
GPON Series OLT

CLI USER MANUAL

Version V1.1

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1. Access to OLT

You can access to OLT by CLI via console cable or telnet. This chapter introduces how to access to OLT CLI via console cable.

1. Connect PC to OLT console port by console cable.
2. Run hypertextual or other simulation tools such as secureCRT and Putty in PC. Set parameters as follows.

✂ Baudrate: **115200**

Data bits: **8**

✂ Parity: **none**

✂ Stop bits: **1**

✂ Follow control: **none**



COM port properties

After turned on the power, there is boot information printing. After startup, press enter and

input username and password to login.

Notice:

The default username and password of CLI both are admin. For example,

Login: admin

Password: admin

GPON> enable

Password: admin

GPON#

Input commands to configure or check device's status. Input "?" any time you need help.

This document will introduce each command Begin at next chapter.

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2. Command Line Interface

2.1 Abstract

GPON provides command line interface for configuration and management. The following is its specialities.

- Configure from console port.
- Input “?” any time you need help.
- Provide network test command, such as ping, for diagnosing connection.
- Provide FTP service for uploading and downloading files.
- Provide Doskey analogous function, you can execute a history command.
- Support ambiguous keywords searching, you just need to input unconflict keywords and press “tab” or “?”.

2.2 CLI configuration mode

GPON provides three configuration modes.

- Privileged mode
- Global configuration mode
- Interface configuration mode

The following table shows specialties, commands to enter and prompts.

CLI mode	Specialty	Prompt	Command to enter	Command to exit
Privileged mode	Show configurations and execute system commands	GPON#		exit
Global configuration mode	Configure system parameters	GPON(config)#	configure terminal	exit
Interface configuration mode	Configure interface parameters	GPON(config-if)#	interface <i>{interface_type slot/port}</i>	exit

2.3 CLI specialities

2.3.1 Online help

GPON CLI provides the following online help:

- Completely help
- Partly help

You can get some help information of CLI with the help above.

(1) Input “?” to get all commands and illustrations at any configuration mode.

GPON(config)#

access-list	Add an access list entry.
alarm	Specify alarm.
banner	Set banner string
channel-group	Etherchannel/port bundling configuration.
clean	Specify clean operation.
clear	Specific save syslog to flash.
copy	Copy configuration
debug	System debugging functions.
enable	Modify enable password parameters
enable-password	Set your enable password.
end	Exit current mode and down to previous mode
erase	Erase info from flash.
event	Specify event.
exec	exec system cmd
exit	Exit current mode and down to previous mode
fan	Specify olt fan management.
gateway	system manage gateway.
help	Description of the interactive help system
hostname	Set system's network name
igmp	Global IP configuration subcommands
interface	Select an interface to configure.
ip	IP information
ipmc	Global IP configuration subcommands
isolate	the isolate configuration information.Set switchport characteristics.
I3	set ecmp dip reg
line	Configure a terminal line
list	Print command list
log	Logging control
login-password	Reset your login password.
mac	Configure the MAC address table.
mc	pim add ipmc group
monitor	Configure SPAN monitoring.
no	Negate a command or set its default.
password	Assign the terminal connection password
pim	pim add ipmc group
ping	ping command
profile	Select profile to configure.
queue-scheduler	Configure egress queueing policy.

quit	Exit current mode and down to previous mode
reboot	Reboot the switch.
save	Specific save syslog to flash.
service	Set up miscellaneous service
set	Specify set command.
show	Show information
snmp-server	Snmp server config
spanning-tree	Config STPD information.
storm-control	Specify the storm control.
switch	switch to shell
syslog	Specific system log save level,which syslog level not less than level will save to flash.
tftp	Specify tftp download.
time	Specify system time configuration.
upgrade	Specify upgrade system.
upload	Upload file for software or user config.
user	Manage System's users.
vlan	Vlan commands.
write	Write running configuration to memory, network, or terminal

- (2) Input "?" behind a command, it will display all key words and illustrations when this site should be a key word.

GPON(config)# interface

aux	aux interface.
gpon	Specify gpon interface
gigabitethernet	GigabitEthernet IEEE 802.3z.
vlan	Config vlan information.

- (3) Input "?" behind a command, it will display description of parameters when this site should be a parameter.

GPON(config)# access-list

<0-999>	IP standard access list.
<1000-1999>	IP extended access list.
<2000-2999>	L2 packet header access list.
<3000-3999>	User define field access list.
<4000-4999>	Vlan translation access list.
<5000-5999>	Port business access list.
<6000-6999>	Port quality of service access list.
<7000-7999>	Port lpmc Vlan translation of service access list.

- (4) Input a character string end with "?", it will display all key words that Begin at this character string.

GPON(config)# e

enable	Modify enable password parameters
enable-password	Set your enable password.
end	End current mode and change to enable mode.
erase	Erase info from flash.

- | | |
|-------|---|
| event | Specify event |
| exec | Exec system cmd |
| exit | Exit current mode and down to previous mode |
- (5) Input a command and a character string end with "?", it will display all key words Begin at this character string.
- ```
GPON(config)# show ver
version show version command.
```
- (6) Input a character string end with "Tab", it will display completely key words that Begin at this character string when it is unique.

### 2.3.2 Display specialities

GPON CLI provides the following display specialities. There is a pause when the information displays a whole screen at a time. Users have two ways to choose.

| Operation      | function                        |
|----------------|---------------------------------|
| Input <Ctrl+C> | Stop displaying and executing.  |
| Input any key  | Continue displaying next screen |

### 2.3.3 History commands

CLI provides Doskey analogous function. It can save history commands that executed before. Users can use direction key to invoke history command. The device can save at most ten commands.

| Operation                | action                             | result                                                      |
|--------------------------|------------------------------------|-------------------------------------------------------------|
| Display history commands | <b>history</b>                     | Display all history commands.                               |
| Visit previous command   | Up direction key "↑" or <Ctrl+P>   | Display previous command if there is early history command. |
| Visit next command       | Down direction key "↓" or <Ctrl+N> | Display next command if there is later history command.     |

### 2.3.4 Error messages

Every command will be executed if it passes syntax check. Otherwise it will come out error message. The following table shows some frequent errors.

| Error messages      | Reasons                 |
|---------------------|-------------------------|
| Unknown command     | No this command         |
|                     | No this key word        |
|                     | Parameter type error    |
|                     | Parameter out of range  |
| Command incomplete  | Command is not complete |
| Too many parameters | Too many parameters     |
| Ambiguous command   | Command is ambiguous    |

### 2.3.5 Edit specialities

CLI provides basic edit function. Every command supports maxum 256 characters. The following table shows how to edit.

| operation                                                          | function                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Generally input                                                    | Insert character at cursor position and move cursor to right if edit buffer has enough space.                                                                                                                                                                                                                                    |
| Backspace key                                                      | Delete the character in front of cursor.                                                                                                                                                                                                                                                                                         |
| Left direction key ← or <Ctrl+B>                                   | Cursor moves one character position towards the left.                                                                                                                                                                                                                                                                            |
| Right direction key → or <Ctrl+F>                                  | Cursor moves one character position towards the right.                                                                                                                                                                                                                                                                           |
| Up direction key ↑ or <Ctrl+P><br>Down direction key ↓ or <Ctrl+N> | Display history command.                                                                                                                                                                                                                                                                                                         |
| Tab key                                                            | Input incomplete key words end with Tab key, CLI will provide partly help.<br>If it is unique, the key word which matches what you input will be used and display in another row.<br>If it should be parameter, or the key word is mismatched or matched but not unique, CLI will use what you input and display in another row. |



## 3. Port Configuration

### 3.1 Port configuration

#### 3.1.1 Enter port configure mode

Begin at privileged configuration mode, input the following commands to enter port configuration mode.

|        | Command                                            | Function                            |
|--------|----------------------------------------------------|-------------------------------------|
| Step 1 | <b>configure terminal</b>                          | Enter global configuration mode.    |
| Step 2 | <b>interface</b> <i>{interface_type slot/port}</i> | Enter interface configuration mode. |

#### 3.1.2 Enable /Disable port

You can use these commands to enable or disable port. The ports are enabled by default. If you want a port not to transfer data, you can shutdown it.

Begin at privileged configuration mode, enable or disable ports as the following table shows.

|         | Command                                                 | Function                            |
|---------|---------------------------------------------------------|-------------------------------------|
| Step 1  | <b>configure terminal</b>                               | Enter global configuration mode.    |
| Step 2  | <b>interface</b> <i>{interface_type slot/port}</i>      | Enter interface configuration mode. |
| Step 3a | <b>no shutdown</b>                                      | Enable port                         |
| Step 3b | <b>shutdown</b>                                         | Disable port.                       |
| Step 4  | <b>exit</b>                                             | Exit to gloable configuration mode. |
| Step 5  | <b>show interface</b> <i>{interface_type slot/port}</i> | Show interface configurations.      |
| Step 6  | <b>write</b>                                            | Save configurations.                |

#### 3.1.3 Configure port description

This command is used to configure port description. There is no description by default.

Begin at privileged configuration mode, configure port description as the following table shows.

|        | Command                                            | Function                            |
|--------|----------------------------------------------------|-------------------------------------|
| Step 1 | <b>configure terminal</b>                          | Enter global configuration mode.    |
| Step 2 | <b>interface</b> <i>{interface_type slot/port}</i> | Enter interface configuration mode. |

|                |                                                  |                                    |
|----------------|--------------------------------------------------|------------------------------------|
| <b>Step 3a</b> | <b>description</b> <string>                      | Configure port description.        |
| <b>Step 3b</b> | <b>no description</b>                            | Delete description.                |
| <b>Step 4</b>  | <b>exit</b>                                      | Exit to global configuration mode. |
| <b>Step 5</b>  | <b>show interface</b> {interface_type slot/port} | Show interface configurations.     |
| <b>Step 6</b>  | <b>write</b>                                     | Save configurations.               |

### 3.1.4 Configure port duplex mode

Duplex includes full duplex and half duplex. When it works at full duplex, port can transmit and receive data at the same time; when it works at half duplex, port can only transmit or receive data at the same time. The duplex is auto by default.

Begin at privileged configuration mode, configure port duplex mode as the following table shows.

|                | <b>Command</b>                                   | <b>Function</b>                     |
|----------------|--------------------------------------------------|-------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                        | Enter global configuration mode.    |
| <b>Step 2</b>  | <b>interface</b> {interface_type slot/port}      | Enter interface configuration mode. |
| <b>Step 3a</b> | <b>duplex</b> { auto   full   half }             | Configure port duplex mode.         |
| <b>Step 3b</b> | <b>no duplex</b>                                 | Reset duplex mode to default.       |
| <b>Step 4</b>  | <b>exit</b>                                      | Exit to global configuration mode.  |
| <b>Step 5</b>  | <b>show interface</b> {interface_type slot/port} | Show interface configurations.      |
| <b>Step6</b>   | <b>write</b>                                     | Save configurations.                |

### 3.1.5 Configure port speed

When port speed mode is auto, the actual speed of port is determined by the automated negotiation result with opposite port. The speed is auto by default.

Begin at privileged configuration mode, configure port speed as the following table shows.

|                | <b>Command</b>                              | <b>Function</b>                     |
|----------------|---------------------------------------------|-------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                   | Enter global configuration mode.    |
| <b>Step 2</b>  | <b>interface</b> {interface_type slot/port} | Enter interface configuration mode. |
| <b>Step 3a</b> | <b>speed</b> { 10   100   1000   auto }     | Configure port speed.               |
| <b>Step 3b</b> | <b>no speed</b>                             | Reset port speed to default.        |
| <b>Step 4</b>  | <b>exit</b>                                 | Exit to global configuration mode.  |
| <b>Step 5</b>  | <b>show interface</b> {interface_type       | Show interface configurations.      |

|               |                  |                      |
|---------------|------------------|----------------------|
|               | <i>slot/port</i> |                      |
| <b>Step 6</b> | <b>write</b>     | Save configurations. |

### 3.1.6 Configure port rate limitation

Begin at privileged configuration mode, configure port rate limitation as the following table shows.

|                | <b>Command</b>                                          | <b>Function</b>                                                                                    |
|----------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                               | Enter global configuration mode.                                                                   |
| <b>Step 2</b>  | <b>interface</b> <i>{interface_type slot/port}</i>      | Enter interface configuration mode.                                                                |
| <b>Step 3a</b> | <b>line-rate</b> <i>{ingress   egress} bps value</i>    | Configure port rate limitation. Value range: 64-1000000, it should be integral multiple of 64kbps. |
| <b>Step 3b</b> | <b>no line-rate</b> <i>{ingress   egress}</i>           | Delete port rate limitation configurations.                                                        |
| <b>Step 4</b>  | <b>exit</b>                                             | Exit to global configuration mode.                                                                 |
| <b>Step 5</b>  | <b>show interface</b> <i>{interface_type slot/port}</i> | Show interface configurations.                                                                     |
| <b>Step6</b>   | <b>write</b>                                            | Save configurations.                                                                               |

### 3.1.7 Configure port VLAN mode

Each port has three VLAN mode, access, trunk and hybrid.

Access mode is usually used for port that connects with PC or other terminals, only one VLAN can be set up. Trunk mode is usually used for port that connects with switch; one or more VLAN can be set up. Hybrid mode can be used for port that connects with PC or switch. Default VLAN mode is hybrid.

Begin at privileged configuration mode, configure port VLAN mode as the following table shows.

|                | <b>Command</b>                                           | <b>Function</b>                     |
|----------------|----------------------------------------------------------|-------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                | Enter global configuration mode.    |
| <b>Step 2</b>  | <b>interface</b> <i>{interface_type slot/port}</i>       | Enter interface configuration mode. |
| <b>Step 3a</b> | <b>switchport mode</b> <i>{ access   trunk   hybrid}</i> | Configure port VLAN mode.           |
| <b>Step 3b</b> | <b>no switchport mode</b>                                | Reset VLAN mode to default.         |
| <b>Step 4</b>  | <b>exit</b>                                              | Exit to global configuration mode.  |
| <b>Step 5</b>  | <b>show interface</b> <i>{interface_type slot/port}</i>  | Show interface configurations.      |

|               |              |                      |
|---------------|--------------|----------------------|
| <b>Step 6</b> | <b>write</b> | Save configurations. |
|---------------|--------------|----------------------|

**Notice:**

All VLAN configurations will lose when you change port VLAN mode.

### 3.1.8 Configure hybrid port VLAN

Hybrid port can belong to several VLAN. It can be used to connect with switch or router, and also terminal host.

Begin at privileged configuration mode, configure hybrid port VLAN as the following table shows.

|                | <b>Command</b>                                                             | <b>Function</b>                     |
|----------------|----------------------------------------------------------------------------|-------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                  | Enter global configuration mode.    |
| <b>Step 2</b>  | <b>interface</b> <i>{interface_type slot/port}</i>                         | Enter interface configuration mode. |
| <b>Step 3a</b> | <b>switchport hybrid vlan</b> <i>vlan_id</i><br><b>{tagged   untagged}</b> | Add specific VLAN to hybrid port.   |
| <b>Step 3b</b> | <b>no switchport hybrid vlan</b> <i>vlan_id</i>                            | Remove VLAN from port.              |
| <b>Step 4</b>  | <b>exit</b>                                                                | Exit to global configuration mode.  |
| <b>Step 5</b>  | <b>show interface</b> <i>{interface_type</i><br><i>slot/port}</i>          | Show interface configurations.      |
| <b>Step 6</b>  | <b>write</b>                                                               | Save configurations.                |

**Notice:**

You must configure PVID for the port that if it is configured untagged mode. PVID is the same as VLAN ID. Please refer to 3.1.10.

### 3.1.9 Configure trunk port VLAN

Trunk mode port can belong to several VLAN. It is usually used to connect with switches routers.

Begin at privileged configuration mode, configure trunk port VLAN as the following table shows.

|                | <b>Command</b>                                                    | <b>Function</b>                                          |
|----------------|-------------------------------------------------------------------|----------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                         | Enter global configuration                               |
| <b>Step 2</b>  | <b>interface</b> <i>{interface_type slot/port}</i>                | Enter interface configuration                            |
| <b>Step 3a</b> | <b>switchport trunk vlan</b> <i>vlan_id</i>                       | Add specific VLAN to trunk port.<br>VLAN mode is tagged. |
| <b>Step 3b</b> | <b>no switchport trunk vlan</b> <i>vlan_id</i>                    | Remove VLAN from port.                                   |
| <b>Step 5</b>  | <b>exit</b>                                                       | Exit to global configuration mode.                       |
| <b>Step 6</b>  | <b>show interface</b> <i>{interface_type</i><br><i>slot/port}</i> | Show interface configurations.                           |

|               |              |                      |
|---------------|--------------|----------------------|
| <b>Step 7</b> | <b>write</b> | Save configurations. |
|---------------|--------------|----------------------|

**Notice:**

If PVID of trunk mode port is the same as VLAN ID, the VLAN will add to the port as untagged mode.

**3.1.10 Configure port PVID**

Only under hybrid mode and trunk mode can set up PVID.

Begin at privileged configuration mode. Configure port PVID as the following table shows.

|                | <b>Command</b>                                               | <b>Function</b>                                |
|----------------|--------------------------------------------------------------|------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                    | Enter global configuration.                    |
| <b>Step 2</b>  | <b>interface</b> <i>{interface_type slot/port}</i>           | Enter interface configuration mode.            |
| <b>Step 3a</b> | <b>switchport {hybrid trunk} pvid vlan</b><br><i>vlan_id</i> | Configure hybrid mode or trunk mode port PVID. |
| <b>Step 3b</b> | <b>no switchport {hybrid trunk} pvid</b>                     | Reset hybrid or trunk port PVID to default.    |
| <b>Step 4</b>  | <b>exit</b>                                                  | Exit to global configuration mode.             |
| <b>Step 5</b>  | <b>show interface</b> <i>{interface_type slot/port}</i>      | Show interface configurations.                 |
| <b>Step 6</b>  | <b>write</b>                                                 | Save configurations.                           |

**3.1.11 Configure access port VLAN**

Only one untagged mode VLAN can be set to access port. Port's PVID is the same as VLAN ID.

Begin at privileged configuration mode, configure access port VLAN as the thable shows.

|                | <b>Command</b>                                          | <b>Function</b>                     |
|----------------|---------------------------------------------------------|-------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                               | Enter global configuration mode.    |
| <b>Step 2</b>  | <b>interface</b> <i>{interface_type slot/port}</i>      | Enter interface configuration mode. |
| <b>Step 3a</b> | <b>switchport access vlan</b> <i>vlan_id</i>            | Configure access port VLAN.         |
| <b>Step 3b</b> | <b>no switchport access vlan</b>                        | Reset access port VLAN to default.  |
| <b>Step 4</b>  | <b>exit</b>                                             | Exit to global configuration mode.  |
| <b>Step 5</b>  | <b>show interface</b> <i>{interface_type slot/port}</i> | Show interface configurations.      |
| <b>Step 6</b>  | <b>write</b>                                            | Save configurations.                |

**3.1.12 Configure port flow control**

Begin at privileged configuration mode, configure port flow control as the following table shows.

|         | Command                                                 | Function                            |
|---------|---------------------------------------------------------|-------------------------------------|
| Step 1  | <b>configure terminal</b>                               | Enter global configuration mode.    |
| Step 2  | <b>interface</b> <i>{interface_type slot/port}</i>      | Enter interface configuration mode. |
| Step 3a | <b>flowcontrol on</b>                                   | Enable flow control function.       |
| Step 3b | <b>no flowcontrol</b>                                   | Disable flow control function.      |
| Step 4  | <b>exit</b>                                             | Exit to global configuration mode.  |
| Step 5  | <b>show interface</b> <i>{interface_type slot/port}</i> | Show interface configurations.      |
| Step 6  | <b>write</b>                                            | Save configurations.                |

### 3.1.13 Configure port broadcast suppression

Begin at privileged configuration mode, configure port broadcast suppression as the following table shows.

|         | Command                                                 | Function                                                                                               |
|---------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                               | Enter global configuration mode.                                                                       |
| Step 2  | <b>interface</b> <i>{interface_type slot/port}</i>      | Enter interface configuration mode.                                                                    |
| Step 3a | <b>storm-control broadcast bps value</b>                | Configure broadcast suppression.<br>Value range: 64-1000000, it should be integral multiple of 64kbps. |
| Step 3b | <b>no storm-control broadcast</b>                       | Remove broadcast suppression.                                                                          |
| Step 4  | <b>exit</b>                                             | Exit global configuration mode.                                                                        |
| Step 5  | <b>show interface</b> <i>{interface_type slot/port}</i> | Show interface configurations.                                                                         |
| Step 6  | <b>write</b>                                            | Save configurations.                                                                                   |

### 3.1.14 Configure port multicast suppression

Begin at privileged configuration mode, configure port multicast suppression as the following table shows.

|         | Command                                            | Function                            |
|---------|----------------------------------------------------|-------------------------------------|
| Step 1  | <b>configure terminal</b>                          | Enter global configuration mode.    |
| Step 2  | <b>interface</b> <i>{interface_type slot/port}</i> | Enter interface configuration mode. |
| Step 3a | <b>storm-control multicast bps value</b>           | Configure multicast suppression.    |

|         |                                                         |                                                                    |
|---------|---------------------------------------------------------|--------------------------------------------------------------------|
|         |                                                         | Value range: 64-1000000, it should be integral multiple of 64kbps. |
| Step 3b | <b>no storm-control multicast</b>                       | Remove multicast suppression.                                      |
| Step 4  | <b>exit</b>                                             | Exit global configuration mode.                                    |
| Step 5  | <b>show interface</b> <i>{interface_type slot/port}</i> | Show interface configurations.                                     |
| Step 6  | <b>write</b>                                            | Save configurations.                                               |

### 3.1.15 Configure port unknown unicast suppression

Begin at privileged configuration mode, configure port unknown unicast suppression as the following table shows.

|         | <b>Command</b>                                          | <b>Function</b>                                                                                              |
|---------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                               | Enter global configuration mode.                                                                             |
| Step 2  | <b>interface</b> <i>{interface_type slot/port}</i>      | Enter interface configuration mode.                                                                          |
| Step 3a | <b>storm-control unicast bps</b> <i>value</i>           | Configure unknown unicast suppression.<br>Value range: 64-1000000, it should be integral multiple of 64kbps. |
| Step 3b | <b>no storm-control unicast</b>                         | Remove unknown unicast suppression.                                                                          |
| Step 4  | <b>exit</b>                                             | Exit global configuration mode.                                                                              |
| Step 5  | <b>show interface</b> <i>{interface_type slot/port}</i> | Show interface configurations.                                                                               |
| Step 6  | <b>write</b>                                            | Save configurations.                                                                                         |

### 3.1.16 Configure port isolation

With this function, customers can add ports to a same isolation group so that these ports can be isolated among L2 and L3 steams. This will improve security of network and provide flexible networking scheme.

Begin at privileged configuration mode, configure port isolation as the following table shows.

|         | <b>Command</b>                                     | <b>Function</b>                     |
|---------|----------------------------------------------------|-------------------------------------|
| Step 1  |                                                    |                                     |
| Step 2  | <b>configure terminal</b>                          | Enter global configuration mode.    |
|         | <b>interface</b> <i>{interface_type slot/port}</i> | Enter interface configuration mode. |
| Step 3a | <b>switchport isolate</b>                          | Add port to isolation group.        |
| Step 3b | <b>no switchport isolate</b>                       | Remove port from isolation          |

|                |                                                         |                                    |
|----------------|---------------------------------------------------------|------------------------------------|
|                |                                                         | group.                             |
| <b>Step 4</b>  | <b>exit</b>                                             | Exit to global configuration mode. |
| <b>Step 5a</b> | <b>show interface</b> <i>{interface_type slot/port}</i> | Show interface configurations.     |
| <b>Step 5b</b> | <b>show isolate port</b>                                | Show isolation group.              |
| <b>Step 6</b>  | <b>write</b>                                            | Save configurations.               |

### 3.1.17 Configure port loopback

Begin at privileged configuration mode, configure port loopback as the following table shows.

|               | <b>Command</b>                                     | <b>Function</b>                                                                                                   |
|---------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                          | Enter global configuration mode.                                                                                  |
| <b>Step 2</b> | <b>interface</b> <i>{interface_type slot/port}</i> | Enter interface configuration mode.                                                                               |
| <b>Step 3</b> | <b>loopback</b> [internal   external   outside]    | Internal means cpu inner loopback.<br>External means cpu outer loopback.<br>Outside means external data loopback. |
| <b>Step 4</b> | <b>exit</b>                                        | Exit to global configuration mode.                                                                                |

#### Notice:

When testing port loopback function, please disable port loopback detection. Please refer to 3.1.18.

### 3.1.18 Configure port loopback detection

Begin at privileged configuration mode, configure port loopback detection as the following table shows.

|                | <b>Command</b>                | <b>Function</b>                      |
|----------------|-------------------------------|--------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>     | Enter global configuration mode.     |
| <b>Step 2a</b> | <b>loopback detect enable</b> | Enable port loopback detection.      |
| <b>Step 2b</b> | <b>no loopback detect</b>     | Disable port loopback detection.     |
| <b>Step 3</b>  | <b>show loopback detect</b>   | Show port loopback detection status. |
| <b>Step 4</b>  | <b>exit</b>                   | Exit to global configuration mode.   |

### 3.1.19 Configure port jumboframe

Begin at privileged configuration mode, configure jumboframe that the port can pass as the following table shows.



|         | Command                                            | Function                                                                                                                                                               |
|---------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                          | Enter global configuration mode.                                                                                                                                       |
| Step 2  | <b>interface</b> <i>{interface_type slot/port}</i> | Enter interface configuration mode.                                                                                                                                    |
| Step 3a | <b>jumboframe enable</b>                           | Enable jumboframe transmission. By default, switch chipset supports transmitting maximum 1536 bytes frame; PON chipset supports transmitting maximum 2047 bytes frame. |
| Step 3b | <b>no jumboframe</b>                               | Disable jumboframe transmission.                                                                                                                                       |
| Step 4  | <b>exit</b>                                        | Exit to global configuration mode.                                                                                                                                     |

### 3.1.20 Show port statistics

Begin at privileged configuration mode, show port statistics as the following table shows.

|        | Command                                            | Function                            |
|--------|----------------------------------------------------|-------------------------------------|
| Step 1 | <b>configure terminal</b>                          | Enter global configuration mode.    |
| Step 2 | <b>interface</b> <i>{interface_type slot/port}</i> | Enter interface configuration mode. |
| Step 3 | <b>show statistics</b>                             | Show port statistics.               |
| Step 4 | <b>exit</b>                                        | Exit to global configuration mode.  |

### 3.1.21 Clean port statistics

Begin at privileged configuration mode, clean port statistics as the following table shows.

|        | Command                                                 | Function                         |
|--------|---------------------------------------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b>                               | Enter global configuration mode. |
| Step 2 | <b>show interface</b> <i>{interface_type slot/port}</i> | Show port statistics.            |
| Step 3 | <b>clean statistics</b>                                 | Clean port statistics.           |

### 3.1.22 Show interface configurations

| Operation                      | Command                                                 |
|--------------------------------|---------------------------------------------------------|
| Show interface configurations. | <b>Show interface</b> <i>{interface_type slot/port}</i> |

In the system, interface gigabitethernet 0/1~0/x stands for uplink port 1~x. Interface gpon0/1~0/x stands for GPON port 1~x.

For example, display configurations of uplink port 5.

```
GPON(config)# show interface gigabitethernet 0/5
```

```
Interface gigabitEthernet0/5's information.
```

```
GigabitEthernet0/5 current state : Down
Hardware Type is Gigabit Ethernet, Hardware address is 0:0:0:0:0:0
The Maximum Transmit Unit is 1500
Media type is twisted pair, loopback not set
Port hardware type is 1000Base-TX
Link speed type: autonegotiation, Link duplex type: autonegotiation
Current link state: Down
Current autonegotiation mode: enable
Current link speed: 1000Mbps, Current link mode: half-duplex
Flow Control: disable MDIX Mode: force
The Maximum Frame Length is 1536
Broadcast storm control: 512 fps
Multicast storm control: disable
Unknow unicast storm control: 512 fps
Ingress line rate control: no limit
Egress line rate control: no limit
mac address learn state : enable, no limit
Port priority: 0
PVID: 1
Port combo mode: null
Isolate member : yes
Port link-type: hybrid
Untagged VLAN ID: 1
Tagged VLAN ID : 100
Last 300 seconds input: 0 packets 0 bytes
Last 300 seconds output: 0 packets 0 bytes
Input(total): 1113473691 packets, 4081075466 bytes
0 broadcasts, 1113473687 multicasts
Input(normal): 1113473691 packets, 4081075466 bytes
0 broadcasts, 1113473687 multicasts, 0 pauses
Input: 0 input errors, 0 runts, 0 giants, 0 throttles, 4 CRC
0 overruns, 0 aborts, 0 ignored, 0 parity errors
Output(total): 4371 packets, 351860 bytes
1280 broadcasts, 3091 multicasts, 0 pauses
Output(normal): 4371 packets, 351860 bytes
1280 broadcasts, 3091 multicasts, 0 pauses
Output: 0 output errors, 0 underruns, 0 buffer failures
0 aborts, 0 deferred, 0 collisions, 0 late collisions
0 lost carrier, 0 no carrier
```

## 3.2 Example

Configure VLAN and broadcast suppression of trunk mode port.

### 1. Requirement

Uplink port 1 of OLT connects to switch, port mode is trunk. It can pass through VLAN 20 and VLAN 100, add VLAN tag 123 to untagged streams. Rate of broadcast streams is 64bps.

### 2. Framework



### 3. Steps

(1) Enter interface configuration mode.

```
GPON(config)# interface gigabitethernet 0/1
```

```
GPON(config-if-ge0/1) #
```

(2) configure port mode and add VLAN

```
GPON(config-if-ge0/1) # switchport mode trunk
```

```
GPON(config-if-ge0/1) # switchport trunk vlan 20
```

```
GPON(config-if-ge0/1) # switchport trunk vlan 100 PS.
```

The VLAN must be added first. Please refer to 4.1.1.

(3)configure port PVID

```
GPON(config-if-ge0/1) # switchport trunk pvid vlan 123
```

(4)configure port broadcast suppression

```
GPON(config-if-ge0/1) # storm-control broadcast pps 64
```

## 4. Port Aggregation Configuration

### 4.1 Introduction

Port aggregation is that several ports constitute an aggregation group so that it can share responsibility for traffic load in each port. When one link is broken down, the traffic will switch to another automatically to ensure traffic is unblocked. It seems that the aggregation group is the same as a port.

In an aggregation group, member ports must have the same speed, the same duplex mode and the same basic configurations. Basic configurations contain:

- (1) STP configurations such as STP status, link properties (e.g. p2p port), priority, cost, message format, loopdetect status, edge port or not.
- (2) QoS configurations such as rate limiting, priority mark, 802.1p priority, congestion avoidance.
- (3) VLAN configurations such as VLAN ID, PVID.
- (4) Port link type such as trunk mode, hybrid mode and access mode.
- (5) GVRP configurations such as switch status, registration type, timer value.

### 4.2 Port Aggregation Configuration

#### 4.2.1 Create static aggregation group

At most 4 groups can be created. You can add 4 member ports altogether in every group and at most 4 ports will come into being aggregation at the same time.

Every group is defined as a channel group; the commands are centre on channel group.

|         | Command                                      | Function                                     |
|---------|----------------------------------------------|----------------------------------------------|
| Step 1  | <b>configure terminal</b>                    | Enter global configuration mode.             |
| Step 2a | <b>channel-group &lt;1-4&gt; mode static</b> | Create static aggregation group.             |
| Step 2b | <b>no channel-group &lt;1-4&gt;</b>          | Delete static aggregation group.             |
| Step 3  | <b>show channel-group summary</b>            | Show static aggregation group configuration. |

#### 4.2.2 Configure load balancing policy of aggregation group

Configuring load balancing policy includes source MAC, destination MAC, both source and destination MAC, source IP, destination IP, both source and destination IP. Default load balancing policy is based on source MAC.

|        | Command                                                                       | Function                                                             |
|--------|-------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                     | Enter global configuration mode.                                     |
| Step 2 | <b>channel-group &lt;1-4&gt; load-balance {smac dmac sdlmac sip dip sdip}</b> | Specify which link is used to transmit traffic in aggregation group. |
| Step 3 | <b>show channel-group summary</b>                                             | Show aggregation configurations.                                     |

#### 4.2.3 Configure member port of aggregation group

|         | Command                                     | Function                                         |
|---------|---------------------------------------------|--------------------------------------------------|
| Step 1  | <b>configure terminal</b>                   | Enter global configuration mode.                 |
| Step 2  | <b>interface {interface_type slot/port}</b> | Enter interface configuration mode.              |
| Step 3a | <b>channel-group &lt;1-4&gt;</b>            | Add current port to specific channel group.      |
| Step 3b | <b>no channel-group &lt;1-4&gt;</b>         | Delete current port from specific channel group. |
| Step 4  | <b>exit</b>                                 | Exit global configuration mode.                  |
| Step 5  | <b>show channel-group summary</b>           | Show aggregation group configurations.           |

## 5. VLAN Configuration

### 5.1 VLAN configuration

VLAN configuration mainly contains:

- Create/delete VLAN
- Configure/delete VLAN description
- Configure/delete IP address and mask of VLAN

#### 5.1.1 Create/Delete VLAN

Begin at privileged configuration mode, create or delete VLAN as the following table shows.

|                | <b>Command</b>                        | <b>Function</b>                                                                                                                                       |
|----------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>             | Enter global configuration mode.                                                                                                                      |
| <b>Step 2a</b> | <b>vlan <i>vlan_id</i></b>            | Create VLAN or enter VLAN interface configuration mode. VLAN ID range is from 1 to 4094.                                                              |
| <b>Step 2b</b> | <b>no vlan <i>vlan_id</i></b>         | Delete specific VLAN.                                                                                                                                 |
| <b>Step 3</b>  | <b>exit</b>                           | Exit to global configuration mode.                                                                                                                    |
| <b>Step 4a</b> | <b>show vlan [<i>vlan_id/all</i>]</b> | Show VLAN configurations. Choosing <b>all</b> means display all existed VLAN. And choosing <i>vlan_id</i> means display information of specific VLAN. |
| <b>Step 4b</b> | <b>show vlan</b>                      | Show information of all existed VLAN.                                                                                                                 |
| <b>Step 5</b>  | <b>write</b>                          | Save configurations.                                                                                                                                  |

#### 5.1.2 Configure/delete VLAN description

Begin at privileged configuration mode, configure or delete VLAN description as the following table shows.

|               | <b>Command</b>                       | <b>Function</b>                                                                          |
|---------------|--------------------------------------|------------------------------------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>            | Enter global configuration mode.                                                         |
| <b>Step 2</b> | <b>interface vlan <i>vlan_id</i></b> | Create VLAN or enter VLAN interface configuration mode. VLAN ID range is from 1 to 4094. |

|                |                                           |                                    |
|----------------|-------------------------------------------|------------------------------------|
| <b>Step 3a</b> | <b>description</b> <i>string</i>          | Configure VLAN description.        |
| <b>Step 3b</b> | <b>no description</b>                     | Delete VLAN description.           |
| <b>Step 4</b>  | <b>exit</b>                               | Exit to global configuration mode. |
| <b>Step 5</b>  | <b>show interface vlan</b> <i>vlan_id</i> | Show VLAN interface information.   |
| <b>Step 6</b>  | <b>write</b>                              | Save configurations.               |

**Notice:**

By default, VLAN description is VLAN ID, such as “vlan 1”.

### 5.1.3 Configure/delete IP address and mask of VLAN

Begin at privileged configuration mode, configure or delete IP address and mask of VLAN as the following table shows.

|                | <b>Command</b>                                           | <b>Function</b>                                                              |
|----------------|----------------------------------------------------------|------------------------------------------------------------------------------|
| <b>Step 1</b>  | <b>config terminal</b>                                   | Enter global configuration mode.                                             |
| <b>Step 2</b>  | <b>interface vlan</b> <i>vlan_id</i>                     | Enter VLAN interface configuration mode.<br>VLAN ID range is from 1 to 4094. |
| <b>Step 3a</b> | <b>ip address</b> <i>&lt;A.B.C.D&gt;</i> <i>net-mask</i> | Configure IP address and mask of VLAN.                                       |
| <b>Step 3b</b> | <b>no ip address</b> <i>&lt;A.B.C.D&gt;</i>              | Delete IP address and mask of VLAN.                                          |
| <b>Step 4</b>  | <b>exit</b>                                              | Exit to global configuration mode.                                           |
| <b>Step 5</b>  | <b>show interface vlan</b> <i>vlan_id</i>                | Show VLAN information.                                                       |
| <b>Step 6</b>  | <b>write</b>                                             | Save configurations.                                                         |

## 5.2 Show VLAN information

Input the following commands to Show VLAN information and port members.

| <b>Operation</b>       | <b>Command</b>                            |
|------------------------|-------------------------------------------|
| Show VLAN information  | <b>show interface vlan</b>                |
| Show VLAN port members | <b>show interface vlan</b> <i>vlan-id</i> |

**Example:**

```
Show VLAN 100 port members
GPON(config)# show in vlan 100
Vlan ID 100
```

Name : vlan100  
Mac address : 00:90:4c:06:a5:73  
Tagged Ports : gpon0/1  
Untagged Ports : ge0/8

**Notice:**

By default, It have one vlan on system ,do not delete and edit.

Vlan ID 1  
Name : vlan1  
Mac address : 00:90:4c:06:a5:73  
Tagged Ports :

Untagged Ports : ge0/1 ge0/2 ge0/3 ge0/4 ge0/5 ge0/6 ge0/7 ge0/8  
ge0/9 ge0/10 ge0/11 ge0/12  
gpon0/1 gpon0/2 gpon0/3 gpon0/4 gpon0/5 gpon0/6 gpon0/7 gpon0/8



## 6. VLAN Translation/QinQ

### 6.1 Configure VLAN translation/QinQ

Begin at privileged configuration mode, configure VLAN translation/QinQ as the following table shows.

|                | <b>Command</b>                                                                                                                                      | <b>Function</b>                                                                      |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                                                                                           | Enter global configuration mode.                                                     |
| <b>Step 2</b>  | <b>interface</b> <i>{interface_type slot/port}</i>                                                                                                  | Enter interface configuration mode.                                                  |
| <b>Step 3a</b> | <b>dot1q-tunnel vlan-maping</b> <i>ori_vlan</i><br><i>{any  ori_vlan_pri}</i> <i>tra_vlani</i><br><i>{any tra_vlan_pri}</i> <b>{db-tag one-tag}</b> | Configure VLAN translation/QinQ.<br>db-tag means QinQ.<br>one-tag means translation. |
| <b>Step 3b</b> | <b>no dot1q-tunnel vlan-maping</b><br><i>ori_vlan tra_vlanid</i>                                                                                    | Delete VLAN translation/QinQ.                                                        |
| <b>Step 4</b>  | <b>exit</b>                                                                                                                                         | Exit to global configuration mode.                                                   |
| <b>Step 5</b>  | <b>show vlan vlan-maping interface</b><br><i>{interface_type slot/port}</i>                                                                         | Show VLAN translation/QinQ configurations.                                           |
| <b>Step 6</b>  | <b>write</b>                                                                                                                                        | Save configurations.                                                                 |

### 6.2 Example

(1)VLAN translation function

Configure GE1 VLAN translation function, CVLAN is 100, priority is 1, and translated VLAN is 200, priority is 2.

```
GPON(config)# interface gigabitethernet 0/1
GPON(config-if)#switchport hybrid vlan 100 tagged
GPON(config-if)#switchport hybrid vlan 200 tagged GPON(config-if)#
vlan-mapping 100 1 200 2 one-tagged GPON(config)#show vlan
vlan-mapping interface gigabitethernet 0/1 (2)QinQ function
```

Configure GE2 QinQ function, CVLAN is 300, priority is 3, and SVLAN is 400, priority is 4.

```
GPON(config)# interface gigabitethernet 0/2
GPON(config-if)#switchport hybrid vlan 300 tagged
GPON(config-if)#switchport hybrid vlan 400 tagged
GPON(config-if)# vlan-mapping 300 3 400 4 db-tagged
GPON(config)#show vlan vlan-mapping interface gigabitethernet 0/2
```

## 7. MAC Address Configuration

### 7.1 Overview

In order to forward messages rapidly, a device need to maintain its MAC address table. MAC address table contains MAC addresses that connect with the device, ports, VLAN, type and aging status. Dynamic MAC addresses in the table are learnt by device. The process of learning is that: if port A receives a message, device will analyze the source MAC address (SrcMAC), and think of messages whose destination MAC address is SrcMAC can be forwarded to port A. If SrcMAC has been in the table, device will update it; if not, device will add this new address to the table.

For the messages whose destination MAC address can be found in MAC address table, they are forwarded by hardware. Otherwise, they flood to all ports. When flooded messages arrive to its destination, the destination device will respond. The device will add new MAC to the table. Then, messages with this destination MAC will be forwarded via the new table. However, when messages still can't find its destination by flood, device will discard them and tell sender destination is unreachable.

### 7.2 Configure MAC address

MAC address management includes:

- Configure MAC address table
- Configure MAC address aging time

#### 7.2.1 Configure MAC address table

You can add static MAC address entries, delete MAC address entries or clean MAC address table.

Begin at privileged configuration mode, configure MAC address table as the following table shows.

|         | Command                                                                                                                     | Function                         |
|---------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                   | Enter global configuration mode. |
| Step 2a | <b>mac address-table static vlan <i>vlan_id</i><br/>xxxx:xxxx:xxxx interface <i>interface_type</i><br/><i>slot/port</i></b> | Add static MAC address entry.    |
| Step 2b | <b>no mac address-table vlan <i>vlan_id</i><br/>xxxx:xxxx:xxxx</b>                                                          | Delete MAC address entry.        |
| Step 2c | <b>mac address-table clean</b>                                                                                              | Clean MAC address table.         |
| Step 3  | <b>show mac address-table</b>                                                                                               | Show MAC address table.          |

|               |              |                      |
|---------------|--------------|----------------------|
| <b>Step 4</b> | <b>write</b> | Save configurations. |
|---------------|--------------|----------------------|

### 7.2.2 Configure MAC address aging time

There is aging time in device. If device doesn't receive any message from other devices in aging time, it will delete the MAC address from MAC table. But for static MAC in the table, aging time is not effective.

Begin at privileged configuration mode, configure MAC address aging time as the following table shows.

|               | <b>Command</b>                                  | <b>Function</b>                                                                                      |
|---------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                       | Enter global configuration mode.                                                                     |
| <b>Step 2</b> | <b>mac address-table agingtime <i>value</i></b> | Configure MAC address aging time, range is 10-1000000s.<br>0s means don't aging.<br>Default is 300s. |
| <b>Step 3</b> | <b>show mac address-table agingtime</b>         | Show aging time.                                                                                     |
| <b>Step 4</b> | <b>write</b>                                    | Save configurations.                                                                                 |

### 7.2.3 Clean MAC address table

Begin at privileged configuration mode, clean MAC address table as the following table shows.

|               | <b>Command</b>                 | <b>Function</b>                  |
|---------------|--------------------------------|----------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>      | Enter global configuration mode. |
| <b>Step 2</b> | <b>mac address-table clean</b> | Clean MAC address table.         |

### 7.2.4 Configure maximum learnt MAC entries of port

Begin at privileged configuration mode, configure maximum learnt MAC entries of port as the following table shows.

|               | <b>Command</b>                                     | <b>Function</b>                     |
|---------------|----------------------------------------------------|-------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                          | Enter global configuration mode.    |
| <b>Step 2</b> | <b>interface <i>{interface_type slot/port}</i></b> | Enter interface configuration mode. |
| <b>Step 3</b> | <b>mac-address mac-limit &lt;0-16384&gt;</b>       | 0 means no limitation.              |
| <b>Step 4</b> | <b>exit</b>                                        | Exit to global configuration mode.  |

## 7.3 Show MAC address table

### 7.3.1 Show MAC address table

Begin at privileged configuration mode, show MAC address table as the following table

shows.

|                | <b>Command</b>                                                               | <b>Function</b>                                |
|----------------|------------------------------------------------------------------------------|------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                    | Enter global configuration mode.               |
| <b>Step 2a</b> | <b>show mac address-table interface</b><br><i>{interface_type slot/port}</i> | Show MAC address table based on Ethernet port. |
| <b>Step 2b</b> | <b>show mac address-table vlan</b> <i>vlan_id</i>                            | Show MAC address table based on VLAN ID.       |
| <b>Step 2c</b> | <b>show mac address-table</b>                                                | Show whole MAC address table.                  |

### 7.3.2 Show MAC address aging time

Begin at privileged configuration mode, show MAC address aging time as the following table shows.

|               | <b>Command</b>                          | <b>Function</b>                  |
|---------------|-----------------------------------------|----------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>               | Enter global configuration mode. |
| <b>Step 2</b> | <b>show mac address-table agingtime</b> | Show MAC address aging time.     |

## 8. Configure Port Mirroring

Port mirroring is to copy one or more ports' traffic to specific port. It is usually used for network traffic analysis and diagnosis.

The device supports 4 mirroring sessions.

### 8.1 Configure mirroring destination port

Begin at privileged configuration mode, configure mirroring destination port as the following table shows.

|        | Command                                                                                                                    | Function                                                        |
|--------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                                                                  | Enter global configuration mode.                                |
| Step 2 | <b>monitor session</b> <i>session_number</i><br><b>destination interface</b> <i>interface_type</i><br><i>interface_num</i> | Configure mirroring destination port.<br>Session number is 1~4. |
| Step 3 | <b>show monitor session all</b>                                                                                            | Show mirroring configurations.                                  |
| Step 4 | <b>write</b>                                                                                                               | Save configurations.                                            |

### 8.2 Configure mirroring source port

Mirroring source port is the port we want to monitor. Data that pass through the port will be copied to mirroring destination port.

Begin at privileged configuration mode, configure mirroring source port as the following table shows.

|        | Command                                                                                                                                                                                               | Function                                                                                                                                                                                   |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                                                                                                                                             | Enter global configuration mode.                                                                                                                                                           |
| Step 2 | <b>monitor session</b> <i>session_number</i><br><b>source interface</b> <i>interface_type</i><br><i>start_interface_num</i> [ -<br><i>end_interface_num</i> ] { <b>both</b>   <b>rx</b>   <b>tx</b> } | Configure mirroring source port.<br>session_number is 1-4.<br><b>Both</b> means received data and transmitted data.<br><b>rx</b> means received data.<br><b>tx</b> means transmitted data. |
| Step 3 | <b>show monitor session all</b>                                                                                                                                                                       | Show mirroring configurations.                                                                                                                                                             |
| Step 4 | <b>write</b>                                                                                                                                                                                          | Save configurations.                                                                                                                                                                       |

### 8.3 Delete port mirroring

Begin at privileged configuration mode, delete port mirroring as the following table shows.

|               | <b>Command</b>                                                                                                     | <b>Function</b>                                 |
|---------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                                                                          | Enter global configuration mode.                |
| <b>Step 2</b> | <b>no monitor session <i>session_number</i> {[destination   source] interface <i>interface_type slot/port</i>}</b> | Delete port mirroring.<br>session_number is 1-4 |
| <b>Step 3</b> | <b>show monitor session all</b>                                                                                    | Show mirroring configurations.                  |

**Example:**

Mirror data from gpon 0/1 to uplink port 1.

```
GPON(config)# monitor session 1 destination interface gigabitethernet 0/1
```

```
GPON(config)# monitor session 1 source interface gpon 0/1 both
```

## 9. IGMP Configuration

### 9.1 IGMP Snooping

#### 9.1.1 Enable/disable IGMP Snooping

IGMP snooping is disabled by default. You should enable by the following command. Begin at privileged configuration mode, enable/disable IGMP snooping as the following table shows.

|         | Command                                    | Function                           |
|---------|--------------------------------------------|------------------------------------|
| Step 1  | <b>configure terminal</b>                  | Enter global configuration mode.   |
| Step 2a | <b>ip igmp snooping enable</b>             | Enable IGMP Snooping.              |
| Step 2b | <b>no ip igmp snooping</b>                 | Disable IGMP snooping.             |
| Step 3  | <b>show ip igmp snooping configuration</b> | Show IGMP snooping configurations. |
| Step 4  | <b>write</b>                               | Save configurations.               |

#### 9.1.2 Configure multicast data forwarding mode

Begin at privileged configuration mode, configure multicast data forwarding mode as the following table shows.

|        | Command                                                                                               | Function                                  |
|--------|-------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                                             | Enter global configuration mode.          |
| Step 2 | <b>ip igmp snooping forward vlan <i>vlan-id</i><br/>mode { flood   forward  <br/>strict-forward }</b> | Configure multicast data forwarding mode. |
| Step 3 | <b>write</b>                                                                                          | Save configurations.                      |

#### 9.1.3 Configure port multicast VLAN

After add VLAN to the port, you should also configure multicast VLAN for multicast service. Begin at privileged configuration mode, configure port multicast VLAN as the following table shows.

|        | Command                                            | Function                            |
|--------|----------------------------------------------------|-------------------------------------|
| Step 1 | <b>configure terminal</b>                          | Enter global configuration mode.    |
| Step 2 | <b>interface {<i>interface_type slot/port</i>}</b> | Enter interface configuration mode. |

|                |                                                                                                          |                                                         |
|----------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| <b>Step 3a</b> | <b>ip igmp snooping user-vlan <i>vlan_id</i><br/>group-vlan <i>vlan_id</i> { tagged  <br/>untagged }</b> | Configure port multicast VLAN.<br>VLAN range is 1-4094. |
| <b>Step 3b</b> | <b>no ip igmp snooping group-vlan<br/><i>vlan_id</i></b>                                                 | Delete port multicast VLAN.                             |
| <b>Step 4</b>  | <b>exit</b>                                                                                              | Exit to global configuration mode.                      |
| <b>Step 5</b>  | <b>show ip igmp snooping user-vlan</b>                                                                   | Show multicast VLAN.                                    |
| <b>Step 6</b>  | <b>write</b>                                                                                             | Save configurations.                                    |

#### 9.1.4 Configure multicast router port

Multicast router port is used to forward IGMP messages. Usually, uplink port is configured as multicast router port.

Begin at privileged configuration mode, configure multicast router port as the following table shows.

|                | <b>Command</b>                                                                                         | <b>Function</b>                           |
|----------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                                              | Enter global configuration mode.          |
| <b>Step 2a</b> | <b>ip igmp snooping mrouter vlan <i>vlan-id</i><br/>interface {<i>interface_type slot/port</i>}</b>    | Configure multicast router port.          |
| <b>Step 2b</b> | <b>no ip igmp snooping mrouter vlan<br/><i>vlan-id</i> interface {<i>interface_type slot/port</i>}</b> | Delete multicast router port.             |
| <b>Step 3</b>  | <b>show ip igmp-snooping mrouter vlan<br/>all</b>                                                      | Show multicast router mode configuration. |
| <b>Step 4</b>  | <b>write</b>                                                                                           | Save configurations.                      |

#### 9.1.5 Configure static multicast

Begin at privileged configuration mode, configure static multicast as the following table shows.

|                | <b>Command</b>                                                                                                 | <b>Function</b>                  |
|----------------|----------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                                                      | Enter global configuration mode. |
| <b>Step 2a</b> | <b>ip igmp snooping static vlan <i>vlan-id</i><br/>&lt;<i>A.B.C.D</i>&gt; interface <i>interface-id</i></b>    | Configure static multicast.      |
| <b>Step 2b</b> | <b>no ip igmp snooping static vlan <i>vlan-id</i><br/>&lt;<i>A.B.C.D</i>&gt; interface <i>interface-id</i></b> | Delete static multicast.         |
| <b>Step 3</b>  | <b>show ip igmp-snooping configuration</b>                                                                     | Show IGMP configurations.        |
| <b>Step 4</b>  | <b>write</b>                                                                                                   | Save configurations.             |

#### 9.1.6 Configure fast leave



Begin at privileged configuration mode, configure fast leave as the following table shows.

|         | Command                                            | Function                            |
|---------|----------------------------------------------------|-------------------------------------|
| Step 1  | <b>configure terminal</b>                          | Enter global configuration mode.    |
| Step 2  | <b>interface</b> <i>{interface_type slot/port}</i> | Enter interface configuration mode. |
| Step 3a | <b>ip igmp snooping immediate-leave</b>            | Enable fast leave.                  |
| Step 3b | <b>no ip igmp snooping immediate-leave</b>         | Disable fast leave.                 |
| Step 4  | <b>exit</b>                                        | Exit to global configuration mode.  |
| Step 5  | <b>show ip igmp snooping port information</b>      | Show port IGMP information.         |
| Step 6  | <b>write</b>                                       | Save configurations.                |

### 9.1.7 Configure multicast group limit

Begin at privileged configuration mode, configure multicast group limitation as the following table shows.

|         | Command                                             | Function                                     |
|---------|-----------------------------------------------------|----------------------------------------------|
| Step 1  | <b>configure terminal</b>                           | Enter global configuration mode.             |
| Step 2  | <b>interface</b> <i>{interface_type slot/port}</i>  | Enter interface configuration mode.          |
| Step 3a | <b>ip igmp snooping limit</b> <i>&lt;0-1024&gt;</i> | Configure port multicast group limitation.   |
| Step 3b | <b>no ip igmp snooping limit</b>                    | Reset multicast group limitation to default. |
| Step 4  | <b>exit</b>                                         | Exit to global configuration mode.           |
| Step 5  | <b>show ip igmp snooping port information</b>       | Show port multicast information.             |
| Step 6  | <b>write</b>                                        | Save configurations.                         |

### 9.1.8 Configure parameters of special query

Begin at privileged configuration mode, configure parameters of specific query as the following table shows.

|         | Command                                                               | Function                                          |
|---------|-----------------------------------------------------------------------|---------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                             | Enter global configuration mode.                  |
| Step 2a | <b>ip igmp snooping lastmember-querycount</b> <i>&lt;1-255&gt;</i>    | Configure specific query count. Default is 2.     |
| Step 2b | <b>ip igmp snooping lastmember-queryinterval</b> <i>&lt;1-255&gt;</i> | Configure specific query interval. Default is 1s. |

|                |                                                                    |                                                        |
|----------------|--------------------------------------------------------------------|--------------------------------------------------------|
| <b>Step 2c</b> | <b>ip igmp snooping<br/>lastmember-queryresponse &lt;1-255&gt;</b> | Configure specific query response time. Default is 1s. |
| <b>Step 3</b>  | <b>show ip igmp snooping configuration</b>                         | Show IGMP configurations.                              |
| <b>Step 4</b>  | <b>write</b>                                                       | Save configurations.                                   |

### 9.1.9 Configure parameters of general query

Begin at privileged configuration mode, configure parameters of general query as the following table shows.

|                | <b>Command</b>                                                          | <b>Function</b>                                               |
|----------------|-------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                               | Enter global configuration mode.                              |
| <b>Step 2a</b> | <b>ip igmp snooping general-query-packet<br/>&lt;enable disable&gt;</b> | Enable or disable general query function. Default is disable. |
| <b>Step 2b</b> | <b>ip igmp snooping general-query-time<br/>&lt;10-255&gt;</b>           | Configure general query interval. Default is 126s.            |
| <b>Step 3</b>  | <b>show ip igmp snooping configuration</b>                              | Show IGMP configurations.                                     |
| <b>Step 4</b>  | <b>write</b>                                                            | Save configurations.                                          |

### 9.1.10 Configure source IP of query

Begin at privileged configuration mode, configure source IP of query message as the following table shows.

|               | <b>Command</b>                                                     | <b>Function</b>                                           |
|---------------|--------------------------------------------------------------------|-----------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                          | Enter global configuration mode.                          |
| <b>Step 2</b> | <b>ip igmp snooping member-query source-ip<br/>&lt;A.B.C.D&gt;</b> | Configure source IP of query message. Default is 1.1.1.1. |
| <b>Step 3</b> | <b>show ip igmp snooping configuration</b>                         | Show IGMP configurations.                                 |
| <b>Step 4</b> | <b>write</b>                                                       | Save configurations.                                      |

### 9.1.11 Configure multicast member aging time

If the port doesn't receive any report message from member in aging time, device will delete this port from group members.

Begin at privileged configuration mode, configure muticast member aging time as the following table shows.

|               | <b>Command</b>                                      | <b>Function</b>                                                                             |
|---------------|-----------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                           | Enter global configuration mode.                                                            |
| <b>Step 2</b> | <b>ip igmp snooping host-aging-time<br/>seconds</b> | Configure multicast port member aging time.<br>Value range is 10-3600s,<br>default is 260s. |

|               |                                            |                           |
|---------------|--------------------------------------------|---------------------------|
| <b>Step 3</b> | <b>show ip igmp snooping configuration</b> | Show IGMP configurations. |
| <b>Step 4</b> | <b>write</b>                               | Save configurations.      |

### 9.1.12 Show multicast group information

If there is member join a group, you can use the following commands to show multicast group information.

|                | <b>Command</b>                                    | <b>Function</b>                   |
|----------------|---------------------------------------------------|-----------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                         | Enter global configuration mode.  |
| <b>Step 2a</b> | <b>show ip igmp snooping vlan [vlan-id   all]</b> | Show multicast group information. |
| <b>Step 2b</b> | <b>show ip igmp snooping statistic</b>            | Show multicast statistic.         |

### 9.1.13 Configure multicast on pon

Include the way to process unknown-mcast and igmp

|                | <b>Command</b>                                                                                       | <b>Function</b>                                           |
|----------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                                            | Enter global configuration mode                           |
| <b>Step 2a</b> | <b>ip igmp snooping mvlan &lt;1-4094&gt; unknown-mcast [forward drop] igmp [forward trap-to-cpu]</b> | Configure the way to process mvlan and unknown multicast. |

## 9.2 Example

This example introduces how to configure IGMP snooping function, including multicast VLAN, multicast router port and ONU LAN port, etc.

### 1. Requirement

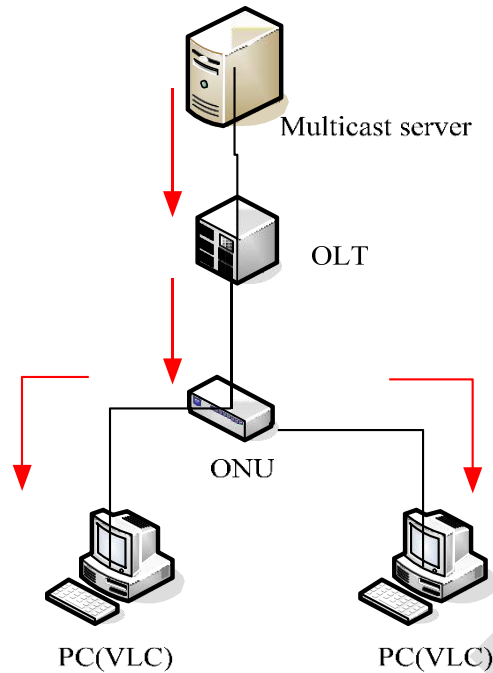
In order to achieve multicast function, you should enable IGMP Snooping, configure multicast VLAN, multicast router port, and so on. The requirement contains: multicast is VLAN 100.

Multicast server connects to uplink port 1.

ONU connects to PON 1.

Client, such as a PC, connects to ONU LAN 1.

### 2. Framework



### 3. Steps

#### (1) Create VLAN

```
GPON(config)# vlan 100
GPON(config-vlan-100)# exit
```

#### (2) Configure multicast VLAN100

```
GPON(config)# interface g0/1
GPON(config-if-ge0/1)# switchport hybrid vlan 100 tagged
GPON(config-if-ge0/1)# exit
GPON(config)# inter gpon 0/1
GPON(config-pon-0/1)# switchport hybrid vlan 100 tagged
GPON(config-pon-0/1)# ip igmp snooping user-vlan 100 group-vlan 100 tagged
```

```
GPON(config-pon-0/1)# exit
```

#### (3) Enable IGMP Snooping

```
GPON(config)# ip igmp snooping enable
```

#### (4) Configure the G0/1 to multicast router port

```
GPON(config)# ip igmp snooping mrouter vlan 100 interface gigabitethernet 0/1
```

#### (5) Configure the multicast and igmp rule

```
GPON(config)# ip igmp snooping mvlan 100 unknown-mcast drop igmp trap-to-cpu
```

#### (6) Configure the onu

```
GPON(config)# inter gpon 0/1
GPON(config-pon-0/1)# onu add 1 profile 1GE sn GPON00000031
GPON(config-pon-0/1)# onu 1 tcont 1
GPON(config-pon-0/1)# onu 1 gempport 1 tcont 1
GPON(config-pon-0/1)# onu 1 service 1 gempport 1 vlan 100
GPON(config-pon-0/1)# onu 1 service-port 1 gempport 1 uservlan 100 vlan 100
GPON(config-pon-0/1)# onu 1 portvlan eth 1 mode hybrid def_vlan 100
```

```
GPON(config)#ip igmp snooping mvlan 100
GPON(config)#ip igmp snooping mvlan 100 receive-port gpon-onu_1/1/2:1 vport 1
GPON(config)#ip igmp snooping mvlan 100 group 224.1.1.1 to 224.1.1.10 static-port gpon-
onu_1/1/2:1 vport 1
```

TOP SECRET

## 10. ACL Configuration

### 10.1 Overview

In order to filter data packages, network equipments need to setup a series of rules for identifying what need to be filtered. Only matched with the rules the data packages can be filtered. ACL can achieve this function. Matched conditions of ACL rules can be source address, destination address, Ethernet type, VLAN, protocol port, and so on.

These ACL rules also can be used in other situations, such as classification of stream in QoS.

An ACL rule may contain one or several sub-rules, which have different matched conditions.

This device supports the following types of ACL.

- IP Standard ACL.
- IP Extended ACL.
- ACL based on MACaddress
- ACL based on port binding.
- ACL based on QoS.

Limitation of each ACL rule:

| ACL type                  | ACL index | Maxium rules |
|---------------------------|-----------|--------------|
| IP Standard ACL           | 0-999     | 1000         |
| IP Extended ACL           | 1000-1999 | 1000         |
| ACL based on MAC address  | 2000-2999 | 1000         |
| ACL based on port binding | 5000-5999 | 1000         |
| ACL based on QoS          | 6000-6999 | 1000         |

### 10.2 ACL confiuration

ACL configuration mainly includes:

- IP Standard ACL.
- IP Extended ACL.
- ACL based on MACaddress
- ACL based on port binding.
- ACL based on QoS.
- ACL rule apply to port.

#### 10.2.1 IP standard ACL

Begin at privileged configuration mode, configure IP standard ACL as the following table shows.

|               | Command                   | Function                         |
|---------------|---------------------------|----------------------------------|
| <b>Step 1</b> | <b>configure terminal</b> | Enter global configuration mode. |

|                |                                                                                                                                                                            |                                                                                                                                                                                                                                   |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 2</b>  | <b>access-list</b> <i>access-list-index</i>                                                                                                                                | Enter ACL configuration mode.<br><i>access-list-number</i> is ACL index.<br>range:0-999.                                                                                                                                          |
| <b>Step 3a</b> | <b>subset ip (permit deny) &lt;A.B.C.D&gt;</b><br><i>[net-mask]</i><br><b>subset ip (permit deny) host</b><br><i>&lt;A.B.C.D&gt;</i><br><b>subset ip [permit deny] any</b> | Configure ACL rule.<br><i>&lt;A.B.C.D&gt;</i> : define based on source IP address and mask ACL rule.<br><b>Host</b> : define based on single IP address ACL rule.<br><b>Any</b> : define based on any source IP address ACL rule. |
| <b>Step 3b</b> | <b>No access-list</b> <i>access-list-index</i>                                                                                                                             | Delete the ACL                                                                                                                                                                                                                    |
| <b>Step 4</b>  | <b>exit</b>                                                                                                                                                                | Exit to global configuration mode.                                                                                                                                                                                                |
| <b>Step 5</b>  | <b>show access-list</b><br><i>[access-list-number   all]</i>                                                                                                               | Show ACL configurations.                                                                                                                                                                                                          |
| <b>Step 6</b>  | <b>write</b>                                                                                                                                                               | Save configurations.                                                                                                                                                                                                              |

### 10.2.2 IP extended ACL

Begin at privileged configuration mode, configure IP extended ACL as the following table shows.

|                | <b>Command</b>                                                                                                                                                                                                                                                                                              | <b>Function</b>                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                                                                                                                                                                                                                                                   | Enter global configuration mode.                                                                                                                                          |
| <b>Step 2</b>  | <b>access-list</b> <i>access-list-index</i>                                                                                                                                                                                                                                                                 | Enter ACL configuration mode.<br><i>access-list-number</i> is ACL index.<br>range:1000-1999.                                                                              |
| <b>Step 3a</b> | <b>subset protocol {deny   permit}</b><br><i>protocol { &lt;A.B.C.D&gt; net-mask</i><br><i>{&lt;A.B.C.D&gt; net-mask   host &lt;A.B.C.D&gt;  </i><br><b>any } [match {dscp priority  precedence</b><br><i>priority   tos priority}] [set {dscp priority </i><br><b>precedence priority   tos priority}]</b> | Configure IP extended ACL rule.<br>Parameter <i>protocol</i> should be icmp, igmp, igmp, ip, ospf, pim, tcp, or udp, etc. it also can be replaced by protocol code 0~255. |
| <b>Step 3b</b> | <b>no access-list</b> <i>access-list-index</i>                                                                                                                                                                                                                                                              | Delete ACL                                                                                                                                                                |
| <b>Step 4</b>  | <b>exit</b>                                                                                                                                                                                                                                                                                                 | Exit global configuration mode.                                                                                                                                           |
| <b>Step 5</b>  | <b>show access-list</b> <i>[access-list-number   all ]</i>                                                                                                                                                                                                                                                  | Show ACL configurations.                                                                                                                                                  |
| <b>Step 6</b>  | <b>write</b>                                                                                                                                                                                                                                                                                                | Save configurations.                                                                                                                                                      |

### 10.2.3 ACL based on MAC address

Begin at privileged configuration mode, configure ACL based on MAC address as the following table shows.

|         | Command                                                                                                                                                                                                                                                      | Function                                                                                     |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                                                                                                                                                    | Enter global configuration mode.                                                             |
| Step 2  | <b>access-list <i>access-list-number</i></b>                                                                                                                                                                                                                 | Enter ACL configuration mode.<br><i>access-list-number</i> is ACL index.<br>range:2000-2999. |
| Step 3a | <b>subset ethernet [permit deny] [source] &lt;xx:xx:xx:xx:xx:xx&gt; &lt;xx:xx:xx:xx:xx:xx&gt; {[dest] &lt;xx:xx:xx:xx:xx:xx&gt; &lt;xx:xx:xx:xx:xx:xx&gt;}*1 {[vlan] &lt;1-4094&gt;}*1 {[cos] &lt;0-7&gt;}*1 {[ethernet-type] &lt;XXXX&gt; &lt;XXXX&gt;}</b> | Configure IP extended ACL rule.                                                              |
| Step 3b | <b>no access-list <i>access-list-index</i></b>                                                                                                                                                                                                               | Delete ACL                                                                                   |
| Step 4  | <b>exit</b>                                                                                                                                                                                                                                                  | Exit to global configuration mode.                                                           |
| Step 5  | <b>show access-list [<i>access-list-number</i>   all]</b>                                                                                                                                                                                                    | Show ACL configurations.                                                                     |
| Step 6  | <b>write</b>                                                                                                                                                                                                                                                 | Save configurations.                                                                         |

#### 10.2.4 ACL based on port binding

This type of ACL includes the other types.

Begin at privileged configuration mode, configure ACL based on port binding as the following table shows.

|         | Command                                                                                                                                                     | Function                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                                                   | Enter global configuration mode.                                                                                                                                                                                                                                                                                                                                                                                                      |
| Step 2  | <b>access-list <i>access-list-number</i></b>                                                                                                                | Enter ACL configuration mode.<br><i>access-list-number</i> is ACL index.<br>range:5000-5999;                                                                                                                                                                                                                                                                                                                                          |
| Step 3a | <b>subset port-business [permit deny] {src-ip   dest-ip   protocol   tos-dscp   src-mac   dest-mac   vlan   cos   ethernet-type   src-port   dest-port}</b> | Permit:Permit data stream which match the rule passing through.<br>Deny:Do not permit data stream which match the rule passing through.<br>src-ip : source IP address<br>dest-ip:destination IP address<br>protocol:IP protocol type<br>tos-dscp:IP priority<br>src-mac:source MAC address<br>dest-mac:destination MAC address<br>vlan:VLAN IAD<br>cos:802.1p priority<br>ethernet-type:ethernet type<br>src-port:Layer 4 source port |



|                |                                                   |                                    |
|----------------|---------------------------------------------------|------------------------------------|
|                |                                                   | dest-port:Layer 4 destination port |
| <b>Step 3b</b> | <b>no access-list</b> <i>access-list-index</i>    | Delete ACL                         |
| <b>Step 4</b>  | <b>exit</b>                                       | Exit to global configuration mode. |
| <b>Step 5</b>  | <b>show access-list</b> <i>access-list-number</i> | Show ACL configurations.           |
| <b>Step 6</b>  | <b>write</b>                                      | Save configurations.               |

### 10.2.5 ACL based on QoS

Begin at privileged configuration mode, configure ACL based on QoS as the following table shows.

|                | <b>Command</b>                                                                                                                      | <b>Function</b>                                                                                                                                                                                                                                                                                                                        |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                                                                           | Enter global configuration mode.                                                                                                                                                                                                                                                                                                       |
| <b>Step 2</b>  | <b>access-list</b> <i>access-list-number</i>                                                                                        | Enter ACL configuration mode.<br><i>access-list-number</i> is ACL index.<br>range:6000-6999.                                                                                                                                                                                                                                           |
| <b>Step 3a</b> | <b>subset qos</b> <0-8> <0-7> <1-12>                                                                                                | <0-8>: output priority<br><0-7>: output queue<br><1-12>: rule priority                                                                                                                                                                                                                                                                 |
| <b>Step 3b</b> | <b>subset qos</b> {src-ip   dest-ip   protocol   tos-dscp   src-mac   dest-mac   vlan   cos   ethernet-type   src-port   dest-port} | src-ip : source IP address<br>dest-ip: destination IP address<br>protocol: IP protocol type<br>tos-dscp: IP priority<br>src-mac: source MAC address<br>dest-mac: destination MAC address<br>vlan: VLAN ID<br>cos:802.1p priority<br>ethernet-type: Ethernet type<br>src-port:Layer 4 source port<br>dest-port:Layer 4 destination port |
| <b>Step 3c</b> | <b>no access-list</b> <i>access-list-number</i>                                                                                     | Deleting ACL rule. Only the ACL that have not been applied can be deleted.                                                                                                                                                                                                                                                             |
| <b>Step 4</b>  | <b>exit</b>                                                                                                                         | Exit to global configuration mode.                                                                                                                                                                                                                                                                                                     |
| <b>Step 5</b>  | <b>show access-list</b> <i>access-list-number</i>                                                                                   | Show ACL configurations.                                                                                                                                                                                                                                                                                                               |
| <b>Step 6</b>  | <b>write</b>                                                                                                                        | Save configurations.                                                                                                                                                                                                                                                                                                                   |

### 10.2.6 ACL rule apply to port

Begin at privileged configuration mode, apply ACL rule to port as the following table shows.

|                | <b>Command</b>                                  | <b>Function</b>                     |
|----------------|-------------------------------------------------|-------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                       | Enter global configuration mode.    |
| <b>Step 2</b>  | <b>interface {interface_type slot/port}</b>     | Enter interface configuration mode. |
| <b>Step 3a</b> | <b>ip access-group access-list-number in</b>    | Apply ACL rule to port.             |
| <b>Step 3b</b> | <b>no ip access-group access-list-number in</b> | Delete ACL rule from port.          |
| <b>Step 4</b>  | <b>exit</b>                                     | Exit to global configuration mode.  |
| <b>Step 5</b>  | <b>show access-list access-list-number</b>      | Show ACL configurations.            |
| <b>Step 6</b>  | <b>write</b>                                    | Save configurations.                |

### 10.3 Example

#### (1) Deny specific IP address packets passing through

PON1 denies packets which source IP is 192.168.100.10 passing through.

```
GPON(config)# access-list 5000
GPON(config-bsn-acl-5000)# subset port-business deny src-ip 192.168.100.10
255.255.255.255
GPON(config-bsn-acl-5000)# exit GPON(config)#
interface gpon 0/1 GPON(config-pon-0/1)# ip
access-group 5000 in
```

#### (2) Permit specific MAC address packets passing through

PON1 permits IP packets which source MAC is b8:97:5a:72:37:8d passing through.

```
GPON(config)#access-list 2000
GPON(config-eth-acl-2000)# subset ethernet deny ethernet-type 0800 ffff
GPON(config-eth-acl-2000)#exit
GPON(config)# access-list 2001
GPON(config-eth-acl-2001)# subset ethernet permit source b8:97:5a:72:37:8d
ff:ff:ff:ff:ff:ff
GPON(config-eth-acl-2001) # exit GPON(config)#
interface gpon 0/1 GPON(config-pon-0/1)# ip
access-group 2000 in GPON(config-pon-0/1)# ip
access-group 2001 in GPON(config-pon-0/1)#exit
```

## 11. QoS Configuration

### 11.1 Configure queue scheduling mode

Queue scheduling mode contains strict priority, weighted round robin and hybrid mode. This device supports 8 queues altogether.

Begin at privileged configuration mode, configure queue scheduling mode as the following table shows.

|         | Command                                                                                          | Function                                                                                                                                                                                                                              |
|---------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                        | Enter global configuration mode.                                                                                                                                                                                                      |
| Step 2a | <b>queue-scheduler strict-priority</b>                                                           | Configure strict priority scheduling mode.                                                                                                                                                                                            |
| Step 2b | <b>queue-scheduler wrr</b> [ <i>queue0 queue1 queue2 queue3 queue4 queue5 queue6 queue7</i> ]    | Configure weighted round robin scheduling mode.<br><i>Queue<sub>x</sub></i> is weight of queue <i>x</i> , range is 1-127.<br>By default, weights of queue 0~7 are 1, 1, 2, 2, 4, 4, 8, 8.                                             |
| Step 2c | <b>queue-scheduler sp-wrr</b> [ <i>queue0 queue1 queue2 queue3 queue4 queue5 queue6 queue7</i> ] | Configure hybrid scheduling mode.<br><i>Queue<sub>x</sub></i> is weight of queue <i>x</i> , range is 0-127. If it is set to be 0, the queue is strict priority queue.<br>By default, weights of queue 0~7 are 1, 1, 2, 2, 4, 4, 8, 8. |
| Step 3  | <b>show queue-scheduler</b>                                                                      | Show queue scheduling configurations.                                                                                                                                                                                                 |
| Step 4  | <b>write</b>                                                                                     | Save configurations.                                                                                                                                                                                                                  |

### 11.2 Configure queue mapping

Begin at privileged configuration mode, configure queue mapping as the following table shows.

|        | Command                   | Function                         |
|--------|---------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b> | Enter global configuration mode. |

|               |                                                              |                                                                                                                  |
|---------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>Step 2</b> | <b>queue-scheduler tc <i>priority</i> queue <i>queue</i></b> | Configure mapping relation between queues and priority. By default, priority 0~7 maps to queue 0~7 respectively. |
| <b>Step 3</b> | <b>show queue-scheduler priority mapping</b>                 | Show queue mapping.                                                                                              |
| <b>Step 4</b> | <b>write</b>                                                 | Save configurations.                                                                                             |

TOP SECRET

## 12. STP Configuration

### 12.1 STP default settings

STP default settings:

| Speciality         | Default value                                                                       |
|--------------------|-------------------------------------------------------------------------------------|
| Enable status      | STP disabled                                                                        |
| Bridge priority    | 32768                                                                               |
| STP port priority  | 128                                                                                 |
| STP port cost      | 10-Gigabit Ethernet :2<br>Gigabit Ethernet :4<br>Fast Ethernet :19<br>Ethernet :100 |
| Hello time         | 2s                                                                                  |
| Forward delay time | 15s                                                                                 |
| Maxmum aging time  | 20s                                                                                 |
| Mode               | RSTP                                                                                |

### 12.2 Cofigure STP

STP configurations mainly contain:

- Enable device's STP function.
- Enable port's STP function.
- Configure STP mode.
- Configure bridge priority of device.
- Configure forward delay of device.
- Configure hello time of device.
- Configure max age of designated device.
- Configure priority of designated port.
- Configure path cost of designated port.

#### 12.2.1 Enable device's STP function

Begin at privileged configuration mode, enable device's STP function as the following table shows.

|         | Command                   | Function                                                               |
|---------|---------------------------|------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b> | Enter global configuration mode.                                       |
| Step 2a | <b>spanning-tree on</b>   | Enable device's STP function.<br>By default, STP function is disabled. |

|                |                           |                                |
|----------------|---------------------------|--------------------------------|
| <b>Step 2b</b> | <b>no spanning-tree</b>   | Disable device's STP function. |
| <b>Step 3</b>  | <b>show spanning-tree</b> | Show STP configurations.       |
| <b>Step 4</b>  | <b>write</b>              | Save configurations.           |

### 12.2.2 Enable port STP

In order to work flexibly, you can disable some specific ports' STP function.

Begin at privileged configuration mode, enable port's STP function as the following table shows.

|                | <b>Command</b>                                                 | <b>Function</b>                     |
|----------------|----------------------------------------------------------------|-------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                      | Enter global configuration mode.    |
| <b>Step 2</b>  | <b>interface {interface_type slot/port}</b>                    | Enter interface configuration mode. |
| <b>Step 3a</b> | <b>spanning-tree on</b>                                        | Enable port's STP function.         |
| <b>Step 3b</b> | <b>no spanning-tree on</b>                                     | Disable port's STP function.        |
| <b>Step 4</b>  | <b>exit</b>                                                    | Exit to global configuration mode.  |
| <b>Step 5</b>  | <b>show spanning-tree interface {interface_type slot/port}</b> | Show port's STP configurations.     |
| <b>Step 6</b>  | <b>write</b>                                                   | Save configurations.                |

### 12.2.3 Configure spanning tree mode

This device supports STP and RSTP. By default, it runs RSTP. You can choose RTP manually.

Begin at privileged configuration mode, configure spanning tree mode as the following table shows.

|               | <b>Command</b>                         | <b>Function</b>                                        |
|---------------|----------------------------------------|--------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>              | Enter global configuration mode.                       |
| <b>Step 2</b> | <b>spanning-tree mode [rstp   stp]</b> | Configure spanning tree mode. It runs RSTP by default. |
| <b>Step 3</b> | <b>show spanning-tree</b>              | Show STP configurations.                               |
| <b>Step 4</b> | <b>write</b>                           | Save configurations.                                   |

### 12.2.4 Configure bridge priority

Device's bridge priority decides if it will be selected as root of spanning tree.

Begin at privileged configuration mode, configure device's bridge priority as the following table shows.

|               | <b>Command</b>            | <b>Function</b>            |
|---------------|---------------------------|----------------------------|
| <b>Step 1</b> | <b>configure terminal</b> | Enter global configuration |

|               |                                                      |                                                                                     |
|---------------|------------------------------------------------------|-------------------------------------------------------------------------------------|
|               |                                                      | mode.                                                                               |
| <b>Step 2</b> | <b>spanning-tree priority</b> <i>bridge-priority</i> | Configure device's bridge priority.<br>Priority range is 0~65535, default is 32768. |
| <b>Step 3</b> | <b>show spanning-tree</b>                            | Show STP configurations.                                                            |
| <b>Step 4</b> | <b>write</b>                                         | Save configurations.                                                                |

### 12.2.5 Configure forward delay

Network will recompute spanning tree when there is link down in network. Construction of spanning tree will be changed too. But the new STP PDU can't go the rounds of network. In this case, a temporary loop will come out if the new root port and designated port forward data immediately. So, STP adopts state transition mechanism. Before re-forwarding data, root port and designated port will undergo an intermediate state. After forward delay time out in the intermediate state, the new STP PDU have gone the rounds of network, then root port and designated port begin to forward data.

Begin at privileged configuration mode, configure device's forward delay as the following table shows.

|               | <b>Command</b>                                   | <b>Function</b>                                                                    |
|---------------|--------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                        | Enter global configuration mode.                                                   |
| <b>Step 2</b> | <b>spanning-tree forward-time</b> <i>seconds</i> | Configure device's forward delay.<br>bridge-priority range is 4~30, default is 15. |
| <b>Step 3</b> | <b>show spanning-tree</b>                        | Show STP configurations.                                                           |
| <b>Step 4</b> | <b>write</b>                                     | Save configurations.                                                               |

Forward Delay has something to do with that how big the network is. Generally, the bigger the network, the longer forward delay should be configured. If forward delay is too small, there may be temporary redundant path; while it is too big, network will take more time to resume connectivity. We suggest using default value if you have no idea about this.

#### Notice:

Hello time, forward delay and maximum age are time parameters of root device. These three parameters should meet the following formula, otherwise, the network will not stable.

$$2 \times (\text{forward-delay} - 1) \geq \text{maximum-age} \geq 2 \times (\text{hello} + 1)$$

The unit of "1" in formula is second.

### 12.2.6 Configure hello time

Network Bridge will send hello message to other surrounding network bridge at regular intervals for verifying link connectivity. A suitable hello time can ensure a device find link failure in time and not occupy more network resource. If hello time is too big, device will be in mistake for link failure when loss packets. Then network device recomputes spanning tree.

While if too small, network device sends repeated STP PDU frequently. This will increase device's load and waste network resource.

Begin at privileged configuration mode, configure device's hello time as the following table shows.

|               | <b>Command</b>                                | <b>Function</b>                                                        |
|---------------|-----------------------------------------------|------------------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                     | Enter global configuration mode.                                       |
| <b>Step 2</b> | <b>spanning-tree hellotime <i>seconds</i></b> | Configure device's hello time. Hello time range is 1~10, default is 2. |
| <b>Step 3</b> | <b>show spanning-tree</b>                     | Show STP configurations.                                               |
| <b>Step 4</b> | <b>write</b>                                  | Save configurations.                                                   |

### 12.2.7 Configure max age time

Max age time is maximum life time of configuration message. When message age is bigger than maximum age, configuration message will be discarded.

Begin at privileged configuration mode, configure maximum age as the following table shows.

|               | <b>Command</b>                              | <b>Function</b>                                                        |
|---------------|---------------------------------------------|------------------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                   | Enter global configuration mode.                                       |
| <b>Step 2</b> | <b>spanning-tree max-age <i>seconds</i></b> | Configure maximum age of device. max age range is 6-40, default is 20. |
| <b>Step 3</b> | <b>show spanning-tree</b>                   | Show STP configurations.                                               |
| <b>Step 4</b> | <b>write</b>                                | Save configurations.                                                   |

### 12.2.8 Configure priority of designated port

Port priority decides whether it can be selected as root port or not. On equal conditions, the higher priority port will be selected as root port. Generally, the priority value is smaller, the port has higher priority. If all ports' priority value are the same, their priority decided by their port index.

Begin at privileged configuration mode, configure priority of designated port as the following table shows.

|               | <b>Command</b>                                     | <b>Function</b>                        |
|---------------|----------------------------------------------------|----------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                          | Enter global configuration mode.       |
| <b>Step 2</b> | <b>interface <i>{interface_type slot/port}</i></b> | Enter interface configuration mode.    |
| <b>Step 3</b> | <b>spanning-tree port-priority <i>priority</i></b> | Configure priority of designated port. |



|               |                                                                          |                                          |
|---------------|--------------------------------------------------------------------------|------------------------------------------|
|               |                                                                          | priority range is 1-255, default is 128. |
| <b>Step 4</b> | <b>exit</b>                                                              | Exit to global configuration mode.       |
| <b>Step 5</b> | <b>show spanning-tree interface</b><br><i>{interface_type slot/port}</i> | Show port STP configurations.            |
| <b>Step 6</b> | <b>write</b>                                                             | Save configurations.                     |

### 12.2.9 Configure path cost of designated port

Path Cost is related to the speed of the link connected to the port. On the STP switch, a port can be configured with different path costs.

Begin at privileged configuration mode, configure path cost of designated port as the following table shows.

|               | <b>Command</b>                                                           | <b>Function</b>                                                                         |
|---------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                                | Enter global configuration mode.                                                        |
| <b>Step 2</b> | <b>interface</b> <i>{interface_type slot/port}</i>                       | Enter interface configuration mode.                                                     |
| <b>Step 3</b> | <b>spanning-tree cost</b> <i>value</i>                                   | Configure path cost of designated port.<br>Path cost range is 1-65535, default is auto. |
| <b>Step 4</b> | <b>exit</b>                                                              | Exit to global configuration mode.                                                      |
| <b>Step 5</b> | <b>show spanning-tree interface</b><br><i>{interface_type slot/port}</i> | Show port STP configurations.                                                           |
| <b>Step 6</b> | <b>write</b>                                                             | Save configurations.                                                                    |

### 12.2.10 Configure edge port

The port which connects with terminal host is Edge Port. In process of spanning tree recomputation, edge port can transfer to forwarding status directly so that it can reduce transfer time. Because RSTP can't detect whether the port is edge port or not, if the port doesn't connect with switch, you'd better configure it as edge port. But when the port connects with a switch, RSTP can detect and configure it as non-edge port. By default, all ports are configured as non-edged port.

Begin at privileged configuration mode, configure edge port as the following table shows.

|                | <b>Command</b>                                     | <b>Function</b>                     |
|----------------|----------------------------------------------------|-------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                          | Enter global configuration mode.    |
| <b>Step 2</b>  | <b>interface</b> <i>{interface_type slot/port}</i> | Enter interface configuration mode. |
| <b>Step 3a</b> | <b>spanning-tree operedge</b>                      | Configure port as an edge port.     |
| <b>Step 3b</b> | <b>no spanning-tree operedge</b>                   | Reset spanning tree port to         |

|               |                                                                          |                                    |
|---------------|--------------------------------------------------------------------------|------------------------------------|
|               |                                                                          | default.                           |
| <b>Step 4</b> | <b>exit</b>                                                              | Exit to global configuration mode. |
| <b>Step 5</b> | <b>show spanning-tree interface</b><br><i>{interface_type slot/port}</i> | Show port STP configurations.      |
| <b>Step 6</b> | <b>write</b>                                                             | Save configurations.               |

### 12.2.11 Configure point to point mode

Point to point mode is usually the link which connects with switches. For the ports connected with the point-to-point link, upon some port role conditions met, they can transit to forwarding state fast through transmitting synchronization packet, thereby reducing the unnecessary forwarding delay.

Begin at privileged configuration mode, configure port to connect with point to point link as the following table shows.

|                | <b>Command</b>                                                           | <b>Function</b>                                                                                           |
|----------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                | Enter global configuration mode.                                                                          |
| <b>Step 2</b>  | <b>interface</b> <i>{interface_type slot/port}</i>                       | Enter interface configuration mode.                                                                       |
| <b>Step 3a</b> | <b>spanning-tree point-to-point</b>                                      | Configure a port as point to point port.<br>By default, all ports are configured as point to point ports. |
| <b>Step 3b</b> | <b>no spanning-tree point-to-point</b>                                   | Not to configure a port as point to point port.                                                           |
| <b>Step 4</b>  | <b>exit</b>                                                              | Exit to global configuration mode.                                                                        |
| <b>Step 5</b>  | <b>show spanning-tree interface</b><br><i>{interface_type slot/port}</i> | Show port STP configurations.                                                                             |
| <b>Step 6</b>  | <b>write</b>                                                             | Save configurations.                                                                                      |

### 12.3 Show STP information

After configuring, use the following commands to show STP information.

| <b>Command</b>                                                        | <b>Function</b>                                       |
|-----------------------------------------------------------------------|-------------------------------------------------------|
| <b>show spanning-tree</b>                                             | Show STP configurations and running status.           |
| <b>show spanning-tree interface</b> <i>{interface_type slot/port}</i> | Show STP configurations and running status of a port. |

## 13. Static Route Configuration

Static route is usually used in a simple network. This device supports maximum 512 static route rules.

|                | <b>Command</b>                                    | <b>Function</b>                  |
|----------------|---------------------------------------------------|----------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                         | Enter global configuration mode. |
| <b>Step 2a</b> | <b>ip route <i>A.B.C.D A.B.C.D A.B.C.D</i></b>    | Add static route rule.           |
| <b>Step 2b</b> | <b>ip route <i>A.B.C.D/M A.B.C.D</i></b>          | Add static route rule.           |
| <b>Step 3a</b> | <b>no ip route <i>A.B.C.D A.B.C.D A.B.C.D</i></b> | Delete static route rule.        |
| <b>Step 3b</b> | <b>no ip route <i>A.B.C.D/M A.B.C.D</i></b>       | Delete static route rule.        |
| <b>Step 4</b>  | <b>show ip route</b>                              | Show route rules.                |

## 14. IP Management Configuration

### 14.1 Configure outband management

Port AUX is outband management port. So its IP is outband management IP.

#### 14.1.1 Enter AUX port configuration mode

Begin at privileged configuration mode, enter interface configuration mode as the following table shows.

|        | Command                   | Function                         |
|--------|---------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b> | Enter global configuration mode. |
| Step 2 | <b>interface aux</b>      | Enter AUX interface.             |

#### 14.1.2 Configure outband management IP address and mask

Begin at privileged configuration mode, configure outband management IP address and mask as the following table shows.

|         | Command                                    | Function                                   |
|---------|--------------------------------------------|--------------------------------------------|
| Step 1  | <b>config terminal</b>                     | Enter global configuration mode.           |
| Step 2  | <b>interface aux</b>                       | Enter AUX interface.                       |
| Step 3a | <b>ip address &lt;A.B.C.D&gt; net-mask</b> | Configure IP address and mask of AUX port. |
| Step 3b | <b>no aux ip address</b>                   | Reset outband management IP to default.    |
| Step 4  | <b>exit</b>                                | Exit to global configuration mode.         |
| Step 5  | <b>show aux ip address</b>                 | Show outband management IP.                |
| Step 6  | <b>write</b>                               | Save configurations.                       |

#### 14.1.3 Show AUX port information

Begin at privileged configuration mode, show AUX port information as the following table shows.

|        | Command                   | Function                         |
|--------|---------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b> | Enter global configuration mode. |
| Step 2 | <b>show interface aux</b> | Show AUX port information.       |

## 14.2 Configure inband management

This device provides inband management which can be managed from uplink port.

Begin at privileged configuration mode, configure inband management IP address and mask as the following table shows.

|         | Command                                    | Function                                                                    |
|---------|--------------------------------------------|-----------------------------------------------------------------------------|
| Step 1  | <b>config terminal</b>                     | Enter global configuration mode.                                            |
| Step 2  | <b>vlan <i>vlan_id</i></b>                 | Create VLAN.                                                                |
| Step 3  | <b>exit</b>                                | Exit to global configuration mode.                                          |
| Step 4  | <b>interface vlan <i>vlan_id</i></b>       | Enter VLAN interface configuration mode.<br><i>vlan_id</i> range is 1–4094. |
| Step 5a | <b>ip address &lt;A.B.C.D&gt; net-mask</b> | Configure IP address and mask.                                              |
| Step 5b | <b>no ip address &lt;A.B.C.D&gt;</b>       | Delete IP address and mask.                                                 |
| Step 6  | <b>exit</b>                                | Exit to global configuration mode.                                          |
| Step 7  | <b>show interface vlan <i>vlan_id</i></b>  | Show VLAN information.                                                      |
| Step 8  | <b>write</b>                               | Save configurations.                                                        |

## 14.3 Configure management gateway

When OLT management IP and management server are not in the same network segment, it needs to configure a gateway.

Begin at privileged configuration mode, configure management gateway as the following table shows.

|        | Command                                      | Function                               |
|--------|----------------------------------------------|----------------------------------------|
| Step 1 | <b>config terminal</b>                       | Enter global configuration mode.       |
| Step 2 | <b>ip route 0.0.0.0/0 &lt;A.B.C.D&gt;</b>    | Configure management gateway.          |
| Step 3 | <b>no ip route 0.0.0.0/0 &lt;A.B.C.D&gt;</b> | Delete management gateway.             |
| Step 4 | <b>show ip route</b>                         | Show management gateway configuration. |
| Step 5 | <b>write</b>                                 | Save configurations.                   |

## 14.4 Configure DNS

It can configure two DNS server

|        | Command                                         | Function                         |
|--------|-------------------------------------------------|----------------------------------|
| Step 1 | <b>config terminal</b>                          | Enter global configuration mode. |
| Step 2 | <b>ip dns &lt;A.B.C.D&gt; {&lt;A.B.C.D&gt;}</b> | Configure DNS                    |
| Step 3 | <b>show ip dns</b>                              | Show management gateway.         |
| Step 4 | <b>write</b>                                    | Save configurations.             |

## 15. ARP Proxy

In order to achieve interconnection between ONU in the same PON, the devices added the ARP Proxy function.

|         | Command                              | Function                                |
|---------|--------------------------------------|-----------------------------------------|
| Step 1  | <b>config terminal</b>               | Enter global configuration mode.        |
| Step 2  | <b>interface vlan <i>vlan_id</i></b> | Create vlan and enter to vlan interface |
| Step 3a | <b>ip proxy-arp</b>                  | Enable ARP Proxy                        |
| Step 3b | <b>no ip proxy-arp</b>               | Disable ARP Proxy                       |

## 16. DHCP Management Configuration

### 16.1 Configure DHCP server

Now, larger and larger number of IP address are needed to allocate .DHCP (Dynamic Host configuration Protocol) is created to solve this problem .It concludes DHCP Server and DHCP Client.Requested by client, IP address are allocated by the server.Configure DHCP Server as the following table show:

|         | Command                                                         | Function                                                                                                          |
|---------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Step 1  | <b>config terminal</b>                                          | Enter global configuration mode.                                                                                  |
| Step 2a | <b>dhcp-server [enable   disable]</b>                           | Disable the DHCP server function                                                                                  |
| Step 2b | <b>dhcp-server   dns1   dns2   dns3   wins] &lt;A.B.C.D&gt;</b> | Configure DHCP's DNS and WINS Server                                                                              |
| Step 2c | <b>dhcp-server startip A.B.C.D endip A.B.C.D</b>                | Configure DHCP IP address pool                                                                                    |
| Step 2d | <b>dhcp-server subnet A.B.C.D</b>                               | Configure DHCP mask                                                                                               |
| Step 2e | <b>dhcp-server gateway A.B.C.D</b>                              | Configure DHCP gateway                                                                                            |
| Step 2f | <b>dhcp-server interface vlan &lt;1-4095&gt;</b>                | Add the VLAN to the DHCP Server (If want DHCP server successful, need to configure the vlan interface IP address) |
| Step 2g | <b>dhcp-server leasetime leasetime</b>                          | Configure IP address leasetime                                                                                    |
| Step 3a | <b>show dhcp-server</b>                                         | Show DHCP server configuration                                                                                    |
| Step 3d | <b>show dhcp-server lease</b>                                   | Show DHCP Server allocate IP address                                                                              |
| Step 4  | <b>copy running-config startup-config</b>                       | Save the configuration                                                                                            |

### 16.2 Configure DHCP relay

Because the DHCP receiving need to broadcast ,so the server and the client should be in the same network.The DHCP relay can save this issue effective. Configure DHCP relay as the following table show:

1. Single DHCP relay configuration:

| Command | Function |
|---------|----------|
|---------|----------|

|         |                                           |                                                                             |
|---------|-------------------------------------------|-----------------------------------------------------------------------------|
| Step 1  | <b>config terminal</b>                    | Enter global configuration mode.                                            |
| Step 2  | <b>interface vlan <i>vlan_id</i></b>      | Add VLAN and enter VLAN interface configuration<br><i>vlan_id</i> (1–4094); |
| Step 3  | <b>dhcp relay A.B.C.D</b>                 | Configure the DHP relay server IP address ,and enable the DHCP relay        |
| Step 3b | <b>no dhcp relay A.B.C.D</b>              | Delete DHCP relay                                                           |
| Step 4  | <b>exit</b>                               | Exit to global configuration mode                                           |
| Step 5  | <b>show dhcp-relay configure</b>          | Show the DHCP relay configuration。                                          |
| Step 6  | <b>copy running-config startup-config</b> | Save the configuration                                                      |

## 2. Multiple DHCP relay configuration:

|         | <b>Command</b>                                       | <b>Function</b>                                                                  |
|---------|------------------------------------------------------|----------------------------------------------------------------------------------|
| Step 1  | <b>config terminal</b>                               | Enter global configuration mode.                                                 |
| Step 2  | <b>dhcp-server group &lt;groupname&gt;</b>           | Add a DHCP server group, and enter group configuration mode.                     |
| Step 3a | <b>dhcp-server A.B.C.D</b>                           | Add the DHCP server to the group.                                                |
| Step 3b | <b>no dhcp-server A.B.C.D</b>                        | Delete DHCP server                                                               |
| Step 4  | <b>exit</b>                                          | Exit to the global configuration mode                                            |
| Step 5  | <b>interface vlan <i>vlan_id</i></b>                 | Add a VLAN and enter to VLAN interface configuration<br><i>vlan_id</i> (1–4094); |
| Step 6a | <b>dhcp relay server-select &lt;groupname&gt;</b>    | Select DHCP server group 。                                                       |
| Step 6b | <b>no dhcp relay server-select &lt;groupname&gt;</b> | Delete the DHCP server group。                                                    |
| Step 7  | <b>exit</b>                                          | Exit to global configuration mode                                                |
| Step 8  | <b>show dhcp-relay configure</b>                     | Sow DHCP relay configuration.                                                    |
| Step 9  | <b>copy running-config startup-config</b>            | Save the configuration.                                                          |

## 16.3 Configure DHCP Snooping

To prevent the DHCP message attacking and protect you network to get a useful IP address.DHCP Snooping is used for do that.Configure DHCP Snooping as the following table



show:

A.DHCP Snooping enable/disable

|         | Command                                        | Function                                                                                         |
|---------|------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Step 1  | <b>config terminal</b>                         | Enter global configuration mode.                                                                 |
| Step 2  | <b>dhcp-snooping (enable disable)</b>          | Enable/disable DHCP Snooping.<br>(DHCP Snooping enable, can not open dhcp server and dhcp relay) |
| Step 3a | <b>dhcp-snooping vlan &lt;1-4095&gt; ...</b>   | Configure DHCP Snooping vlan list                                                                |
| Step 3b | <b>no dhcp-snooping vlan &lt;1-4095&gt;...</b> | Delete DHCP Snooping vlan list                                                                   |
| Step 4  | <b>exit</b>                                    | Exit to global configuration mode.                                                               |
| Step 5  | <b>show dhcp-snooping configuration</b>        | Show DHCP Snooping configuration.                                                                |
| Step 6  | <b>copy running-config startup-config</b>      | Save configuration.                                                                              |

B. Configure DHCP Snooping option82

|        | Command                                                       | Function                                                    |
|--------|---------------------------------------------------------------|-------------------------------------------------------------|
| Step 1 | <b>config terminal</b>                                        | Enter global configuration mode.                            |
| Step 2 | <b>dhcp-snooping information option (enable disable)</b>      | Enable/disable DHCP Snooping option82.                      |
| Step 3 | <b>dhcp-snooping information strategy (drop keep release)</b> | Deal with the message with option82, drop、keep and replace. |
| Step 4 | <b>exit</b>                                                   | Exit to global configuration mode.                          |
| Step 5 | <b>show dhcp-snooping configuration</b>                       | Show DHCP Snooping configuration.                           |
| Step 6 | <b>copy running-config startup-config</b>                     | Save configuration.                                         |

C. Configure DHCP Snooping binding list

|        | Command                                                                                                                                           | Function                          |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Step 1 | <b>config terminal</b>                                                                                                                            | Enter global configuration mode.  |
| Step 2 | <b>dhcp-snooping binding<br/>HHHH:HHHH:HHHH vlan &lt;1-4095&gt;<br/>A.B.C.D interface {interface_type<br/>slot/port} lease &lt;60-1000000&gt;</b> | Add the static DHCP binding list. |

|        |                                                             |                                                          |
|--------|-------------------------------------------------------------|----------------------------------------------------------|
|        | <b>no dhcp-snooping binding<br/>HHHH:HHHH:HHHH</b>          | Delete MAC binding list.                                 |
|        | <b>no dhcp-snooping binding<br/>(all static dynamic)</b>    | Delete DHCP binding list.can delete all、static、dynamic . |
| Step 3 | <b>dhcp-snooping binding delete-time<br/>&lt;1-3600&gt;</b> | Configure the biding list aging time and delete time.    |
| Step 4 | <b>exit</b>                                                 | Exit to global configuration mode                        |
| Step 5 | <b>show dhcp-snooping configuration</b>                     | Show DHCP Snooping configuration.                        |
| Step 6 | <b>copy running-config startup-config</b>                   | Save configuration.                                      |

## D. Configure DHCP Snooping port

|         | <b>Command</b>                                                           | <b>Function</b>                                                                         |
|---------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Step 1  | <b>config terminal</b>                                                   | Enter global configuration mode.                                                        |
| Step 2  | <b>interface {interface_type slot/port}</b>                              | Enter the interface configuration                                                       |
| Step 3a | <b>dhcp-snooping (trust untrust)</b>                                     | Configure the trust/untrust port. All the port are untrust in default.                  |
| Step 3b | <b>dhcp-snooping information circuit-id<br/>string &lt;string&gt;</b>    | Configure the option82的circuit-id value.                                                |
| Step 3c | <b>no dhcp-snooping information circuit-id<br/>string &lt;string&gt;</b> | Delete the option82 circuit-id value , and load default.                                |
| Step 3d | <b>dhcp-snooping information remote-id<br/>string &lt;string&gt;</b>     | Configure option82remote-id value.                                                      |
| Step 3e | <b>no dhcp-snooping information<br/>remote-idstring &lt;string&gt;</b>   | Delete option82 remote-id value, load default value.                                    |
| Step 3f | <b>dhcp-snooping limit rate &lt;0-4096&gt;</b>                           | Configure the port max speed of receiving the DHCP packet. It doesn't limit by default. |
| Step 3e | <b>no dhcp-snooping limit rate</b>                                       | No limit speed.                                                                         |
| Step 4  | <b>exit</b>                                                              | Exit to the global configuration mode                                                   |
| Step 5a | <b>dhcp-snooping errdisable recovery<br/>(enable disable)</b>            | Configure whether the port get down when the DHCP packetreceiving speed larger then     |

|                |                                                                  |                                                              |
|----------------|------------------------------------------------------------------|--------------------------------------------------------------|
|                |                                                                  | the limit speed .The default is disable.                     |
| <b>Step 5b</b> | <b>dhcp-snooping errdisable recovery interval &lt;3-3600&gt;</b> | Configure the time when the port recovery after getting down |
| <b>Step 6</b>  | <b>show dhcp-snooping configuration</b>                          | Show DHCP Snooping configuration.                            |
| <b>Step 7</b>  | <b>copy running-config startup-config</b>                        | Save configuration.                                          |

TOP SECRET

## 17. PON Management Configuration

### 17.1 Show PON port info and optical power

#### 17.1.1 Show Pon port statistics

|        | Command                                | Function                                |
|--------|----------------------------------------|-----------------------------------------|
| Step 1 | <b>configure terminal</b>              | Enter global configuration mode.        |
| Step 2 | <b>interface gpon <i>slot/port</i></b> | Enter PON interface configuration mode. |
| Step 3 | <b>show pon statistics</b>             | Show PON port statistics.               |

#### 17.1.2 Show PON port optical power

Optical module parameters contain transmit optical power, receive optical power, temperature, voltage and bias current. These 5 parameters decide whether the optical module can work normal or not. Any of them is abnormal may cause ONU deregister or lose packets.

Begin at privileged configuration mode, show PON port optical module parameters as the following table shows.

|        | Command                                | Function                                |
|--------|----------------------------------------|-----------------------------------------|
| Step 1 | <b>configure terminal</b>              | Enter global configuration mode.        |
| Step 2 | <b>interface gpon <i>slot/port</i></b> | Enter PON interface configuration mode. |
| Step 3 | <b>show pon optical transceiver</b>    | Show pon optical parameters.            |

#### 17.1.3 Show ONU optical transceiver

|        | Command                                                | Function                                |
|--------|--------------------------------------------------------|-----------------------------------------|
| Step 1 | <b>configure terminal</b>                              | Enter global configuration mode.        |
| Step 2 | <b>interface gpon <i>slot/port</i></b>                 | Enter PON interface configuration mode. |
| Step 3 | <b>show pon onu [<i>&lt;1-128&gt;</i>all] rx-power</b> | Show ONU optical transceiver            |

## 17.2 PON port configuration

### 17.2.1 Enable/Disable PON

Begin at privileged configuration mode, enable or disable PON port as the following table shows.

|         | Command                                | Function                                |
|---------|----------------------------------------|-----------------------------------------|
| Step 1  | <b>configure terminal</b>              | Enter global configuration mode.        |
| Step 2  | <b>interface gpon <i>slot/port</i></b> | Enter PON interface configuration mode. |
| Step 3a | <b>Shutdown</b>                        | Disable pon port                        |
| Step 3b | <b>No shutdown</b>                     | Enable pon port                         |
| Step 4  | <b>show pon info</b>                   | Show pon info                           |

## 17.3 ONU auto-learn configuration

打开或者关闭 PON 口的 ONU 自动授权功能。

|         | Command                                                                   | Function                                                                                                     |
|---------|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                 | Enter global configuration mode.                                                                             |
| Step 2  | <b>interface gpon <i>slot/port</i></b>                                    | Enter PON interface configuration mode.                                                                      |
| Step 3a | <b>onu auto-learn {<i>default-onu-profile</i> &lt;profile_name&gt;}*1</b> | Enable the auto-learn function.It support to select onu profile.will bind the default profile if not select. |
| Step 3b | <b>no onu auto-learn</b>                                                  | Disable the auto-learn                                                                                       |
| Step 4  | <b>show onu auto-learn</b>                                                | Show the auto-learn                                                                                          |

Note: After the ONU is auto-learned, there will be ONU connected to this PON port. The OLT will check whether there is equipment ID in the auto-binding list. If the equipment ID of this ONU is in the auto-binding list, the ONU uses the information of auto-binding list to register.

## 18. ONU Management Configuration

### 18.1 ONU basic configuration

#### 18.1.1 Show auto-find ONU

|        | Command                                            | Function                                |
|--------|----------------------------------------------------|-----------------------------------------|
| Step 1 | <b>configure terminal</b>                          | Enter global configuration mode.        |
| Step 2 | <b>interface gpon <i>slot/port</i></b>             | Enter PON interface configuration mode. |
| Step 3 | <b>Show onu auto-find</b>                          | Show auto-find ONU                      |
|        | <b>show onu auto-find <i>{[detail-info]}*1</i></b> | Show auto-find ONU detail info          |

#### 18.1.2 ONU automatic authorize

OLT can enable/disable automatic authorized mode. ONU will authorized automatically when ONU online

|        | Command                                                                   | Function                                |
|--------|---------------------------------------------------------------------------|-----------------------------------------|
| Step 1 | <b>configure terminal</b>                                                 | Enter global configuration mode.        |
| Step 2 | <b>interface gpon <i>slot/port</i></b>                                    | Enter PON interface configuration mode. |
| Step 3 | <b>onu auto-learn <i>{default-onu-profile &lt;profile_name&gt;}*1</i></b> | Enable/disable auto-auth                |
| Step 4 | <b>Show onu auto-learn</b>                                                | Show auto-learn                         |

#### 18.1.3 Show ONU authorized info

|        | Command                                      | Function                                |
|--------|----------------------------------------------|-----------------------------------------|
| Step 1 | <b>configure terminal</b>                    | Enter global configuration mode.        |
| Step 2 | <b>interface gpon <i>slot/port</i></b>       | Enter PON interface configuration mode. |
| Step 3 | <b>Show onuinfo [<i>&lt;1-128&gt;]*1</i></b> | Show ONU authorized info                |

#### 18.1.4 Show ONU authorized detail-info

It can show ONU Vendor ID, Version, SN, product Code.....

|        | Command                                       | Function                                     |
|--------|-----------------------------------------------|----------------------------------------------|
| Step 1 | <b>configure terminal</b>                     | Enter global configuration mode.             |
| Step 2 | <b>interface gpon <i>slot/port</i></b>        | Enter PON interface configuration mode.      |
| Step 3 | <b>Show onu detail-info {&lt;1-128&gt;}*1</b> | Show a onu detail-info or can select a range |

### 18.1.5 Activate|deactivate ONU

ONU will online/offline when you activate/deactivate ONU

|         | Command                                                            | Function                                |
|---------|--------------------------------------------------------------------|-----------------------------------------|
| Step 1  | <b>configure terminal</b>                                          | Enter global configuration mode.        |
| Step 2  | <b>interface gpon <i>slot/port</i></b>                             | Enter PON interface configuration mode. |
| Step 3a | <b>onu [<i>all</i> &lt;1-128&gt;] [<i>activate deactivate</i>]</b> | Activate/deactivate ONU on pon port     |

### 18.1.6 ONU authorization

|         | Command                                                                                                                          | Function                                |
|---------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                        | Enter global configuration mode.        |
| Step 2  | <b>interface gpon <i>slot/port</i></b>                                                                                           | Enter PON interface configuration mode. |
| Step 3a | <b>onu     add     &lt;1-128&gt;     profile<br/>&lt;onu_profile_name&gt;<br/>[hpw loid+hpw loid+pw loid pw sn+hpw sn+pw sn]</b> | Authorize ONU                           |

### 18.1.7 Configure ONU description string

|        | Command                                | Function                         |
|--------|----------------------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b>              | Enter global configuration mode. |
| Step 2 | <b>interface gpon <i>slot/port</i></b> | Enter PON interface              |

|               |                                                     |                                |
|---------------|-----------------------------------------------------|--------------------------------|
|               |                                                     | configuration mode.            |
| <b>Step 3</b> | <b>onu &lt;onuid&gt; description &lt;string&gt;</b> | Add description string to ONU. |
| <b>Step 4</b> | <b>show onu &lt;onuid&gt; description</b>           | Show ONU description.          |

## 18.2 ONU remote configuration

### 18.2.1 Show ONU SFP info

|               | <b>Command</b>                             | <b>Function</b>                         |
|---------------|--------------------------------------------|-----------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                  | Enter global configuration mode.        |
| <b>Step 2</b> | <b>interface gpon slot/port</b>            | Enter PON interface configuration mode. |
| <b>Step 3</b> | <b>show onu &lt;1-128&gt; optical-info</b> | Show onu SFP info                       |

### 18.2.2 Upgrade ONU

Only ONU had authorized on OLT, ONU can upgrade.

|               | <b>Command</b>                                                                          | <b>Function</b>                                                |
|---------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                                               | Enter global configuration mode.                               |
| <b>Step 2</b> | <b>upgrade load image &lt;filename&gt;<br/>&lt;A.B.C.D&gt;</b>                          | Configure ONU firmware name and TFTP server.                   |
| <b>Step 3</b> | <b>upgrade select pon &lt;pon_num&gt;<br/>{&lt;onuid_list&gt;}*1</b>                    | Select ONU. ONU ID format is 1-2.                              |
| <b>Step 4</b> | <b>upgrade start<br/>[download active commit mix]</b>                                   | Download ONU firmware and save in memory, and then update ONU. |
| <b>Step 5</b> | <b>upgrade stop</b>                                                                     | Delete the firmware in memory, and delete the upgrader info    |
| <b>Step 6</b> | <b>show upgrade [status info] onu-version]<br/>{pon &lt;1-8&gt; &lt;onu_list&gt;}*1</b> | Show the upgrade status, upgrade info and firmware info        |

**Notice:**

1. DO NOT turn power off when updating. After finishing update, OLT will inform ONU if updated successfully and reset ONU with the new firmware.
2. After ONU updated and restarted, OLT will send commit command to confirm the new version.
3. Please delete the firmware and upgrade settings by command **upgrade onu stop**.
4. Display ONU upgrade progress by command **show upgrade onu status**.



5. Display ONU upgrade settings by command **show upgrade onu info**.
6. Stop upgrading ONU by command **upgrade onu stop**.

### 18.2.3 Auto-upgrade ONU

OLT will compared equipment id with onu info, if they are consistent, will start to upgrade

|        | Command                                                                                                       | Function                                                           |
|--------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                                                     | Enter global configuration mode.                                   |
| Step 2 | <b>auto-upgrade onu equipment_id</b><br><string> <b>version</b> <string> <b>image</b><br><filename> <A.B.C.D> | Configure the onu equipment, id , version ,file name ,file address |
| Step 3 | <b>no auto-upgrade onu equipment_id</b><br><string>                                                           | Delete the onu equipment                                           |
| Step 4 | <b>show auto-upgrade</b> [status config]                                                                      | Show the auto-upgrade                                              |

### 18.2.4 Reboot ONU

Reboot the ONU which had authorized

|         | Command                              | Function                                |
|---------|--------------------------------------|-----------------------------------------|
| Step 1  | <b>configure terminal</b>            | Enter global configuration mode.        |
| Step 2  | <b>interface gpon slot/port</b>      | Enter PON interface configuration mode. |
| Step 3a | <b>onu [all &lt;1-128&gt; reboot</b> | Reboot one of ONU or all of onu on PON  |

### 18.2.5 TCONT Configuration

Create/modify a TCONT, and bind to DBA profile.

|         | Command                                                                              | Function                                     |
|---------|--------------------------------------------------------------------------------------|----------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                            | Enter global configuration mode.             |
| Step 2  | <b>interface gpon slot/port</b>                                                      | Enter PON interface configuration mode.      |
| Step 3a | <b>onu &lt;1-128&gt; tcont &lt;1-255&gt; {[name]</b><br><string>*1 {[dba] <string>*1 | Configure ONU TCONT and dba you had created. |
| Step 3b | <b>no onu &lt;1-128&gt; tcont &lt;1-255&gt;</b>                                      | Delete TCONT                                 |
| Step 4  | <b>show onu &lt;onuid&gt; tcont</b>                                                  | Show ONU TCONT                               |

## 18.2.6 GEMPORT Configuration

|         | Command                                                                                                                                                            | Function                                                              |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                                                          | Enter global configuration mode.                                      |
| Step 2  | <b>interface gpon slot/port</b>                                                                                                                                    | Enter PON interface configuration mode.                               |
| Step 3a | <b>onu &lt;1-128&gt; gemport &lt;1-255&gt; [tcont] &lt;1-255&gt; {[gemport_name] &lt;gemport_name&gt;}*1 {[portid] &lt;129-4095&gt;}*1 {[queue] &lt;0-7&gt;}*1</b> | Configure GEMPORT to bind a TCONT. And can select portid and queue id |
| Step 3b | <b>onu &lt;1-128&gt; gemport &lt;1-255&gt; [traffic-limit] upstream &lt;dba_name&gt; downstream &lt;dba_name&gt;</b>                                               | Configure GEMPORT to bind a traffic limit profile                     |
| Step 3c | <b>onu &lt;1-128&gt; gemport &lt;1-255&gt; [state] [enable disable]</b>                                                                                            | Enable/disable gemport.                                               |
| Step 3d | <b>onu &lt;1-128&gt; gemport &lt;1-255&gt; [down-queue-map-id] &lt;0-7&gt; up-queue-map-id &lt;0-3&gt;</b>                                                         | Configure GEMPORT up/down queue                                       |
| Step 3e | <b>onu &lt;1-128&gt; gemport &lt;1-255&gt; encrypt [disable enable] {[downstream bidirection]}*1</b>                                                               | Configure GEMPORT encrypt                                             |
| Step 4  | <b>no onu &lt;1-128&gt; gemport &lt;1-255&gt;</b>                                                                                                                  | Delete ONU GEMPORT                                                    |
| Step 5  | <b>show onu &lt;onuid&gt; gemport</b>                                                                                                                              | Show ONU GEMPORT configuration                                        |

## 18.2.7 ONU Service Configuration

|         | Command                                                                                                                                                                                  | Function                                |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                                                                                | Enter global configuration mode.        |
| Step 2  | <b>interface gpon slot/port</b>                                                                                                                                                          | Enter PON interface configuration mode. |
| Step 3a | <b>onu &lt;1-128&gt; service &lt;service_name&gt; gemport &lt;1-255&gt; [vlan] &lt;vlan_list&gt; {[iphost] &lt;1-255&gt;}*1 {[ethuni] lan &lt;1-32&gt;}*1 {[cos] &lt;cos_list&gt;}*1</b> | Configure ONU service with vlan         |
| Step 3b | <b>onu &lt;1-128&gt; service &lt;service_name&gt; gemport &lt;1-255&gt; [untag] {[ethuni] lan &lt;1-32&gt;}*1 {[iphost] &lt;1-255&gt;}*1</b>                                             | Configure ONU service without vlan      |
| Step 4  | <b>no onu &lt;1-128&gt; service</b>                                                                                                                                                      | Delete ONU service                      |

|                |
|----------------|
| <service_name> |
|----------------|

### 18.2.8 Configure the service-port

Configure the service-port .

|         | Command                                                                                                                                                                                                                                              | Function                                                                         |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                                                                                                                                            | Enter global configuration mode.                                                 |
| Step 2  | <b>interface gpon slot/port</b>                                                                                                                                                                                                                      | Enter PON interface configuration mode.                                          |
| Step 3a | <b>onu &lt;1-128&gt; service-port &lt;1-128&gt; gempport &lt;1-128&gt; uservlan &lt;1-4094&gt; {[to] &lt;1-4094&gt;}*1 transparent</b>                                                                                                               | Configure the vlan transparent mode                                              |
| Step 3b | <b>onu &lt;1-128&gt; service-port &lt;1-128&gt; gempport &lt;1-128&gt; uservlan &lt;1-4094&gt; [user_priority] &lt;0-7&gt; [vlan] &lt;1-4094&gt; {[new_cos] &lt;0-7&gt;}*1</b>                                                                       | Configure the vlan translate mode                                                |
| Step 3c | <b>onu &lt;1-128&gt; service-port &lt;1-128&gt; gempport &lt;1-128&gt; uservlan &lt;1-4094&gt; [vlan] &lt;1-4094&gt; {[new_cos] &lt;0-7&gt;}*1 {[svlan] &lt;1-4094&gt;}*1 {[new_scos] &lt;0-7&gt;}*1</b>                                             | Configure the vlan translate mode and QinQ                                       |
| Step 3d | <b>onu &lt;1-128&gt; service-port &lt;1-128&gt; gempport &lt;1-128&gt; uservlan &lt;1-4094&gt; [user_etype] [pppoe ipoe] [vlan] &lt;1-4094&gt; {[new_cos] &lt;0-7&gt;}*1 {[svlan] &lt;1-4094&gt;}*1 {[new_scos] &lt;0-7&gt;}*1</b>                   | Configure the vlan translate mode and QinQ.can select the type of packets        |
| Step 3e | <b>onu &lt;1-128&gt; service-port &lt;1-128&gt; gempport &lt;1-128&gt; uservlan &lt;1-4094&gt; [user_etype] [user_define] &lt;eth_type&gt; [vlan] &lt;1-4094&gt; {[new_cos] &lt;0-7&gt;}*1 {[svlan] &lt;1-4094&gt;}*1 {[new_scos] &lt;0-7&gt;}*1</b> | Configure the vlan translate mode and QinQ.can select the type that user define. |
| Step 3f | <b>onu &lt;1-128&gt; service-port &lt;1-128&gt; gempport &lt;1-128&gt; uservlan untag [user_etype] [user_define] &lt;eth_type&gt; [vlan] &lt;1-4094&gt; {[new_cos] &lt;0-7&gt;}*1 {[svlan] &lt;1-4094&gt;}*1 {[new_scos] &lt;0-7&gt;}*1</b>          | Configure the vlan untagged mode, can configure QinQ and type that user define.  |
| Step 3g | <b>onu &lt;1-128&gt; service-port &lt;1-128&gt; gempport &lt;1-128&gt; uservlan untag [vlan] &lt;1-4094&gt; {[new_cos] &lt;0-7&gt;}*1 {[svlan] &lt;1-4094&gt;}*1 {[new_scos] &lt;0-7&gt;}*1</b>                                                      | Configure the vlan untagged mode,can configure QinQ                              |
| Step 4  | <b>onu &lt;1-128&gt; service-port &lt;1-128&gt; admin-status [enable disable]</b>                                                                                                                                                                    | Enable/disable service-port                                                      |
| Step 5  | <b>onu &lt;1-128&gt; service-port &lt;1-128&gt; description &lt;desc&gt;</b>                                                                                                                                                                         | Configure the service-port description                                           |

|               |                                                        |                         |
|---------------|--------------------------------------------------------|-------------------------|
| <b>Step 6</b> | <b>no onu &lt;1-128&gt; service-port &lt;1-128&gt;</b> | Delete the service-port |
|---------------|--------------------------------------------------------|-------------------------|

### 18.2.9 ONU UNI Configuration

Inclue LAN, VEIP, IPHOST

|                | <b>Command</b>                                                                                                                                                                                         | <b>Function</b>                                  |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                                                                                                                                              | Enter global configuration mode.                 |
| <b>Step 2</b>  | <b>interface gpon slot/port</b>                                                                                                                                                                        | Enter PON interface configuration mode.          |
| <b>Step 3a</b> | <b>onu &lt;1-128&gt; portvlan [eth wifi veip] &lt;1-32&gt; [mode] [transparent]</b>                                                                                                                    | Configure the UNI mode is transparent            |
| <b>Step 3b</b> | <b>onu &lt;1-128&gt; portvlan [eth wifi veip] &lt;1-32&gt; [mode] [trunk]</b>                                                                                                                          | Configure the UNI mode is trunk                  |
| <b>Step 3c</b> | <b>onu &lt;1-128&gt; portvlan [eth wifi veip] &lt;1-32&gt; [mode] [tag] vlan &lt;1-4094&gt; {pri &lt;0-7&gt;}*1</b>                                                                                    | Configure the UNI mode is access and bind a vlan |
| <b>Step 3d</b> | <b>onu &lt;1-128&gt; portvlan [eth wifi veip] &lt;1-32&gt; [mode] [hybrid] def_vlan &lt;1-4094&gt; {def_pri &lt;0-7&gt;}*1</b>                                                                         | Configure the UNI mode is hybrid and bind a vlan |
| <b>Step 3e</b> | <b>onu &lt;1-128&gt; portvlan [eth wifi veip] &lt;1-32&gt; [vlan] &lt;vlan_list&gt;</b>                                                                                                                | Configure the list of UNI vlan                   |
| <b>Step 3f</b> | <b>onu &lt;1-128&gt; portvlan [eth wifi veip] &lt;1-32&gt; [translate] [vlan] &lt;1-4094&gt; [cvlan] &lt;1-4094&gt; {[cvlan_pri] &lt;0-7&gt;}*1 [svlan] &lt;1-4094&gt; {[svlan_pri] &lt;0-7&gt;}*1</b> | Configure the UNI mode is translate              |

### 18.2.10 ONU FEC Configuration

Enable/disable ONU FEC

|               | <b>Command</b>                                | <b>Function</b>                         |
|---------------|-----------------------------------------------|-----------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                     | Enter global configuration mode.        |
| <b>Step 2</b> | <b>interface gpon slot/port</b>               | Enter PON interface configuration mode. |
| <b>Step 3</b> | <b>onu &lt;1-128&gt; fec [enable disable]</b> | Enable/disable ONU FEC                  |

### 18.2.11 Show ONU Service

| <b>Command</b> | <b>Function</b> |
|----------------|-----------------|
|----------------|-----------------|

|               |                                                   |                                         |
|---------------|---------------------------------------------------|-----------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                         | Enter global configuration mode.        |
| <b>Step 2</b> | <b>interface gpon slot/port</b>                   | Enter PON interface configuration mode. |
| <b>Step 3</b> | <b>show running-config onu {&lt;1-128&gt;} *1</b> | Show ONU Service                        |

### 18.2.12 Show ONU capability

|               | <b>Command</b>                                 | <b>Function</b>                         |
|---------------|------------------------------------------------|-----------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                      | Enter global configuration mode.        |
| <b>Step 2</b> | <b>interface gpon slot/port</b>                | Enter PON interface configuration mode. |
| <b>Step 3</b> | <b>show onu [&lt;1-128&gt; all] capability</b> | Show ONU capability                     |

## 18.3 ONU remote port configuration

### 18.3.1 ONU port enable/disable

|               | <b>Command</b>                                                         | <b>Function</b>                         |
|---------------|------------------------------------------------------------------------|-----------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                              | Enter global configuration mode.        |
| <b>Step 2</b> | <b>interface gpon slot/port</b>                                        | Enter PON interface configuration mode. |
| <b>Step 3</b> | <b>onu &lt;1-128&gt; eth &lt;1-32&gt; {[state] [disable enable]}*1</b> | Disable/enable port                     |

### 18.3.2 ONU port autonegotiation

|               | <b>Command</b>                                                                                           | <b>Function</b>                         |
|---------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                                                                | Enter global configuration mode.        |
| <b>Step 2</b> | <b>interface gpon slot/port</b>                                                                          | Enter PON interface configuration mode. |
| <b>Step 3</b> | <b>onu &lt;1-128&gt; eth &lt;1-32&gt; {[speed] [auto full-10 full-100 full-1000 half-10 half-100]}*1</b> | ONU port autonegotiation                |

### 18.3.3 ONU port flow control configuration

Begin at privileged configuration mode, configure ONU port flow control as the following table shows.

|        | Command                                                                              | Function                                |
|--------|--------------------------------------------------------------------------------------|-----------------------------------------|
| Step 1 | <b>configure terminal</b>                                                            | Enter global configuration mode.        |
| Step 2 | <b>interface gpon slot/port</b>                                                      | Enter PON interface configuration mode. |
| Step 3 | <b>onu &lt;onuid&gt; eth &lt;port-num&gt; <br/> {[pause-time] &lt;0-65535&gt;}*1</b> | Configure flow control                  |

#### 18.3.4 Multicast vlan configuration

|         | Command                                                  | Function                                |
|---------|----------------------------------------------------------|-----------------------------------------|
| Step 1  | <b>configure terminal</b>                                | Enter global configuration mode.        |
| Step 2  | <b>interface gpon slot/port</b>                          | Enter PON interface configuration mode. |
| Step 3a | <b>onu &lt;1-128&gt; mvlan &lt;vlanList&gt;</b>          | Add a multicast vlan                    |
| Step 3b | <b>no onu &lt;1-128&gt; mvlan [all &lt;vlanList&gt;]</b> | Delete multicast vlan                   |

#### 18.3.5 Configure onu iphost

|         | Command                                                                                                                | Function                                |
|---------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                              | Enter global configuration mode.        |
| Step 2  | <b>interface gpon slot/port</b>                                                                                        | Enter PON interface configuration mode. |
| Step 3a | <b>onu &lt;1-128&gt; iphost &lt;1-255&gt; [id] <br/> &lt;desc&gt;</b>                                                  | Configure iphost descible               |
| Step 3b | <b>onu &lt;1-128&gt; iphost &lt;1-255&gt; [dhcp]</b>                                                                   | Configure to dhcp mode                  |
| Step 3c | <b>onu &lt;1-128&gt; iphost &lt;1-255&gt; [static-ip] <br/> &lt;A.B.C.D&gt; &lt;A.B.C.D&gt; {&lt;A.B.C.D&gt;}*1</b>    | Configure to static mode,and subnet,GW  |
| Step 3d | <b>onu &lt;1-128&gt; iphost &lt;1-255&gt; <br/> [primary-dns] &lt;A.B.C.D&gt; {second-dns <br/> &lt;A.B.C.D&gt;}*1</b> | Configure the dns                       |
| Step 3e | <b>no onu &lt;1-128&gt; iphost &lt;1-255&gt;</b>                                                                       | Delte the iphost configuration          |

#### 18.3.6 ONU port multicast tag-strip configuration

|        | Command                   | Function                         |
|--------|---------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b> | Enter global configuration mode. |

|                |                                                                |                                         |
|----------------|----------------------------------------------------------------|-----------------------------------------|
| <b>Step 2</b>  | <b>interface gpon slot/port</b>                                | Enter PON interface configuration mode. |
| <b>Step 3a</b> | <b>onu &lt;1-128&gt; mvlan [tag-strip] eth &lt;1-32&gt;</b>    | Configure the multicast tag-strip       |
| <b>Step 3b</b> | <b>no onu &lt;1-128&gt; mvlan [tag-strip] eth &lt;1-32&gt;</b> | Delete the configuration                |

### 18.3.7 Example for SFU

1GE ONU with vlan 100. Uplink DBA mode: assured 10M, maximum 20M. Gempport 1 with downlink 20M.

1. Create a onu profile with 1 eth port

Profile onu name 1GE\_SFU

Port eth 1

Commit

Exit

2. Create a dba profile with assured 10M max20M

Profile dba name 20M

Type 3 assured 10240 maximum 20480

Exit

3. Create a traffic profile to limit the downlink speed

Profile traffic name DN\_20M

Sir 20480 pir 20480

Exit

4. Register onu and configure the service

Interface gpon 0/1

Show onu auto-find

Onu add 1 profile 1GE\_SFU sn GPON00000031

Onu 1 tcont 1 dba 20M

Onu 1 gempport 1 tcont 1

Onu 1 gempport 1 traffic-limit upstream default downstream DN\_20M

Onu 1 service 1 gempport 1 vlan 100

Onu 1 service-port 1 gempport 1 user-vlan 100 vlan 100

Onu 1 portvlan eth 1 mode tag vlan 100

5. Create vlan 100

Vlan 100

Exit

6. Bind the vlan to uplink port

Interface gigabitethernet 0/10

Switchport hybrid pvid vlan 100

### 18.3.8 Example for HGU

4FE ONU with vlan 41 and vlan 46. Uplink DBA mode: assured 10M, maximum 20M.

Gemport 1 with downlink 20M. vlan 46 is for tr069 , DBA mode: fixed 2M

1. Create a onu profile with 1 veipport

Profile onu name HGU

Port veip 1

Commit

Exit

2. Create a dba profile

Profile dba name 20M

Type 3 assured 10240 maximum 20480

Exit

Profile dba name 2M

Type 1 fixed 2048

Exit

3. Create a traffic profile to limit the downlink speed

Profile traffic name DN\_20M

Sir 20480 pir 20480

Exit

4. register onu and configure the service

Interface gpon 0/1

Show onu auto-find

Onu add 1 profile HGU sn GPON000000AB

Onu 1 tcont 1 dba 20M

Onu 1 tcont 2 dba 2M

Onu 1 gemport 1 tcont 1

Onu 1 gemport 1 traffic-limit upstream default downstream DN\_20M

Onu 1 service HSI gemport 1 vlan 41

Onu 1 service-port 1 gemport 1 user-vlan 41 vlan 41

Onu 1 gemport 2 tcont 2

Onu 1 service TR69 gemport 2 vlan 46

Onu 1 service-port 2 gemport 2 user-vlan 46 vlan 46

Onu 1 portvlan veip 1 mode transparent

5. Create vlan 41 and 46, bind to uplink port

Vlan 41

Exit

Vlan 46

Exit



```

Interface gigabitethernet 0/10
Switchport mode trunk
Switchport trunk vlan 41
Switchport trunk vlan 46

```

6. Login to onu webinterface, create two WAN connection,one is internet with vlan41; another one is tr069 with vlan46

## 18.4 Rogue-onu configuration

We called this rogue ONT which does not follow the assigned timestamp to send up the optical signal.

Rogue ONT mainly divided into the following two types:

- 1) The long Lighting rogue ont: ONT is lighting (glowing at any moment).
- 2) Luminous rogue ont: Lighting in OLT non allocation of the timestamp, may be light in advance, or delay to turn off and so on.

### 18.4.1 Configure the rogue-onu-detect

|        | Command                                                                                                                                  | Function                                                  |
|--------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                                                                                | Enter global configuration mode.                          |
| Step 2 | <b>rogue-onu-detect</b> <i>[enable disable]</i><br><b>locate</b> <i>[enable disable]</i> <b>auto-shutdown</b><br><i>[enable disable]</i> | Enable/disable<br>detect/locate/auto-shutdown<br>function |
| Step 3 | <b>show rogue-onu-detect config</b>                                                                                                      | Show the configuration                                    |
| Step 4 | <b>show rogue-onu-detect info pon</b> <1-8>                                                                                              | Show the result                                           |

### 18.4.2 Configure the rogue-onu status

|        | Command                                                                                                                           | Function                                                                |
|--------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                                                                         | Enter global configuration mode.                                        |
| Step 2 | <b>rogue-onu-state</b> pon <1-8> <b>onu</b><br><1-128> <i>[on off shutdown]</i> <b>duration</b><br><i>[forever &lt;1-255&gt;]</i> | Configure the rogue-onu<br>online/offline/shutdown and<br>duration time |
| Step 3 | <b>show rogue-onu-detect config</b>                                                                                               | Show the configuration                                                  |

## 19. ONU template management

### 19.1 Summary of the ONU template

Template under “config” node, the operation steps are as follows:

1. Create a template  

```
profile [onu|dba|traffic|line|srv|voip|alarm] {id <1-32767>}*1 {name <string>}*1
```
2. Through profile\_id into the corresponding template node  

```
profile [onu|dba|traffic|line|srv|voip|alarm] {id <1-32767>}*1 {name <string>}*1
```
3. Modify the template parameters  

```
modify ...
```
4. Exit template node  

```
exit
```
5. Binding template to an onu equipment  

```
Interface gpon slot/port
onu add 1 profile <string>
onu <onuid> profile [line|srv] <string>
```
6. Query onu equipment binding template  

```
Interface gpon slot/port
show profile [onu|dba|traffic|line|srv|voip|alarm] {id <1-32767>}*1 {name <string>}*1
```
7. query template configuration information  

```
Show profile [onu|dba|traffic|line|srv|voip|alarm] {id <1-32767>}*1 {name <string>}*1
used-info
```

### 19.2 ONU profile configuration

The Onu template is used for onu authorization, and each ONU must specify only one ONU template when authorized. The ONU template specifies the capability of this ONU.

|                | Command                                                           | Function                                                |
|----------------|-------------------------------------------------------------------|---------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                         | Enter global configuration mode.                        |
| <b>Step 2</b>  | <b>profile onu {id &lt;1-32767&gt;}*1 {name &lt;string&gt;}*1</b> | Create or enter the onu profile you had created before. |
| <b>Step 3a</b> | <b>tcont-num &lt;1-255&gt; gempport-num &lt;1-255&gt;</b>         | Configure the onu support max tcont and gempport.       |
| <b>Step 3b</b> | <b>switch-num &lt;1-255&gt; flow-num &lt;1-255&gt;</b>            | Configure the onu support max switch and flow           |
| <b>Step 3c</b> | <b>port-num {[eth] &lt;0-64&gt;}*1 {[pots] &lt;0-64&gt;}*1</b>    | Configure the onu support                               |

|                |                                                                                                      |                                                                   |
|----------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
|                | <code>{{[iphost] &lt;0-255&gt;}*1 {{[ipv6host] &lt;0-255&gt;}*1<br/>{{[veip] &lt;0-127&gt;}*1</code> | eth/pots/iphost/ipv6host/veip                                     |
| <b>Step 3d</b> | <code>service-ability n:1 [yes no] 1:p [yes no] 1:m<br/>[yes no]</code>                              | Capability profile                                                |
| <b>Step 4</b>  | <code>commit</code>                                                                                  | Commit the profile. only enter<br>“commit” can submit the setting |
| <b>Step 5</b>  | <code>exit</code>                                                                                    |                                                                   |

### 19.3 DBA bandwidth template configuration

The default system will have an id 0 dba template, this template parameters cannot be modified, all onu when create the default binding in the template. Each ONU must bind a dba template.

It have 5 dba file:

Type1: fix, integral

Type2: assure, integral

Type5: fix, assure, max, integral

Fix<=assure<=max.

| BW Type     | Delay Sensitive | Applicable T-CONT types |        |        |        |        |
|-------------|-----------------|-------------------------|--------|--------|--------|--------|
|             |                 | Type 1                  | Type 2 | Type 3 | Type 4 | Type 5 |
| Fixed       | Yes             | X                       |        |        |        | X      |
| Assured     | No              |                         | X      | X      |        | X      |
| Non-Assured | No              |                         |        | X      |        | X      |
| Best Effort | No              |                         |        |        | X      | X      |
| Max.        | No              |                         |        | X      | X      | X      |

|                | Command                                                                     | Function                         |
|----------------|-----------------------------------------------------------------------------|----------------------------------|
| <b>Step 1</b>  | <code>configure terminal</code>                                             | Enter global configuration mode. |
| <b>Step 2</b>  | <code>profile dba {id &lt;1-32767&gt;}*1 {name<br/>&lt;string&gt;}*1</code> | Create/modify a dba profile      |
| <b>Step 3a</b> | <code>type [1] fixed &lt;64-2488320&gt;</code>                              | Configure type 1 with fixed      |
| <b>Step 3b</b> | <code>type [2] assured &lt;64-2488320&gt;</code>                            | Configure type 2 with assured    |
| <b>Step 3c</b> | <code>type [3] assured &lt;64-2488320&gt;</code>                            | Configure type 3 with assured    |

|                |                                                                                                                                                               |                                                |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
|                | <b>maximum</b> <64-2488320>                                                                                                                                   | and maximum                                    |
| <b>Step 3d</b> | <b>type</b> [4] <b>maximum</b> <64-2488320> <i>[[priority] &lt;1-4&gt;*1 [[weight] &lt;1-1000&gt;*1</i>                                                       | Configure type 4 with maximum                  |
| <b>Step 3e</b> | <b>type</b> [5] <b>fixed</b> <64-2488320> <b>assured</b> <64-2488320> <b>maximum</b> <64-2488320> <i>[[priority] &lt;1-4&gt;*1 [[weight] &lt;1-1000&gt;*1</i> | Configure type 5 with fixed, assured, maximum. |

## 19.4 Traffic template configuration

The default system will have an id 0 traffic template, this template parameters cannot be modified, all GEMPORT when create the default binding in the template.Each GEMPORT must bind a traffic template.。

| parameter | Detail                     | Range           |
|-----------|----------------------------|-----------------|
| Sir       | sustained information rate | 0-10000000kbps  |
| Pir       | Peak information rate      | 64-10000000kbps |
| Cbs       | Committed Burst Size       | 0-1023kbytes    |
| pbs       | Peak Burst Size            | 0-1023kbytes    |

|               | Command                                                                                          | Function                                              |
|---------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                                                        | Enter global configuration mode.                      |
| <b>Step 2</b> | <b>profile traffic</b> {id <1-32767>*1 {name <string>*1                                          | Creat/modify a traffic profile                        |
| <b>Step 3</b> | <b>sir</b> <0-10000000> <b>pir</b> <64-10000000> <i>{cbs &lt;0-1023&gt; pbs &lt;0-1023&gt;*1</i> | Configure the sir and pri, cbs and pbs is selectable. |
| <b>Step 4</b> | <b>Exit</b>                                                                                      | Exit                                                  |

## 19.5 Line template configuration

The default system will have an id 0 LINE template, this template parameters cannot be modified,

|                | Command                                                                      | Function                         |
|----------------|------------------------------------------------------------------------------|----------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                    | Enter global configuration mode. |
| <b>Step 2</b>  | <b>profile line</b> {id <1-32767>*1 {name <string>*1                         | Create/modify a line profile     |
| <b>Step 3a</b> | <b>tcont</b> <1-255> <i>[[name] &lt;string&gt;*1 [[dba] &lt;string&gt;*1</i> | Bind a tcont profile             |
| <b>Step 4a</b> | <b>gemport</b> <1-255> <i>[tcont] &lt;1-255&gt;</i>                          | Bind a gemport profile           |

|         |                                                                                                                                                                                                                                                     |                                                                                |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
|         | <code>{{gemport_name} &lt;gemport_name&gt;*1<br/>{{portid} &lt;129-4095&gt;*1 {{queue} &lt;0-7&gt;*1</code>                                                                                                                                         |                                                                                |
| Step 4b | <code>gemport &lt;1-255&gt; [encrypt]<br/>[enable disable]</code>                                                                                                                                                                                   | Enable/disable the gemport encrypt.by default, is enable                       |
| Step 4c | <code>gemport &lt;1-255&gt; [state] [enable disable]</code>                                                                                                                                                                                         | Enable/disable the gemport state                                               |
| Step 4d | <code>gemport &lt;1-255&gt; [traffic-limit] upstream<br/>&lt;dba_name&gt; downstream &lt;dba_name&gt;</code>                                                                                                                                        | Bind a up/downstream limit to gemport                                          |
| Step 5a | <code>service &lt;service_name&gt; gemport<br/>&lt;1-255&gt; [vlan] &lt;vlan_list&gt; {{iphost}<br/>&lt;1-255&gt;*1 {{ethuni} lan &lt;1-32&gt;*1 {{cos}<br/>&lt;cos_list&gt;*1</code>                                                               | Bind a gemport which with vlan to service                                      |
| Step 5b | <code>service &lt;service_name&gt; gemport<br/>&lt;1-255&gt; [untag] {{ethuni} lan &lt;1-32&gt;*1<br/>{{iphost} &lt;1-255&gt;*1</code>                                                                                                              | Bind a gemport without vlan to service                                         |
| Step 5c | <code>mvlan &lt;vlanlist&gt;</code>                                                                                                                                                                                                                 | Create the multicast vlan                                                      |
| Step 6a | <code>service-port &lt;1-128&gt; gemport &lt;1-128&gt;<br/>uservlan &lt;1-4094&gt; {{to} &lt;1-4094&gt;*1<br/>transparent</code>                                                                                                                    | Configure the vlan mode to transparent                                         |
| Step 6b | <code>service-port &lt;1-128&gt; gemport &lt;1-128&gt;<br/>uservlan &lt;1-4094&gt; [user_priority] &lt;0-7&gt;<br/>[vlan] &lt;1-4094&gt; {{new_cos} &lt;0-7&gt;*1</code>                                                                            | Configure the vlan mode to translate                                           |
| Step 6c | <code>service-port &lt;1-128&gt; gemport &lt;1-128&gt;<br/>uservlan &lt;1-4094&gt; [vlan] &lt;1-4094&gt;<br/>{{new_cos} &lt;0-7&gt;*1 {{svlan} &lt;1-4094&gt;*1<br/>{{new_scos} &lt;0-7&gt;*1</code>                                                | Configure the vlan mode to translate,QinQ                                      |
| Step 6d | <code>service-port &lt;1-128&gt; gemport &lt;1-128&gt;<br/>uservlan &lt;1-4094&gt; [user_etype] [pppoe ipoe]<br/>[vlan] &lt;1-4094&gt; {{new_cos} &lt;0-7&gt;*1 {{svlan}<br/>&lt;1-4094&gt;*1 {{new_scos} &lt;0-7&gt;*1</code>                      | Configure the vlan mode to translate,QinQ,can select the type of data          |
| Step 6e | <code>service-port &lt;1-128&gt; gemport &lt;1-128&gt;<br/>uservlan &lt;1-4094&gt; [user_etype]<br/>[user_define] &lt;eth_type&gt; [vlan]&lt;1-4094&gt;<br/>{{new_cos} &lt;0-7&gt;*1 {{svlan} &lt;1-4094&gt;*1<br/>{{new_scos} &lt;0-7&gt;*1</code> | Configure the vlan mode to translate,QinQ,can select the type that user define |
| Step 6f | <code>service-port &lt;1-128&gt; gemport &lt;1-128&gt;<br/>uservlan untag [user_etype] [user_define]<br/>&lt;eth_type&gt; [vlan] &lt;1-4094&gt; {{new_cos}<br/>&lt;0-7&gt;*1 {{svlan} &lt;1-4094&gt;*1 {{new_scos}<br/>&lt;0-7&gt;*1</code>         | Configure the vlan mode to untag,QinQ,can select the type that user define     |
| Step 6g | <code>service-port &lt;1-128&gt; gemport &lt;1-128&gt;<br/>uservlan untag [vlan] &lt;1-4094&gt; {{new_cos}<br/>&lt;0-7&gt;*1 {{svlan} &lt;1-4094&gt;*1 {{new_scos}<br/>&lt;0-7&gt;*1</code>                                                         | Configure the vlan mode to untag,QinQ                                          |

|         |                                                                            |                                  |
|---------|----------------------------------------------------------------------------|----------------------------------|
| Step 6h | <b>service-port</b> <1-128> <b>admin-status</b><br><i>[enable disable]</i> | Enable/disable service-port      |
| Step 6l | <b>service-port</b> <1-128> <b>description</b> <desc>                      | Add the service-port description |
| Step 7  | <b>no onu</b> <1-128> <b>service-port</b> <1-128>                          | Delete the service-port          |
| Step 8  | <b>no mvlan</b> <i>[all &lt;vlanlist&gt;]</i>                              | Delete the multicast vlan        |
| Step 9  | <b>no tcont</b> <1-255>                                                    | Delete the tcont                 |
| Step 10 | <b>no gemport</b> <1-255>                                                  | Delete the gemport               |
| Step 11 | <b>no service</b> <service_name>                                           | Delete the service               |
| Step 12 | <b>commit</b>                                                              | Commit the configuration         |
| Step 13 | <b>Exit</b>                                                                | Exit                             |

## 19.6 SRV template configuration

The default system will have an id 0 SRV template, this template parameters cannot be modified

|         | Command                                                                                                                                                           | Function                                          |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                                                         | Enter global configuration mode.                  |
| Step 2  | <b>profile srv</b> {id <1-32767>}*1 {name <string>}*1                                                                                                             | Create/modify sre profile                         |
| Step 3a | <b>portvlan</b> <i>[eth wifi veip]</i> <1-32> <i>[mode]</i><br><i>[transparent]</i>                                                                               | Configure portvlan mode to transparent            |
| Step 3b | <b>portvlan</b> <i>[eth wifi veip]</i> <1-32> <i>[mode]</i> <i>[trunk]</i>                                                                                        | Configure portvlan mode to trunk                  |
|         | <b>portvlan</b> <i>[eth wifi veip]</i> <1-32> <i>[mode]</i> <i>[tag]</i><br>vlan <1-4094> {pri <0-7>}*1                                                           | Configure portvlan mode to tag, and configure pri |
|         | <b>portvlan</b> <i>[eth wifi veip]</i> <1-32> <i>[mode]</i><br><i>[hybrid]</i> def_vlan <1-4094> {def_pri <0-7>}*1                                                | Configure portvlan mode to hybrid                 |
|         | <b>portvlan</b> <i>[eth wifi veip]</i> <1-32> <i>[translate]</i><br>[vlan] <1-4094> [cvlan] <1-4094> {[cvlan_pri] <0-7>}*1 [svlan] <1-4094> {[svlan_pri] <0-7>}*1 | Configure portvlan mode to translate              |
| Step 4a | <b>mvlan</b> <i>[tag-strip]</i> eth <1-32>                                                                                                                        | Configure the lan port to untag mode              |
| Step 4b | <b>no mvlan</b> <i>[tag-strip]</i> eth <1-32>                                                                                                                     | Delete the the lan port to untag mode             |
| Step 5a | <b>iphost</b> <1-255> [id] <desc>                                                                                                                                 | Configure the iphost description                  |
| Step 5b | <b>iphost</b> <1-255> [dhcp]                                                                                                                                      | Configure the iphost to dhcp mode                 |
| Step 5c | <b>iphost</b> <1-255> <i>[static-ip]</i> <A.B.C.D><br><A.B.C.D> {<A.B.C.D>}*1                                                                                     | Configure the iphost to static mode.              |
| Step 5d | <b>iphost</b> <1-255> <i>[primary-dns]</i> <A.B.C.D><br>{second-dns <A.B.C.D>}*1                                                                                  | Configure the DNS                                 |
| Step 5e | <b>no iphost</b> <1-255>                                                                                                                                          | Delete the iphost setting                         |

|               |               |                          |
|---------------|---------------|--------------------------|
| <b>Step 6</b> | <b>Commit</b> | Commit the configuration |
| <b>Step 7</b> | <b>Exit</b>   | Exit                     |

## 19.7 Alarm threshold template configuration

Alarm threshold only can be configured by template. Begin at privileged configuration mode, configure alarm threshold template as the following table shows.

|                | <b>Command</b>                                                      | <b>Function</b>                   |
|----------------|---------------------------------------------------------------------|-----------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                           | Enter global configuration mode.  |
| <b>Step 2</b>  | <b>profile alarm {id &lt;1-32767&gt;}*1 {name &lt;string&gt;}*1</b> | Create or enter a profile         |
| <b>Step 3a</b> | <b>sf-sd-threshold sf &lt;3-8&gt; sd &lt;4-10&gt;</b>               | Configure the range of sf and sd  |
| <b>Step 3b</b> | <b>rx-optical low &lt;-27~-8&gt; upper &lt;-27~-8&gt;</b>           | Configure the range of rx-optical |
| <b>Step 3c</b> | <b>Tx-optical low &lt;0-5&gt; upper &lt;0-5&gt;</b>                 | Configure the range of tx-optical |
| <b>Step 4</b>  | <b>Commit</b>                                                       | Commit the configuration          |
| <b>Step 5</b>  | <b>Exit</b>                                                         | Exit                              |

## 19.8 Show/Delete the profile configuration

|                | <b>Command</b>                                                    | <b>Function</b>                    |
|----------------|-------------------------------------------------------------------|------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                         | Enter global configuration mode.   |
| <b>Step 2</b>  | <b>no profile {dba srv voip alarm} id &lt;1-32767&gt;</b>         | Delete profile                     |
| <b>Step 3a</b> | <b>show profile {dba srv voip alarm} all{id &lt;0-65535&gt; }</b> | Show profile                       |
| <b>Step 3b</b> | <b>show profile {dba srv voip alarm} id &lt;0-65535&gt; bind</b>  | Show the onu which binding profile |

## 20. ONU auto-learn configuration

### 20.1 ONU auto-learn

|        | Command                                                                                                                      | Function                                           |
|--------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                                                                    | Enter global configuration mode.                   |
| Step 2 | <b>onu auto-learn bind onu-profile</b><br><i>&lt;equipid&gt; &lt;onu_profile&gt;</i>                                         | Bind the equipment id with onu profile             |
| Step 3 | <b>onu auto-learn bind</b><br><i>(line-profile srv-profile alarm-profile)</i><br><i>&lt;equipid&gt; &lt;profile_name&gt;</i> | Bind the onu equipment with line/srv/alarm profile |
| Step 4 | <b>no onu auto-learn bind onu-profile</b><br><i>&lt;equipid&gt;</i>                                                          | Delete the binding setting                         |
| Step 5 | <b>no onu auto-learn bind</b><br><i>(line-profile srv-profile alarm-profile)</i><br><i>&lt;equipid&gt;</i>                   | Delete the binding setting                         |
| Step 6 | <b>show onu auto-learn bind</b><br><i>{[ onu-profile line-profile srv-profile alarm-profile]}*1</i>                          | Show the equipment and profile                     |

### 20.2 Enable auto-learn

|         | Command                                                                   | Function                                |
|---------|---------------------------------------------------------------------------|-----------------------------------------|
| Step 1  | <b>configure terminal</b>                                                 | Enter global configuration mode.        |
| Step 2  | <b>interface gpon slot/port</b>                                           | Enter Gpon interface                    |
| Step 3a | <b>onu auto-learn</b> <i>{default-onu-profile &lt;profile_name&gt;}*1</i> | Enable auto-learn and select a profile. |
| Step 3b | <b>no onu auto-learn</b>                                                  | Disable auto-learn                      |
| Step 4  | <b>show onu auto-learn</b>                                                | Show auto-learn configuration           |



## 21. System Management

### 21.1 Configuration file management

#### 21.1.1 Save configurations

After modified the configurations, you should save them so that these configurations can take effect next time it restarts. Use the following commands to save configurations.

|        | Command                   | Function                         |
|--------|---------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b> | Enter global configuration mode. |
| Step 2 | <b>write</b>              | Save configurations.             |

#### 21.1.2 Erase configurations

If you need to reset to factory default, you can use the following commands to erase all configurations. After erased, the device will reboot automatically.

|        | Command                     | Function                         |
|--------|-----------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b>   | Enter global configuration mode. |
| Step 2 | <b>erase startup-config</b> | Erase all configurations.        |

#### 21.1.3 Show startup configurations

Use the following command to display the configurations you have saved.

|        | Command                    | Function                         |
|--------|----------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b>  | Enter global configuration mode. |
| Step 2 | <b>show startup-config</b> | Show configuration               |

#### 21.1.4 Show running configurations

Use the following commands to display running configurations. These running configurations may not be saved in flash.

|        | Command                    | Function                         |
|--------|----------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b>  | Enter global configuration mode. |
| Step 2 | <b>show running-config</b> | Show running configurations.     |

#### 21.1.5 Upload/download configuration file

Use the following commands to upload configuration file to PC and download configuration file to device.

|                | <b>Command</b>                                             | <b>Function</b>                                       |
|----------------|------------------------------------------------------------|-------------------------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                  | Enter global configuration mode.                      |
| <b>Step 2</b>  | <b>debug mode</b>                                          | Enter debug mode                                      |
| <b>Step 3a</b> | <b>upload tftp configuration</b> <filename><br><A.B.C.D>   | filename is Upgrade file<br>A.B.C.D is TFTP server IP |
| <b>Step 3b</b> | <b>download tftp configuration</b><br><filename> <A.B.C.D> | filename is Upgrade file<br>A.B.C.D is TFTP server IP |

## 21.2 Check the system information

### 21.2.1 Check system running information

Use the following commands to view system information.

| <b>Command</b>            | <b>Function</b>      |
|---------------------------|----------------------|
| <b>show sys arp</b>       | Show ARP table       |
| <b>show sys cpu</b>       | Show CPU information |
| <b>show sys cpu-usage</b> | Show CPU usage rate  |
| <b>show sys mem</b>       | Show system memory   |
| <b>show sys ps</b>        | Show system process  |
| <b>show top</b>           | Show CPU utilization |
| <b>show task</b>          | Showthread name      |

### 21.2.2 Check version information

Use the following commands to check version information which includes hardware version, software version, software created time and so on.

|               | <b>Command</b>            | <b>Function</b>                  |
|---------------|---------------------------|----------------------------------|
| <b>Step 1</b> | <b>configure terminal</b> | Enter global configuration mode. |
| <b>Step 2</b> | <b>show version</b>       | Show version information.        |

### 21.2.3 Check system running time

Use the following command to show system running time after turned power on.

|               | <b>Command</b>               | <b>Function</b>                  |
|---------------|------------------------------|----------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>    | Enter global configuration mode. |
| <b>Step 2</b> | <b>show sys running-time</b> | Show system running time.        |

## 21.3 System basic configurations

### 21.3.1 Configure system name

Use the following command to modify system name. This modification will take effect immediately. You will see it in command prompt prefix.

Begin at privileged configuration mode, configure system name as the following table shows.

|        | Command                      | Function                                            |
|--------|------------------------------|-----------------------------------------------------|
| Step 1 | <b>configure terminal</b>    | Enter global configuration mode.                    |
| Step 2 | <b>hostname &lt;name&gt;</b> | Configure system name. It must start with alphabet. |
| Step 3 | <b>hostname default</b>      | Restore default                                     |

### 21.3.2 Configure terminal display attribute

This command is used to configure display line number when access by console port or telnet.

Begin at privileged configuration mode, configure terminal display attribute as the following table shows.

|        | Command                      | Function                                             |
|--------|------------------------------|------------------------------------------------------|
| Step 1 | <b>configure terminal</b>    | Enter global configuration mode.                     |
| Step 2 | <b>terminal length value</b> | Configure display line number. Value range is 0-512. |

### 21.3.3 Configure terminal time-out value

Use the following commands to configure terminal time-out value. Default value is 10 minutes.

|         | Command                                          | Function                                |
|---------|--------------------------------------------------|-----------------------------------------|
| Step 1  | <b>configure terminal</b>                        | Enter global configuration mode.        |
| Step 2  | <b>line vty</b>                                  | Enter line node                         |
| Step 3a | <b>exec-timeout &lt;min&gt; [&lt;second&gt;]</b> | Set the command-line timeout            |
| Step 3b | <b>no exec-timeout</b>                           | Set the command-line timeout to default |
| Step 4  | <b>show exec-timeout</b>                         | Show the command-line timeout           |

## 21.4 System basic operations

### 21.4.1 Upgrade system

Use the following command to upgrade the equipment.

|         | Command                                                         | Function                         |
|---------|-----------------------------------------------------------------|----------------------------------|
| Step 1  | <b>configure terminal</b>                                       | Enter global configuration mode. |
| Step 2b | <b>download tftp image &lt;filename&gt;<br/>&lt;A.B.C.D&gt;</b> | Update firmware with header.     |

#### 21.4.2 Network connectivity test

Use **ping** command to check network connectivity.

|        | Command                                              | Function                                                |
|--------|------------------------------------------------------|---------------------------------------------------------|
| Step 1 | <b>configure terminal</b>                            | Enter global configuration mode.                        |
| Step 2 | <b>ping [-s &lt;packet size&gt;] &lt;A.B.C.D&gt;</b> | <i>Packet size</i> is test packet length, unit is byte. |

#### 21.4.3 Reboot system

Use the following command to reboot system.

|        | Command                   | Function                         |
|--------|---------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b> | Enter global configuration mode. |
| Step 2 | <b>reboot</b>             | Reboot system.                   |

#### 21.4.4 Telnet

You can telnet to system via outband or inband management IP. The default outband management IP is 192.168.8.100.

| Command                        | Function                                                                               |
|--------------------------------|----------------------------------------------------------------------------------------|
| <b>telnet 192.168.200</b>      | Telnet to application layer of system. Login name and password both are <b>admin</b> . |
| <b>telnet 192.168.200 2223</b> | Telnet to kernel of system. Login name is <b>default</b> .                             |
| <b>GPON(config)#switch</b>     | Telnet to kernel of system. Login name is <b>default</b> .                             |

#### 21.4.5 Configure RTC system time

Use the following command to configure RTC system time.

|        | Command                                      | Function                         |
|--------|----------------------------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b>                    | Enter global configuration mode. |
| Step 2 | <b>time set year &lt;2000-2099&gt; month</b> | Configure the RTC clock          |

|               |                                                                                          |                      |
|---------------|------------------------------------------------------------------------------------------|----------------------|
|               | <1-12> <b>day</b> <1-31> <b>hour</b> <0-23> <b>minute</b><br><0-59> <b>second</b> <0-59> |                      |
| <b>Step 3</b> | <b>show time</b>                                                                         | Show the system time |

#### 21.4.6 NTP Client

Device will update the time auto when you enable the NTP

|               | <b>Command</b>                         | <b>Function</b>                        |
|---------------|----------------------------------------|----------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>              | Enter global configuration mode.       |
| <b>Step 2</b> | <b>ntp server &lt;ip_or_domain&gt;</b> | Configure the NTP server and enable it |
| <b>Step 3</b> | <b>no ntp server</b>                   | Disable the NTP server                 |
| <b>Step 4</b> | <b>show time</b>                       | Show the system time                   |

#### 21.4.7 TimeZone configuration

|               | <b>Command</b>                  | <b>Function</b>                  |
|---------------|---------------------------------|----------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>       | Enter global configuration mode. |
| <b>Step 2</b> | <b>time zone &lt;-12-12&gt;</b> | Configure the timezone           |
| <b>Step 3</b> | <b>show sys timezone</b>        | Show the timezone                |

#### 21.4.8 Fan control

Use the following command to control fan running attribute.

|               | <b>Command</b>                       | <b>Function</b>                                              |
|---------------|--------------------------------------|--------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>            | Enter global configuration mode.                             |
| <b>Step 2</b> | <b>fan temperature &lt;20-80&gt;</b> | Configure Temperature of the fan                             |
| <b>Step 3</b> | <b>fan mode [open close auto]</b>    | Configure the fan open mode                                  |
| <b>Step 4</b> | <b>show fan</b>                      | Show the fan configuration and current equipment temperature |

### 21.5 Debug information

#### 21.5.1 Enable/disable CPU debug information

Use the following commands to enable or disable CPU debug information.

|               | <b>Command</b>            | <b>Function</b>                  |
|---------------|---------------------------|----------------------------------|
| <b>Step 2</b> | <b>configure terminal</b> | Enter global configuration mode. |

|               |                                      |                                                                                                  |
|---------------|--------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Step 2</b> | <b>debug mode</b>                    | Enter debug node.                                                                                |
| <b>Step 3</b> | <b>system debug {rx tx} {on off}</b> | On off : enable or disable CPU debug.<br>Rx: CPU receives packets.<br>Tx: CPU transmits packets. |

### 21.5.2 Enable/disable each function module debug information

Use the following commands to enable or disable function module debug information.

|               | <b>Command</b>                                                         | <b>Function</b>                                               |
|---------------|------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                              | Enter global configuration mode.                              |
| <b>Step 2</b> | <b>debug mode</b>                                                      | Enter debug node.                                             |
| <b>Step 3</b> | <b>system debug {acl timer port mac vlan vt igmp cfp qos} {on off}</b> | On off : enable or disable function module debug information. |

## 22 User Management

### 22.1 User privilege

There are two privileges for user, administrator user and normal user.

Normal user is a read-only user, only can view system information but not user information, configurations. Administrator user can view all information and configure all parameters.

### 22.2 Default user

By default, there is a administrator user **admin**, and password is **admin** too. Default user can't be deleted, modified, but you can modify its password.

### 22.3 Add user account

|        | Command                                                                                       | Function                                                |
|--------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                                     | Enter global configuration mode.                        |
| Step 2 | <b>user add <i>user-name</i> login-password<br/><i>login-password</i></b>                     | Add new user account.                                   |
| Step 3 | <b>user role <i>user-name</i> {admin   normal<br/>enable-password <i>enable-password</i>}</b> | Specify user role. New user is a normal privilege user. |

### 22.4 Show user account list

|        | Command                   | Function                         |
|--------|---------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b> | Enter global configuration mode. |
| Step 2 | <b>user list</b>          | Show user account list.          |

### 22.5 Delete user account

|        | Command                   | Function                         |
|--------|---------------------------|----------------------------------|
| Step 1 | <b>configure terminal</b> | Enter global configuration mode. |

|               |                                    |                      |
|---------------|------------------------------------|----------------------|
| <b>Step 2</b> | <b>user delete</b> <i>username</i> | Delete user account. |
|---------------|------------------------------------|----------------------|

## 22.6 Modify password

Every user can modify its own password while administrator user can modify other users' password. Modify password as the following table shows.

|               | <b>Command</b>                                                                                                                            | <b>Function</b>                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                                                                                                 | Enter global configuration mode.              |
| <b>Step 2</b> | <b>user login-password</b> <i>user-name</i> <CR><br>Input new login password for user abc please.<br>New Password:<br>Confirm Password:   | Configure user's login password.              |
| <b>Step 3</b> | <b>user enable-password</b> <i>user-name</i> <CR><br>Input new enable password for user abc please.<br>New Password:<br>Confirm Password: | Configure user's configuration mode password. |



## 23 SNMP Configuration

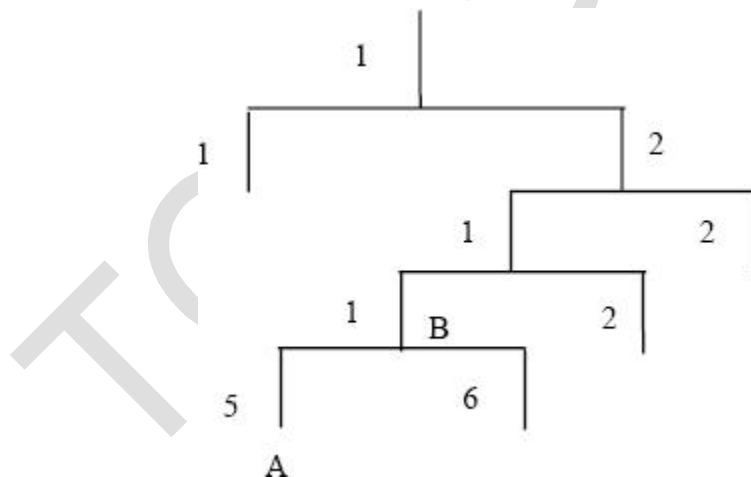
### 23.1 SNMP introduction

SNMP (Simple Network Management Protocol) is an extensive network management protocol at the moment. It is an industrial standard which is adopted and come into use for transmitting management information between two devices. Network administrator can search information, modify information, troubleshoot, diagnose fault, plan capacity and generate reports. SNMP adopts polling mechanism and provides basic functions, especially fits small, fast and low cost conditions. It is based on transport layer protocol UDP.

There are two parts of SNMP, NMS (Network Management Station) and agent. NMS is a station that runs client program, and agent is a server program that runs in device. NMS can send GetRequest, GetNextRequest and SetRequest messages to agent. Then agent will execute read or write command and respond to NMS. Agent also sends trap messages to NMS when device is abnormal.

### 23.2 SNMP version and MIB

In order to mark device's management variable uniquely, SNMP identifies management object by hierarchical structure name scheme. The set of objects is like a tree, which the node stands for management object, shown as the following picture.



MIB(Management Information Base), a set of device's variable definition, is used to describe the tree's hierarchical structure. For the management object B in above picture, we can use a string of numbers {1.2.1.1} to describe it uniquely. This string of numbers is Object Identifier. GPON series OLT support SNMP V1, V2C and V3. Common MIB shows in the following table.

| MIB attribute | MIB content | Refer to |
|---------------|-------------|----------|
|---------------|-------------|----------|

|             |                        |         |
|-------------|------------------------|---------|
| Public MIB  | MIB II based on TCP/IP | RFC1213 |
|             | RMON MIB               | RFC2819 |
|             | Ethernet MIB           | RFC2665 |
| Private MIB | VLAN MIB               |         |
|             | Device management      |         |
|             | Interface management   |         |

## 23.3 Configure SNMP

### 23.3.1 Configure community

Begin at privileged configuration mode, configure community as the following table shows.

|        | Command                                                 | Function                                                                               |
|--------|---------------------------------------------------------|----------------------------------------------------------------------------------------|
| Step 1 | <b>config terminal</b>                                  | Enter global configuration mode.                                                       |
| Step 2 | <b>snmp-server community &lt;word&gt;<br/>[ro  rw ]</b> | Configure SNMP community strings;                                                      |
| Step 3 | <b>show snmp-server community</b>                       | Show the SNMP community configuration                                                  |
| Step 4 | <b>exit</b>                                             | From the global configuration mode to return to the privileged user configuration mode |
| Step 5 | <b>write</b>                                            | Save the configuration                                                                 |

### 23.3.2 Configure Trap the target host address

Use the following command to configure or remove the Trap messages of the target host IP address. Begin at privileged configuration mode, Configure Trap the target host address as the following table shows.

|         | Command                                                                                                                    | Function                                                                            |
|---------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Step 1  | <b>config terminal</b>                                                                                                     | Enter global configuration mode.                                                    |
| Step 2a | <b>snmp-server host &lt;A.B.C.D &gt;{udp-port<br/>&lt;1-65535&gt;}*1 {version [1 2c]}*1<br/>{community &lt;WORD&gt;}*1</b> | Configure the Trap the target host address.<br>Configure the community string value |
| Step 2b | <b>no snmp-server host &lt; A.B.C.D &gt; version<br/>1 2c 3 community</b>                                                  | Delete trap target host address.                                                    |
| Step 3a | <b>snmp-server enable traps snmp</b>                                                                                       | Enable SNMP traps function                                                          |
| Step 3b | <b>no snmp-server enable traps snmp</b>                                                                                    | Delete SNMP traps function                                                          |

|               |                                       |                                   |
|---------------|---------------------------------------|-----------------------------------|
| <b>Step 4</b> | <b>show snmp-server targetaddress</b> | Check the SNMP trap configuration |
| <b>Step 5</b> | <b>write</b>                          | Save the configuration            |

### 23.3.3 Configure Administrator ID and contact method

Begin at privileged configuration mode, Configure administrator ID and contact method as the following table shows.

|               | <b>Command</b>                          | <b>Function</b>                       |
|---------------|-----------------------------------------|---------------------------------------|
| <b>Step 1</b> | <b>config terminal</b>                  | Enter global configuration mode.      |
| <b>Step 2</b> | <b>snmp-server contact &lt;line&gt;</b> | Configure contact string value        |
| <b>Step 3</b> | <b>show snmp-server contact</b>         | Check the SNMP contact configuration. |
| <b>Step 4</b> | <b>write</b>                            | Save the configuration.               |

### 23.3.4 Configure Ethernet switch location information

Begin at privileged configuration mode, Configure Ethernet switch location information as the following table shows.

|               | <b>Command</b>                           | <b>Function</b>                        |
|---------------|------------------------------------------|----------------------------------------|
| <b>Step 1</b> | <b>config terminal</b>                   | Enter global configuration mode        |
| <b>Step 2</b> | <b>snmp-server location &lt;line&gt;</b> | Configure location string value        |
| <b>Step 3</b> | <b>show snmp-server location</b>         | Check the SNMP location configuration. |
| <b>Step 4</b> | <b>write</b>                             | Save the configuration.                |

## 24 Alarm and Event Management

### 24.1 Alarm and event introduction

If you enable alarm report, it will trigger alarm events when system occurred error or did some important operations. The alarm information will be save in a buffer, you can execute some commands such as show syslog to display. All the alarms can be sent to specific servier.

Alarms include fault alarm and recovery alarm. Fault alarm will not disappear until the fault is repaired and the alarm is cleared.

Events include running envents and secury events, are notifications which generate and inform administrators under a normal condition. The difference between event and alarm is that event generates under a normal condition while alarm generates under an abnormal condition.

Command “show alarm-event information” is used to show description, level, type and class of all alarms and events.

### 24.2 Alarm management

Alarm severity level includes critical, major, minor and warning. Corresponding level in system log are alerts, critical, major and warnings. Alarm type includes device alarm, communication alarm and disposing alarm.

Device alarm contains low temperature, high temperature, CPU usage, memory usage, fan, PON, optical power and so on.

- Communication alarm contains port up/down, loopback, PON deregister, PON register failed, PON los, ONU deregister, illegal ONU register, ONU authorized failed, ONU MAC conflication, ONU LOID conflication, ONU link los, ONU dying gasp, ONU link fault, ONU link events, ONU extended OAM notification and so on.
- Dispoing alarm contains upgrade failed, upload configuration file failed, download configuration file failed and so on.

#### 24.2.1 System alarms

System alarms show the performance and security of system. The following table shows the system alarm list.

| System alarm   | Reason                                    | Default |
|----------------|-------------------------------------------|---------|
| temp-high      | Device temperature higher than threshold. | disable |
| temp-low       | Device temperature lower than threshold.  | disable |
| cpu-usage-high | CPU usage higher than threshold.          | disable |

|                      |                                     |         |
|----------------------|-------------------------------------|---------|
| mem-usage-high       | Memory usage higher than threshold. | disable |
| fan                  | Fan switch.                         | disable |
| download-file-failed | Download file failed                | enable  |
| upload-file-failed   | Upload file failed.                 | enable  |
| upgrade-file-failed  | Upgrade firmware failed.            | enable  |
| port-updown          | Port link up and link down.         | enable  |
| port-loopback        | Port loopback.                      | disable |

|         | Command                                                                                                         | Function                                                                                                                           |
|---------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                       | Enter global configuration mode.                                                                                                   |
| Step 2a | <b>alarm {temp-high temp-low cpu-usage-high mem-usage-high} disable</b>                                         | Disable system alarm report.                                                                                                       |
| Step 2b | <b>alarm {temp-high temp-low cpu-usage-high  mem-usage-high} enable &lt;alarm-value&gt; &lt;clear-value&gt;</b> | Enable system alarm report and configure system alarm threshold.<br>alarm-value: alarm threshold.<br>clear-value: clear threshold. |
| Step 2c | <b>alarm {fan port-updown port-loopback register-failed deregister}{enable disable}</b>                         | Enable or disable system alarm report.                                                                                             |
| Step 3  | <b>show alarm configuration</b>                                                                                 | Show system alarm configurations.                                                                                                  |

### 24.2.2 PON alarms

Get rid of the issue caused by PON port or fiber by monitoring PON alarms, ensure PON works well. The following table shows PON alarm list.

| PON alarm        | Reason                                             | Default |
|------------------|----------------------------------------------------|---------|
| pon-txpower-high | PON port transmitting power higher than threshold. | enable  |
| pon-txpower-low  | PON port transmitting power lower than threshold.  | enable  |
| pon-txbias-high  | PON port bias current higher than threshold.       | enable  |

|                 |                                             |         |
|-----------------|---------------------------------------------|---------|
| pon-txbias-low  | PON port bias current lower than threshold. | enable  |
| pon-vcc-high    | PON port voltage higher than threshold.     | enable  |
| pon-vcc-low     | PON port voltage lower than threshold.      | enable  |
| pon-temp-high   | PON port temperature higher than threshold. | enable  |
| pon-temp-low    | PON port temperature lower than threshold.  | enable  |
| pon-los         | Fiber unconnected or link fault.            | enable  |
| deregister      | PON deregister.                             | disable |
| register-failed | PON register failed.                        | enable  |

Configure global PON alarm as the following table shows.

|         | Command                                                                                                                                                                                | Function                                 |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                                                                              | Enter global configuration mode.         |
| Step 2a | <b>alarm</b><br><b>{pon-register-failed pon-deregister}</b><br><b>{enable disable}</b>                                                                                                 | Enable or disable PON alarm report.      |
| Step 2a | <b>alarm</b> {pon-txpower-high <br>pon-txpower-low pon-txbias-high <br>pon-txbias-low pon-vcc-high <br>pon-vcc-low pon-temp-high <br>pon-temp-low  pon-los}<br><b>{enable disable}</b> | Enable or disable PON port alarm report. |
| Step 3  | <b>show alarm configuration</b>                                                                                                                                                        | Show alarm configurations.               |

Configure PON port alarm as the following table shows. Before this, you must enable global PON alarm. By default, global PON alarm is enabled, the alarms will be record in system log.

|         | Command                                                                                                                                      | Function                                                     |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Step 1  | <b>configure terminal</b>                                                                                                                    | Enter global configuration mode.                             |
| Step 2  | <b>interface gpon slot/port</b>                                                                                                              | Enter PON interface configuration mode.                      |
| Step 3a | <b>alarm pon optical {tx_power_high <br/>tx_power_low tx_bias_high tx_bias_l<br/>ow  vcc_high  vcc_low  <br/>temp_high temp_low} disable</b> | Disable PON port alarm report.                               |
| Step 3b | <b>alarm pon optica {tx_power_high <br/>tx_power_low  tx_bias_high<br/> tx_bias_low  vcc_high  vcc_low  </b>                                 | Enable PON port alarm report and configure alarm parameters. |

|               |                                                                              |               |                                                                |
|---------------|------------------------------------------------------------------------------|---------------|----------------------------------------------------------------|
|               | <b>temp_high temp_low}</b><br><b>&lt;alarm-value&gt; &lt;clear-value&gt;</b> | <b>enable</b> | alarm-value: alarm threshold.<br>clear-value: clear threshold. |
| <b>Step 4</b> | <b>show alarm pon optical configuration</b>                                  |               | Show PON port alarm configurations.                            |

## ONU alarms

ONU alarms also can help administrator to get rid of some ONU fault. The following table shows ONU alarm list.

| ONU alarm            | Reason                                                                                  | Default |
|----------------------|-----------------------------------------------------------------------------------------|---------|
| onu-deregister       | ONU deregister                                                                          | enable  |
| onu-link-lost        | ONU fiber unconnected or link fault.                                                    | disable |
| onu-illegal-register | Illegal ONU register.                                                                   | enable  |
| onu-auth-failed      | ONU LOID authorized failed in auto authorization mode or failed caused by packets loss. | enable  |
| onu-mac-conflict     | Current PON port exist MAC conflict with authorized ONU in the system.                  | enable  |
| onu-loid-conflict    | Current PON port exist LOID conflict with authorized ONU in the system.                 | enable  |
| onu-critical-event   | ONU critical link event.                                                                | enable  |
| onu-dying-gasp       | ONU power down.                                                                         | enable  |
| onu-link-fault       | ONU link fault.                                                                         | enable  |
| onu-link-event       | ONU link event                                                                          | disable |
| onu-event-notific    | ONU extended OAM notification                                                           | enable  |

|               | Command                                                                                                                                                                                                                | Function                            |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                                                                                                                                                                              | Enter global configuration mode.    |
| <b>Step 2</b> | <b>alarm {onu-deregister onu-link-lost onu-illegal-register onu-auth-failed onu-mac-conflict onu-loid-conflict onu-critical-event onu-dying-gasp onu-link-fault onu-link-event onu-event-notific} {enable disable}</b> | Enable or disable ONU alarm report. |
| <b>Step 3</b> | <b>show alarm configuration</b>                                                                                                                                                                                        | Show system alarm configurations.   |

## 24.3 Event management

Event severity level includes critical, major, minor and warning. Corresponding level in system log are alerts, critical, major, warnings. Event type includes device event, communication event and disposing event.

- Device event contains device reboot, PON event and so on.
- Communication event contains PON register, PON los recovery, ONU register, ONU find, ONU authorized successful, ONU deregister successful and so on.
- Disposing event contains save configuration event, erase configuration event, download configuration file successful, upload configuration file successful, ungrade successful and so on.

### 24.3.1 System events

System events are mainly used to monitor performance and security of system, ensure system works well.

| System event          | Reason                       | Default |
|-----------------------|------------------------------|---------|
| reset                 | Device reset.                | disable |
| config-save           | Save configuration.          | enable  |
| config-erase          | Erase configuration.         | enable  |
| download-file-success | Download file successful.    | enable  |
| upload-file-success   | Upload file successful.      | enable  |
| upgrade-file-success  | Upgrade firmware successful. | enable  |

|         | Command                             | Function                               |
|---------|-------------------------------------|----------------------------------------|
| Step 1  | <b>configure terminal</b>           | Enter global configuration mode.       |
| Step 2a | <b>event reset {enable disable}</b> | Enable or disable system event report. |
| Step 3  | <b>show event configuration</b>     | Show system event configurations.      |

### 24.3.2 PON events

Get rid of the issue caused by PON port or fiber by monitoring PON events, ensure PON works well. The following table shows PON event list.

| PON event        | Reason            | Default |
|------------------|-------------------|---------|
| pon-register     | PON register.     | disable |
| pon-los-recovery | PON los recovery. | enable  |



|               | <b>Command</b>                                                | <b>Function</b>                     |
|---------------|---------------------------------------------------------------|-------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                     | Enter global configuration mode.    |
| <b>Step 2</b> | <b>event {pon-register pon-los-recovery} {enable disable}</b> | Enable or disable PON event report. |
| <b>Step 3</b> | <b>show event configuration</b>                               | Show system event configurations.   |

### 24.3.3 ONU events

ONU events also can help administrator to get rid of some ONU fault. The following table shows ONU event list.

| <b>ONU event</b>   | <b>Reason</b>                    | <b>Default</b> |
|--------------------|----------------------------------|----------------|
| onu-register       | ONU register.                    | enable         |
| onu-link-discover  | ONU discover.                    | disable        |
| onu-auth-success   | OLT authorizes ONU successful.   | enable         |
| onu-deauth-success | OLT deauthorizes ONU successful. | disable        |

|                | <b>Command</b>                                                                                     | <b>Function</b>                     |
|----------------|----------------------------------------------------------------------------------------------------|-------------------------------------|
| <b>Step 1</b>  | <b>configure terminal</b>                                                                          | Enter global configuration mode.    |
| <b>Step 2b</b> | <b>event {onu-register onu-link-discover onu-auth-success onu-deauth-success} {enable disable}</b> | Enable or disable ONU event report. |
| <b>Step 3</b>  | <b>show event configuration</b>                                                                    | Show system event configuration.    |

## 25 System Log

### 25.1 System log introduction

System log is mainly used to record running condition and user operant behavior of the whole system. It is helpful for administrator to know and monitor system working condition, record abnormal information. System log comes from all the running module of system. Log system gather, manage, save and display the information. It can be shown in the device when you need to debug or check system status, and also can be sent to a server for long-term running status and operation tracking.

#### 25.1.1 Log type

System log has five types:

- **Abnormal information log**  
Abnormal information log mainly records the abnormal phenomenon of each module, such as abnormal response, inside state machine error, key process execute error and so on.
- **Alarm log**  
Alarm log mainly records the information from alarm module. Critical alarm, major alarm, minor alarm and warning are corresponding with alerts, critical, major, warnings log level respectively.
- **Event log**  
Event log mainly records the information from event module. Critical event, major event, minor event and warning are corresponding with alerts, critical, major, warnings log level respectively.
- **Operation log**  
Operation log mainly records the informations from CLI and SNMP.
- **Debug log**  
Debug log mainly records the information from networking debugging, such as received IGMP messages, RSTP BPDU messages, state machine skip and so on.

#### 25.1.2 System log level

Syslog information level reference:

| Log level     | Log contrast                            |
|---------------|-----------------------------------------|
| 7:emergencies | Abnormal log                            |
| 6:alerts      | Alarm/event log(urgent)<br>Abnormal log |
| 5:critical    | Alarm/event log(major)<br>Abnormal log  |
| 4:major       | Alarm/event log(minor)<br>Abnormal log  |

|                 |                                          |
|-----------------|------------------------------------------|
| 3:warnings      | Alarm/event log(warning)<br>Abnormal log |
| 2:notifications | Operation log                            |
| 1:informational | Operation log                            |
| 0:debugging     | Debug log                                |

## 25.2 Configure system log

### 25.2.1 Show system log

|        | Command                                                                           | Function                                      |
|--------|-----------------------------------------------------------------------------------|-----------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                         | Enter global configuration mode.              |
| Step 2 | <b>Show syslog [level {debug info notice warning major critical alert emerg}]</b> | Show all system log or log of specific level. |

### 25.2.2 Clear system log

|        | Command                                                                            | Function                                       |
|--------|------------------------------------------------------------------------------------|------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                          | Enter global configuration mode.               |
| Step 2 | <b>Clear syslog [level {debug info notice warning major critical alert emerg}]</b> | Clear all system log or log of specific level. |

### 25.2.3 Configure system log server

|         | Command                                                      | Function                                 |
|---------|--------------------------------------------------------------|------------------------------------------|
| Step 1  | <b>configure terminal</b>                                    | Enter global configuration mode.         |
| Step 2a | <b>syslog server ip &lt;A.B.C.D&gt; port &lt;1-65535&gt;</b> | Configure system log server IP and port. |
| Step 2b | <b>no syslog server</b>                                      | Delete system log server configuration.  |
| Step 3  | <b>show syslog server</b>                                    | Show system log server configuration.    |

### 25.2.4 Configure save level of system log

|        | Command                                                                          | Function                                                        |
|--------|----------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Step 1 | <b>configure terminal</b>                                                        | Enter global configuration mode.                                |
| Step 2 | <b>syslog flash level {debug info notice warning major critical alert emerg}</b> | System log will be saved to flash if it is higher than you set. |
| Step 3 | <b>show syslog flash level</b>                                                   | Show system log level in flash.                                 |

**25.2.5 Save system log to flash**

|               | <b>Command</b>            | <b>Function</b>                  |
|---------------|---------------------------|----------------------------------|
| <b>Step 1</b> | <b>configure terminal</b> | Enter global configuration mode. |
| <b>Step 2</b> | <b>save syslog flash</b>  | Save system log to flash.        |

**25.2.6 Clear system log in flash**

|               | <b>Command</b>            | <b>Function</b>                  |
|---------------|---------------------------|----------------------------------|
| <b>Step 1</b> | <b>configure terminal</b> | Enter global configuration mode. |
| <b>Step 2</b> | <b>clear syslog flash</b> | Clear system log in flash.       |

**25.2.7 Upload system log**

|               | <b>Command</b>                                                 | <b>Function</b>                         |
|---------------|----------------------------------------------------------------|-----------------------------------------|
| <b>Step 1</b> | <b>configure terminal</b>                                      | Enter global configuration mode.        |
| <b>Step 2</b> | <b>upload tftp syslog &lt;filename&gt;<br/>&lt;A.B.C.D&gt;</b> | Upload system log to local host byTFTP. |