ONU Management Configuration

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Chapter 1 Local ONU Management Settings

1.1 Authenticating and Registering ONU

You can run **gpon onu-authen-method {sn|pass}** on OLT to enable the ONU detection mechanism at MPCP registration.   After the ONU MAC detection mechanism is enabled, ONUs without static binding settings cannot be registered to OLT.   If you want to add static binding entries, run **gpon bind-onu sn word [password word]**.   One LLID port maps to only one ONU's MAC address.

By default, the ONU SN detection mechanism at MPCP registration is disabled; in this case all ONUs can be registered freely.

Note:

Once ONU passes through the authentication, or it is set not to base on the authentication and the registration is successful, the SN of ONU and the static binding entries of the ONU number will be automatically added; when this settings is saved and the system is restarted, this ONU will not be re-authenticated.

To control ONU registration and authentication, run the following command:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode
Interface gpon *port*	Enters the GPON port configuration mode.
gpon bind-onu sn *word* [**password** *word* | *onu-id*]	Adds static binding entries.
exit	Exits from the GPON interface configuration mode.
gpon onu-authen-method {sn | pass}	Enables the checkup mechanism of the ONU SN during MPCP registration, run this command.
exit	Exits from the privileged configuration mode.

1.2 Enabling Global Downlink Encryption Function

To enable global downlink encryption function, run the following command:

gpon encryption {enable | disable}

Command	Purpose

enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon encryption{enable | disable}	Enables global downlink encryption function.
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

1.3 Configuring the System Global GEM Port

To configure the system global GEM Port, run the following command:

gpon broadcast-gem-port *gem-port-id*.

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon broadcast-gem-port *gem-port-id*	Configures the system global GEM Port
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

1.4 Configuring the Secret Key in the Global Mode

To set the system global security re-negotiation period, run the following command:

gpon key-exchange-interval *ex-interval*.

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon key-exchange-interval *ex-interval*	Sets the system global security key re-negotiation period.
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

1.5 Deactivating the Designated ONU

To deactivate the designated ONU, run the following command:

gpon deactivate-onu interface *slot/port:sequence*.

Command	Purpose
enable	Enters the privileged configuration mode.
gpon deactivate-onu interface	Deactivates the designated ONU.

slot/port:sequence	
exit	Exits from the privileged configuration mode.

Note: After ONU is deactivated, registration will be conducted automatically.

1.6 Activating the Designated ONU

To deactivate the designated ONU, run the following command:

gpon activate-onu interface *slot/port:sequence*.

Command	Purpose
enable	Enters the PRIVILEGED configuration mode.
gpon activate-onu interface *slot/port:sequence*	Activates the designated ONU.
exit	Exits from the privileged configuration mode.

1.7 Disabling the Designated ONU

To disable the designated ONU, run the following command:

gpon disable-onu interface *slot/port:sequence*.

Command	Purpose
enable	Enters the privileged configuration mode.
gpon disable-onu interface *slot/port:sequence*	Disables the designated ONU
exit	Exits from the privileged configuration mode.

1.8 Enabling the Designated ONU

To deactivate the designated ONU, run the following command:

gpon enable-onu interface *slot/port:sequence*.

Command	Purpose
enable	Enters the privileged configuration mode.
gpon enable-onu interface *slot/port:sequence*	Enables the designated ONU.
exit	Exits from the privileged configuration mode.

1.9 Restarting the Designated ONU

To disable the designated ONU, run the following command:

gpon reboot onu interface *slot/port:sequence*.

Command	Purpose
enable	Enters the privileged configuration mode.
gpon reboot onu interface *slot/port:sequence*	Restarts the designated ONU
exit	Exits from the privileged configuration mode.

The command takes effect only when ONU is in the activated state.

1.10 Updating the ONU Software Version

BDCOM GP3600 Series supports to update the ONU version remotely from OLT. The ONU update software needs be downloaded to the flash memory of GP3600 main card. For the detailed download procedure, please see the chapter related to software update in Basic Configuration in the configuration volume. The detailed command is shown below:

gpon update-onu *image_name* **interface gpon {***slot/port*[*:sequence*] | *slot/port   sequence_value***}**

The command takes effect through OMCI.

Steps for updating ONU version are shown below:

Command	Purpose
enable	Enters the privileged configuration mode.
gpon update-onu *image_name* **interface gpon** **{***slot/port*[*:sequence*]	*slot/port sequence_value***}**	Updates the ONU version. If the port parameter of the command is GPON port, all ONU softwares under the port can be updated synchronously; if the port parameter of the command is ONU port, the single ONU software can be updated; if the port parameter is the ONU range, all ONU softwares within the ONU range can be updated.
gpon activate-imge **interface gpon** *slot/port*[*:sequence*]	activate the ONU software version
gpon commit-imge interface gpon *slot/port*[*:sequence*]	Confirms the upgrade of this version after ONU is restarted and registered again.
exit	Exits from the privileged configuration mode.

Note:

1.   Unless the to-be-updated software matches the corresponding ONU type can this

software not be updated.

2. During the update process of ONU software, do not cut off the power of ONU. After the completion of ONU update, OLT will notify users of the successful ONU update by the way of log, and ONU will use the updated version for rebooting.

3. After the ONU version is updated and restarted, you need to run gpon commit-image interface on OLT to confirm the ONU version.

1.11 Creating ONU Configuration Template

To create ONU modification configuration template, run the following command:]

gpon profile { onu-tcont | onu-virtual-port | onu-tcont-virtual-port-bind | onu-flow-mapping | onu-uni | onu-vlan | onu-rate-limit} *name*

Steps for creating and entering template modification mode are shown below:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
**gpon profile { onu-tcont	onu-virtual-port	onu-tcont-virtual-port-bind	onu-flow-mapping	onu-uni	onu-vlan	onu-rate-limit}** *name*	Creates and enters the modification mode of corresponding ONU configuration template. ONU-tcont: ONU T-Cont Configuration Template onu-virtual-port: The virtual port configuration template is applied to ONU and takes effect on GEM Port. onu-tcont-virtual-port-bind: ONU T-Cont and virtual port binding relation configuration template onu-flow-mapping: ONU flow mapping configuration template onu-uni: ONU user interface configuration template onu-vlan: ONU VLAN configuration template onu-rate-limit: ONU rate-limit configuration template
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Note: When the configuration template is used by ONU, it cannot be deleted.

1.12 Binding ONU Configuration Template

To bind the configuration template on ONU, run the following command:

gpon onu {tcont-virtual-port-bind-profile | flow-mapping-profile | uni *port* **uni-profile | uni** *port*

vlan-profile } *name*.

Steps for binding ONU configuration template:

Command	Purpose
configure	Enters the global configuration mode.
interface gpon 0/1:1	Enters ONU interface mode
gpon onu {tcont-virtual-port-bind-profile | flow-mapping-profile | uni *port* **uni-profile | uni** *port* **vlan-profile }** *name*	Binding ONU configuration template tcont-virtual-port-bind-profile: binding ONU T-Count and virtual port binding relation configuration template. flow-mapping-profile: binding ONU flow mapping configuration template uni-profile: binding ONU user port configuration template vlan-profile: binding ONU VLAN configuration template
exit	Exits from ONU interface mode
exit	Exits from the global configuration mode.
write all	Saves the Settings

Note: When the configuration template is used by ONU, it cannot be deleted.

1.13 Enabling ONU Port

To enable/disable the configuration port on ONU, run the following command:

gpon onu {uni uni *port* **{shutdown | noshutdown} | virtual-port** *port* **{shutdown | no-shutdown}}**.

Steps for enabling and disabling the port on ONU are shown below:

Command	Purpose
configure	Enters the global configuration mode.
interface gpon 0/1:1	Enters ONU interface mode
gpon onu {uni uni *port* **{shutdown	noshutdown}	virtual-port** *port* **{shutdown	no-shutdown}}**	Enables/disables the port on ONU
exit	Exits from ONU interface mode
exit	Exits from the global configuration mode.
write all	Saves the Settings

1.14 Configuring GEM Port of the ONU Virtual Port

To compulsorily designate GEM Port on the virtual port of ONU, run the following command:

gpon onu virtual-port *port* **gem-port** *gem-port-id*.

Steps for configuring the GEM Port corresponding to ONU virtual port:

Command	Purpose
configure	Enters the global configuration mode.
interface gpon 0/1:1	Enters ONU interface mode
gpon onu virtual-port *port* **gem-port** *gem-port-id*	Configures GEM Port corresponding to the ONU virtual port virtual-port: the designated virtual port number gem-port: the designated GEM Port number
exit	Exits from ONU interface mode
exit	Exits from the global configuration mode.
write all	Saves the Settings

Note: The command can be used to correctly generate a virtual port-GEM Port. Later the command may be deleted, and GEM port will be generated automatically.

1.15 Configuring the Downlink Flow Rate Limit of the ONU Virtual Port

To compulsorily designate GEM Port on the virtual port of ONU, run the following command:

gpon onu virtual-port *port* **downstream rate-limit** *value*.

Steps for configuring the downlink flow rate limit of the ONU virtual port:

Command	Purpose
configure	Enters the global configuration mode.
interface gpon 0/1:1	Enters ONU interface mode
gpon onu virtual-port *port* **downstream rate-limit** *value*	Steps for configuring the downlink flow rate limit of the ONU virtual port: designated virtual port number rate-limit: designated downlink rate limit
exit	Exits from ONU interface mode
exit	Exits from the global configuration mode.
write all	Saves the Settings

1.16 Configuring ONU Performance Statistics Function

To enable or disable ONU performance statistics, run the following command: **gpon onu pm {enable | disable}**.

Steps for enabling or disabling ONU are shown below:

Command	Purpose
configure	Enters the global configuration mode.
interface gpon 0/1:1	Enters ONU interface mode
gpon onu pm {enable | disable}	Enables or disables ONU performance statistics
exit	Exits from ONU interface mode
exit	Exits from the global configuration mode.
write all	Saves the Settings

1.17 Configuring ONU Uplink FEC Function

To enable or disable ONU uplink FEC function, run the following command:

[no] gpon onu fec-tx.

Steps for enabling or disabling ONU uplink FEC function are shown below:

Command	Purpose
configure	Enters the global configuration mode.
interface gpon 0/1:1	Enters ONU interface mode
[no] gpon onu fec-tx	Configures enabling or disabling uplink FEC function
exit	Exits from ONU interface mode
exit	Exits from the global configuration mode.
write all	Saves the Settings

Note: The command is used for OLT to inform ONU enabling uplink FEC forwarding. Some ONU may not support FEC function and may not involve FEC in its packets. GPON port will always correct errors in FEC information of the uplink packets. It handles packets with FEC information regularly. FEC enabling will not be considered as failure.

1.18 Configuring PON Port Downlink FEC Function

To enable or disable PON port downlink FEC function, run the following command:

[no] gpon fec-tx.

Steps for enabling or disabling PON port downlink FEC function are shown below:

Command	Purpose
configure	Enters the global configuration mode.
interface gpon 0/1:1	Enters ONU interface mode
[no] gpon fec-tx	Configures enabling or disabling PON port downlink FEC

	function
exit	Exits from ONU interface mode
exit	Exits from the global configuration mode.
write all	Saves the Settings

Note: The command is used for OLT to inform ONU enabling uplink FEC forwarding. Some ONU may not support FEC function and may not involve FEC in its packets. GPON port will always correct errors in FEC information of the uplink packets. It handles packets with FEC information regularly. FEC enabling will not be considered as failure.

1.19 Displaying the Basic ONU Information

BDCOM GP3600 Series supports the remote display of ONU's basic information on OLT. The detailed command is shown below:

show gpon interface gpon *slot/port:sequence* **onu basic-info**

Steps for displaying the ONU basic information:

Command	Purpose
show gpon interface gpon *slot/port:sequence* **onu basic-info**	Displays the ONU basic information.

Note: The ONU basic information cannot be displayed until ONU is registered.

1.20 Displaying the Optical Power Information of ONU

Run the following command to display the optical power information of ONU.

show gpon interface gpon *slot/port:sequence* **onu optical-transceiver-diagnosis**

Steps for displaying the optical power information of ONU:

Command	Purpose
show gpon interface gpon *slot/port:sequence* **onu optical-transceiver-diagnosis**	Displays the optical power information of ONU

1.21 Displaying the Packet Statistics on the ONU Port

The administrator needs to know the packet statistics on the ONU port to further know the running state of the current ONU. The display of packet statistics supports the function. The packet statistics includes the total number of receiving and forwarding packets, the multicast number, the broadcast number, pause frame and error frame. If the packet statistics of the ONU interface is

displayed, run the following command:

show gpon interface gpon *slot/port:sequence* **onu {port** *port-num* **| virtual-port** *port-num* **}**

{ current-statistics | history-statistics }

Only BDCOM ONU supports the function.

Command	Purpose
show gpon interface gpon *slot/port:sequence* **onu {port** *port-num* **| virtual-port** *port-num* **} { current-statistics	history-statistics }**	Displays packet statistics on the ONU port. *slot/port:sequence* Means the ONU port number corresponds to the ONU *port-num* means ONU user port number or virtual port number

1.22 Displaying ONU Configuration Template Information

Run the following command to display the template information of ONU.

show **gpon**

{onu-flow-mapping-profile|onu-rate-limit-profile|onu-tcont-profile|onu-tcont-virtual_port-bin

d-profile|onu-uni-profile|onu-virtual-port-profile|onu-vlan-cfg-profile} [_profile-name_**]**

Steps for displaying the template information of ONU:

Command	Purpose
show **gpon {onu-flow-mapping-profile|onu-rate-limit-profile|onu-tcont-profile|onu-tcont-virtual_port-bind-profile|onu-uni-profile|onu-virtual-port-profile|onu-vlan-cfg-profile} [**_profile-name_**]**	Displays ONU configuration template information onu-flow-mapping-profile means the designated template type *profile-name* means the designated configuration template name

1.23 Displaying ONU Software Version Information

Run the following command to display the ONU software version information.

show gpon onu-image-information [interface gpon *slot/port:sequence***]**

Steps for displaying the ONU software basic information:

Command	Purpose
Command	Purpose

show gpon onu-image-information [interface gpon *slot/port:sequence*]	Displays ONU software version information

1.24 Displaying ONU State Information

Run the following command to display the ONU state information:

show gpon onu-information [interface gpon *slot/port:sequence***]**

Steps for displaying the ONU state information:

Command	Purpose
show gpon onu-information [interface gpon *slot/port:sequence***]**	Displays ONU state information

1.25 Displaying Statistics Information of the ONU State

Run the following command to display the ONU state statistics information:

show gpon onu-status-count

Steps for displaying the ONU state statistics information:

Command	Purpose
show gpon onu-status-count	Displays statistics information of the ONU state

1.26 Displaying the ONU Software Upgrade State Information

Run the following command to display the ONU software upgrade state information.

show gpon onu-update-status [interface gpon *slot/port:sequence***]**

Steps for displaying the ONU state information are shown below:

Command	Purpose
show gpon onu-update-status [interface gpon *slot/port:sequence***]**	Displays the ONU software upgrade state information

Chapter 2 Configuring ONU T-Cont Configuration Template

2.1 Configuring T-Cont Type and Bandwidth

User pre-configuration template. Enter the template configuration mode and use and manage the pre-configuration based on the need. Run the following command to configure T-Cont type and bandwidth.

gpon-profile tcont-type *type-value* [**pir** *pir-value*] [**cir** *cir-value*] [**fir** *fir-value*]

Steps for configuring T-Cont type and bandwidth are shown below:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-tcont *tcont-name*	Enters T-Cont template configuration mode
gpon-profile tcont-type *type-value* [**pir** *pir-value*] [**cir** *cir-value*] [**fir** *fir-value*]	Configures T-Cont type and bandwidth. *type-value*: T-Cont reference classification serial number defined by ITU. The value ranges from 1 to 5. pir: designate the peak value bandwidth cir: designate the guaranteed bandwidth fir: designate the fixed bandwidth
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the PRIVILEGED configuration mode.

Note: ITU pre-defines 5 common T-Cont service module classifications. The definition is shown below:

	Type 1	Type 2	Type 3	Type 4	Type 5
Fixed bandwidth	FIR				FIR
Guaranteed Bandwidth		CIR	CIR		CIR
Maximum bandwidth	PIR=FIR	PIR=CIR	PIR > CIR	PIR	PIR >= CIR + FIR

The value of the unfilled part is 0.

Therefore the valid command option combination is

gpon-profile tcont-type 1 fir fir-value

gpon-profile tcont-type 2 cir cir-value

gpon-profile tcont-type 3 pir pir-value cir cir-value

gpon-profile tcont-type 4 pir pir-value

gpon-profile tcont-type 5 pir pir-value cir cir-value fir fir-value

Chapter 3 Configuring ONU Rate-Limit Configuration Template

3.1 Configuring ONU Rate Limit Guaranteed Bandwidth

Run the following command to configure ONU rate limit guaranteed bandwidth

gpon-profile pir *pir-value* **cir** *value*

Steps for configuring ONU rate limit guaranteed bandwidth:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-rate-limit *onu-rate-limit-name*	Enters rate-limit template configuration mode
gpon-profile pir *pir-value* **cir** *value*	Configures rate limit guaranteed bandwidth pir: designate the peak value bandwidth cir: designate the guaranteed bandwidth
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Chapter 4 Configuring ONU Virtual Port Configuration Template

4.1 Configuring ONU Virtual Port Downlink Encryption Function

Run the following command to configure ONU virtual port downlink encryption:

gpon-profile encryption {enable | disable}

Steps for configuring the ONU virtual port downlink encryption

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the GLOBAL configuration mode.
gpon profile onu-virtual-port *onu-virtual-port-name*	Enters the ONU virtual port template configuration mode
**gpon-profile encryption {enable	disable}**	Configures ONU virtual port downlink encryption function, run the following command.
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Note: After applied to ONU, the virtual port configuration template takes effective on GEM Port. To use the encrypted downlink flow on the encrypted virtual port, enable downlink encryption in the global mode.

4.2 Configuring the Upstream Queue of the ONU Virtual Port

Run the following command to configure ONU virtual port uplink queue:

gpon-profile upstream queue *num*

Steps for configuring the ONU virtual port uplink queue:

Command	Purpose
enable	Enters the PRIVILEGED configuration mode.
config	Enters the GLOBAL configuration mode.
gpon profile onu-virtual-port	Enters the ONU virtual port template configuration mode

onu-virtual-port-name	
gpon-profile upstream queue *num*	Configures the upstream queue of the ONU virtual port
exit	Exits from the template configuration mode
exit	Exits from THE GLOBAL configuration mode.
exit	Exits from the PRIVILEGED configuration mode.

Note: After applied to ONU, the virtual port configuration template takes effective on GEM Port.

To use the encrypted downlink flow on the encrypted virtual port, enable downlink encryption in the global mode.

4.3 Configuring the ONU Virtual Port Uplink Rate Limit Policy

Run the following command to configure ONU virtual port uplink rate limit policy:

[no] gpon-profile upstream rate-limit-profile *name*

Steps for configuring the ONU virtual port uplink rate limit policy:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-virtual-port *onu-virtual-port-name*	Enters the ONU virtual port template configuration mode
[no] gpon-profile upstream rate-limit-profile *name*	Configures the ONU virtual port uplink rate limit policy, run the following command:
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Note: After applied to ONU, the virtual port configuration template will take effect on GEM Port. When multiple GEM Ports corresponds to one T-Cont, the congestion occur. ONU can set rate limit for every GEM Port under T-Cont, so that the uplink bandwidth can be distributed.

ONU may not support uplink rate limit, and the uplink queue schedule can be the backup option of the congestion management.

4.4 Configuring the Downstream Queue of the ONU Virtual Port

Run the following command to configure ONU virtual port downlink queue:

gpon-profile downstream queue *num*

Steps for configuring the ONU virtual port downlink queue:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-virtual-port *onu-virtual-port-name*	Enters the ONU virtual port template configuration mode
gpon-profile downstream queue *num*	Configures the downstream queue of the ONU virtual port, run the following command:
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Note: After applied to ONU, the virtual port configuration template will take effect on GEM Port. When multiple GEM Ports corresponds to one T-Cont, the congestion occur. ONU can set rate limit for every GEM Port under T-Cont, so that the uplink bandwidth can be distributed.

ONU may not support uplink rate limit, and the uplink queue schedule can be the backup option of the congestion management.

Chapter 5 Configuring ONU T-Cont and virtual port binding relation configuration template

5.1 Configuring ONU virtual port and its corresponding T-Cont

Run the following command to configure ONU virtual port and its corresponding T-Cont:

gpon-profile virtual-port *vp-index* **profile** *vp-prof-name* **tcont** *tcont-index* **profile** *tcont-prof-name*

Steps for configuring the ONU virtual Port and its corresponding T-Cont:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-tcont-virtual-port-bind *tvpb-name*	Enters the ONU virtual port and Tcont binding template configuration mode
gpon-profile virtual-port *vp-index* **profile** *vp-prof-name* **tcont** *tcont-index* **profile** *tcont-prof-name*	Configures the ONU virtual port and its corresponding T-Cont virtual-port: designate the virtual port number profile: virtual port configuration template name tcont: designate the corresponding T-Cont tcont-prof-name: ONU T-Cont configuration template name
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Note: After T-Cont and the virtual port binding relation configuration template is applied to ONU, every virtual port will be instantiated to GEM Port and every T-Cont index will be distributed with AllocID and conduct dynamic uplink bandwidth schedule. Multiple virtual ports can bind to a T-Cont so that the uplink bandwidth can be shared.

The same T-Cont index should share the same T-Cont template.

Chapter 6 Configuring ONU Flow Mapping Configuration Template

6.1 Configuring ONU Flow Mapping Items

If configuring ONU flow mapping items and its corresponding application location, run the following command:

gpon-profile entry *index* **{uni** *port-list* | **vlan** {*vid* | *start-stop*} | **cos** *cos-list* | **virtual-port** *vp-index*}

Steps for configuring ONU flow mapping items and their locations

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-flow-mapping *onu-flow-mapping-name*	Enters the ONU flow mapping template configuration mode
gpon-profile entry *index* **{uni** *port-list*	**vlan** {*vid*	*start-stop*}	**cos** *cos-list*	**virtual-port** *vp-index*}	Configures ONU flow mapping items and their locations uni: designate user port number vlan: designate vlan serial number range cos: designate cos table range virtual-port: designate the virtual port number
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Note: Each mapping item needs at least one user port. The VLAN range cannot be more than 12 VLAN IDs.

Chapter 7 Configuring ONU VLAN Configuration Template

7.1 Configuring ONU VLAN Mode

UNI VLAN Tag process mode of ONU is classified into six: transparent mode, tag mode, translation mode, aggregation mode, TRUNK mode and STACKING mode.

Downlink means OLT transmits packets to ONU, while uplink means ONU transmits packets to OLT.

● Definition of the transparent mode is shown below:

Direction	whether Ethernet packet has Tag	Processing mode
Uplink	Having VLAN tag	Make no change of the Ethernet packet (the previous VLAN TAG is preserved) and forward it.
	No VLAN tag	Make no change of the Ethernet packet and forward it.
Downlink	Having VLAN tag	Make no change of the Ethernet packet (the previous VLAN TAG is preserved) and forward it.
	No VLAN tag	Make no change of the Ethernet packet and forward it.

● Definition of the tag mode is shown below:

Direction	Ethernet packet has Tag	Processing mode
Uplink	Having VLAN tag	Discard
	No VLAN tag	Add a new VLAN Tag (the main parameter is VID) to the packet and forward this packet. Currently, the only requirement that the VID value can be set on ONU, the fields, TPID and Pri which are in the VLAN Config Parameters domain of the received VLAN Variable Container, can be omitted and the tagged TPID and Pri can be set to the default values (TPID=0x8100, Pri＝0).
Downlink	Having VLAN tag	Forward the packet to the corresponding UNI port according to VID, remove the tag; if the VLAN ID of a downlink tagged packet is not the configured VID,

		this packet will be dropped.
	No VLAN tag	Discard

- Definition of the transparent mode is shown below:

Direction	whether Ethernet packet has Tag	Processing mode
Uplink	Having VLAN tag	If a VID of the previous tag has the corresponding entry (equal to the incoming VID) in the VLAN translation list of the corresponding port, this VID will be transformed to the corresponding VID (outgoing VID) according to the entry and then this corresponding VID will be forwarded; if not, this VID will be dropped. At present, only ONU is required to conduct VID transformation, while the transformation of other fields such as TPID, CFI and Pri is not required; ONU will omit the TPID and Pri fields in the VLAN Config Parameters domain of the received VLAN Variable Container, and set the transformed TPID and Pri to be the default values (the TPID value and Pri value before transformation will not be reserved).
	Not having the VLAN tag	Adds the default VLAN to the untagged packets and forwards them.
Downlink	Having VLAN tag	If a VID of the previous tag has the corresponding entry (equal to the outgoing VID) in the VLAN translation list of the corresponding port, this VID will be transformed to the corresponding VID (incoming VID) according to this entry and then this corresponding VID will be forwarded; if the VID of the previous tag has the default VID, this tag will be removed and then forwarded; If the VID of the previous tag has no the corresponding entry in the VLAN translation list of the corresponding port, it will be dropped; at present, only ONU is required to conduct VID transformation, while the transformation of other fields such as TPID, CFI and Pri is not required. During the transformation at the downlink direction, ONU keeps the original TPID value and the original Pri value unchanged.
	No VLAN tag	Discard

- The aggregation mode is shown in the following table:

Direction	whether Ethernet packet has Tag	Processing mode
Uplink	Having VLAN tag	If the VLAN ID carried by a packet is equal to an aggregated VLAN in the VLAN aggregation list of a port, this VLAN ID of this packet will be transformed to the corresponding "vlan to be aggr", and at the same time the source MAC address of this packet will be recorded and forwarded; if the VLAN ID carried by this packet is not equal to any

		aggregated VLAN in the VLAN aggregation list of this port, the VLAN ID will be dropped. At present, only ONU is required to conduct VID transformation, while the transformation of other fields such as TPID, CFI and Pri is not required; ONU will omit the TPID and Pri fields in the VLANConfig Parameters domain of the received VLAN Variable Container and set the transformed TPID to be the default value (TPID=0x8100), but keep pri to be the original value.
	No VLAN tag	Adds the default VLAN to the untagged packets and forwards them.
Downlink	Having VLAN tag	If the VLAN ID carried by a packet is equal to "vlan to be aggr" in the VLAN aggregation entry of a port, this VLAN ID will be transformed to the corresponding "aggregated VLAN" according to this entry, and then forwarded; if the VLAN ID of the original tag is not the default VLAN ID, this tag will be removed and forwarded; if this VLAN ID is equal to neither "vlan to be aggr" nor the default VLAN ID, the VLAN ID will be dropped. At present, only ONU is required to conduct VID transformation, while the transformation of other fields such as TPID, CFI and Pri is not required. ONU will omit the TPID and Pri fields in the VLANConfig Parameters domain of the received VLAN Variable Container and set the TPID of the transformed VLAN tag to be the default value (TPID=0x8100), but keep pri to be the original value.
	No VLAN tag	Discard

● Trunk mode

Direction	whether Ethernet packet has Tag	Processing mode
Uplink	Having VLAN tag	If the VLAN attaching to the packet is "the available VLAN", forward it upwards; if the VLAN attaching to the packet is not "the available VLAN", drop it. At present, only ONU is required to conduct VID transformation, while the transformation of other fields such as TPID, CFI and Pri is not required; ONU will omit the TPID and Pri fields in the VLAN Config Parameters domain of the received VLAN Variable Container and set the transformed TPID to be the default value (TPID=0x8100),but keep pri to be the original value.
	No VLAN tag	Adds the default VLAN to the untagged packets and forwards them.
Downlink	Having VLAN tag	If the VLAN ID attaching to the packet is "the available VLAN", forward it downwards; if the VLAN ID attaching to the packet "default VLAN", delete the VLAN tag and forward it downwards; if the VLAN attaching to the packet is not "the available VLAN", drop it. At present, only ONU is required to conduct VID transformation, while

		the transformation of other fields such as TPID, CFI and Pri is not required. ONU will omit the TPID and Pri fields in the VLAN Config Parameters domain of the received VLAN Variable Container and set the TPID of the transformed VLAN tag to be the default value (TPID=0x8100), but keep pri to be the original value.
	No VLAN tag	Discard

- Stacking mode

Direction	whether Ethernet packet has Tag	Processing mode
Uplink	Having VLAN tag	If it is in the translation list, the out-layer tag in the translation entry should be added and sent to OLT, or PVID should be added.
	No VLAN tag	Adds the PVID of the port and sends it to OLT.
Downlink	Having VLAN tag	If it is in the translation list or the tag is equal to PVID, the tag will be removed, or dropped.
	No VLAN tag	Discard

Run the following command to configure ONU VLAN mode

gpon-profile vlan mode {transparent | tag | translation | trunk | vlan-stacking | aggregation}

Steps for configuring ONU VLAN mode:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-vlan *onu-vlan-name*	Enters the ONU VLAN template configuration mode
**gpon-profile vlan mode {transparent	tag	translation	trunk	vlan-stacking	aggregation}**	Configure ONU VLAN mode, run the following command.
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

7.2 Configuring the ONU Port Default VLAN

Run the following command to configure ONU port default VLAN:

gpon-profile vlan pvid *vid*

Steps for configuring ONU port default VLAN:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-vlan *onu-vlan-name*	Enters the onu vlan template configuration mode
gpon-profile vlan pvid *vid*	Configures the onu port default vlan
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

7.3 Configuring Translation Items

If the VLAN mode of the ONU UNI port is the translation mode or the STACKING mode, you have to set the translation entry for the designated VLAN to modify or add its out-layer tag.

Run the following command to configure the translation items for translation and vlan-stacking:

gpon-profile vlan translation-entry *old_vid new_vid*

Steps for configuring translation items for translation and vlan-stacking:

Command	Purpose
enable	Enters the PRIVILEGED configuration mode.
config	Enters the GLOBAL configuration mode.
gpon profile onu-vlan *onu-vlan-name*	Enters the ONU VLAN template configuration mode
gpon-profile vlan translation-entry *old_vid new_vid*	Configures the translation entry of translation and vlan-stacking, run the following command. old_vid: vlan ID before translation new_vid: vlan ID after translation
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Note: The ONU port mode must be configured to the translation mode and the total number of VLAN translation item cannot be more than 12 VLAN IDs.

7.4 Configuring the VLAN Allowed Range of the Trunk Mode

Run the following command to configure the vlan allowed range of the trunk mode:

gpon-profile vlan trunk vlan-allowed *vlan-list*

Steps for configuring the vlan allowed range of the trunk mode:

Command	Purpose
enable	Enters the PRIVILEGED configuration mode.
config	Enters the GLOBAL configuration mode.
gpon profile onu-vlan *onu-vlan-name*	Enters the ONU VLAN template configuration mode
gpon-profile vlan trunk vlan-allowed *vlan-list*	Configures the vlan allowed range for the trunk mode.
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Note: The total number of the VLAN translation item cannot be more than 12 VLAN IDs.

7.5 Configuring the Ethernet Type Determined VLAN ID for the Tag Mode

Run the following command to configure the Ethernet type determined VLAN ID for the tag mode:

gpon-profile vlan ether-type {ipoe | pppoe | arp} *vid*

Steps for using Ethernet type determined VLAN ID for the tag mode

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-vlan *onu-vlan-name*	Enters the ONU VLAN template configuration mode
**gpon-profile vlan ether-type {ipoe	pppoe	arp}** *vid*	Uses Ethernet type determined VLAN ID for the tag mode. VID: To be added VLAN ID
exit	Exits from the template configuration mode.
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

Note: The Ethernet type will be preferentially considered to determine VLAN ID under the tag mode.

Use pvid if there is no corresponding Ethernet type.

Chapter 8 Configuring ONU User Port Configuration Template

8.1 Configuring the ONU User Interface Rate

Run the following command to configure ONU user port speed:

gpon-profile speed {10 | 100 | 1000 | auto}

Steps for configuring user port speed:

Command	Purpose
enable	Enters the PRIVILEGED configuration mode.
config	Enters the GLOBAL configuration mode.
gpon profile onu-uni *onu-uni-name*	Enters the ONU user port template configuration mode.
gpon-profile speed {10 | 100 | 1000 | auto}	Configures the ONU user interface rate.
exit	Exits from the template configuration mode.
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

8.2 Configuring the Duplex Mode of the ONU User Port

The duplex mode can be configured only after the port negotiation is disabled.

Run the following command to configure the duplex mode of ONU user port:

gpon-profile duplex {full | half | auto}

Steps for configuring the duplex mode of ONU user port:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-uni *onu-uni-name*	Enters the ONU user port template configuration mode
gpon-profile duplex {full | half | auto}	Sets the duplex mode of the ONU user port.
exit	Exits from the template configuration mode.
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

8.3 Configuring the Maximum Frame Length of ONU User Port

Run the following command to configure the maximum frame length of ONU user port:

gpon-profile max-frame-size *value*

Steps for configuring the maximum frame length of ONU user port:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-uni *onu-uni-name*	Enters the ONU user port template configuration mode
gpon-profile max-frame-size *value*	Sets the maximum frame length of ONU user port.
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.

8.4 Configuring ONU User Port Ethernet Line Sequence Type

Run the following command to configure the ONU user port Ethernet line sequence type:

gpon-profile eth-wiring {dce | dte | auto}

Steps for configuring the ONU user port Ethernet line sequence type:

Command	Purpose
enable	Enters the privileged configuration mode.
config	Enters the global configuration mode.
gpon profile onu-uni *onu-uni-name*	Enters the ONU user port template configuration mode
**gpon-profile eth-wiring {dce	dte	auto}**	Sets ONU user port Ethernet line sequence type dce: Uses DCE line sequence (MDI-X) dte: Uses DTE line sequence (MDI) auto: auto-selection
exit	Exits from the template configuration mode
exit	Exits from the global configuration mode.
exit	Exits from the privileged configuration mode.