this parameter is optional.

default *vlan-id*[*priority*] —— The packets from the user's side are added with a outer layer of VLAN tag and then forwarded to the ISP's side. The value of *vlan-id* should be between 1 and 4094. The priority should be between 0 and 7, and this parameter is optional.

transparent—— The IGMP VLAN and priority on the ISP's side is the same as that on the user's side.

### Command Mode

ONT Service Profile Configuration Mode

### Privilege Requirement

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

### Example

Set the igmp-forward of port 2 as transparent in service profile 1:

```
Device(config)# ont-srvprofile gpon profile-id 1
```

```
Device(config-ont-srvprofile)# port igmp-forward eth 2 transparent
```



## 10.9 port q-in-q

### Description

The **port q-in-q** command is used to configure the QinQ feature of the ONU port. By default, the q-in-q is set as unconcern.

### Syntax

```
port q-in-q eth ont-port-id{unconcern | enable | disable}
```

### Parameter

*ont-port-id*—— The ONU port where the q-in-q is set.

unconcern —— The settings of q-in-q is not determined by the service profile, but by the settings of the ONU.

enable —— The q-in-q is enabled by the ONU port.

disable —— The q-in-q is disabled by the ONU port.

### Command Mode

ONT Service Profile Configuration Mode

### Privilege Requirement

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

### Example

Set the q-in-q of port 2 as enabled in service profile 1:

```
Device(config)# ont-srvprofile gpon profile-id 1
```

```
Device(config-ont-srvprofile)# port q-in-q eth 2 enable
```

## 10.10 max-mac-count

### Description

The **max-mac-count** command is used to configure the maximum number of MAC learning entries of the ONU port. By default, the max-mac-count is set as unlimited.

## Syntax

```
port eth ont-port-id max-mac-count { mac-address-num | unlimited }
```

## Parameter

*ont-port-id*—— The ONU port where the max-mac-count is set. This value should be between 1 and 24

*mac-address-num* ——The maximum number of MAC learning entries of the ONU port. This value should be between 1 and 255

unlimited —— The number of MAC learning entries of the ONU port is unlimited.

## Command Mode

ONT Service Profile Configuration Mode

## Privilege Requirement

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

## Example

Set the max-mac-count of port 2 as 255 in service profile 1:

```
Device(config)# ont-srvprofile gpon profile-id 1
```

```
Device(config-ont-srvprofile)# port eth 2 max-mac-count 255
```

# 10.11 port vlan

## Description

The **port vlan** command is used to configure the VLAN feature of the ONU port on the user's side. To disable the VLAN configuration of the ONU port, use **no port vlan** command.

## Syntax

```
port vlan eth ont-port-id-list transparent  
port vlan pots transparent  
port vlan eth ont-port-id-list trunk vlan-id [priority-val | user-cos] [tls]  
port vlan pots trunk vlan-id [priority-val | user-cos]  
port vlan eth ont-port-id-list translation vlan-id [priority-val | user-cos]  
user-vlan user-vlanid [cpriority-val]  
port vlan pots translation vlan-id [priority-val | user-cos] user-vlan  
user-vlanid [cpriority-val]  
port vlan eth ont-port-id-list q-in-q vlan-id [priority-val | user-cos] user-vlan  
user-vlanid [cpriority-val]  
port vlan pots q-in-q vlan-id [priority-val | user-cos] user-vlan user-vlanid  
[cpriority-val]  
no port vlan eth ont-port-id-list {vlan-id priority-val | trunk vlan-id [tls]}  
no port vlan pots vlan-id [priority-val | user-cos]
```

## Command Mode

ONT Service Profile Configuration Mode

## Privilege Requirement

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

# 10.12 show ont-srvprofile gpon

## Description

The **show ont-srvprofile gpon** command is used to display the information of the GPON ONT service profile.

## Syntax

```
show ont-srvprofile gpon {all | profile-id profile-id | profile-name  
profile-name}
```

## Parameter

*all* — Display all the service profiles.

*profile-id* — The profile ID of the service profile. The profile ID is the unique identifier for the service profile.

*profile-name* — The profile name of the service profile.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the service profile of profile-id 1:

```
Device(config)# show ont-srvprofile gpon profile-id 1
```

# 10.13 show ont-srvprofile gpon bound-info

## Description

The **show ont-srvprofile gpon bound-info** command is used to display the ONUs which the service profile is bound to.

## Syntax

```
show ont-srvprofile gpon bound-info {profile-id profile-id | profile-name  
profile-name}
```

## Parameter

*profile-id*—— The profile ID of the service profile.

*profile-name*—— The profile name of the service profile.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the bound-info of service profile 1:

```
Device(config)# show ont-srvprofile gpon bound-info profile-id 1
```

# Chapter 11 Traffic Profile Configuration Commands

In Traffic profile, you can set up desired rate limit for any traffic which uses this profile, such as the inbound and outbound traffic of service ports.

## 11.1 traffic-profile

### Description

The **traffic-profile** command is used to create or modify a traffic profile. To delete the traffic profile, please use **no traffic-profile** command.

### Syntax

```
traffic-profile {profile-name profile-name | profile-id profileid | cir cir | pir pir |  
cbs cbs | pbs pbs | priority {assigned | user-cos} | prival prival | inner-priority  
{none | assigned | user-cos} | inner-prival innerPri | priority-policy  
{local-setting | tag-in-package | tag-in-ingress-package } }  
no traffic-profile { all | profile-id profile-id | profile-name profile-name }
```

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

## 11.2 show traffic-profile

### Description

The **show traffic-profile** command is used to display the information of the traffic profile.

### Syntax

```
show traffic-profile { profile-id profile-id | [profile-name profile-name] | all }
```

### Parameter

*profile-id*—— The profile ID of the traffic profile. The profile ID is the unique identifier for the traffic profile.

*profile-name*—— The profile name of the traffic profile.

all—— Display all the traffic profiles.

## **Command Mode**

Privileged EXEC Mode and Any Configuration Mode

## **Privilege Requirement**

None.

## **Example**

Display the traffic profile of profile-id 1:

```
Device(config)# show traffic-profile profile-id 1
```

# Chapter 12 Management Profile Configuration

## Commands

Management profiles are used to uniformly configure ONU management settings, including ONU WAN connection configuration, ONU Wireless configuration, ONU VoIP configuration, ONU CWMP configuration, ONU CATV configuration, etc. If you want to configure the above settings uniformly, you can create management profiles according to your needs.

### 12.1 ont-mgmtprofile

#### Description

The **ont-mgmtprofile** command is used to create or modify a management profile on the OLT. The **no ont-mgmtprofile** command is used to delete a management profile.

#### Syntax

**ont-mgmtprofile gpon** [profile-id *profile-id*] profile-name *profile-name*\*

**no ont-mgmtprofile gpon** {profile-id *profile-id*} profile-name *profile-name*\*

#### Parameter

*profile-id*—The profile ID of the management profile. The profile ID is the unique identifier for the management profile. If you leave the profile ID as blank, the system automatically assigns the profile ID. The value ranges from 1 to 127.

*profile-name*— The profile name of the management profile. If you leave the profile name as blank, the system will automatically assign a name of "mgmt\_profile\_x", with "x" being the management profile ID. String type: It can consist of uppercase letters, lowercase letters, numbers, and underscores. The length can range from 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 management profile on the OLT:

```
Device(config)# ont-mgmtprofile gpon profile-name TP-Link
```

## 12.2 catv

### Description

The **catv** command is used to configure CATV parameters. With this command, the fiber network administrator can set a series of parameters to support the transmission and reception of CATV signals over fiber, ensuring stable transmission of CATV signals and enabling end users to watch TV programs through related devices. The **no catv** command is used to delete the configured CATV configuration.

### Syntax

```
catv {enable | disable}
```

```
no catv
```

### Command Mode

ONT Management Profile Configuration Mode

### Privilege Requirement

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

### Example

Add CATV configuration:

```
Device(config-ont-mgmeprofile)# catv enable
```

## 12.3 sipuser

### Description

The **sipuser** command is used to add a SIP (Session Initiation Protocol) user account. It enables the configuration of SIP user accounts to facilitate Voice over IP (VoIP) services. These user accounts allow for the initiation, modification, and termination of real-time voice and video communication sessions over the IP network. The **no sipuser** command is used to remove a specific SIP user account.



## Syntax

```
sipuser {registration-server reg-server | sipusername sipusername |  
sippassword sippassword | registration-port port | proxy-server server |  
proxy-port port | outbound-server server | outbound-port port}*
```

```
no sipuser
```

## Parameter

*sipusername*—The username of the SIP account. The length can range from 0 to 50 characters.

*sippassword*—The password of the SIP account. The length can range from 0 to 25 characters.

*reg-server*—The registration server address of the SIP account. The length can range from 1 to 40 characters.

*server*—The server of the SIP account. The length can range from 0 to 40 characters.

*port*—The port of the SIP server. The value ranges from 0 to 65535.

## Command Mode

ONT Management Profile Configuration Mode

## Privilege Requirement

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

## Example

Add an SIP account in the management profile:

```
Device(config-ont-mgmtprofile)# sipuser sipusername TP-Link  
sippassword admin
```

# 12.4 wlan

## Description

The **wlan** command is used to add WLAN (Wireless Local Area Network) configuration. It allows for the configuration of Wi-Fi networks, enabling wireless network connectivity. This command can be used to set parameters for the wireless network, such as the SSID (Service Set Identifier), encryption method, frequency band, etc., allowing terminal devices to connect to the network wirelessly. On the other hand, the **no wlan** command is used to

delete the configured WLAN configuration, clearing out any unwanted wireless network settings.

## Syntax

```
wlan {2_4g 2_4g_ssid ssid[2_4g_hide_ssid {enable | disable} | 2_4g_security security| 2_4g_password password| 2_4g_mode mode| 2_4g_channel channel| 2_4g_channel_width width| 2_4g_radio {enable | disable}]}* | 5g_5g_ssid ssid[5g_hide_ssid {enable | disable} | 5g_security security| 5g_password password| 5g_mode mode| 5g_channel channel| 5g_channel_width width| 5g_radio {enable | disable}]}*
```

```
wlan band-steering ssid ssid[security security| ssid-password password| hide-ssid {enable | disable} | radio {enable | disable}]*
```

```
no wlan
```

## Parameter

*ssid*—The SSID of the WLAN. The length can range from 1 to 32 characters.

*security*—The encryption method of the WLAN. The valid values are: no\_security, wpa\_psk\_tkip\_wpa2\_psk\_aes, wpa2\_psk\_aes, wpa2\_psk\_aes\_wpa3\_personal

*password*—The password of the WLAN. The length can range from 8 to 63 characters. When the security is set to no\_security, this parameter is not applicable.

*mode*—The mode of the WLAN. The 2.4G valid values are: 802\_11\_n, 802\_11\_g\_n, 802\_11\_b\_g\_n; the 5G valid values are: 802\_11\_ac, 802\_11\_ac\_n, 802\_11\_a\_n\_ac.

*channel*—The frequency band of the WLAN. The 2.4G valid values are: auto, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13; the 5G valid values are: auto, 36, 40, 44, 48, 149, 153, 157, 161.

*width*—The frequency band width of the WLAN. The 2.4G valid values are: auto, 20, 40; the 5G valid values are: auto, 20, 40, 80.

## Command Mode

ONT Management Profile Configuration Mode

## Privilege Requirement

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

## Example

Add a WLAN configuration in the management profile:

```
Device(config-ont-mgmtprofile)# wlan 2_4g 2_4g_ssid TP-Link_1234
```

## 12.5 wan

### Description

The **wan** command is used to create a new ONT WAN connection. It uniquely identifies a WAN connection using the wan-id parameter. If the WAN connection corresponding to the wan-id does not exist, a new one will be created. If it already exists, the WAN connection will be modified. The **no wan** command is used to delete a WAN connection.

### Syntax

The WAN Connection type is Bridge:

```
wan wan-id admin-status {enable | disable} conn-type bridge {internet | internet-tr069 | internet-voip | internet-voip-tr069 | other | tr069 | voip | voip-tr069} mtu-val [vlan vlan-id priority priority] [lan-dhcp {enable | disable}] [conn-name name] [port-banding {eth port_id_list | wifi_2_4_g | wifi_5g_1 | wifi_5g_2}* ]
```

The WAN Connection type is Dynamic-IP:

```
wan wan-id admin-status {enable | disable} conn-type dynamic-ip {internet | internet-tr069 | internet-voip | internet-voip-tr069 | other | tr069 | voip | voip-tr069} mtu-val [vlan vlan-id priority priority] [lan-dhcp {enable | disable}] [nat {enable | disable}] [conn-name name] {ipv4 dns-type {auto | manual {primary-dns ipv4_addr secondary-dns ipv4_addr}} [ipv4-default-gateway {enable | disable}] | ipv6 [dhcpv6 | slaac] dns-type {auto | manual {ipv6-primary-dns ipv6_addr ipv6-secondary-dns ipv6_addr}} [ipv6-default-gateway {enable | disable}]]* [port-banding {eth port_id_list | wifi_2_4_g | wifi_5g_1 | wifi_5g_2}* ]
```

The WAN Connection type is PPPoE:

```
wan-pppoeprofile wan-id
```

```
pppoe-username username
```

```
pppoe-password password
```

```
wan wan-id admin-status {enable | disable} conn-type pppoe {internet | internet-tr069 | internet-voip | internet-voip-tr069 | other | tr069 | voip | voip-tr069} mtu-val [vlan vlan-id priority priority] [nat {enable | disable}]
```

[lan-dhcp {enable | disable}] [conn-name *name*] [ipv4 [ipv4-default-gateway {enable | disable}]| ipv6 {dhcpv6 | slaac} [ipv6-default-gateway {enable | disable}]] [port-banding {eth *port\_id\_list* | wifi\_2\_4\_g | wifi\_5g\_1 | wifi\_5g\_2}\* ]  
**no wan** *wan-id*

## Parameter

*wan-id*—The ID of the WAN connection. The value ranges from 1 to 8.

bridge—The WAN connection type is bridge.

dynamic-ip—The WAN connection type is dynamic-ip.

pppoe—The WAN connection type is PPPoE.

internet—Indicates that the connection is used for the Internet.

internet-tr069—Indicates that the connection is used for Internet and TR069 services.

internet-voip—Indicates that the connection is used for Internet and voice services.

internet-voip-tr069—Indicates that the connection is used for Internet access, voice services and TR069 services.

other—Indicates that the connection is for IPTV service.

tr069—Indicates that the connection is used for TR069 service.

voip—Indicates that the connection is used for voice services.

voip-tr069—Indicates that the connection is used for voice and TR069 services.

*mtu-val*—Set MTU value.

*vlan-id*—Set the VLAN ID to which the WAN connection belongs. The value ranges from 1 to 4094.

*priority*—Set the priority of the WAN connection. The value ranges from 0 to 7.

lan-dhcp—Enable or disable the DHCP function of the LAN port.

nat—Enable or disable the NAT function of the WAN connection.

*name*—The name of the WAN connection. The length can range from 1 to 32 characters.

auto—Obtain DNS automatically.

manual—To manually set DNS, you need to set primary-DNS and secondary-DNS.

primary-dns—Set the IP of the manually configured primary DNS Server.

*secondary-dns*—Set the IP of the manually configured secondary DNS server.

*username*—The username used by PPPOE for dialing.

*password*—The password used by PPPOE dial.

*IPv4\_addr*—The static IP address for IPv4.

*IPv6\_addr*—The static IP address for IPv6.

*ipv4-default-gateway*—When the *admin-status* is enabled, set this connection as the default connection for IPv4.

*ipv6-default-gateway*—When the *admin-status* is enabled, set this connection as the default connection for IPv6.

*dhcpv6*—Set the IPV6 addressing type to DHCPv6.

*slaac*—Set the IPV6 addressing type to SLAAC.

*port-id-list*—The value range of the ONT port bound to the WAN connection. The valid values are: Port1-4, *wifi\_2\_4\_g*, *wifi\_5g\_1*, *wifi\_5g\_2*.

## Command Mode

ONT Management Profile Configuration Mode

## Privilege Requirement

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

## Example

Create a new ONT WAN connection:

```
Device(config-ont-mgmtprofile)# wan 1 admin-status enable conn-type
bridge internet 64 vlan 1 priority 0 lan-dhcp enable conn-name TP-Link
port-banding eth 1
```

# 12.6 cwmp

## Description

The **cwmp** command is specifically used to add the necessary configuration for enabling CPE WAN Management Protocol (CWMP). CWMP is a widely-used protocol that facilitates efficient remote management and configuration of customer premises equipment (CPE) in a wide area network (WAN) environment. The **no cwmp** command is used to delete the configured CWMP configuration.

Note: When connection authentication is enabled, you must first create a `cwmp-auth-profile` to input the required port, path, username, and password for the authentication.

## Syntax

```
cwmp url url[username acs-username | pwd acs-pwd | cwmp-status {enable | disable} | inform-status{enable | disable} | inform-interval inform-interval | auth-status{enable | disable}]*
```

### **no cwmp**

When the auth-status is enabled, create the `cwmp-auth-profile` first:

### **cwmp-auth-profile**

```
conn-auth path path port port
```

```
auth-username auth-username
```

```
auth-password auth-password
```

## Parameter

*url*—The address of the ACS URL. The length can range from 1 to 255 characters.

*acs-username*—The username of the ACS URL. The length can range from 0 to 50 characters.

*acs-pwd*—The password of the ACS URL. The length can range from 0 to 25 characters.

*Inform-interval*—The interval of inform messages. The value ranges from 1 to 4294967295.

*path*—The path of the authentication. The length can range from 1 to 15 characters and must start with a "/".

*port*—The port of the authentication. The interval of inform messages. The value ranges from 1000 to 65535.

*auth-username*—The username of the authentication. The length can range from 0 to 255 characters.

*auth-password*—The password of the authentication. The length can range from 0 to 255 characters.

## Command Mode

ONT Management Profile Configuration Mode

## Privilege Requirement

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

## Example

Add a CWMP configuration on a management profile:

```
Device(config-ont-mgmtprofile)# cwmp-auth-profile
Device(config-mgmtprofile-cwmp-auth)# conn-auth path /192.168.1.1
port 1000
```

## 12.7 show ont-mgmtprofile gpon

### Description

The **show ont-mgmtprofile gpon** command is used to display management profile information.

### Syntax

```
show ont-mgmtprofile gpon {all | profile-id profile-id | profile-name
profile-name}
```

### Parameter

*all*— Display all management profile information.

*profile-id*—The ID of the management profile. The value ranges from 1 to 127.

*profile-name*—The name of the management profile. It can consist of uppercase and lowercase letters, numbers, and underscores, with a length ranging from 1 to 32 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

Display all management profile information:

```
Device# show ont-mgmtprofile gpon all
```

## 12.8 show ont-mgmtprofile gpon bound-info

### Description

The **show ont-mgmtprofile gpon bound-info** command is used to query the binding information of a specified GPON ONT management profile.

### Syntax

```
show ont-mgmtprofile gpon bound-info {profile-id profile-id | profile-name  
profile-name}
```

### Parameter

*profile-id*—The ID of the management profile. The value ranges from 1 to 127.

*profile-name*—The name of the management profile. It can consist of uppercase and lowercase letters, numbers, and underscores, with a length ranging from 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

Query the binding information of the management profile 1:

```
Device# show ont-mgmtprofile gpon bound-info profile-id 1
```



## Chapter 13 ONU-Register Commands

After connecting the ONU to the GPON network, the ONU is auto-found by the OLT. Then you need to authenticate and register the ONU. You can also set auto authentication for ONUs. After the ONU is registered, the ONU goes online and is able to communicate with the OLT via the GPON network.

### 13.1 ont autofind

#### Description

The **ont autofind** command is used to enable the autofind feature of the ONT. To disable autofind, please use **no ont autofind** command.

#### Syntax

**ont autofind**

**no ont autofind**

#### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

#### Privilege Requirement

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

### 13.2 ont autofind timeout

#### Description

The **ont autofind timeout** command is used to set the aging time of the auto-found ONT.

#### Syntax

**ont autofind** {timeout *time* | no-aging}

#### Parameter

*time*—— The aging time of the auto-found ONT.

no-aging—— No setting the aging time of the auto-found ONT.

#### Command Mode

Global Configuration Mode

## Privilege Requirement

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

## Example

Set the aging time of the auto-found ONT to 100s:

```
Device(config)# ont autofind timeout 100
```

## 13.3 ont autofind interval

### Description

The **ont autofind interval** command is used to set the interval between each time the OLT auto-find the ONTs.

### Syntax

```
ont autofind interval time
```

### Parameter

*time* — The interval between each time the OLT auto-find the ONTs.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Set the interval between each time the OLT auto-find the ONTs to 1s:

```
Device(config-if-gpon)# ont autofind interval 1
```

## 13.4 ont cancel

### Description

The **ont cancel** command is used to clear the information of auto-found ONTs.

### Syntax

```
ont cancel {all | sn-val}
```

## Parameter

*all*—— All of the ONTs

*sn-val*—— The SN value in the auto-found ONTs list.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Clear all the information of auto-found ONTs.:

```
Device(config-if-gpon)# ont cancel all
```

# 13.5 ont confirm

## Description

The **ont confirm** command is used to confirm and register autofound ONT.

## Syntax

(1) Authenticate the ONT using password:

```
ont confirm password-auth password-type {ascii | hex }password-val  
{ always-on | once-on} [[sn | sn-password]] [[ont-lineprofile-id profile-id] |  
[ont-lineprofile-name profile-name]] [[ont-srvprofile-id profile-id] |  
[ont-srvprofile-name profile-name]] [desc desc] [ont ont-id]  
[ont-mgmtprofile-id profile-id] ont-mgmtprofile-name profile-name]*
```

(2) Authenticate the ONT using SN:

```
ont confirm sn-auth sn-val [[ont-lineprofile-id profile-id] |  
[ont-lineprofile-name profile-name]] [[ont-srvprofile-id profile-id] |  
[ont-srvprofile-name profile-name]] [desc desc] [ont ont-id]  
[ont-mgmtprofile-id profile-id] ont-mgmtprofile-name profile-name]*
```

(3) Authenticate the ONT using LOID:

```
ont confirm loid-auth loid-val { always-on | once-on} [[ont-lineprofile-id  
profile-id] | [ont-lineprofile-name profile-name]] [[ont-srvprofile-id profile-id] |  
[ont-srvprofile-name profile-name]] [desc desc] [ont ont-id]  
[ont-mgmtprofile-id profile-id] ont-mgmtprofile-name profile-name]*
```

(4) Authenticate the ONT using password and LOID:

**ont confirm loid-and-password-auth** *loid-val loid-password*{ always-on | once-on} {[ont-lineprofile-id *profile-id*] | [ont-lineprofile-name *profile-name*]} {[ont-srvprofile-id *profile-id*] | [ont-srvprofile-name *profile-name*]} [desc *desc*] [ont *ont-id*] [ont-mgmtprofile-id *profile-id*] ont-mgmtprofile-name *profile-name*]\*

(5) Authenticate the ONT using password and SN:

**ont confirm sn-and-password-auth** *sn-val password-val*{[ont-lineprofile-id *profile-id*] | [ont-lineprofile-name *profile-name*]} {[ont-srvprofile-id *profile-id*] | [ont-srvprofile-name *profile-name*]} [desc *desc*] [ont *ont-id*] [ont-mgmtprofile-id *profile-id*] ont-mgmtprofile-name *profile-name*]\*

## Parameter

*ont-id*—— The ONT-ID assigned to the ONT, if not specified, the system automatically assigns the smallest ont ID that is free under the current port.

*sn-val*—— The SN value of the autofound ONT.

*password-type*—— The password type of the autofound ONT.

*password-val*—— The password value of the autofound ONT.

*loid-val*—— The LOID value of the autofound ONT.

*loid-password*—— The LOID password value of the autofound ONT.

*always-on*—— According to different authentication methods, the first authentication will use password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will not be automatically matched, and each subsequent authentication will use the same authentication method as the first authentication. After the ONT is certified, it can go online even if the SN is modified.

*once-on*—— According to different authentication methods, the first authentication uses password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will be automatically matched, and each subsequent authentication will use the method of SN or SN+password/ SN+LOID / SN+LOID+password, which corresponds to the authentication method of the first authentication.

*sn*—— Configure the second and subsequent authentication to only verify the SN.

*sn password*—— Configure the second and subsequent authentication to verify the SN and password at the same time.

*ont-lineprofile-id*—— The line profile ID.

ont-lineprofile-name— The line profile name.

ont-srvprofile-id— The service profile ID.

ont-srvprofile-name— The service profile name.

ont-mgmtprofile-id— The management profile ID.

ont-mgmtprofile-name— The management profile name.

*desc*—The description of the autofound ONT.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Authenticate with the password, confirm and register autofound ONTs:

```
Device(config-if-gpon)# ont confirm password-auth password-type ascii
admin always-on ont-lineprofile-id 0 ont-srvprofile-id 0
```

# 13.6 ont confirm all

## Description

The **ont confirm** command is used to confirm and register autofound ONTs in batches.

## Syntax

(1) Authenticate the ONT using password:

```
ont confirm all password-auth { always-on | once-on } [[sn |
sn-password]][[ont-lineprofile-id profile-id] | [ont-lineprofile-name
profile-name]] [[ont-srvprofile-id profile-id] | [ont-srvprofile-name
profile-name]] [desc desc] [ont-mgmtprofile-id profile-id]
ont-mgmtprofile-name profile-name]*
```

(2) Authenticate the ONT using SN:

```
ont confirm all sn-auth [[ont-lineprofile-id profile-id] | [ont-lineprofile-name
profile-name]] [[ont-srvprofile-id profile-id] | [ont-srvprofile-name
profile-name]] [desc desc] [ont-mgmtprofile-id profile-id]
ont-mgmtprofile-name profile-name]*
```

(3) Authenticate the ONT using LOID:

**ont confirm all loid-auth** { always-on | once-on} {[ont-lineprofile-id *profile-id*] | [ont-lineprofile-name *profile-name*]} {[ont-srvprofile-id *profile-id*] | [ont-srvprofile-name *profile-name*]} [desc *desc*] [ont-mgmtprofile-id *profile-id* | ont-mgmtprofile-name *profile-name*]\*

(4) Authenticate the ONT using password and LOID:

**ont confirm all loid-and-password-auth** { always-on | once-on} {[ont-lineprofile-id *profile-id*] | [ont-lineprofile-name *profile-name*]} {[ont-srvprofile-id *profile-id*] | [ont-srvprofile-name *profile-name*]} [desc *desc*] [ont-mgmtprofile-id *profile-id* | ont-mgmtprofile-name *profile-name*]\*

(5) Authenticate the ONT using password and SN:

**ont confirm all sn-and-password-auth** {[ont-lineprofile-id *profile-id*] | [ont-lineprofile-name *profile-name*]} {[ont-srvprofile-id *profile-id*] | [ont-srvprofile-name *profile-name*]} [desc *desc*] [ont-mgmtprofile-id *profile-id* | ont-mgmtprofile-name *profile-name*]\*

## Parameter

**always-on**—— According to different authentication methods, the first authentication will use password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will not be automatically matched, and each subsequent authentication will use the same authentication method as the first authentication. After the ONT is certified, it can go online even if the SN is modified.

**once-on**—— According to different authentication methods, the first authentication uses password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will be automatically matched, and each subsequent authentication will use the method of SN or SN+password/ SN+LOID / SN+LOID+password, which corresponds to the authentication method of the first authentication.

**sn**—— Configure the second and subsequent authentication to only verify the SN.

**sn password**—— Configure the second and subsequent authentication to verify the SN and password at the same time.

**ont-lineprofile-id**—— The line profile ID.

**ont-lineprofile-name**—— The line profile name.

**ont-srvprofile-id**—— The service profile ID.

**ont-srvprofile-name**—— The service profile name.

*ont-mgmtprofile-id*— The management profile ID.

*ont-mgmtprofile-name*— The management profile name.

*desc*—The description of the autofound ONT.

### Command Mode

Interface Configuration Mode (interface *gpon* / interface range *gpon*)

### Privilege Requirement

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

### Example

Authenticate with the password, confirm and register autofound ONTs in batches.:

```
Device(config-if-gpon)# ont confirm all password-auth always-on  
ont-lineprofile-id 0 ont-srvprofile-id 0
```

## 13.7 show ont autofind

### Description

The **show ont autofind** command is used to display the information of autofound ONTs.

### Syntax

```
show ont autofind { by-equipment-id equip-id | by-hardware-version  
hardware-version | by-loid loid | by-loid-password loid-password |  
by-password { ascii | hex } password | by-sn sn-val | by-software-version  
software-version | by-vendor-id vendor-id | gpon pon-port-list }
```

### Parameter

*by-equipment-id*—Display the information of autofound ONTs through equipment ID.

*by-hardware-version*—Display the information of autofound ONTs through hardware version.

*by-software-version*—Display the information of autofound ONTs through software version.

*by-loid*—Display the information of autofound ONTs through LOID.

*by-loid-password*—Display the information of autofound ONTs through LOID password.

*by-password*—Display the information of autofound ONTs through password.

*by-sn*—Display the information of autofound ONTs through SN.

*by-vendor-id*—Display the information of autofound ONTs through vendor id.

*pon-port-list*— The PON port list.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the information of autofound ONTs configured by 1/0/1:

```
Device(config)# show ont autofind 1/0/1
```

# 13.8 ont add

## Description

The **ont add** command is used to add the method of ONT authentication and bind the profiles to the ONT. This command is mainly used to add the ONT when the ONT is offline.

## Syntax

(1) Authenticate the ONT using password:

```
ont add [ont-id] password-auth password-type {ascii | hex} password-val  
{ always-on | once-on {sn | sn-password}} [[ont-lineprofile-id profile-id] |  
[ont-lineprofile-name profile-name]] [[ont-srvprofile-id profile-id] |  
[ont-srvprofile-name profile-name]] [desc desc] [ont-mgmtprofile-id  
profile-id] ont-mgmtprofile-name profile-name*
```

(2) Authenticate the ONT using SN:

```
ont add [ont-id] sn-auth sn-val [[ont-lineprofile-id profile-id] |  
[ont-lineprofile-name profile-name]] [[ont-srvprofile-id profile-id] |  
[ont-srvprofile-name profile-name]] [desc desc] [ont-mgmtprofile-id profile-id]  
| ont-mgmtprofile-name profile-name*
```

(3) Authenticate the ONT using LOID:

```
ont add [ont-id] loid-auth loid-val { always-on | once-on } [[ont-lineprofile-id  
profile-id] | [ont-lineprofile-name profile-name]] [[ont-srvprofile-id profile-id] |
```



[ont-srvprofile-name *profile-name*] [desc *desc*] [ont-mgmtprofile-id *profile-id* | ont-mgmtprofile-name *profile-name*]\*

(4) Authenticate the ONT using password and LOID:

**ont add** [*ont-id*] **loid-and-password-auth** *loid-val* *loid-password* { always-on | once-on } {[ont-lineprofile-id *profile-id*] | [ont-lineprofile-name *profile-name*]} {[ont-srvprofile-id *profile-id*] | [ont-srvprofile-name *profile-name*]} [desc *desc*] [ont-mgmtprofile-id *profile-id* | ont-mgmtprofile-name *profile-name*]\*

(5) Authenticate the ONT using password and SN:

**ont add** [*ont-id*] **sn-and-password-auth** *sn-val* **password-type** {asci | hex }*sn-val* *password-val* {[ont-lineprofile-id *profile-id*] / [ont-lineprofile-name *profile-name*]} {[ont-srvprofile-id *profile-id*] | [ont-srvprofile-name *profile-name*]} [desc *desc*] [ont-mgmtprofile-id *profile-id* | ont-mgmtprofile-name *profile-name*]\*

## Parameter

*ont-id*—— The ONT-id assigned to the ONT, if not specified, the system automatically assigns the smallest ont id that is free under the current port.

*password-auth*—— Set the ONT authentication mode to password authentication.

*password-val*—— The password value of the ONT.

*sn-auth*—— Set the ONT authentication mode to SN authentication.

*sn-val*—— The SN value of the ONT.

*loid-auth*—— Set the ONT authentication mode to LOID authentication.

*loid-val*—— The LOID value of the ONT.

*loid-password*—— The LOID password value of setting ONT loid authentication.

*loid-and-password-auth*—— Set the ONT authentication mode to LOID and password authentication.

*sn-and-password-auth*—— Set the ONT authentication mode to SN and password authentication.

*always-on*—— According to different authentication methods, the first authentication will use password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will not be automatically matched, and each subsequent authentication will use the same authentication method as the first authentication. After the ONT is certified, it can go online even if the SN is modified.

once-on—— According to different authentication methods, the first authentication uses password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will be automatically matched, and each subsequent authentication will use the method of SN or SN+password/ SN+LOID / SN+LOID+password, which corresponds to the authentication method of the first authentication.

sn—— Configure the second and subsequent authentication to only verify the SN.

sn password—— Configure the second and subsequent authentication to verify the SN and password at the same time.

ont-lineprofile-id—— The line profile ID.

ont-lineprofile-name—— The line profile name.

ont-srvprofile-id—— The service profile ID.

ont-srvprofile-name—— The service profile name.

ont-mgmtprofile-id—— The management profile ID.

ont-mgmtprofile-name—— The management profile name.

desc——The description of the ONT.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Authenticate with the password "admin", add the method of ONT authentication and bind the profiles to the ONT:

```
Device(config-if-gpon)# ont add 0 password-auth password-type ascii
admin always-on ont-lineprofile-id 0 ont srvprofile-id 0
```

## 13.9 ont activate

### Description

The **ont activate** command is used to activate the ONT which is found by the OLT PON port. To deactivate the ONT, use **ont deactivate** command.

### Syntax

```
ont activate ontid-list
```

**ont deactivate** *ontid-list*

### Parameter

*ontid-list*— The ont ID list of the ONT which is found by the OLT PON port.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Activate the ONT 1-3 which is found by the OLT PON port:

```
Device(config-if-gpon)# ont activate 1-3
```

## 13.10 ont delete

### Description

The **ont delete** command is used to delete the ONT which is found by the OLT PON port. If the configuration of the ONT is incorrect, delete the ONT and then add it again.

### Syntax

**ont delete** *ontid-list*

### Parameter

*ontid-list*— The ont ID list of the ONT which is found by the OLT PON port.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Delete the ONT 1-3 which is found by the OLT PON port:

```
Device(config-if-gpon)# ont delete 1-3
```

## 13.11 show ont auth-info

### Description

The **show ont auth-info** command is used to display the authentication information of ONTs.

### Syntax

```
show ont auth-info {by-active-status {active|inactive}} by-match-status  
{match|mismatch}} by-online-status {online|offline}} by-admin-status  
{activated|deactivated} | by-config-status {success|failed}} by-desc desc |  
by-line-profile {profile-id id | profile-name name}} by-srv-profile {profile-id id |  
profile-name name}} | by-mgmt-profile {profile-id id | profile-name name}} |  
by-loid loid | by-loid-password loid-password | by-sn sn-val | by-password  
password-type {ascii | hex } password | gpon } pon-port-list
```

### Parameter

by-active-status—— Display ONU authentication information through active status.

by-match-status—— Display ONU authentication information through match status.

by-online-status—— Display ONU authentication information through online status.

by-admin-status—— Display ONU authentication information through admin status.

by-config-status—— Display ONU authentication information through config status.

by-desc—— Display ONU authentication information through description.

by-line-profile—— Display ONU authentication information through line profile.

by-srv-profile—— Display ONU authentication information through srv profile.

by-mgmt-profile—— Display ONU authentication information through management profile.

by-loid—— Display ONU authentication information through LOID.

by-loid-password—— Display ONU authentication information through loid-password.

by-sn—— Display ONU authentication information through SN.

*by-password*— Display ONU authentication information through password.

*gpon*— Display ONU authentication information through the PON port.

*pon-port-list*— The PON port list.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the authentication information of ONTs configured by 1/0/1:

```
Device(config)# show ont auth-info gpon 1/0/1
```

## 13.12 ont auto-auth

### Description

The **ont auto-auth** command is used to enable the auto-authentication feature of the ONT. To disable this feature, please use **no ont auto-auth** command.

### Syntax

**ont auto-auth**

**no ont auto-auth**

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

## 13.13 ont auto-auth match-mode

### Description

The **ont auto-auth match-mode** command is used to configure the matching mode of the ONT in the auto-authentication process.

### Syntax

**Ont auto-auth match-mode** { all-ont | equid-auth | equid-swver-auth | vendor-auth }

## Parameter

**all-ont**— All online ONTs support automatic authentication and registration; ONTs that have been configured with authentication policies are still authenticated and registered according to the authentication policies.

**equid-auth**— Based on Equid matching, ONTs that meet the matching rules support automatic authentication and registration; ONTs that have been configured with an authentication policy still authenticate and register according to the authentication policy.

**equid-swver-auth**— Based on Equid+Softwareversion matching, ONTs that meet the matching rules support automatic authentication and registration; ONTs that have been configured with authentication policies are still authenticated and registered according to the authentication policies.

**vendor-auth**— Based on Vendor ID matching, ONTs that meet the matching rules support automatic authentication and registration; ONTs that have been configured with authentication policies still authenticate and register according to the authentication policies.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Configure the matching method of ONTs during the auto-authentication process so that all online ONTs support auto-authentication and registration:

```
Device(config-if-gpon)# ont auto-auth match-mode all-ont
```

# 13.14 ont auto-auth authmode

## Description

The **ont auto-auth authmode** command is used to configure the auto-authentication mode of the ONT.

## Syntax

```
ont auto-auth authmode {loid-and-password-auth { always-on | once-on } |  
loid -auth { always-on | once-on } | password-auth { always-on | once-on {sn |  
sn-password}} | sn-auth |sn-and-password-auth}
```

## Parameter

password-auth—— Set the ONT authentication mode to password authentication.

sn-auth—— Set the ONT authentication mode to SN authentication.

loid-auth—— Set the ONT authentication mode to LOID authentication.

sn-and-password-auth—— Set the ONT authentication mode to SN and password authentication.

always-on—— According to different authentication methods, the first authentication will use password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will not be automatically matched, and each subsequent authentication will use the same authentication method as the first authentication. After the ONT is certified, it can go online even if the SN is modified.

once-on—— According to different authentication methods, the first authentication uses password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will be automatically matched, and each subsequent authentication will use the method of SN or SN+password/ SN+LOID / SN+LOID+password, which corresponds to the authentication method of the first authentication.

sn—— Configure the second and subsequent authentication to only verify the SN.

sn password—— Configure the second and subsequent authentication to verify the SN and password at the same time.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Configure the auto-authentication mode of the ONT as password authentication:

```
Device(config-if-gpon)# ont auto-auth authmode password-auth  
always-on
```

## 13.15 ont auto-auth rule

### Description

The **ont auto-auth rule** command is used to add the auto-authentication rule of the ONT. The ONT which is auto-authenticated is bound with the specified line profile. To delete the rule, use **no ont auto-auth rule** command.

### Syntax

```
ont auto-auth rule [rule-id] {equip-id equip-id | vendor-id vendor-id | version version} {[ont-lineprofile-id profile-id] | [ont-lineprofile-name profile-name]}  
{[ont-srvprofile-id profile-id] | [ont-srvprofile-name profile-name]}  
[ont-mgmtprofile-id profile-id | ont-mgmtprofile-name profile-name]*  
no ont auto-auth rule rule-id
```

### Parameter

*rule-id*—— Specify the Rule number. This parameter is optional. If not specified, the system automatically assigns the smallest available Rule ID.

*equip-id*—— Set the value of the matching device ID, and the ONT that meets the matching rules can be automatically authenticated and registered.

*vendor-id*—— Set the value of the matching vendor ID, and the ONT that meets the matching rules can be automatically authenticated and registered.

*version*—— Set the value of the matching device software version, and the ONT that meets the matching rules can automatically authenticate and register.

*ont-lineprofile-id*—— The line profile ID.

*ont-lineprofile-name*—— The line profile name.

*ont-srvprofile-id*—— The service profile ID.

*ont-srvprofile-name*—— The service profile name.

*ont-mgmtprofile-id*—— The management profile ID.

*ont-mgmtprofile-name*—— The management profile name.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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



## Example

Specify rule1 to add the auto-authentication rule of the ONT. The ONT which is auto-authenticated is bound with the specified line profile:

```
Device(config-if-gpon)# ont auto-auth rule 1 equip-id  
equip1ont-lineprofile-id 0 ont-srvprofile-id 0
```

## 13.16 show ont auto-auth

### Description

The **show ont auth-info** command is used to display the auto-authentication information of ONTs. Sort by Rule ID in ascending order, and display the following information: Rule ID, Authentication method, Equip ID, Vendor ID, Software Version, Line profile, Service profile, and Management profile.

### Syntax

```
show ont auto-auth [pon-port-list]
```

### Parameter

*pon-port-list*— The PON port list.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Displays the auto-authentication information of ONTs configured by 1/0/1:

```
Device(config)# show ont auto-auth 1/0/1
```

## 13.17 ont re-register

### Description

The **ont re-register** command is used to reactivate the ONTs.

### Syntax

```
ont re-register ontid-list
```

### Parameter

*ontid-list*— The ID list of the ONTs.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Reactivate the ONT 0:

```
Device(config-if-config)# ont re-register 0
```

# 13.18 ont reboot

## Description

The **ont reboot** command is used to restart the ONTs.

## Syntax

```
ont reboot ontid-list
```

## Parameter

*ontid-list*— The ID list of the ONTs.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Restart the ONT 0:

```
Device(config-if-config)# ont reboot 0
```

## Chapter 14 ONU-Management Commands

After the ONU is authenticated and registered, you can manage the ONUs.

### 14.1 ont port attribute admin-status

#### Description

The **ont port attribute** command is used to enable or disable the specified ONT port.

#### Syntax

```
ont port attribute ont-id{eth eth-port-id| pots pots-id} admin-status  
{enable | disable}
```

#### Parameter

*ont-id*— The ID of the ONT.

*eth-port-id*— The ID of the ONT ETH port.

*pots-id*— The ID of the ONT POTS port.

#### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

#### Privilege Requirement

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

#### Example

Enable the specified ONT ETH port:

```
Device(config-if-gpon)# ont port attribute 0 eth 1 admin-status enable
```

### 14.2 ont port native-vlan

#### Description

The **ont port native-vlan** command is used to configure the native VLAN for the uplink traffic of the ONT. To disable the native VLAN configuration, use **no ont port native-vlan** command.

#### Syntax

```
ont port native-vlan ont-id{eth eth-port-id| pots} {[vlan vlan-id] | [priority  
priority]}
```

**no ont port native-vlan** *ont-id*{eth *eth-port-id*| pots}

### Parameter

*ont-id*— The ID of the ONT.

*eth-port-id*— The ID of the ONT ETH port.

*vlan-id*— The ID of the native VLAN.

*priority*— The priority of the native VLAN.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Configure the native VLAN for the uplink traffic of the ONT to 1:

```
Device(config-if-gpon)# ont port native-vlan 0 eth 1 vlan 1
```

## 14.3 ont port attribute speed

### Description

The **ont port attribute speed** command is used to configure the ONT port speed.

### Syntax

**ont port attribute** *ont-id* **eth** *eth-port-id* **speed** *speed-val*

### Parameter

*ont-id*— The ID of the ONT.

*eth-port-id*— The ID of the ONT ETH port.

*speed-val*— The negotiation speed value of the ONT ETH port.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Configure the ONT port speed to 10Mb/s:

```
Device(config-if-gpon)# ont port attribute 0 eth 1 speed 10
```

## 14.4 ont port attribute duplex

### Description

The **ont port attribute duplex** command is used to configure the ONT port duplex mode.

### Syntax

```
ont port attribute ont-id eth eth-port-id duplex {auto | full | half}
```

### Parameter

*ont-id*— The ID of the ONT.

*eth-port-id*— The ID of the ONT ETH port.

auto— The automatic mode of the ONT port.

full— The full duplex mode of the ONT port.

half— The half duplex mode of the ONT port.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Configure the ONT port duplex mode to auto mode:

```
Device(config-if-gpon)# ont port attribute 0 eth 1 duplex auto
```

## 14.5 ont port attribute flow-control

### Description

The **ont port attribute flow-control** command is used to enable the ONT port flow-control feature. To disable this feature, use **no ont port attribute flow-control**

### Syntax

```
ont port attribute ont-id eth eth-port-id flow-control
```

```
no ont port attribute ont-id eth eth-port-id flow-control
```

## Parameter

*ont-id*— The ID of the ONT.

*eth-port-id*— The ID of the ONT ETH port.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Enable the ONT port flow-control feature:

```
Device(config-if-gpon)# ont port attribute 0 eth 1 flow-control
```

# 14.6 ont port car

## Description

The **ont port car** command is used to bind the traffic profile to the ONT port to set the rate limit. To unbind the traffic profile, use **no ont port car** command.

## Syntax

```
ont port car ont-id eth eth-port-id traffic-profile-id
```

```
no ont port car ont-id eth eth-port-id
```

## Parameter

*ont-id*— The ID of the ONT.

*eth-port-id*— The ID of the ONT ETH port.

*traffic-profile-id*— The traffic profile ID bound to the ONT port.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Bind the traffic profile to the ONT port to set the rate limit:

```
Device(config-if-gpon)# ont port car 0 eth 1 1
```

## 14.7 show ont port attribute

### Description

The **show ont port attribute** command is used to display the information of ONT Ethernet ports in detail.

### Syntax

```
show ont port attribute pon-port-id ont-id{eth {eth-port-id| all } | pots {pots-id| all}}
```

### Parameter

*pon-port-id*— The PON port list.

*ont-id*— The ID of the ONT.

*eth-port-id*— The ID of the ONT ETH port.

*pots-id-list*— The ID list of the ONT POTS port.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the information of ONT Ethernet ports configured by 1/0/1 in detail:

```
Device(config)# show ont port attribute 1/0/1 0 eth 1
```

## 14.8 show ont port state

### Description

The **show ont port state** command is used to display the status of ONT Ethernet ports in detail.

### Syntax

```
show ont port state pon-port-id ont-id{eth {eth-port-id| all } | pots {pots-id| all}}
```

### Parameter

*pon-port-id*— The PON port list.

*ont-id*— The ID of the ONT.

*eth-port-id*— The ID of the ONT ETH port.

*pots-id-list*— The ID list of the ONT POTS port.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the status of ONT Ethernet ports configured by 1/0/1 in detail.:

```
Device(config)# show ont port state 1/0/1 0 eth 1
```

# 14.9 ont wan

## Description

The **ont wan** command is used to create or modify a new ONT WAN connection using the unique identification of ont-id and wan-id. If the wan-id corresponding to a specific ont-id does not exist, then create a new WAN connection. If the wan-id corresponding to a specific ont-id exists, then modify the existing WAN connection. To delete the ONT WAN connection, use **no ont wan** command.

Note: When the connection type is PPPoE, it is necessary to first create a wan-pppoeprofile and input the username and password for PPPoE dial-up.

The **batch** command is used for batch operations on WAN connections, and the **action push** command is used to simultaneously push the WAN connection to the ONU.

## Syntax

The WAN Connection type is Bridge:

```
ont wan ont-id wan-id admin-status {enable | disable} conn-type bridge  
{internet | internet-tr069 | internet-voip | internet-voip-tr069 | other | tr069 |  
voip | voip-tr069} mtu-val [vlan vlan-id priority priority] [lan-dhcp {enable |  
disable}] [conn-name name] [port-banding {[eth port_id_list]}|[wifi_2_4_g]  
|[ wifi_5g_1] |[wifi_5g_2] ]}]
```

The WAN Connection type is Dynamic-IP:

```
ont wan ont-id wan-id admin-status {enable | disable} conn-type dynamic-ip  
{internet | internet-tr069 | internet-voip | internet-voip-tr069 | other | tr069  
|voip | voip-tr069} mtu-val [vlan vlan-id priority priority] [lan-dhcp {enable  
|disable}] [nat {enable | disable}] [conn-name name] {[ipv4 dns-type {auto  
|manual} } { [primary-dns ipv4_addr] |[ secondary-dns ipv4_addr] }
```



**[ipv4-default-gateway {enable | disable}]] | [ipv6 {dhcpv6|slaac} dns-type {auto|manual} {[ipv6-primary-dns ipv6\_addr] | [ipv6-secondary-dns ipv6\_addr]} [ipv6-default-gateway {enable | disable}]] [port-banding {[eth port\_id\_list] | [wifi\_2\_4\_g] | [wifi\_5g\_1] | [wifi\_5g\_2]}]**

The WAN Connection type is PPPoE:

**ont wan-pppoeprofile** *ont-id wan-id*

**pppoe-username** *username*

**pppoe-password** *password*

**ont wan** *ont-id wan-id* **admin-status** {enable | disable} **conn-type** **pppoe** {internet | internet-tr069 | internet-voip | internet-voip-tr069 | other | tr069 | voip | voip-tr069} *mtu-val* [**vlan** *vlan-id* **priority** *priority*] [**nat** {enable | disable}] [**lan-dhcp** {enable | disable}] [**conn-name** *name*] {[**ipv4** [**ipv4-default-gateway** {enable|disble}]] | [**ipv6** {dhcpv6 | slaac} [**ipv6-default-gateway** {enable|disble}]]]} [**port-banding** {[eth *port\_id\_list*] | [wifi\_2\_4\_g] | [wifi\_5g\_1] | [wifi\_5g\_2]}]

The WAN Connection type is Static:

**ont wan** *ont-id wan-id* **admin-status** {enable | disable} **conn-type** **static**{internet | internet-tr069 | internet-voip | internet-voip-tr069 | other | tr069 | voip | voip-tr069} *mtu-val* [**nat** {enable | disable}] [**lan-dhcp** {enable | disable}][**conn-name** *name*] [**vlan** *vlan-id* **priority** *priority*] {[**ipv4** *ipv4\_addr* *ipv4\_mask* *ipv4\_gateway* *ipv4\_pri\_dns\_addr* [**secondary-dns** *ipv4\_sec\_dns\_addr*] | [**ipv4-default-gateway** {enable|disble}]]} | [**ipv6** *ipv6\_addr* *ipv6\_prefix\_length* *ipv6\_gateway* *ipv6\_pri\_dns\_addr* [**ipv6-secondary-dns** *ipv6\_sec\_dns\_addr*] | [**ipv6-default-gateway** {enable|disble}]]]} [**port-banding** {eth [*port\_id\_list*] | [wifi\_2\_4\_g] | [wifi\_5g\_1] | [wifi\_5g\_2]}]

**ont wan** { *ont-id wan-id* | batch *ontlist wanid-list* } **action** **push**

**no ont wan** { *ont-id wan-id* | batch *ontlist wanid-list* } [action push]

## Parameter

*ont-id*— The ID of the ONT.

*wan-id*— The ID of the WAN connection.

*ontlist*— The ID list of the ONT.

*wanid-list*— The ID list of the WAN connection.

bridge— The WAN connection type is bridge.

pppoe— The WAN connection type is PPPOE.

*dynamic-ip*— The WAN connection type is dynamic-ip.

*static*— The WAN connection type is static.

*auto*— Obtain DNS automatically.

*manual*— To manually set DNS, you need to set primary-DNS and secondary-DNS.

*primary-DNS*— Set the IP of the manually configured primary DNS Server.

*secondary-DNS*— Set the IP of the manually configured secondary DNS server.

*username*— The username used by PPPOE for dialing.

*password*— The password used by PPPOE dial.

*IPv4\_addr*— The static IP address for IPv4.

*IPv4\_mask*— The static IP address mask for IPv4.

*IPv4\_gateway*— The gateway IP address for IPv4.

*IPv4\_pri\_dns\_addr*— The manually configured primary DNS Server IP address for IPv4.

*IPv4\_sec\_dns\_addr*— The manually configured secondary DNS Server IP address for IPv4.

*IPv6\_addr*— The static IP address for IPv6.

*IPv6\_mask*— The static IP address mask for IPv6.

*IPv6\_gateway*— The gateway IP address for IPv6.

*IPv6\_pri\_dns\_addr*— The manually configured primary DNS Server IP address for IPv6.

*IPv6\_sec\_dns\_addr*— The manually configured secondary DNS Server IP address for IPv6.

*slaac*— Set the IPV6 addressing type to SLAAC.

*dhcpv6*— Set the IPV6 addressing type to DHCPv6.

*ipv4-default-gateway*— When the admin-status is enabled, set this connection as the default connection for IPv4.

*ipv6-default-gateway*— When the admin-status is enabled, set this connection as the default connection for IPv6.

*vlan-id*— Set the VLAN ID to which the WAN connection belongs.

*priority*— Set the priority of the WAN connection.

*Internet*— Indicates that the connection is used for the Internet.

*Internet-tr069*— Indicates that the connection is used for Internet and TR069 services.

*Internet-voip*— Indicates that the connection is used for Internet and voice services.

*Internet-voip-tr069*— Indicates that the connection is used for Internet access, voice services and TR069 services.

*other*— Indicates that the connection is for IPTV service.

*tr069*— Indicates that the connection is used for TR069 service

*voip*— Indicates that the connection is used for voice services.

*voip-tr069*— Indicates that the connection is used for voice and TR069 services.

*mtu-val*— Set MTU value.

*lan-dhcp*— Enable or disable the DHCP function of the LAN port.

*nat*— Enable or disable the NAT function of the WAN connection.

*name*— The name of the WAN connection.

*port-id-list*— The value range of the ONT port bound to the WAN connection.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Create or modify the WAN connection of the ONT in bridge mode:

```
Device(config-if-gpon)# ont wan 1 1 admin-status enable conn-type  
bridge internet 64 vlan 1 priority 0
```

# 14.10 ont wan admin-status

## Description

The **ont wan admin-status** command is used to enable or disable the ONT WAN connection.

## Syntax

```
ont wan ont-id wan-id admin-status {enable | disable}
```

## Parameter

*ont-id*— The ID of the ONT.

*wan-id*— The ID of the ONT WAN connection.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Enable the ONT WAN connection:

```
Device(config-if-gpon)# ont wan 0 1 admin-status enable
```

## 14.11 show ont wan

### Description

The **show ont wan** command is used to display the information of the ONT WAN connection.

### Syntax

```
show ont wan pon-id ont-id[wan-id]
```

### Parameter

*pon-id*— The ID of the ONT PON.

*ont-id*— The ID of the ONT.

*wan-id*— The ID of the ONT WAN connection.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the information of the ONT WAN connection configured by 1/0/1:

```
Device(config)# show ont wan 1/0/1 0 1
```

## 14.12 ont upgrade

### Description

The **ont upgrade** command is used to specify the FTP server for ONT upgrade.

### Syntax

```
ont upgrade ftp username password ip-addr filename
```

### Parameter

*username*— The username for logging in to the FTP server.

*password*— The password for logging in to the FTP server.

*ip-addr*— The IP address of the FTP server.

*filename*— The name of the ONU image to be upgraded.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Specify the FTP server for ONT upgrade through the username "tplink", password "admin", and IP address "192.168.0.1":

```
Device(config)# ont upgrade ftp tplink admin 192.168.0.1 file1
```

## 14.13 ont upgrade select

### Description

The **ont upgrade select** command is used to select the ONT to be upgraded.

### Syntax

```
ont upgrade select pon-port-list ont-id-list
```

### Parameter

*pon-port-list*— The PON port list.

*ont-id-list*— The ID list of the ONT that need to be upgraded.

### Command Mode

Global Configuration Mode

## Privilege Requirement

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

## Example

Select the ONT 1-3 to be upgraded configured by 1/0/1:

```
Device(config)# ont upgrade select 1/0/1 1-3
```

# 14.14 ont upgrade start

## Description

The **ont upgrade start** command is used to start to upgrade the ONT.

## Syntax

```
ont upgrade start activemode {immediately | next-startup}
```

```
ont upgrade stop [pon-port-list]
```

## Parameter

*filename*— The filename used to start to upgrade ONT.

*immediately*— After loading the upgrade file to the ONT, restart and upgrade the ONT immediately.

*next-start-up*— After loading the file to the ONT, wait for the next restart of the ONT to start the upgrade.

*pon-port-list*— The PON port list.

## Command Mode

Global Configuration Mode

## Privilege Requirement

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

## Example

Start to upgrade the ONT and set the active mode to immediately:

```
Device(config)# ont upgrade start activemode immediately
```

## 14.15 show ont upgrade info

### Description

The **show ont upgrade info** command is used to display the information of the ONT to be upgraded.

### Syntax

```
show ont upgrade info
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

## 14.16 show ont upgrade progress

### Description

The **show ont upgrade progress** command is used to display the progress of the ONT upgrade process.

### Syntax

```
show ont upgrade progress
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

## 14.17 ont modify profile

### Description

The **ont modify profile** command is used to modify the line or service profile which is bound with the ONT.

### Syntax

```
ont modify ont-id{[ont-lineprofile-id profile-id] | [ont-lineprofile-name  
profile-name]}
```

```
ont modify ont-id{[ont-srvprofile-id profile-id] | [ont-srvprofile-name  
profile-name]}
```

**ont modify** *ont-id*{[ont-mgmtprofile-id *profile-id*] | [ont-mgmtprofile-name *profile-name*]}

### Parameter

*ont-id*— The ID of the ONT.

ont-lineprofile-id— The line profile ID.

ont-lineprofile-name— The line profile name.

ont-srvprofile-id— The service profile ID.

ont-srvprofile-name— The service profile name.

ont-mgmtprofile-id— The management profile ID.

ont-mgmtprofile-name— The management profile name.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Modify the line profile which is bound with the ONT:

```
Device(config-if-gpon)# ont modify 0 ont-lineprofile-id 0
```

## 14.18 ont modify authmode

### Description

The **ont modify authmode** command is used to modify the authentication mode of the ONT.

### Syntax

```
ont modify ont-id authmode loid-and-password-auth loid-val loid-password  
{always-on | once-on}
```

```
ont modify ont-id authmode loid-auth loid-val{always-on | once-on}
```

```
ont modify ont-id authmode password-auth password-type {ascii | hex}  
password-val{always-on | once-on {sn | sn-password}}
```

```
ont modify ont-id authmode sn-and-password-auth sn-val password-type  
{ascii | hex} password-val
```

```
ont modify ont-id authmode sn-auth sn-val
```



## Parameter

*ont-id*— The ID of the ONT.

*loid-val*— The LOID value of the ONT.

*loid-password*— The LOID password of the ONT.

*password-type*—The password type of the specified user.

*password-val*— The password value of the ONT.

*sn-val*— The SN value of the ONT.

*always-on*— According to different authentication methods, the first authentication will use password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will not be automatically matched, and each subsequent authentication will use the same authentication method as the first authentication. After the ONT is certified, it can go online even if the SN is modified.

*once-on*— According to different authentication methods, the first authentication uses password authentication / LOID authentication / LOID+password authentication. After the authentication is passed, the serial number will be automatically matched, and each subsequent authentication will use the method of SN or SN+password/ SN+LOID / SN+LOID+password, which corresponds to the authentication method of the first authentication.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Modify the authentication mode of the ONT to LOID value and LOID password authentication:

```
Device(config-if-gpon)# ont modify 0 authmode loid-and-password-auth  
loid1 admin always-on
```

## 14.19 ont modify description

### Description

The **ont modify description** command is used to modify the description of the ONT.

### Syntax

```
ont modify ont-id description desc
```

### Parameter

*ont-id*— The ID of the ONT.

*desc*— The description of the ONT.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Modify the description of the ONT:

```
Device(config-if-gpon)# ont modify 0 description description1
```

## 14.20 show ont capability

### Description

The **show ont capability** command is used to display the port capability of the ONT.

### Syntax

```
show ont capability pon-port-list [ont-id-list]
```

### Parameter

*pon-port-id-list*— The PON port list.

*ont-id-list*— The ID list of the ONT.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

## Example

Display the port capability of the ONT configured by 1/0/1:

```
Device(config)# show ont capability 1/0/1 0
```

## 14.21 show ont config-capability

### Description

The **show ont config-capability** command is used to display the configuration capability of the ONT.

### Syntax

```
show ont config-capability pon-port-id-list [ont-id-list]
```

### Parameter

*pon-port-id-list*— The PON port list.

*ont-id-list*— The ID list of the ONT.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the configuration capability of the ONT configured by 1/0/1:

```
Device(config)# show ont config-capability 1/0/1 0
```

## 14.22 show ont failed-config

### Description

The **show ont failed-config** command is used to display the failed configuration of the ONT.

### Syntax

```
show ont failed-config pon-id ont-id
```

### Parameter

*pon-id*— The ID of the ONT PON port.

*ont-id*— The ID of the ONT.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the failed configuration of the ONT configured by 1/0/1:

```
Device(config)# show ont failed-config 1/0/1 0
```

# 14.23 show ont info

## Description

The **show ont info** command is used to display the authentication info of the ONT.

## Syntax

```
show ont info {by-active-status {active|inactive}} by-match-status  
{match|mismatch}} by-online-status {online|offline}} by-admin-status  
{activated|deactivated} | by-config-status {success|failed}} by-desc desc |  
by-line-profile {profile-id id | profile-name name}} | by-srv-profile {profile-id id |  
profile-name name}} | by-mgmt-profile {profile-id id | profile-name name}} |  
by-sn sn-val | gpon } pon-port-list [detail]
```

## Parameter

by-active-status—— Display ONU information through active status.

by-match-status—— Display ONU information through match status.

by-online-status—— Display ONU information through online status.

by-admin-status—— Display ONU information through admin status.

by-config-status—— Display ONU information through config status.

by-desc—— Display ONU information through description.

by-line-profile—— Display ONU information through line profile.

by-srv-profile—— Display ONU information through service profile.

by-mgmt-profile—— Display ONU information through management profile.

by-sn—— Display ONU information through SN.

gpon—— Display ONU information through the PON port.

*pon-port-list*—— The PON port list.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the authentication info of the ONT configured by 1/0/1 by active-status:

```
Device(config)# show ont info by-active-status active 1/0/1
```

# 14.24 show ont optical-info

## Description

The **show ont optical-info** command is used to display the optical line info of the ONT.

## Syntax

```
show ont optical-info pon-port-list [ont-id-list]
```

## Parameter

*pon-port-list*— The PON port list.

*ont-id-list*— The ID list of the ONT.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the optical line info of the ONT configured by 1/0/1:

```
Device(config)# show ont optical-info 1/0/1 0
```

# 14.25 show ont version

## Description

The **show ont version** command is used to display the version of the ONT.

## Syntax

```
show ont version pon-port-list [ont-id-list]
```

## Parameter

*pon-port-list*— The PON port list.

*ont-id-list*— The ID list of the ONT.

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the version of the ONT configured by 1/0/1:

```
Device(config)# show ont version 1/0/1 0
```

# 14.26 show ont register-statistics

## Description

The **show ont register-statistics** command is used to display the statistics of ONT registration.

## Syntax

```
show ont register-statistics
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the statistics of ONT registration:

```
Device(config)# show ont register-statistics
```

# 14.27 ont iphost

## Description

The **ont iphost** command is used to configure IPHOST on the ONT, which assigns IP addresses and related configurations to specific network hosts. With this command, IPHOST configurations can be pushed to the ONU device to expand the network and implement specific functionalities. The **no ont iphost** command is used to delete the configured IPHOST configurations.

Additionally, the **action push** directive is used to push the configurations to the ONU device for them to take effect, while the **batch** directive allows for batch pushing or deleting of IPHOST configurations, improving configuration efficiency.

## Syntax

**ont iphost** *ontid ip-index dhcp* [*vlan vlanid priority priority*]

**ont iphost** *ontid ip-index static ip-address ip-address mask mask* [*gateway gateway | primary-dns primary-dns | secondary-dns secondary-dns | vlan vlanid priority priority*]\*

**no ont iphost** {*ontid ip-index | batch ontlist ip-index-list*} [*action push*]

**ont iphost** {*ontid ip-index | batch ontlist ip-index-list*} **action push**

## Parameter

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

*ontlist*— The ONT ID list for batch operations. The value range is from 0 to 127,(e.g.:1-3, 5).

*ip-index*— The index of the IP Host interface. The value range is from 1 to 2.

*ip-index-list*— The index list of IP Hosts in batch configuration. The value range is from 1 to 2,(e.g.:1-2, 2).

*ip-address*— The static IP address.

*mask*— The address mask of the static IP address.

*gateway*— The IP address of the gateway for the ONT management network.

*primary-dns*— The IP address of the primary DNS server.

*secondary-dns*— The IP address of the secondary DNS server.

*vlanid*— The Management VLAN of the ONT. The value range is from 1 to 4094.

*priority*— The Priority of the management VLAN on the ONT. The value range is from 0 to 7.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Add IPHOST configurations on the ONT 1:

```
Device(config-if-gpon)# ont iphost 1 1 dhcp
```

## 14.28 show ont iphost

### Description

The **show ont iphost** command is used to display the existing IPHOST configurations in the system.

### Syntax

```
show ont iphost portid ontid [ip-index]
```

### Parameter

*portid*— The ID number of the PON port. It must be a valid PON port number.

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

*ip-index*— The index of the IP Host interface. The value range is from 1 to 2.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Display the IPHOST configured by 1/0/1:

```
Device(config)# show ont iphost 1/0/1 0
```

## 14.29 ont sipuser

### Description

The **ont sipuser** command is used to add a SIP (Session Initiation Protocol) user account on the OLT. It enables the configuration of SIP user accounts to facilitate Voice over IP (VoIP) services. These user accounts allow for the initiation, modification, and termination of real-time voice and video communication sessions over the IP network. The **no ont sipuser** command is used to remove a specific SIP user account from the OLT configuration.



Additionally, the **action push** directive is used to push the configurations to the ONU device for them to take effect, while the **batch** directive allows for batch pushing or deleting of SIP configurations, improving configuration efficiency.

## Syntax

```
ont sipuser ontid sipuserid telno telno registration-server reg-server  
[ sipusername sipusername | sippassword sippassword ] registration-port  
port | proxy-server server | proxy-port port | outbound-server server |  
outbound-port port]*
```

```
ont sipuser { ontid sipuserid | batch ont-id-list sipuserid-list } action push
```

```
no ont sipuser { ontid sipuserid | batch ont-id-list sipuserid-list } [ action push ]
```

## Parameter

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

*sipuserid*— The ID number of the SIP account. The value range is from 1 to 1.

*ont-id-list*— The ID number list of the ONT. The value range is from 1 to 1.

*sipuserid-list*— The ID number list of the SIP account. The value range is from 0 to 127.

*telno*— The phone number of the SIP account. The length range is from 3 to 32.

*sipusername*— The username of the SIP account. The length range is from 0 to 50.

*sippassword*— The password of the SIP account. The length range is from 0 to 25.

*reg-server*— The registrar server address of the ONT. The length range is from 1 to 40.

*server*— The server of the ONT. The length range is from 0 to 40.

*port*— The port of the ONT. The value range is from 0 to 65535.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Add a SIP account on the OLT:

```
Device(config-if-gpon)# ont sipuser 0 1 telno 123 registration-server 456
```

## 14.30 show ont sipuser

### Description

The **show ont sipuser** command is used to display the existing SIP users in the system.

### Syntax

```
show ont sipuser portid ontid
```

### Parameter

*portid*— The ID number of the PON port. It must be a valid PON port number.

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Display the SIP user by 1/0/1:

```
Device(config)# show ont sipuser 1/0/1 0
```

## 14.31 ont wlan

### Description

The **ont wlan** command is used to add WLAN (Wireless Local Area Network) configuration on the ONT. It allows for the configuration of Wi-Fi networks on the ONT, enabling wireless network connectivity. This command can be used to set parameters for the wireless network, such as the SSID (Service Set Identifier), encryption method, frequency band, etc., allowing terminal devices to connect to the network wirelessly. On the other hand, the **no ont wlan**

command is used to delete the configured WLAN configuration, clearing out any unwanted wireless network settings.

Additionally, the **action push** directive is used to push the configurations to the ONU device for them to take effect, while the **batch** directive allows for batch pushing or deleting of WLAN configurations, improving configuration efficiency.

## Syntax

```
ont wlan ontid{2_4g 2_4g_ssid ssid[2_4g_hide_ssid {enable | disable} |  
2_4g_security security| 2_4g_password password| 2_4g_mode mode |  
2_4g_channel channel| 2_4g_channel_width width| 2_4g_radio {enable |  
disable}]* | 5g_5g_ssid ssid[5g_hide_ssid {enable | disable} | 5g_security  
security| 5g_password password| 5g_mode mode| 5g_channel channel|  
5g_channel_width width| 5g_radio {enable | disable}]* }*  
ont wlan ontidband-steering ssid ssid[security security| ssid-password  
password| hide-ssid {enable | disable} | radio {enable | disable} ]*  
no ont wlan {ontid| batch ontid-list}  
ont wlan ontid{ontid| batch ontid-list} action push
```

## Parameter

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

*ont-id-list*— The ID number list of the ONT. The value range is from 0 to 127.

*ssid*—The SSID of the WLAN. The length can range from 1 to 32 characters.

*security*—The encryption method of the WLAN. The valid values are:  
no\_security, wpa\_psk\_tkip\_wpa2\_psk\_aes, wpa2\_psk\_aes,  
wpa2\_psk\_aes\_wpa3\_personal

*password*—The password of the WLAN. The length can range from 8 to 63 characters. When the security is set to no\_security, this parameter is not applicable.

*mode*—The mode of the WLAN. The 2.4G valid values are: 802\_11\_n, 802\_11\_g\_n, 802\_11\_b\_g\_n; the 5G valid values are: 802\_11\_ac, 802\_11\_ac\_n, 802\_11\_a\_n\_ac.

*channel*—The frequency band of the WLAN. The 2.4G valid values are: auto, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13; the 5G valid values are: auto, 36, 40, 44, 48, 149, 153,157,161.

*width*—The frequency band width of the WLAN. The 2.4G valid values are: auto, 20, 40; the 5G valid values are: auto, 20, 40, 80.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Add an SIP account in the management profile:

```
Device(config-if-gpom)# ont wlan 0 2_4g 2_4g_ssid TP-Link_1234
```

## 14.32 show ont wlan

### Description

The **show ont wlan** command is used to display the existing wlan configurations in the system.

### Syntax

```
show ont wlan portid ontid
```

### Parameter

*portid*— The ID number of the PON port. It must be a valid PON port number.

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Display the SIP user by 1/0/1:

```
Device# show ont wlan 1/0/1 0
```

## 14.33 ont catv

### Description

The **ont catv** command is used to configure CATV parameters on the OLT. With this command, the fiber network administrator can set a series of parameters to support the transmission and reception of CATV signals over fiber, ensuring stable transmission of CATV signals and enabling end users to watch TV programs through related devices. The **no ont catv** command is used to delete the configured CATV configuration.

Additionally, the **action push** directive is used to push the configurations to the ONU device for them to take effect, while the **batch** directive allows for batch pushing or deleting of CATV configurations, improving configuration efficiency.

### Syntax

**ont catv** *ontid*{enable | disable}

**no ont catv** {*ontid*| batch *ontid-list*}

**ont catv** {*ontid*| batch *ontid-list*} **action push**

### Parameter

*portid*— The ID number of the PON port. It must be a valid PON port number.

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

*ont-id-list*— The ID number list of the ONT. The value range is from 0 to 127.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Add CATV configuration:

```
Device(config-if-gpon)# ont catv 0 enable
```

## 14.34 show ont catv

### Description

The **show ont catv** command is used to display the existing catv information in the system.

### Syntax

```
show ont catv portid ontid
```

### Parameter

*portid*— The ID number of the PON port. It must be a valid PON port number.

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Display the SIP user by 1/0/1:

```
Device# show ont catv 1/0/1 0
```

## 14.35 ont cwmp

### Description

The **ont cwmp** command is specifically used on the ONT to add the necessary configuration for enabling CPE WAN Management Protocol (CWMP). CWMP is a widely-used protocol that facilitates efficient remote management and configuration of customer premises equipment (CPE) in a wide area network (WAN) environment. With the **ont cwmp** command, the ONT can be configured to seamlessly integrate into a remote management system through CWMP, allowing network administrators to remotely manage and configure the ONT for optimal performance and troubleshooting. The **no ont cwmp** command is used to delete the configured CWMP configuration. Additionally, the **action push** directive is used to push the configurations to the ONU device for them to take effect, while the **batch** directive allows for

batch pushing or deleting of CWMP configurations, improving configuration efficiency.

## Syntax

```
ont cwmp ontid url acs-url [username acs-username | pwd acs-pwd]  
cwmp-status {enable | disable} | inform-status {enable | disable} |  
inform-interval inform-interval | auth-status {enable | disable}]*  
no ont cwmp {ontid | batch ontlist}  
ont cwmp {ontid | batch ontlist} action push
```

## Parameter

*acs-url*—The address of the ACS URL. The length can range from 1 to 255 characters.

*acs-username*—The username of the ACS URL. The length can range from 0 to 50 characters.

*acs-pwd*—The password of the ACS URL. The length can range from 0 to 25 characters.

*inform-interval*—The interval of inform messages. The value ranges from 1 to 4294967295.

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

*ont-id-list*— The ID number list of the ONT. The value range is from 0 to 127.

## Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

## Privilege Requirement

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

## Example

Add CWMP configuration:

```
Device(config-if-gpon)# ont cwmp 0 url 192.168.1.1 username TP-Link pwd  
admin
```

## 14.36 ont cwmp-auth-profile

### Description

The **ont cwmp-auth-profile** command is used to add a CWMP authentication profile on the ONT. When configuring CWMP, if the auth-status is set to enable, it will bind to this profile.

### Syntax

```
ont cwmp-auth-profile ontid  
conn-auth path path port port  
auth-username auth-username  
auth-password auth-password
```

### Parameter

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

*path*—The path of the authentication. The length can range from 1 to 15 characters and must start with a "/".

*port*—The port of the authentication. The interval of inform messages. The value ranges from 1000 to 65535.

*auth-username*—The username of the authentication. The length can range from 0 to 255 characters.

*auth-password*—The password of the authentication. The length can range from 0 to 255 characters.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon)

### Privilege Requirement

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

### Example

Add a CWMP authentication profile:

```
Device(config-if-gpon)# ont cwmp-auth-profile 0  
Device(config-ont-cwmp-auth)# conn-auth path /192.168.1.1 port 1000
```



## 14.37 show ont cwmp

### Description

The **show ont cwmp** command is used to display the existing cwmp configurations in the system.

### Syntax

```
show ont cwmp portid ontid
```

### Parameter

*portid*— The ID number of the PON port. It must be a valid PON port number.

*ontid*— The ID number of the ONT. The value range is from 0 to 127.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Display the cwmp configuration by 1/0/1:

```
Device(config)# show ont cwmp 1/0/1 0
```

## 14.38 ont isolation

### Description

The **ont isolation** command is specifically used to configure the VLAN-based ONT isolation feature. With this feature, individual ONTs (Optical Network Terminals) can be isolated from each other by assigning them to separate VLANs. This allows for enhanced network security and segmentation, as traffic from different ONTs can be kept separate. The ont isolation command enables network administrators to enable and configure this feature on the ONT, ensuring that each ONT operates within its designated VLAN. The **no ont isolation** command is used to delete the configured isolation configuration.

### Syntax

```
ont isolation
```

```
no ont isolation
```

**ont isolation vlan** *vlanid-list*

**no ont isolation vlan** *vlanid-list*

### Parameter

*vlanid-list*— The VLAN list of the ONT. The value range is from 1 to 4094, (e.g., 1-100, 4094).

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Configure VLAN-based ONT isolation feature:

```
Device(config)# ont isolation vlan 1-3, 5
```

## 14.39 show ont isolation

### Description

The **show ont isolation** command is used to display the existing ONT isolation configurations in the system.

### Syntax

```
show ont isolation
```

### 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 existing ONT isolation configurations:

```
Device(config)# show ont isolation
```

# Chapter 15 Service Port Configuration Commands

Service ports are used by OLT to map different types of traffic to different SVLANs according to PON ports, ONUs, GEM ports, User VLANs, and priorities, and then transmitted to the uplink network. The rate limit for inbound and outbound traffic of the uplink network is determined by traffic profiles which are applied to the service ports.

## 15.1 service-port

### Description

The **service-port** command is used to create a service port. To delete the service port or delete some configurations of the service port, use **no service-port** command.

### Syntax

```
service-port {servicePortId | auto} { adminstatus {enable | disable} |  
description description | inbound-traffic trafficProfileId | outbound-traffic  
trafficProfileId | statistics-performance {enable | disable} | config gpon  
ponPortId ont ontIdList gem-id gemId svlan svlanId [user-vlan vlanId | user-pri  
vlanPri | ethertype {none | ipv4oe | ipv6oe | pppoe} | tag-action {default |  
transparent | translate | translate-add | add-double} | inner-vlan vlanId |  
inner-pri vlanPri | traffic-in trafficProfileId | traffic-out trafficProfileId | desc  
description | adminstatus {enable | disable} | statistic-performance {enable |  
disable} ] }
```

### Parameter

servicePortId|auto—— The port ID of the service port.

inbound-traffic—— Modify the traffic profile to be called in the upstream direction after the service-port matches the data flow.

outbound-traffic—— Modify the traffic profile to be called in the downstream direction after the service-port matches the data flow.

description—— Modify the item description of the service port.

adminstatus—— Modify the enabled status of the service flow matched by the service port.

statistics-performance —— Modify the traffic statistics switch status of the service flow matched by the service port.

config—— Create or modify the service port. If the service port does not exist, create it. If the service port already exists, use the new configuration to

overwrite the original configuration. At this time, it can be regarded as modifying the original configuration.

gpon—— Specify which pon port the service port is applied to.

ont —— Specify which onts the service port is applied to.

gem-id —— Specify which gem of the ont the service port is applied to.

svlan—— Specify the svlan of the service port.

user-vlan—— Specify the user-vlan of the data flow matched by the service port.

user-pri —— Specify the user-pri of the data flow matched by the service port.

ethertype—— Specify the data flow packet type matched by the service port.

tag-action—— Specify the action performed by the service port on the matched data stream.

*default:* Add a layer of SVLAN, and the CVLAN carried on the user side remains unchanged.

*transparent:* Directly use the user-side CVLAN as the SVLAN to upstream.

*translate:* Translate the CVLAN carried by the user side into the specified SVLAN.

*translate-add:* Switch the CVLAN carried by the user to the newly configured Inner VLAN, and add a layer of SVLAN.

*add-double:* add two VLANs to the message, SVLAN+Inner VLAN.

inner-vlan —— When the specified action for the matched data stream is translate-add/add-double, the added inner vlan needs to be specified.

inner-pri—— When the specified action for the matched data stream is translate-add/add-double, you need to specify the priority of the added inner VLAN.

traffic-in—— Specify the traffic profile to be invoked in the upstream direction after the service-port matches the data flow.

traffic-out—— Specify the traffic profile to be called in the downstream direction after the service-port matches the data flow

desc—— Specify the item description of the service port.

adminstatus—— Specify the enabled status of the service flow matched by the service port.

statistic-performance—— Specify the traffic statistics switch status of the service flow matched by the service port.

## Command Mode

Global Configuration Mode

## Privilege Requirement

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

## Example

Modify the service flow state matching the service port 1 to enable:

```
Device(config)# service-port 1 adminstatus enable
```

# 15.2 show service-port

## Description

The **show service-port** command is used to display the service port info.

## Syntax

```
show service-port {servicePortId[statistics] | ethertype | gpon | svlan |  
user-vlan }
```

## Parameter

*servicePortId*—— Display the service port of the specified id.

statistics—— Display statistics of the specified service port.

ethertype—— Display all service ports of the specified ethertype.

gpon—— Display all service ports of the specified gpon port.

svlan—— Display all service ports of the specified svlan.

user-vlan—— Display all service ports of the specified user-vlan.

## Command Mode

Global Configuration Mode

## Privilege Requirement

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

## Example

Display the service-port 1 information:

```
Device(config)# show service-port 1
```

## 15.3 auto-service-port

### Description

The **auto-service-port** command is used to create an auto service port. To delete some configurations of the auto service port, use **no auto-service-port** command.

### Syntax

```
auto-service-port interface gpon ponPortId{ auto-mode {enable/disable} |  
inbound-traffic trafficProfileId| outbound-traffic trafficProfileId| config  
gem-id gemIdsvlan svlanId[user-vlan vlanId| user-pri vlanPri] ethertype  
{none | ipv4oe | ipv6oe | pppoe}| tag-action {default | transparent | translate |  
translate-add | add-double}| inner-vlan vlanId| inner-pri vlanPri| traffic-in  
trafficProfileId| traffic-out trafficProfileId| auto-mode {enable | disable}] }  
no auto-service-port interface gpon ponPortId{ inbound-traffic |  
outbound-traffic }
```

### Parameter

**gpon**—— Specify the auto service port of a port to be operated.

**auto-mode**—— Modify the switch state of the port automatic flow creation function.

**inbound-traffic**—— Modify the traffic profile to be called in the upstream direction after the service-port matches the data flow.

**outbound-traffic**—— Modify the traffic profile to be called in the downstream direction after the service-port matches the data flow.

**config**—— Modify more detailed configuration of auto service port.

**gem-id**—— Specify which gem of the ont the service port is applied to.

**svlan**—— Specify the svlan of the service port.

**user-vlan**—— Specify the user-vlan of the data flow matched by the service port.

**user-pri**—— Specify the user-pri of the data flow matched by the service port.

**ethertype**—— Specify the data flow packet type matched by the service port.

**tag-action**—— Specify the action performed by the service port on the matched data stream.

*default*: Add a layer of SVLAN, and the CVLAN carried on the user side remains unchanged.

*transparent*: Directly use the user-side CVLAN as the SVLAN to upstream.

*translate*: Translate the CVLAN carried by the user side into the specified SVLAN.

*translate-add*: Switch the CVLAN carried by the user to the newly configured Inner VLAN, and add a layer of SVLAN.

*add-double*: add two VLANs to the message, SVLAN+Inner VLAN.

inner-vlan—— When the specified action for the matched data stream is translate-add/add-double, the added inner vlan needs to be specified.

inner-pri—— When the specified action for the matched data stream is translate-add/add-double, you need to specify the priority of the added inner VLAN.

traffic-in—— Specify the traffic profile to be invoked in the upstream direction after the service-port matches the data flow.

traffic-out—— Specify the traffic profile to be called in the downstream direction after the service-port matches the data flow.

auto-mode—— Modify the switch state of the port automatic flow creation function.

## Command Mode

Global Configuration Mode

## Privilege Requirement

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

## Example

Modify the switch status of the automatic flow creation function of automatic service port 1/0/1 to enable:

```
Device(config)# auto-service-port interface gpon 1/0/1 auto-mode enable
```

# 15.4 show auto-service-port

## Description

The **show auto-service-port** command is used to display the auto service port info.

## Syntax

```
show auto-service-port interface gpon ponPortId
```

## Parameter

*ponPortId*— Display the auto service port of the specified port.

## Command Mode

Global Configuration Mode

## Privilege Requirement

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

## Example

Display the auto service port 1/0/1 information:

```
Device(config)# show auto-service-port interface gpon 1/0/1
```



# Chapter 16 Ethernet Port Configuration Commands

Ethernet Configuration Commands can be used to configure the Negotiation Mode for Ethernet ports.

## 16.1 interface gigabitEthernet

### Description

The **interface gigabitEthernet** command is used to enter the Interface gigabitEthernet Configuration Mode and configure the corresponding Gigabit Ethernet port.

### Syntax

```
interface gigabitEthernet port
```

### Parameter

*port*—— The Ethernet port 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:

```
Device(config)# interface gigabitEthernet 1/0/2
```

## 16.2 interface range gigabitEthernet

### Description

The **interface range gigabitEthernet** command is used to enter the interface range gigabitEthernet Configuration Mode and configure multiple Gigabit Ethernet ports at the same time.

## Syntax

```
interface range gigabitEthernet port-list
```

## Parameter

*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:

```
Device(config)# interface range gigabitEthernet 1/0/1-3,1/0/6-7,1/0/9
```

# 16.3 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:

```
Device(config)# interface gigabitEthernet 1/0/5
Device(config-if)# description Port_5
```

# 16.4 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# shutdown
```

## 16.5 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# duplex full
```

## 16.6 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:

```
Device(config)# jumbo-size 9216
```

## 16.7 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 | auto }
```

```
no speed
```

### Parameter

10 | 100 | 1000 | auto — The speed mode of the Ethernet port. There are four options: 10Mbps, 100Mbps, 1000Mbps and Auto negotiation mode (default).

### 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 Speed Mode as 100Mbps for port 1/0/3:

```
Device(config)# interface gigabitEthernet 1/0/3
```

```
Device(config-if)# speed 100
```

## 16.8 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** [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:

```
Device(config)# clear counters
```

# 16.9 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:

```
Device(config)# show fiber ports
```

## 16.10 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]  
[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:

```
Device(config)# show interface status
```

Display the connection status of port 1/0/1:

```
Device(config)# show interface status gigabitEthernet 1/0/1
```

## 16.11 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 [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:

```
Device(config)# show interface counters
```

Display the statistics information of port 1/0/2:

```
Device(config)# show interface counters gigabitEthernet 1/0/2
```

# 16.12 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 [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:

```
Device(config)# show interface configuration
```

Display the configurations of port 1/0/2:

```
Device(config)# show interface configuration gigabitEthernet 1/0/2
```



# Chapter 17 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.

## 17.1 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]  
[po-forward-list po-forward-list] [te-forward-list te-forward-list] }
```

```
no port isolation
```

### Parameter

*fa-forward-list* / *gi-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:

```
Device(config)# interface gigabitEthernet 1/0/5  
Device(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:

```
Device(config)# interface gigabitEthernet 1/0/2  
Device(config-if)# no port isolation
```

## 17.2 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 |  
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:

```
Device# show port isolation interface gigabitEthernet 1/0/2
```

Display the forward-list of all Ethernet ports and port channels:

```
Device# show port isolation interface
```

# Chapter 18 Loopback Detection Commands

With loopback detection feature enabled, the device can detect loops using loopback detection packets. When a loop is detected, the device will display an alert or further block the corresponding port according to the configuration.

## 18.1 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:

```
Device(config)# loopback-detection
```

## 18.2 loopback-detection interval

### Description

The **loopback-detection interval** command is used to define the interval of sending loopback detection packets from device 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:

```
Device(config)# loopback-detection interval 50
```

# 18.3 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:

```
Device(config)# loopback-detection recovery-time 70
```

## 18.4 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 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 loopback detection function of ports 1-3:

```
Device(config)# interface range gigabitEthernet 1/0/1-3  
Device(Config-if-range)# loopback-detection
```

## 18.5 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 device 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 device 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 device will send a trap message and generate an entry on the log file. In addition, the device 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 device will send a trap message and generate an entry on the log file. In addition, the device 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# loopback-detection config process-mode port-based
recovery-mode manual
```

## 18.6 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# loopback-detection recover
```

## 18.7 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:

```
Device# show loopback-detection global
```

## 18.8 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 [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:

```
Device# show loopback-detection interface
```

Display the configuration of loopback detection function and the status of port 5:

```
Device# show loopback-detection interface gigabitEthernet 1/0/5
```



## Chapter 19 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 device. 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.

### 19.1 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:

```
Device(config)#interface gigabitEthernet 1/0/25
```

```
Device(config-if)#ddm state enable
```

## 19.2 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:

```
Device(config)#interface gigabitEthernet 1/0/25
```

```
Device(config-if)#ddm shutdown warning
```

## 19.3 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:

```
Device(config)#interface gigabitEthernet 1/0/25
Device(config-if)#ddm temperature_threshold high_alarm 5
```

# 19.4 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:

```
Device(config)#interface gigabitEthernet 1/0/25
Device(config-if)#ddm voltage_threshold high_alarm 5
```

# 19.5 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:

```
Device(config)#interface gigabitEthernet 1/0/25
Device(config-if)#ddm bias_current_threshold high_alarm 5
```

# 19.6 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:

```
Device(config)#interface gigabitEthernet 1/0/25
Device(config-if)#ddm tx_power_threshold high_alarm 5
```

# 19.7 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:

```
Device(config)#interface gigabitEthernet 1/0/25
Device(config-if)#ddm rx_power_threshold high_alarm 5
```

# 19.8 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:

```
Device(config)#show ddm configuration state
```

View the threshold of the DDM Voltage value:

```
Device(config)#show ddm configuration voltage
```

## 19.9 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 device's SFP ports.

### Syntax

```
show ddm status
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Example

View the DDM status:

```
Device(config)#show ddm status
```



# Chapter 20 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 device can dynamically group similarly configured ports into a single logical link, which will highly extend the bandwidth and flexibly balance the load.

## 20.1 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, ranging from 1 to 14.

on — Enable the static LAG.

active — Enable the active LACP mode.

passive — Enable the passive LACP mode.

### 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

Add ports 2-4 to EtherChannel Group 1 and enable the static LAG:

```
Device(config)# interface range gigabitEthernet 1/0/2-4
Device(config-if-range)# channel-group 1 mode on
```

## 20.2 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":

```
Device(config)# port-channel load-balance src-dst-ip
```

## 20.3 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:

```
Device(config)# lacp system-priority 1024
```

## 20.4 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:

```
Device(config)# interface range gigabitEthernet 1/0/1-3  
Device(config-if-range)# lacp port-priority 1024
```

Configure the LACP port priority as 2048 for port 4:

```
Device(config)# interface gigabitEthernet 1/0/4  
Device(config-if)# lacp port-priority 2048
```

## 20.5 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, ranging from 1 to 14. 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:

```
Device(config)# show etherchannel 1 detail
```

## 20.6 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:

```
Device(config)# show etherchannel load-balance
```

## 20.7 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, ranging from 1 to 14. 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:

```
Device(config)# show lacp 1 internal
```

## 20.8 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:

```
Device(config)# show lacp sys-id
```

# Chapter 21 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.

## 21.1 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 device to reduce broadcast packets and enhance the efficiency of packets forwarding remarkably.

### Syntax

```
mac address-table static mac-addr vid interface { fastEthernet port |  
gigabitEthernet port | ten-gigabitEthernet port }
```

```
no mac address-table static mac-addr vid interface { fastEthernet port |  
gigabitEthernet port | ten-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:

```
Device(config)# mac address-table static 00:02:58:4f:6c:23 vid 1 interface  
gigabitEthernet 1/0/1
```



## 21.2 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 | 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:

```
Device(config)# no mac address-table dynamic vid 1
```

## 21.3 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:

```
Device(config)# mac address-table aging-time 500
```

# 21.4 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:

```
Device(config)# mac address-table filtering 00:1e:4b:04:01:5d vid 1
```

## 21.5 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 device 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 device 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 device 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.

**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.

### 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:

```
Device(config)# interface gigabitEthernet 1/0/1
Device(config-if)# mac address-table max-mac-count max-number 30
mode static status drop
```

## 21.6 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:

```
Device(config)# show mac address-table
```

## 21.7 clear mac address-table

### Description

The **clear 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:

```
Device(config)# clear mac address-table static
```

## 21.8 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:

```
Device(config)# show mac address-table aging-time
```

## 21.9 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 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:

```
Device(config)# show mac address-table max-mac-count all
```

Display the security configuration of port 1/0/1:

```
Device(config)# show mac address-table max-mac-count interface  
gigabitEthernet 1/0/1
```

## 21.10 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 { gigabitEthernet port | port-channel  
port-channel-id } | gpon pon-port [ont ont-id]
```

### Parameter

*port* — The Ethernet port number.

*port-channel-id* — The ID of the port channel.

*pon-port*—— The PON port list of the ONT.

*ont-id*—— The ID of the ONT.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the address configuration of port 1/0/1:

```
Device(config)# show mac address-table interface gigabitEthernet 1/0/1
```

## 21.11 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:

```
Device(config)# show mac address-table count
```

## 21.12 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 { 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:

```
Device(config)#show mac address-table address 00:00:00:00:23:00 vid 1
```

# 21.13 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:

```
Device(config)# show mac address-table vlan 1
```



# Chapter 22 IEEE 802.1Q VLAN Commands

VLAN (Virtual Local Area Network) technology is developed for the device 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.

## 22.1 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:

```
Device(config)# vlan 2-10,100
```

Delete VLAN 2:

```
Device(config)# no vlan 2
```

## 22.2 interface vlan

### Description

The **interface vlan** command is used to create VLAN Interface hereafter to

access to Interface VLAN Mode.

### Syntax

```
interface vlan vlan-id  
no interface vlan vlan-id
```

### Parameter

*vlan-id*——Specify IEEE 802.1Q VLAN ID, ranging from 1 to 4093.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Create VLAN Interface 2:

```
Device(config)# interface vlan 2
```

## 22.3 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":

```
Device(config)# vlan 2
Device(config-vlan)# name group1
```

## 22.4 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.

tagged | untagged —— egress-rule.

### 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":

```
Device(config)#interface gigabitEthernet 1/0/4
Device(config-if)#switchport general allowed vlan 2 tagged
```

## 22.5 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# switchport pvid 2
```

## 22.6 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# switchport check ingress
```

## 22.7 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":

```
Device(config)#interface gigabitEthernet 1/0/4
Device(config-if)#switchport acceptable frame general
```

## 22.8 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:

```
Device(config)# show vlan summary
```

## 22.9 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:

```
Device(config)# show vlan brief
```

## 22.10 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:

```
Device(config)# show vlan id 5
```

# 22.11 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:

```
Device(config)# show interface switchport
```

## Chapter 23 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.

### 23.1 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":

```
Device(config)#mac-vlan mac-address 00:11:11:01:01:12 vlan 2  
description TP
```



## 23.2 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:

```
Device(config)#interface gigabitEthernet 1/0/3
Device(config-if)#mac-vlan
```

## 23.3 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:

```
Device(config)#show mac-vlan all
```

# 23.4 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:

```
Device(config)#show mac-vlan interface
```

# Chapter 24 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.

## 24.1 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

```
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
```

### 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.

### 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:

```
Device(config)#protocol-vlan template name TP frame ether_2 ether-type
2024
```

## 24.2 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

```
protocol-vlan vlan vlan-id priority priority template template-idx  
no protocol-vlan vlan group-idx
```

### 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 device 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.

### 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:

```
Device(config)#protocol-vlan vlan 2 template 3
```

## 24.3 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

```
protocol-vlan group index
```

```
no protocol-vlan group index
```

### Parameter

*index*—— Specify the protocol group ID.

### 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:

```
Device(config)#interface gigabitEthernet 1/0/20
```

```
Device(config-if)#protocol-vlan group 1
```

## 24.4 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:

```
Device(config)#show protocol-vlan template
```

## 24.5 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:

```
Device(config)#show protocol-vlan vlan
```

# Chapter 25 GVRP Commands

GVRP (GARP VLAN registration protocol) is an implementation of GARP (generic attribute registration protocol). GVRP allows the device to automatically add or remove the VLANs via the dynamic VLAN registration information and propagate the local VLAN registration information to other devices, without having to individually configure each VLAN.

## 25.1 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:

```
Device(config)#gvrp
```

## 25.2 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:

```
Device(config)#interface range gigabitEthernet 1/0/2-6
Device(config-if-range)#gvrp
```

## 25.3 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:

```
Device(config)#interface range gigabitEthernet 1/0/2-6
Device(config-if-range)#gvrp registration fixed
```

## 25.4 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:

```
Device(config)#interface gigabitEthernet 1/0/6
```

```
Device(config-if)#gvrp timer leaveall 2000
```

```
Device(config-if)#no gvrp timer join
```

## 25.5 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:

```
Device(config)#show gvrp interface gigabitEthernet 1/0/1
```

Display the GVRP configuration information of all Ethernet ports:

```
Device(config)#show gvrp interface
```

## 25.6 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:

```
Device(config)#show gvrp global
```

## Chapter 26 IGMP Snooping Commands

IGMP Snooping (Internet Group Management Protocol Snooping) is a multicast control mechanism running on Layer 2 device. It can effectively prevent multicast groups being broadcasted in the network.

### 26.1 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:

```
Device(config)# ip igmp snooping
```

### 26.2 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 device works as an IGMPv1 Snooping device. It can only process IGMPv1 messages from the host. Report messages of other versions are ignored.

v2: The device works as an IGMPv2 Snooping device. It can process both IGMPv1 and IGMPv2 messages from the host. IGMPv3 messages are ignored.

v3: The device works as an IGMPv3 Snooping device. 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:

```
Device (config)# ip igmp snooping version v2
```

## 26.3 ip igmp snooping drop-unknown

### Description

The **ip igmp snooping drop-unknown** command is used to configure the way how the device 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:

```
Device(config)# ip igmp snooping drop-unknown
```

## 26.4 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:

```
Device(config)# ip igmp snooping header-validation
```

## 26.5 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 device 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 device 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 device 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 device 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:

```
Device(config)# ip igmp snooping vlan-config 1-3 rtime 300
```

```
Device(config)# ip igmp snooping vlan-config 1-3 mtime 200
```

## 26.6 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:

```
Device(config)# ip igmp snooping vlan-config 1-3 immediate-leave
```

## 26.7 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 device 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:

```
Device(config)# ip igmp snooping vlan-config 1-3 report-suppression
```

## 26.8 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 :

```
Device(config)# ip igmp snooping vlan-config 1 router-ports-forbidd
interface gigabitEthernet 1/0/1-3
```

## 26.9 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:

```
Device(config)# ip igmp snooping vlan-config 1-2 rport interface
gigabitEthernet 1/0/1
```

## 26.10 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 { gpon port-list }
no ip igmp snooping vlan-config vlan-id-list static ip interface { gpon
port-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:

```
Device(config)# ip igmp snooping vlan-config 2 static 225.0.0.1 interface
gigabitEthernet 1/0/1-3
```

## 26.11 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 device. 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 device. 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 device receives an IGMP leave message, it obtains the address of the multicast group that the host wants to leave from the message. Then the device 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 device 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:

```
Device(config)# ip igmp snooping vlan-config 3 querier
```

```
Device(config)# ip igmp snooping vlan-config 3 querier query interval 100
```

# 26.12 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range 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 IGMP Snooping function of port 1/0/3:

```
Device(config)# interface gigabitEthernet 1/0/3
```

```
Device(config-if)# ip igmp snooping
```

## 26.13 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range 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

Specify the maximum numbers of groups that ports 1/0/2-5 can join as 10, and configure the throttling action as replace:

```
Device(config)#interface range gigabitEthernet 1/0/2-5
Device(config-if-range)#ip igmp snooping max-groups 10
Device(config-if-range)#ip igmp snooping max-groups action replace
```

## 26.14 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range 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 Fast Leave function for port 1/0/3:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# ip igmp snooping immediate-leave
```

## 26.15 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:

```
Device(config)# ip igmp profile 1
```

## 26.16 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:

```
Device(config)# ip igmp profile 1  
Device(config-igmp-profile)#deny
```

## 26.17 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:

```
Device(config)# ip igmp profile 1
Device(config-igmp-profile)#permit
```

# 26.18 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:

```
Device(config)# ip igmp profile 1
Device(config-igmp-profile)#range 225.1.1.1 226.3.2.1
```

## 26.19 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range 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

Bind profile 1 to interface gigabitEthernet 1/0/2:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# ip igmp filter 1
```

## 26.20 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:

```
Device(config)# clear ip igmp snooping statistics
```

## 26.21 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:

```
Device# show ip igmp snooping
```

## 26.22 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 basic configuration configuration of all ports and port channels:

```
Device# show ip igmp snooping interface basic-config
```

Display the IGMP basic configuration of port 1/0/2:

```
Device# show ip igmp snooping interface gigabitEthernet 1/0/2
basic-config
```

Display the IGMP packet statistics of ports 1/0/1-4:

```
Device# show ip igmp snooping interface gigabitEthernet 1/0/1-4
packet-stat
```

## 26.23 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:

```
Device# show ip igmp snooping vlan 2
```

## 26.24 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:

```
Device#show ip igmp snooping groups
```

Display all the multicast entries in VLAN 5:

```
Device(config)#show ip igmp snooping groups vlan 5
```

Display the count of multicast entries in VLAN 5:

```
Device(config)#show ip igmp snooping groups vlan 5 count
```

Display the dynamic multicast groups of VLAN 5

```
Device(config)#show ip igmp snooping groups vlan 5 dynamic
```

Display the static multicast groups of VLAN 5

```
Device(config)#show ip igmp snooping groups vlan 5 static
```

Display the count of dynamic multicast entries of VLAN 5

```
Device(config)#show ip igmp snooping groups vlan 5 dynamic count
```

Display the count of static multicast entries of VLAN 5

```
Device(config)#show ip igmp snooping groups vlan 5 static count
```

## 26.25 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:

```
Device(config)# show ip igmp profile
```

# Chapter 27 MLD Snooping Commands

MLD Snooping (Multicast Listener Discovery Snooping) is a multicast control mechanism running on Layer 2 device. It can effectively prevent multicast groups being broadcasted in the IPv6 network.

## 27.1 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:

```
Device(config)# ipv6 mld snooping
```

## 27.2 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:

```
Device(config)# ipv6 mld snooping drop-unknown
```

## 27.3 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 device 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 device 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 device 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 device 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:

```
Device(config)# ipv6 mld snooping vlan-config 1-3 rtime 300
Device(config)# ipv6 mld snooping vlan-config 1-3 mtime 200
```

## 27.4 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:

```
Device(config)# ipv6 mld snooping vlan-config 1-3 immediate-leave
```

## 27.5 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 device 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:

```
Device(config)# ipv6 mld snooping vlan-config 1-3 report-suppression
```

## 27.6 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:

```
Device(config)# ipv6 mld snooping vlan-config 1 router-ports-forbidd  
interface gigabitEthernet 1/0/1-3
```

## 27.7 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:

```
Device(config)# ipv6 mld snooping vlan-config 1-2 rport interface
gigabitEthernet 1/0/1
```

## 27.8 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 { gpon  
port-list}
```

```
no ipv6 mld snooping vlan-config vlan-id-list static ip interface { gpon  
port-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:

```
Device(config)# ipv6 mld snooping vlan-config 2 static ff80::1234:1  
interface gigabitEthernet 1/0/1-3
```

## 27.9 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 device. 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 device. 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 device receives an MLD done message, it obtains the address of the multicast group that the host wants to leave from the message. Then the device 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 device 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:

```
Device(config)# ipv6 mld snooping vlan-config 3 querier
Device(config)# ipv6 mld snooping vlan-config 3 querier query interval
100
```

## 27.10 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# ipv6 mld snooping
```

## 27.11 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-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:

```
Device(config)#interface range gigabitEthernet 1/0/2-5
Device(config-if-range)#ipv6 mld snooping max-groups 10
Device(config-if-range)#ipv6 mld snooping max-groups action replace
```



## 27.12 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-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:

```
Device(config)# interface gigabitEthernet 1/0/3  
Device(config-if)# ipv6 mld snooping immediate-leave
```

## 27.13 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:

```
Device(config)# ipv6 mld profile 1
```

## 27.14 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:

```
Device(config)# ipv6 mld profile 1
Device(config-MLD-profile)#deny
```

## 27.15 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:

```
Device(config)# ipv6 mld profile 1
Device(config-igmp-profile)#permit
```

# 27.16 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:

```
Device(config)# ipv6 mld profile 1
Device(config-igmp-profile)#range ff80::1234 ff80::1235
```

## 27.17 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-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:

```
Device(config)# interface gigabitEthernet 1/0/2
```

```
Device(config-if)# ipv6 mld filter 1
```

## 27.18 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:

```
Device(config)# clear ipv6 mld snooping statistics
```

## 27.19 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:

```
Device(config)# show ipv6 mld snooping
```

## 27.20 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 basic configuration configuration of all ports and port channels:

```
Device# show ipv6 mld snooping interface basic-config
```

Display the MLD basic configuration of port 1/0/2:

```
Device# show ipv6 mld snooping interface gigabitEthernet 1/0/2
basic-config
```

Display the MLD packet statistics of ports 1/0/1-4:

```
Device# show ipv6 mld snooping interface gigabitEthernet 1/0/1-4
packet-stat
```

## 27.21 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:

```
Device(config)# show ipv6 mld snooping vlan
```

## 27.22 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:

```
Device(config)# show ipv6 mld snooping groups
```

## 27.23 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:

```
Device(config)# show ipv6 mld profile
```



## Chapter 28 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.

### 28.1 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:

```
Device(config)# mvr
```

### 28.2 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:

```
Device (config)# mvr group 225.1.2.3 3
```

## 28.3 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 device 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 device. You have to statically configure the IGMP querier to transmit all the required multicast streams to the device via the multicast VLAN.

**dynamic** — In this mode, after receiving report or leave messages from the hosts, the device 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 device 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:

```
Device(config)# mvr mode dynamic
```

# 28.4 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 to 100 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:

```
Device(config)# mvr querytime 10
```

## 28.5 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:

```
Device(config)# mvr vlan 10
```

## 28.6 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-gigabitEthernet)

## Privilege Requirement

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

## Example

Enable MVR for port 1/0/1:

```
Device(config)# interface gigabitEthernet 1/0/1
Device(config-if)#mvr
```

## 28.7 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. When the interface configuration mode is interface gigabitEthernet, only **mvr type** source can be input.

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. When the interface configuration mode is interface gpon, only **mvr type** receiver can be input.

### Command Mode

Interface Configuration Mode (interface gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)#mvr type receiver
```

## 28.8 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)#mvr immediate
```

## 28.9 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 gpon / interface range gpon / interface gigabitEthernet / interface range gigabitEthernet / interface ten-gigabitEthernet / interface range ten-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 device 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:

```
Device(config)# interface gigabitEthernet 1/0/3
```

```
Device(config-if)#mvr vlan 10 group 225.1.2.3
```

## 28.10 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:

```
Device# show mvr
```

## 28.11 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:

```
Device# show mvr interface gigabitEthernet 1/0/3
```

## 28.12 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:

```
Device# show mvr members
```

# Chapter 29 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.

## 29.1 debug spanning-tree

### Description

The **debug spanning-tree** command is used to enable debuggning 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:

```
Device# debug spanning-tree all
```

## 29.2 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:

```
Device(config)# spanning-tree
```

## 29.3 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# spanning-tree
```

## 29.4 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 0 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 0 to 2000000. By default, it is 0 which means 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:

```
Device(config)# interface gigabitEthernet 1/0/1
Device(config-if)# spanning-tree common-config port-priority 64
ext-cost 100 int-cost 100 portfast enable point-to-point open
```

## 29.5 spanning-tree mode

### Description

The **spanning-tree mode** command is used to configure the STP mode of the device. 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:

```
Device(config)# spanning-tree mode mstp
```

# 29.6 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:

```
Device(config)# spanning-tree mst configuration
```

```
Device(Config-mst)#
```

# 29.7 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:

```
Device(config)# spanning-tree mst configuration  
Device(config-mst)# instance 1 vlan 1-100
```

Disable Instance 1, namely remove all the mapping VLANs 1-100:

```
Device(config)# spanning-tree mst configuration  
Device(config-mst)# no instance 1
```

Remove VLANs 1-50 in mapping VLANs 1-100 for Instance 1:

```
Device(config)# spanning-tree mst configuration  
Device(config-mst)# no instance 1 vlan 1-50
```

## 29.8 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":

```
Device(config)# spanning-tree mst configuration
```

```
Device(config-mst)# name region1
```

# 29.9 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:

```
Device(config)# spanning-tree mst configuration
```

```
Device(config-mst)# revision 100
```



## 29.10 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 device 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:

```
Device(config)# spanning-tree mst instance 1 priority 4096
```

## 29.11 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:

```
Device(config)# interface gigabitEthernet 1/0/1
Device(config-if)# spanning-tree mst instance 1 port-priority 64 cost
2000
```

## 29.12 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:

```
Device(config)# spanning-tree priority 4096
```

# 29.13 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,  $2 * (\text{Forward Delay} - 1) \geq \text{Max Age}$ .

*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,  $2 * (\text{Hello Time} + 1) \leq \text{Max Age}$ .

*max-age*—— The maximum time the device 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:

```
Device(config)# spanning-tree timer forward-time 16 hello-time 3
max-age 22
```

## 29.14 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:

```
Device(config)# spanning-tree hold-count 8
```

## 29.15 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:

```
Device(config)# spanning-tree max-hops 30
```

# 29.16 spanning-tree bpdudfilter

## Description

The **spanning-tree bpdudfilter** 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 devices. To disable the BPDU filter function, please use **no spanning-tree bpdudfilter** command.

## Syntax

**spanning-tree bpdudfilter**

**no spanning-tree bpdudfilter**

## 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:

```
Device(config)# interface gigabitEthernet 1/0/2
```

```
Device(config-if)# spanning-tree bpdudfilter
```

## 29.17 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# spanning-tree bpduflood
```

## 29.18 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# spanning-tree bpduguard
```

# 29.19 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# spanning-tree guard loop
```

## 29.20 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# spanning-tree guard root
```

## 29.21 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 device removes MAC address entries upon receiving TC-BPDUs. If a malicious user continuously sends TC-BPDUs to a device, the device 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# spanning-tree guard tc
```

## 29.22 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# spanning-tree mcheck
```

## 29.23 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:

```
Device(config)# show spanning-tree active
```

## 29.24 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:

```
Device(config)# show spanning-tree bridge
```

## 29.25 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:

```
Device(config)# show spanning-tree interface
```

Display the spanning-tree information of port 1/0/2:

```
Device(config)# show spanning-tree interface gigabitEthernet 1/0/2
```

Display the spanning-tree mode information of port 1/0/2:

```
Device(config)# show spanning-tree interface gigabitEthernet 1/0/2 mode
```

# 29.26 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:

```
Device(config)# show spanning-tree interface-security
```

Display the protect information of port 1:

```
Device(config)# show spanning-tree interface-security gigabitEthernet  
1/0/1
```

Display the interface security bpdudfilter information:

```
Device(config)# show spanning-tree interface-security bpdudfilter
```

## 29.27 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:

```
Device(config)#show spanning-tree mst configuration
```

Display the related information of MST Instance 1:

```
Device(config)#show spanning-tree mst instance 1
```

Display all the ports information of MST Instance 1:

```
Device(config)#show spanning-tree mst instance 1 interface
```

# Chapter 30 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.

## 30.1 Ildp

### 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:

```
Device(config)#lldp
```

## 30.2 Ildp forward\_message

### Description

The **lldp forward\_message** command is used to enable the device 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 device to forward LLDP messages when LLDP function is disabled globally:

```
Device(config)#lldp forward_message
```

# 30.3 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.  $TTL = \text{Hold Multiplier} * \text{Transmit Interval}$ . 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:

```
Device(config)#lldp hold-multiplier 5
```

## 30.4 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:



```
Device(config)#lldp timer tx-interval 45
Device(config)#lldp timer notify-interval 120
```

## 30.5 Ildp 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:

```
Device(config)#interface gigabitEthernet 1/0/1
Device(config-if)#lldp receive
```

## 30.6 Ildp 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:

```
Device(config)# interface gigabitEthernet 1/0/1
Device(config-if)#lldp transmit
```

# 30.7 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:

```
Device(config)#interface gigabitEthernet 1/0/1
Device(config-if)#lldp snmp-trap
```

## 30.8 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:

```
Device(config)# interface gigabitEthernet 1/0/1  
Device(config-if)# no lldp tlv-select management-address port-vlan
```

## 30.9 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:

```
Device(config)# interface gigabitEthernet 1/0/1  
Device(config-if)# lldp management-address 192.168.0.100
```

# 30.10 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:

```
Device(config)# lldp med-fast-count 5
```

## 30.11 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:

```
Device(config)# interface gigabitEthernet 1/0/2
```

```
Device(config-if)# lldp med-status
```

## 30.12 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# no lldp med-tlv-select network-policy inventory-
management
```

# 30.13 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# lldp med-location civic-address language English lci-city
London
```

## 30.14 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:

```
Device#show lldp
```

## 30.15 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:

```
Device#show lldp interface gigabitEthernet 1/0/1
```

# 30.16 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:

```
Device#show lldp local-information interface gigabitEthernet 1/0/1
```



## 30.17 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:

```
Device#show lldp neighbor-information interface gigabitEthernet 1/0/1
```

## 30.18 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:

```
Device#show lldp traffic interface gigabitEthernet 1/0/1
```

# Chapter 31 Static Routes Commands

## 31.1 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 device:

```
Device(config)# ip routing
```

## 31.2 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:

```
Device(config)# interface vlan 2
```

## 31.3 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:

```
Device(config)# interface loopback 1
```

## 31.4 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

Device port 1/0/9 into the routed port:

```
Device(config)# interface gigabitEthernet 1/0/9
Device(config-if)# no switchport
```

# 31.5 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:

```
Device(config)# interface port-channel 1,3-5
```

## 31.6 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 :

```
Device(config)# interface gigabitEthernet 1/0/9  
Device(config-if)# no switchport  
Device(config-if)# description system-if
```

## 31.7 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:

```
Device(config)# interface gigabitEthernet 1/0/9
Device(config-if)# no switchport
Device(config-if)# shutdown
```

# 31.8 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:

```
Device(config)# interface port-channel 1
```

## 31.9 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 { dest-address } { mask } { next-hop-address } [ distance ]
```

```
no ip route { dest-address } { mask } { next-hop-address }
```

### Parameter

*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:

```
Device(config)# ip route 192.168.2.0 255.255.255.0 192.168.0.2
```

## 31.10 ipv6 routing

### Description

This **ipv6 routing** command is enable the IPv6 routing feature globally. To disable 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:

```
Device(config)# ipv6 routing
```

# 31.11 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 { ipv6-dest-address } { next-hop-address } [ distance ]
```

```
no ipv6 route { ipv6-dest-address } { next-hop-address }
```

## Parameter

*ipv6-dest-address*—— The IPv6 address of the destination network.

*next-hop-address*—— The IPv6 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 network IP address as 3200::/64 and the next-hop address as 3100::1234:

```
Device(config)# ipv6 route 3200::/64 3100::1234
```

## 31.12 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:

```
Device(config)#show interface vlan 2
```

## 31.13 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:

```
Device(config)# show ip interface vlan 2
```

## 31.14 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:

```
Device(config)# show ip interface brief
```

## 31.15 show ip route

### Description

This **show ip route** command is used to display the route entries of the specified type.

### Syntax

```
show ip route [ static | connected ]
```

### Parameter

static | connected — Specify the route type. If not specified, all types of route entries will be displayed.

static: The static routes.

connected: The connected routes.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the static routes:

```
Device(config)# show ip route static
```

## 31.16 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:

```
Device(config)# show ip route specify 192.168.0.100
```

Look up the route entry with the destination as 192.168.0.0/24:

```
Device(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:

```
Device(config)# show ip route specify 192.168.0.0 255.255.0.0  
longer-prefixes
```

## 31.17 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:

```
Device(config)# show ip route summary
```

## 31.18 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:

```
Device(config)# show ipv6 interface
```

## 31.19 show ipv6 route

### Description

This **show ipv6 route** command is used to display the IPv6 route entries of the specified type.

### Syntax

```
show ipv6 route [ static | connected ]
```

### Parameter

static | connected — Specify the route type. If not specified, all types of route entries will be displayed.

static: The static routes.

connected: The connected routes.

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the IPv6 static routes:

```
Device(config)# show ipv6 route static
```

## 31.20 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:

```
Device(config)# show ipv6 route summary
```

# Chapter 32 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.

## 32.1 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:

```
Device(config)# interface vlan 1
Device(config-if)# ipv6 enable
```

## 32.2 ipv6 address autoconfig

### Description

This command is used to enable the automatic configuration of the ipv6 link-local address. The device 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 auto-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:

```
Device(config)# interface vlan 1
Device(config-if)# ipv6 address autoconfig
```

## 32.3 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:

```
Device(config)# interface vlan 1
Device(config-if)# ipv6 address fe80::1234 link-local
```

## 32.4 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:

```
Device(config)# interface vlan 1
Device(config-if)# ipv6 address dhcp
```

## 32.5 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:

```
Device(config)# interface vlan 1
Device(config-if)# ipv6 address ra
```

## 32.6 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 device 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:

```
Device(config)# interface vlan 1
Device(config-if)# ipv6 address 3ffe::/64 eui-64
```

## 32.7 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:

```
Device(config)# interface vlan 1
Device(config-if)# ipv6 address 3001::1/64
```

## 32.8 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:

```
Device(config)# show ipv6 interface
```

## Chapter 33 ARP Commands

Address Resolution Protocol (ARP) is used to resolve an IP address into an Ethernet MAC address. The device 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.

### 33.1 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.

#### Syntax

**arp** *ip mac type*

**no arp** *ip type*

#### 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".

#### 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:

```
Device(config)# arp 192.168.0.1 00:11:22:33:44:55 arpa
```

## 33.2 clear arp-cache

### Description

This **clear arp-cache** command is used to clear all the dynamic ARP entries.

### Syntax

```
clear arp-cache
```

### Command Mode

Privileged EXEC Mode

### Privilege Requirement

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

### Example

Clear all the dynamic ARP entries:

```
Device(config)# clear arp-cache
```

## 33.3 arp dynamicrenew

### Description

This **arp dynamicrenew** command is used to automatically renew dynamic ARP entries. To disable the device to automatically renew dynamic ARP entries, please use the **no arp dynamicrenew** command. By default, it is enabled.

### Syntax

```
arp dynamicrenew
```

```
no arp dynamicrenew
```

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Enable the device to automatically renew the dynamic ARP entries:

```
Device(config)# arp dynamicrenew
```

## 33.4 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:

```
Device(config)# arp timeout 60
```

## 33.5 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 device's Layer 3 interfaces to send gratuitous ARP packets when their status becomes up:

```
Device(config)# gratuitous-arp intf-status-up enable
```

## 33.6 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 device'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:

```
Device(config)# gratuitous-arp dup-ip-detected enable
```

## 33.7 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:

```
Device(config)# gratuitous-arp learning enable
```

# 33.8 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)

## Privilege Requirement

None.

## Example

Specify the interface VLAN 1 to send gratuitous ARP packets every 1 second:

```
Device(config)# interface vlan 1  
Device(config-if)# gratuitous-arp send-interval 1
```

## 33.9 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 vlan)

### Privilege Requirement

None

### Example

Enable the Proxy ARP function on VLAN Interface 2:

```
Device(config)# interface vlan 2
Device(config-if)# ip proxy-arp
```

Enable the Proxy ARP function on routed port 1/0/2:

```
Device(config)# interface gigabitEthernet 2
Device(config-if)# no switchport
Device(config-if)# ip proxy-arp
```

## 33.10 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)

## Privilege Requirement

None

## Example

Enable the Proxy ARP function on VLAN Interface 2:

```
Device(config)# interface vlan 2
Device(config-if)# ip local-proxy-arp
```

Enable the Proxy ARP function on routed port 1/0/2:

```
Device(config)# interface gigabitEthernet 2
Device(config-if)# no switchport
Device(config-if)# ip local-proxy-arp
```

## 33.11 show arp

### Description

This **show arp** command is used to display the active ARP entries. If no parameter is specified, all the active ARP entries will be displayed.

### Syntax

```
show arp [ ip ] [ mac ]
```

### Parameter

*ip* — Specify the IP address of your desired ARP entry.

*mac* — Specify the MAC address of your desired ARP entry.

### 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:

```
Device(config)# show arp 192.168.0.2
```

## 33.12 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:

```
Device(config)# show ip arp vlan 2
```

## 33.13 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:

```
Device(config)# show ip arp summary
```

## 33.14 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:

```
Device(config)# show gratuitous-arp
```

## 33.15 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:

```
Device(config)# show ip proxy-arp
```

## 33.16 show ip local-proxy-arp

### Description

The **show ip local-proxy-arp** command is used to display the Local Proxy ARP status.

### Syntax

```
show ip local-proxy-arp
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None

### Example

Display the Local Proxy ARP status:

```
Device(config)# show ip local-proxy-arp
```

## Chapter 34 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 to DHCP clients and manages them.

### 34.1 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:

```
Device(config)# service dhcp server
```

### 34.2 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:

```
Device(config)# ip dhcp server extend-option capwap-ac-ip 192.168.3.1
```

# 34.3 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:

```
Device(config)# ip dhcp server extend-option vendor-class-id 34
```

## 34.4 ip dhcp server exclude-address

### Description

The **ip dhcp server exclude-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 exclude-address** command.

### Syntax

```
ip dhcp server exclude-address start-ip-address end-ip-address  
no ip dhcp server exclude-address start-ip-addr 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:

```
Device(config)# ip dhcp server exclude-address 192.168.1.1 192.168.1.9
```

## 34.5 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:

```
Device(config)# ip dhcp server pool POOL1
```

# 34.6 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:

```
Device(config)# ip dhcp server ping timeout 200
```

## 34.7 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
```

### 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:

```
Device(config)# ip dhcp server ping packets 2
```

## 34.8 network

### Description

The **network** command is used to specify the address and subnet of the network pool.

### Syntax

```
network network-address subnet-mask
```

## 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.

## 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:

```
Device(config)# ip dhcp server pool product
```

```
Device(dhcp-config)# network 192.168.1.0 255.255.255.0
```

# 34.9 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:

```
Device(config)# ip dhcp server pool product
```

## 34.10 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:

```
Device(config)# ip dhcp server pool product  
Device(dhcp-config)# address 192.168.0.10 hardware-address  
5e:4c:a6:31:24:01 hardware-type ethernet
```

## 34.11 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:

```
Device(config)# ip dhcp pool product  
Device(dhcp-config)# address 192.168.0.10 client-identifier abc ascii
```

## 34.12 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:

```
Device(config)# ip dhcp server pool product
```

```
Device(dhcp-config)# default-gateway 192.168.0.1,192.168.1.1
```

# 34.13 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:

```
Device(config)# ip dhcp server pool product
```



```
Device(dhcp-config)# dns-server 192.168.0.1,192.168.1.1
```

## 34.14 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:

```
Device(config)# ip dhcp server pool product  
Device(dhcp-config)# netbios-name-server 192.168.0.1,192.168.1.1
```

## 34.15 netbios-node-type

### Description

The **netbios-node-type** command is used to specify the Netbios server's node type. To delete the node type settings, 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:

```
Device(config)# ip dhcp server pool product
Device(dhcp-config)# netbios-node-type b-node
```

# 34.16 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:

```
Device(config)# ip dhcp server pool product
Device(dhcp-config)# next-server 192.168.2.1
```

## 34.17 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:

```
Device(config)# ip dhcp server pool product
Device(dhcp-config)# domain-name edu
```

## 34.18 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:

```
Device(config)# ip dhcp server pool product
```

```
Device(dhcp-config)# bootfile boot1
```

## 34.19 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:

```
Device(config)# show ip dhcp server status
```

## 34.20 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:

```
Device(config)# show ip dhcp server statistics
```

## 34.21 show ip dhcp server extend-option

### Description

The **show ip dhcp server extend-option** command is used to display the configuration of the remote DHCP 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 DHCP servers:

```
Device(config)# show ip dhcp server extend-option
```

## 34.22 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:

```
Device(config)# show ip dhcp server pool
```

## 34.23 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:

```
Device(config)# show ip dhcp server excluded-address
```

## 34.24 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:

```
Device(config)# show ip dhcp server manual-binding
```

## 34.25 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:

```
Device(config)# show ip dhcp server binding
```

## 34.26 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:

```
Device(config)# clear ip dhcp server statistics
```

# 34.27 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:

```
Device(config)# clear ip dhcp server binding
```



# Chapter 35 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.

## 35.1 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:

```
Device(config)# service dhcp relay
```

## 35.2 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:

```
Device(config)# ip dhcp relay hops 6
```

# 35.3 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 device. 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 device 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:

```
Device(config)# ip dhcp relay time 30
```

## 35.4 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.

### Syntax

```
ip helper-address ip-address  
no ip helper-address [ ip-address ]
```

### Parameter

*ip-address* — DHCP Server address.

### 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:

```
Device(config)# interface vlan 1  
Device(config-if)# ip helper-address 192.168.2.1
```

## 35.5 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 ten-gigabitEthernet / interface range ten-gigabitEthernet / interface port-channel / interface range port-channel / interface gpon / interface range gpon)

## 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)# ip dhcp relay information option
```

# 35.6 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 ten-gigabitEthernet / interface range ten-gigabitEthernet / interface port-channel / interface range port-channel / interface gpon / interface range gpon)

## 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)# ip dhcp relay information strategy replace
```

# 35.7 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 ten-gigabitEthernet / interface range ten-gigabitEthernet / interface port-channel / interface range port-channel / interface gpon / interface range gpon)

## 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)#ip dhcp relay information format normal
```

## 35.8 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 ten-gigabitEthernet / interface range ten-gigabitEthernet / interface port-channel / interface range port-channel / interface gpon / interface range gpon)

### 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)# ip dhcp relay information circuit-id TP-Link
```

## 35.9 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 ten-gigabitEthernet / interface range ten-gigabitEthernet / interface port-channel / interface range port-channel / interface gpon / interface range gpon)

### 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:

```
Device(config)#interface gigabitEthernet 1/0/2  
Device(config-if)# ip dhcp relay information remote-id TP-Link
```

## 35.10 ip dhcp relay default-interface

### Description

The **ip dhcp relay default-interface** command is used to configure default relay agent interface. When the device works at DHCP VLAN Relay mode and there is no IP interface in the VLAN, the device 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:

```
Device(config)# interface vlan 1
Device(config-if)# ip dhcp relay default-interface
```

## 35.11 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**.

### Syntax

```
ip dhcp relay vlan vidhelper-address ip-address
no ip dhcp relay vlan vidhelper-address [ip-address]
```

### Parameter

*vid*—— VLAN ID.

*ip-address*—— DHCP Server address.

### 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:



```
Device(config)# ip dhcp relay vlan 1 helper-address 192.168.2.1
```

## 35.12 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 [[information interface] [fastEthernet port |  
gigabitEthernet port | ten-gigabitEthernet port | port-channel port-channel-id  
| gpon port ]]
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the configuration of DHCP Relay:

```
Device(config)# show ip dhcp relay
```

# Chapter 36 DHCP L2 Relay Commands

## 36.1 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:

```
Device(config)# ip dhcp l2relay
```

## 36.2 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:

```
Device(config)# ip dhcp l2relay vlan 2
```

## 36.3 ip dhcp l2relay information option

### Description

The **ip dhcp l2relay information option** command is used to enable option 82 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 ten-gigabitEthernet / interface range ten-gigabitEthernet / interface port-channel / interface range port-channel / interface gpon / interface range gpon)

## 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:

```
Device(config)#interface gigabitEthernet 1/0/2
```

```
Device(config-if)# ip dhcp l2relay information option
```

## 36.4 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 device.

### Command Mode

Interface Configuration Mode (interface gigabitEthernet / interface range gigabitEthernet / interface port-channel / interface range port-channel / interface gpon / interface range gpon)

### 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:

```
Device(config)#interface gigabitEthernet 1/0/2  
Device(config-if)# ip dhcp l2relay information strategy replace
```

## 36.5 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 ten-gigabitEthernet / interface range ten-gigabitEthernet / interface port-channel / interface range port-channel / interface gpon / interface range gpon)

## 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:

```
Device(config)#interface gigabitEthernet 1/0/2
```

```
Device(config-if)#ip dhcp l2relay information format normal
```

# 36.6 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 ten-gigabitEthernet / interface range

ten-gigabitEthernet / interface port-channel / interface range port-channel /  
interface gpon / interface range gpon)

### 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)# ip dhcp l2relay information circuit-id TP-Link
```

## 36.7 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 ten-gigabitEthernet / interface range ten-gigabitEthernet / interface port-channel / interface range port-channel / interface gpon / interface range gpon)

### 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)# ip dhcp l2relay information remote-id TP-Link
```

## 36.8 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:

```
Device(config)# show ip dhcp l2relay
```

## 36.9 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 [fastEthernet port | gigabitEthernet port |  
ten-gigabitEthernet port | port-channel port-channel-id | gpon port]
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the DHCP L2 Relay configuration of port 1/0/2:

```
Device(config)# show ip dhcp l2relay interface gigabitEthernet 1/0/2
```

## Chapter 37 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 device implements three priority modes based on port, on 802.1p and on DSCP.

### 37.1 qos trust

#### Description

The **qos trust** 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 }
```

#### 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.

#### 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# qos trust dscp
```

### 37.2 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:

```
Device(config)# interface gigabitEthernet 1/0/5
Device(config-if)# qos port-priority 3
```

## 37.3 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

Interface Configuration Mode (interface gpon / interface range gpon)

### 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:

```
Device (config)# qos cos-map 5 2
```

## 37.4 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:

```
Device(config)#qos dot1p-remap 5 6
```

For other devices:

Remap 802.1p priority 5 to 802.1p priority 6 for port 1/0/1:

```
Device(config)# interface gigabitEthernet 1/0/1
```

```
Device(config-if)#qos dot1p-remap 5 6
```

## 37.5 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:

```
Device(config)#qos dscp-map 5 2
```

For other devices:

Map DSCP Priority 5 to 802.1p priority 2 for port 1/0/1:

```
Device(config)# interface gigabitEthernet 1/0/1
```

```
Device(config-if)#qos dscp-map 5 2
```

## 37.6 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:

```
Device(config)# qos dscp-remap 10-12 2
```

For other devices:

Map DSCP values 10-12 to DSCP value 2 for port 1/0/2:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# qos dscp-remap 10-12 2
```

## 37.7 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 { min | max } { 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:

```
Device(config)# interface gigabitEthernet 1/0/1
Device(config-if)# qos queue 5 bandwidth 10
```

# 37.8 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 device will control the forwarding sequence of the packets according to the priority queues and scheduling algorithms you set. On this device, 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:

```
Device(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:

```
Device(config)# interface gigabitEthernet 1/0/1
Device(config-if)# qos queue 1 mode wrr weight 10
```

## 37.9 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
```

```
show qos cos-map interface
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the 802.1p to queue mappings:

```
Device# show qos cos-map
```

## 37.10 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:

```
Device# show qos dot1p-remap interface
```

## 37.11 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:

```
Device# show qos dot1p-remap
```

## 37.12 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 the DSCP priority configuration of all the ports:

```
Device# show qos dscp-map interface
```

## 37.13 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:

```
Device# show qos dscp-map
```

## 37.14 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:

```
Device# show qos dscp-remap interface
```

## 37.15 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:

```
Device# show qos dscp-remap
```

# 37.16 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:

```
Device# show qos port-priority interface
```

## 37.17 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:

```
Device# show qos trust interface
```

## 37.18 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:

```
Device# show qos queue interface
```

# Chapter 38 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 device to monitor broadcast packets, multicast packets and Unknown unicast frames in the network.

## 38.1 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 device 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 device will limit the percentage of bandwidth utilization for specific kinds of traffic.

pps — The device 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:

```
Device(config)# interface gigabitEthernet 1/0/5
Device(config-if)# storm-control rate-mode kbps
```

## 38.2 storm-control

### Description

The **storm-control** command is used to enable the broadcast, multicast, or unknown unicast storm 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, please ensure that the port is not in pps mode.

### Example

Configure the broadcast storm control rate as 1024 kbps on port 1/0/5:

```
Device(config)# interface gigabitEthernet 1/0/5
Device(config-if)# storm-control rate-mode kbps
Device(config-if)# storm-control broadcast 1024
```

## 38.3 storm-control exceed

### Description

The **storm-control exceed** command is used to configure the action that the device will perform when the storm exceeds the defined limit on an interface.

### Syntax

```
storm-control exceed { drop | shutdown } [ recover-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:

```
Device(config)# interface gigabitEthernet 1/0/5
Device(config-if)# storm-control exceed drop
```



## 38.4 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:

```
Device(config)# interface gigabitEthernet 1/0/5
Device(config-if)# storm-control recover
```

## 38.5 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:

```
Device(config)# interface gigabitEthernet 1/0/5
Device(config-if)# bandwidth ingress 5120 egress 1024
```

## 38.6 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:

```
Device(config)# show storm-control interface gigabitEthernet 1/0/4-7
```

## 38.7 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:

```
Device(config)# show bandwidth interface gigabitEthernet 1/0/4
```

# Chapter 39 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.

## 39.1 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:

```
Device(config)# voice vlan 10
```

## 39.2 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:

```
Device(config)# interface gigabitEthernet 1/0/1
Device(config-if)#voice vlan
```

## 39.3 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:

```
Device(config)# voice vlan priority 5
```

## 39.4 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:

```
Device(config)#voice vlan oui 00:11:11 oui-desc TP-Phone
```

## 39.5 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:

```
Device(config)# show voice vlan
```

## 39.6 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-table**

### 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:

```
Device(config)# show voice vlan oui-table
```

## 39.7 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:

```
Device(config)# show voice vlan interface
```



# Chapter 40 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.

## 40.1 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:

```
Device(config)# auto-voip
```

## 40.2 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# auto-voip 3
```

# 40.3 auto-voip dot1p

## Description

The **auto-voip dot1p** command is used to specify the interface mode as dot1p 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# auto-voip dot1p 5
```

## 40.4 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# auto-voip untagged
```

## 40.5 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 device 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# auto-voip none
```

## 40.6 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# no auto-voip
```

## 40.7 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# auto-voip dscp 33
```

## 40.8 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 device 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 device 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# auto-voip data priority trust
```

## 40.9 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:

```
Device (config)# show auto-voip
```

# Chapter 41 Access Control Commands

## 41.1 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:

```
Device(config)# user access-control ip-based enable
```

## 41.2 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:

```
Device(config)# user access-control ip-based 192.168.0.148
255.255.255.255
```

# 41.3 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:

```
Device(config)# user access-control mac-based enable
```

## 41.4 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:

```
Device(config)# user access-control mac-based 00:00:13:0A:00:01
```

## 41.5 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:

```
Device(config)# user access-control port-based enable
```

## 41.6 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:

```
Device(config)# user access-control port-based interface gigabitEthernet  
1/0/2-6
```

# Chapter 42 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 device 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 device 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.

## 42.1 ip http server

### Description

The **ip http server** command is used to enable the HTTP server within the device. 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:

```
Device(config)# no ip http server
```

## 42.2 ip http port

### Description

The **ip http port** command is used to configure the port number of the HTTP server within the device. 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:

```
Device(config)# ip http port 1800
```

## 42.3 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:

```
Device(config)# ip http max-users 5 1 1 1
```

## 42.4 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:

```
Device(config)# ip http session timeout 15
```

## 42.5 ip http secure-server

### Description

The **ip http secure-server** command is used to enable the HTTPS server within the device. 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:

```
Device(config)# no ip http secure-server
```

## 42.6 ip http secure-port

### Description

The **ip http secure-port** command is used to configure the port number of the HTTPS server within the device. 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:

```
Device(config)# ip http secure-port 2800
```

## **42.7 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 device 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:

```
Device(config)# ip http secure-protocol ssl3
```

# 42.8 ip http secure-ciphersuite

## Description

The **ip http secure-ciphersuite** command is used to configure the cipherSuites over the SSL connection supported by the device. 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 device 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:

```
Device(config)# ip http secure-ciphersuite 3des-ede-cbc-sha
```

## 42.9 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 http 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:

```
Device(config)# ip http secure-max-users 5 1 1 1
```

## 42.10 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:

```
Device(config)# ip http secure-session timeout 15
```

## 42.11 ip http secure-server download certificate

### Description

The **ip http secure-server download certificate** command is used to download a certificate to the device 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 device. 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:

```
Device(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

```
Device(config)# ip http secure-server download certificate ssl-cert
ip-address fe80::1234
```

# 42.12 ip http secure-server download key

## Description

The **ip http secure-server download key** command is used to download an SSL key to the device 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 device. 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:

```
Device(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

```
Device(config)# ip http secure-server download key ssl-key ip-address  
fe80::1234
```

## 42.13 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:

```
Device(config)# show ip http configuration
```

## 42.14 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:

```
Device(config)# show ip http secure-server
```

# Chapter 43 SSH Commands

SSH (Security Shell) can provide the unsecured remote management with security and powerful authentication to ensure the security of the management information.

## 43.1 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:

```
Device(config)# ip ssh server
```

## 43.2 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:

```
Device(config)# ip ssh port 22
```

# 43.3 ip ssh version

## Description

The **ip ssh version** command is used to enable the SSH protocol version. To disable the protocol version, please use **no ip ssh version** command.

## Syntax

```
ip ssh version {v1 | v2 }
```

```
no ip ssh version {v1 | v2 }
```

## Parameter

v1 | v2 —— The SSH protocol version to be enabled. They represent SSH v1 and SSH v2 respectively.

## Command Mode

Global Configuration Mode

## Privilege Requirement

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

## Example

Enable SSH v2:

```
Device(config)# ip ssh version v2
```



## 43.4 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** { AES128-CBC | AES192-CBC | AES256-CBC | Blowfish-CBC | Cast128-CBC | 3DES-CBC | HMAC-SHA1 | HMAC-MD5 }

**no ip ssh algorithm**

### Parameter

AES128-CBC | AES192-CBC | AES256-CBC | Blowfish-CBC | Cast128-CBC | 3DES-CBC | HMAC-SHA1 | HMAC-MD5 ——  
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 AES128-CBC:

```
Device(config)# ip ssh algorithm AES128-CBC
```

## 43.5 ip ssh session-timeout

### Description

The **ip ssh session-timeout** command is used to specify the idle-timeout time of SSH. To restore to the factory defaults, please use **ip ssh session-timeout** command.

### Syntax

**ip ssh session-timeout** *value*

**no ip ssh session-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:

```
Device(config)# ip ssh session-timeout 30
```

## 43.6 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:

```
Device(config)# ip ssh max-client 3
```

## 43.7 ip ssh download

### Description

The **ip ssh download** command is used to download the SSH key file from TFTP server.

### Syntax

```
ip ssh download { v1 | v2 } key-file ip-address ip-addr
```

### Parameter

**v1 | v2** — Select the type of SSH key to download, v1 represents SSH-1, v2 represents 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.

### Command Mode

Global Configuration Mode

### Privilege Requirement

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

### Example

Download an SSH-1 type key file named ssh-key from TFTP server with the IP address 192.168.0.148:

```
Device(config)# ip ssh download v1 ssh-key ip-address 192.168.0.148
```

Download an SSH-1 type key file named ssh-key from TFTP server with the IP address fe80::1234:

```
Device(config)# ip ssh download v1 ssh-key ip-address fe80::1234
```

## 43.8 remove public-key

### Description

The **remove public-key** command is used to remove the SSH public key from the device.

### Syntax

```
remove public-key { v1 | v2 }
```

### Parameter

v1 | v2 — Select the type of SSH public key, v1 represents SSH-1, v2 represents SSH-2.

### Command Mode

Privileged EXEC Mode

### Privilege Requirement

Only Admin level users have access to these commands.

### Example

Remove the SSH-1 type public key from the device:

```
Device# remove public-key v1
```

## 43.9 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:

```
Device(config)# show ip ssh
```

# Chapter 44 Telnet Commands

## 44.1 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 device 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:

```
Device# telnet 192.168.0.10
```

## 44.2 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:

```
Device(config)# telnet disable
```

# 44.3 telnet port

## Description

The **telnet port** command is used to configure the telnet 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:

```
Device(config)# telnet port 566
```

# 44.4 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:

```
Device(config)# show telnet-status
```

# Chapter 45 Serial Port Commands



**Note:** Serial Port commands are only available on certain devices.

## 45.1 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:

```
Device(config)# no serial_port
```



## Chapter 46 Port Security Commands

You can limit the number of MAC addresses that can be learned on each port on this page, thus preventing the MAC address table from being exhausted by the attack packets.

### 46.1 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 ]
```

#### 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 1/0/3 as 30, enable exceed-max-learned feature and configure the mode as permanent and the status as drop:

```
Device (config)#interface gigabitEthernet 1/0/3  
Device(config-if)#mac address-table max-mac-count max-number 30  
exceed-maxlearned enable mode permanent status drop
```

### 46.2 show mac address-table max-mac-count

#### Description

The **show mac address-table max-mac-count** command is used to display the port security configuration on each port.

## Syntax

```
show mac address-table max-mac-count interface { fastEthernet port |  
gigabitEthernet port | ten-gigabitEthernet port }
```

## Command Mode

Privileged EXEC Mode and Any Configuration Mode

## Privilege Requirement

None.

## Example

Display the port security configuration on port 1/0/1

```
Device# show mac address-table max-mac-count interface  
gigabitEthernet 1/0/1
```

# Chapter 47 Port Mirroring Commands

Port Mirroring allows the device 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.

## 47.1 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 and Operator level users have access to these commands.

### Example

Create monitor session 1 and configure port 1/0/1 as the monitoring port:

```
Device(config)# monitor session 1 destination interface gigabitEthernet  
1/0/1
```

Delete the monitoring port 1/0/2 from monitor session 1:

```
Device(config)# no monitor session 1 destination interface
gigabitEthernet 1/0/2
```

Delete the monitor session 1:

```
Device(config)# no monitor session 1
```

## 47.2 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 and Operator 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:

```
Device(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:

```
Device(config)# no monitor session 1 source interface gigabitEthernet  
1/0/4 rx
```

## 47.3 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:

```
Device(config)# show monitor session 1
```

## Chapter 48 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.

### 48.1 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.

**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:

```
Device(config)# access-list create 523
```

### 48.2 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:

```
Device(config)# access-list resequence 12 start 1 step 5
```

# 48.3 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:

```
Device (config)#access-list create 50
```

```
Device (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
```

## 48.4 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]
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 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.

## 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:

```
Device (config)#access-list create 600
Device (config)#access-list ip 600 rule 1 permit logging disable sip
192.168.1.100 sip-mask 255.255.255.255
```

## 48.5 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]
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.

## 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 in VLAN 2:

```
Device(config)# access-list create 1100
Device(config)# access-list combined 1100 logging disable rule 1 permit
vid 2 sip 192.168.3.100 sip-mask 255.255.255.255
```

## 48.6 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]

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.

## 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:

```
Device(config)# access-list create 1600
Device(config)# access-list ipv6 1600 rule 1 deny logging disable sip
CDCD:910A:2222:5498:8475:1111:3900:2020 sip-mask ffff:ffff:ffff:ffff
```

# 48.7 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:

```
Device(config)# access-list action 200 rule 1
```

# 48.8 redirect

## Description

The **redirect interface** command is used to define the policy to redirect the matched packets to the desired port. To disable this policy, please use **no redirect interface** command.

## Syntax

**redirect interface** { fastEthernet *port* | gigabitEthernet *port* |  
ten-gigabitEthernet *port* }

**no redirect interface** { fastEthernet *port* | gigabitEthernet *port* |  
ten-gigabitEthernet *port* }

## Parameter

*port*—— The destination port to which the packets will be redirected. The default is All.

## Command Mode

Action Configuration Mode

## Privilege Requirement

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



## Example

Define the policy to redirect the matched packets to port 1/0/1 for rule 1 of ACL 6:

```
Device(config)# access-list action 6 rule 1
Device(config-action)# redirect interface gigabitEthernet 1/0/1
```

## 48.9 traffic

### Description

The **traffic** command is used to limit the rate of the matched packets. To restore the settings to the defaults, please use **no traffic**.

### Syntax

```
traffic traffic-id
traffic traffic-name
```

### Parameter

*traffic-id*— The id of the traffic profile.  
*traffic-name*— The name of the traffic profile.

### 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:

```
Device(config)#access-list action 6 rule 1
Device(config-action)# traffic 1
```

## 48.10 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:

```
Device(config)#access-list action 6 rule 1
Device(config-action)#s-mirror interface gigabitEthernet 1/0/2
```

# 48.11 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:

```
Device(config)#access-list action 6 rule 1
Device(config-action)# qos-remark dscp 30 priority 2
```

## 48.12 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 ] | [ gpon port-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:

```
Device(config)#access-list bind 1 interface vlan 4 gigabitEthernet 1/0/3
```

## 48.13 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:

```
Device(config)# show access-list 20
```

## 48.14 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:

```
Device(config)# show access-list bind
```

## 48.15 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:

```
Device(config)# show access-list status
```

## 48.16 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:

```
Device(config)# show access-list 100 counter
```

## 48.17 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:

```
Device(config)# clear access-list 100
```

# Chapter 49 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.

## 49.1 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
```

## 49.2 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:

```
Device(config)#ipv6 nd snooping vlan 1,4,6-7
```

# 49.3 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)#ipv6 nd snooping max-entries 100
```

## 49.4 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:

```
Device#show ipv6 nd snooping
```

## 49.5 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:

```
Device#show ipv6 nd snooping interface
```

Display the ND Snooping configuration of Gigabit Ethernet port 1/0/5:

```
Device#show ipv6 nd snooping interface gigabitEthernet 1/0/5
```

# Chapter 50 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.

## 50.1 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:

```
Device(config)#ip dhcp filter
```

## 50.2 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 / interface gpon / interface range gpon)

## 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

```
Device(config)#interface gigabitEthernet 1/0/1
Device(Config-if)#ip dhcp filter
```

## 50.3 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 / interface gpon / interface range gpon)

### 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)#ip dhcp filter mac-verify
```

## 50.4 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 / interface gpon / interface range gpon)

### 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)#ip dhcp filter limit rate 20
```

## 50.5 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 Decline 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). Its 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 / interface gpon / interface range gpon)

### 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:

```
Device(config)#interface gigabitEthernet 1/0/2
```

```
Device(config-if)#ip dhcp filter decline 20
```

## 50.6 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 filter server permit-entry** 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 / 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:

```
Device(config)#ip dhcp filter server permit-entry server-ip 192.168.0.100  
client-mac all interface gigabitEthernet 1/0/1
```

# 50.7 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:

```
Device#show ip dhcp filter
```

## 50.8 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 | gpon port]
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the DHCP Filter configuration on port 1/0/3:

```
Device#show ip dhcp filter interface gigabitEthernet 1/0/3
```

## 50.9 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:

```
Device#show ip dhcp filter server permit-entry
```

# Chapter 51 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.

## 51.1 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:

```
Device(config)#ipv6 dhcp filter
```

## 51.2 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 / interface gpon / interface range gpon)

## 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

```
Device(config)#interface gigabitEthernet 1/0/1
Device(config-if)#ipv6 dhcp filter
```

## 51.3 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 / interface gpon / interface range gpon)

## 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:

```
Device(config)#interface gigabitEthernet 1/0/2
```

```
Device(config-if)#ipv6 dhcp filter limit rate 20
```

# 51.4 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 Decline 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). Its 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 / interface gpon / interface range gpon)

## 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:

```
Device(config)#interface gigabitEthernet 1/0/2
Device(config-if)#ipv6 dhcp filter decline 20
```

## 51.5 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 filter server permit-entry** 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 2003::1 and connected port number is 1/0/1:

```
Device(config)#ipv6 dhcp filter server permit-entry server-ip 2003::1
interface gigabitEthernet 1/0/1
```

## 51.6 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:

```
Device#show ipv6 dhcp filter
```

## 51.7 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 [[information interface ][ fastEthernet port |  
gigabitEthernet port | ten-gigabitEthernet port | port-channel port-channel-id  
| gpon port]]
```

### Command Mode

Privileged EXEC Mode and Any Configuration Mode

### Privilege Requirement

None.

### Example

Display the DHCPv6 Filter configuration on port 1/0/3:

```
Device#show ipv6 dhcp filter interface gigabitEthernet 1/0/3
```

## 51.8 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:

```
Device#show ipv6 dhcp filter server permit-entry
```

# Chapter 52 Ethernet OAM Commands

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.

## 52.1 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)#ethernet-oam
```

## 52.2 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:

```
Device(config)# interface gigabitEthernet 1/0/2  
Device(config-if)#ethernet-oam mode passive
```

## 52.3 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:

```
Device(config)# interface gigabitEthernet 1/0/2
Device(config-if)# ethernet-oam link-monitor symbol-period threshold 5
window 30
```

## 52.4 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# ethernet-oam link-monitor frame threshold 6 window
90
```

# 52.5 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, the default value is 1488100 for Gigabit Ethernet port, and the default value is 14881000 for Ten-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 1 and the event detection interval as 148810 frames on Gigabit Ethernet port 1/0/3:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# ethernet-oam link-monitor frame-period threshold 1
window 148810
```

# 52.6 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# ethernet-oam link-monitor frame-seconds threshold 8
window 300
```

## 52.7 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 1/0/3:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# ethernet-oam remote-failure dying-gasp notify disable
```

# 52.8 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:

```
Device(config)# interface gigabitEthernet 1/0/1
Device(config-if)# ethernet-oam remote-loopback received
-remote-loopback process
```

## 52.9 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:

```
Device(config)# interface gigabitEthernet 1/0/3
Device(config-if)# ethernet-oam remote-loopback start
```

## 52.10 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:

```
Device(config)# clear ethernet-oam statistics interface gigabit Ethernet  
1/0/3
```

## 52.11 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:

```
Device(config)# clear ethernet-oam event-log interface gigabitEthernet  
1/0/3
```

# 52.12 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:

```
Device(config)# show ethernet-oam configuration interface  
gigabitEthernet 1/0/2
```

## 52.13 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:

```
Device(config)# show ethernet-oam event-log interface gigabitEthernet  
1/0/2
```

## 52.14 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:

```
Device(config)# show ethernet-oam statistics interface gigabitEthernet
1/0/2
```

# 52.15 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:

```
Device(config)# show ethernet-oam status interface gigabitEthernet
1/0/2
```

## Chapter 53 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).

### 53.1 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:

```
Device(config)# dldp
```

### 53.2 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:

```
Device(config)# dldp interval 10
```

## 53.3 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 device automatically shuts down ports when a unidirectional link is detected. By default, the shut-mode is auto.

manual — The device 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:

```
Device(config)# dldp shut-mode manual
```

## 53.4 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:

```
Device(config)# dldp reset
```

## 53.5 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:

```
Device (config)# interface range gigabitEthernet 1/0/2-4
Device (config-if-range)# dldp
```

## 53.6 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:

```
Device# show dldp
```

## 53.7 show dldp interface

### Description

The **show dldp interface** command is used to display the configuration and state of all the Ethernet ports.

### 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:

```
Device# show dldp interface
```



# Chapter 54 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.

## 54.1 snmp-server

### Description

The **snmp-server** command is used to enable the SNMP function. By default, it is disabled. To return to the default configuration, please use **no snmp-server** command.

### Syntax

**snmp-server**  
**no snmp-server**

### Command Mode

Global Configuration Mode

### Privilege Requirement

Only Admin level users have access to these commands.

### Example

Enable the SNMP function:

```
Device(config)# snmp-server
```

## 54.2 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 device, 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:

```
Device(config)# snmp-server view view1 1.3.6.1.6.3.20 include
```

## 54.3 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 device'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:

```
Device(config)# snmp-server group group1 smode v3 slev authNoPriv
read viewDefault write viewDefault notify viewDefault
```

Delete group 1:

```
Device(config)# no snmp-server group group1 smode v3 slev authNoPriv
```

## 54.4 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 device 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 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 and DES options. None indicates no privacy method is used, and DES indicates DES encryption method is used. By default, the Privacy Mode is “none”.

*encrypt-pwd* — Privacy 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.

## 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:

```
Device(config)# snmp-server user admin local group2 smode v3 slev  
authPriv cmode MD5 cpwd 11111 emode DES epwd 22222
```

## 54.5 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:

```
Device(config)# snmp-server community public read-write viewDefault
```

## 54.6 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 [ 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.

*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 device retries an inform request, ranging from 1 to 255. The device 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 device 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 device to wait as 1000 seconds, and the retries time as 100:

```
Device(config)# snmp-server host 192.168.0.146 162 admin smode v2c  
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 device to wait as 1000 seconds, and the retries time as 100:

```
Device(config)# snmp-server host fe80::1234 162 admin smode v2c type  
inform retries 100 timeout 1000
```

## 54.7 snmp-server engineID

### Description

The **snmp-server engineID** command is used to configure the local and remote engineID of the device. 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 device. Its length ranges from 10 to 64 hexadecimal characters, which must be even number meanwhile.

*remote-engineID*— Remote Engine ID for the device. The Engine ID is a unique alphanumeric string used to identify the SNMP engine on the remote device which receives informs from the device. 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:



```
Device(config)# snmp-server engineID local 1234567890 remote  
abcdef123456
```

## 54.8 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 device 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 device system. The trap can be triggered when you reboot the device.

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 device:

## 54.9 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 { bandwidth-control | 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 device 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 device 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 bandwidth-control trap for the device:

```
Device(config)# snmp-server traps bandwidth-control
```

## 54.10 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 device. 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 device. 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 device. 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 device. 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 device. 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 device. 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 device:

```
Device(config)# snmp-server traps ddm
```

## 54.11 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 device:

```
Device(config)# snmp-server traps vlan
```

Enable VLAN-created trap only for the device:

```
Device(config)# snmp-server traps vlan create
```

# 54.12 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 | acl }

**no snmp-server traps security** { dhcp-filter | ip-mac-binding }

## Parameter

dhcp-filter — Triggered when the DHCPv4 Filter feature is enabled and the device receives DHCP packets from an illegal DHCP server.

ip-mac-binding — Triggered when the ARP Inspection feature is enabled and the device receives an illegal ARP packet, or the IPv4 Source Guard feature is enabled and the device 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 device:

```
Device(config)# snmp-server traps security dhcp-filter
```

# 54.13 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 device 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 device:

```
Device(config)# snmp-server traps acl
```

# 54.14 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 device 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 device:

```
Device(config)# snmp-server traps ip change
```

## 54.15 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 disabled.

### 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:

```
Device(config)# interface gigabitEthernet 1/0/3
```

```
Device(config-if)# snmp-server traps link-status
```

## 54.16 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 device 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:

```
Device(config)# rmon history 1-3 interface gigabitEthernet 1/0/2 interval  
100 owner owner1
```



## 54.17 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:

```
Device(config)# rmon event 1-4 user user1 description description1 type  
log owner owner1
```

## 54.18 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 device 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:

```
Device(config)#rmon alarm 1-3 stats-index 2 owner owner1 interval 100
```

## 54.19 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 gigabitEthernet 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:

```
Device(config)#rmon statistics 1-3 interface gigabitEthernet 1/0/1 owner  
owner1 status valid
```

## 54.20 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:

```
Device# show snmp-server
```

## 54.21 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:

```
Device# show snmp-server view
```

## 54.22 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:

```
Device# show snmp-server group
```

## 54.23 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:

```
Device# show snmp-server user
```

## 54.24 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:

```
Device# show snmp-server community
```

## 54.25 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:

```
Device# show snmp-server host
```

## 54.26 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:

```
Device# show snmp-server engineID
```

## 54.27 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:

```
Device# show rmon history
```

## 54.28 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:

```
Device# show rmon event 1-4
```

## 54.29 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:

```
Device# show rmon alarm 1-2
```

# 54.30 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:

```
Device#show rmon statistics 1
```

## Chapter 55 ND Detection Commands

The ND Detection feature allows the device 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.

### 55.1 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:

```
Device(config)#ipv6 nd detection
```

### 55.2 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:

```
Device(config)#ipv6 nd detection vlan 1,4,6-7
```

## 55.3 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:

```
Device(config)#ipv6 nd detection vlan 1,4,6-7 logging
```

## 55.4 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 device, 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:

```
Device(config)#interface range gigabitEthernet 1/0/2-5
Device(config-if-range)#ipv6 nd detection trust
```

## 55.5 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:

```
Device(config)#show ipv6 nd detection
```

## 55.6 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:

```
Device(config)#show ipv6 nd detection interface gigabitEthernet 1/0/1
```

Display the configuration of all Ethernet ports:

```
Device(config)#show ipv6 nd detection interface
```

# 55.7 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.

```
Device(config)#show ipv6 nd detection statistics
```

## 55.8 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.

```
Device(config)#show ipv6 nd detection vlan
```

# Chapter 56 System Log Commands

The log information will record the settings and operation of the device respectively for you to monitor operation status and diagnose malfunction.

## 56.1 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 device. 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 device 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:

```
Device(config)#logging buffer
```

## 56.2 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:

```
Device(config)#logging buffer level 5
```

# 56.3 logging file flash

## Description

The **logging file flash** command is used to store the log messages in a file in the flash on the device. 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 device 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:

```
Device(config)#logging file flash
```

# 56.4 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:

```
Device(config)#logging file flash frequency periodic 10
```

## 56.5 logging file flash level

### Description

The **logging file flash level** command is used to specify the system log message severity level. Messages with 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 :

```
Device(config)#logging file flash level 7
```

## 56.6 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 level*

**no logging host index** *idx*

## Parameter

*idx*—— The index of the log host. The device 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.

## 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:

```
Device(config)# logging host index 2 192.168.0.148 5
```

# 56.7 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:

```
Device(config)# logging console
```

# 56.8 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 console 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:

```
Device(config)# logging console level 7
```

## 56.9 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:

```
Device(config)# no logging monitor
```

## 56.10 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:

```
Device(config)# logging monitor level 7
```

## 56.11 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:

```
Device(config)# clear logging buffer
```

## 56.12 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:

```
Device(config)# show logging local-config
```

## 56.13 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:

```
Device(config)# show logging loghost 2
```

## 56.14 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:

```
Device(config)# show logging buffer level 5
```

## 56.15 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:

```
Device(config)# show logging flash level 3
```