

# ONU Management Settings

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# Chapter 1 Local ONU Management Settings

## 1.1 Local ONU Management Configuration Tasks

Local ONU Management settings includes the following tasks :

- Authenticating and Registering ONU
- Setting the delay of MPCP
- Adding the Description String for ONU
- Canceling ONU registration
- Removing the Dynamic ONU Binding Manually
- Removing Dynamic ONU Binding Automatically
- Setting the Timeout Time of the Automatic Removal Dynamic ONU Binding
- Enabling or Disabling ONU Registration when the Successful Discovery of CTC OAM of ONU Times out
- Setting the Timeout Time for Waiting for Successful CTC OAM Discovery of ONU
- Setting the Waiting Time and Transmission Times of OAM Transmission after the Initial Registration of ACE ONU is Resumed
- Enabling and Disabling the Print of ONU Power-Off Alarm Log
- Setting the IP Address of OLT Manager
- Setting the IP Address of the Bridge of the ONU Serial Interface

## 1.2 Authenticating and Registering ONU

You can run **epon onu-registration-method mac** on OLT to enable the ONU MAC 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 **epon bind-onu mac-address llid-sequence**. One LLID port maps to only one ONU's MAC address.

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

If you have set **epon onu-authemethod manun-al** for manual ONU authentication, ONU registration still needs the manual confirmation of the administration for being authenticated.

As to the authenticated ONU, OLT will automatically obtain the type and number of the ONU ports and release the saved settings to ONU; before this, ONU can obtain only one 10Kbps bandwidth and cannot be set remotely. You can run **epon conform-onu {mac-address value | interface epon slot/port:sequence}** to let ONU pass through the authentication. Authentication is not required by ONU by default.

The ONU information, including the LLID number, ONU's MAC address, ONU description character string, binding type (static or dynamic) and ONU states (deregistered, registered, authenticated, or automatically configured), can be browsed if you run **show epon onu-information [interface epon slot/port]**.

Note:

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

Run the following commands to control ONU registration and authentication:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>Interface epon slot/port</b>	Enters the EPON port configuration mode.
<b>epon onu-authen-method manual</b>	Conducts manual authentication to the successfully registered ONU.
<b>epon conform-onu {mac-address value   interface epon slot/port:sequence}</b>	Enables the successfully registered ONU to pass through the authentication.
<b>epon bind-onu mac-address llid-sequence</b>	Adds static binding entries.
<b>epon onu-registration-method mac</b>	Opens the checkup mechanism of the ONU MAC address during MPCP registration.
<b>Show epon onu-information [interface epon slot/port]</b>	Displays the ONU information.
<b>exit</b>	Exits from the EPON interface configuration mode.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

### 1.3 Setting the Delay Time of MPCP

To set the delay time of MPCP, you can use the **epon mpcp-registration-mode {normal | ctc value}** command.

Conduct the following steps:

Procedure	Purpose
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<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>Interface EPON slot/port</b>	Enters the EPON interface configuration mode.
<b>epon mpcp-registration-mode {normal   ctc value}</b>	Sets the delay of MPCP.
<b>exit</b>	Exits from the EPON interface configuration mode.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

## 1.4 Adding the Description String for ONU

To add the description character string for ONU, you can use the command, **epon onu description string**.

Conduct the following steps:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>Interface EPON slot/port:llid</b>	Enters the LLID interface configuration mode.
<b>epon onu description string</b>	Adds the description string for ONU.
<b>exit</b>	Exits from the LLID interface configuration mode.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

## 1.5 Canceling ONU Registration

To cancel ONU registration, you can use this command, **epon reset onu {mac-address value | interface epon slot/port:sequence}**.

Its detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>epon epon deregister-onu {interface epon slot/port:sequence}</b>	Deregisters an ONU.
<b>exit</b>	Exits from the privileged configuration mode.

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

## 1.6 Removing the Dynamic ONU Binding

If you want to clear the dynamic ONU binding manually, you can use this command, **clear epon dynamic-binding [interface epon slot/port]**.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>clear epon dynamic-binding [interface epon slot/port]</b>	Removes the information about dynamic ONU binding manually.
<b>exit</b>	Exits from the privileged configuration mode.

Note: Only when ONU does not pass authentication and after ONU is deregistered can the information about dynamic ONU binding be known.

## 1.7 Removing Dynamic ONU Binding Automatically

If you want this system to clear the dynamic ONU binding automatically, you can use this command, **epon dynamic-binding-timeout {disable | enable}**.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>epon dynamic-binding-timeout {disable   enable}</b>	Sets whether to clear the dynamic ONU binding automatically or not.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

Note: Only when ONU does not pass authentication and after ONU is deregistered can the information about dynamic ONU binding be known.

## 1.8 Setting the Timeout Time of Automatic Removal of Dynamic ONU Binding

If you want this system to clear the timeout time of the automatic removal of dynamic ONU binding, you can use this command, **epon dynamic-binding-timeout value**.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>epon dynamic-binding-timeout value</b>	Sets the timeout time of the automatic removal of dynamic ONU binding.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

Note: Only when ONU does not pass authentication and after ONU is deregistered can the information about dynamic ONU binding be known.

## 1.9 Enabling or Disabling ONU Registration when the Successful Discovery of CTC OAM of ONU Times out

If you want to enable or disable ONU deregistration when the discovery of CTC OAM of ONU times out, run **epon ctc-oam-discovery-timeout {disable | enable}**.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>epon ctc-oam-discovery-timeout {disable   enable}</b>	Enables or disables ONU deregistration when the discovery of CTC OAM of ONU times out.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

## 1.10 Setting the Timeout Time for Waiting for Successful ONU CTC OAM Discovery

If you want to set the timeout time for waiting for successful CTC OAM discovery of ONU, run **epon ctc-oam-discovery-timeout value**. If it times out, OLT will try to deregister ONU to resume the fault that makes CTC OAM discovery unsuccessful.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>epon ctc-oam-discovery-timeout</b>	Sets the timeout time for waiting for successful CTC OAM discovery of ONU.

<i>value</i>	
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

### 1.11 Setting the Waiting Time and Transmission Times of OAM Transmission after the Initial Registration of ACE ONU is Resumed

If you want to set the waiting time and transmission times of OAM transmission after the initial registration of ACE ONU is resumed, run **epon ace-reset-delay *value count***.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>epon ace-reset-delay <i>value count</i></b>	Sets the waiting time and transmission times of OAM transmission after the initial registration of ACE ONU is resumed.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

### 1.12 Enabling or Disabling the Print of ONU Power-Off Alarm Log

If you want to enable or disable the print of ONU power-off alarm log, run **epon dying-gasp-log {disable | enable}**.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>epon dying-gasp-log {disable   enable}</b>	Enables or disables the print of ONU power-off alarm log.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

### 1.13 Setting the IP Address of OLT Manager

If you want to set the IP address of OLT network manager, run **epon snmp-ipaddress *ip-address***.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>epon snmp-ipaddress</b> <i>ip-address</i>	Sets the IP address of OLT network manager.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

## 1.14 Setting the IP Address of the Serial Bridge of ONU

If you establish the correlation of the bridge's IP address and the index and then apply the index in LLID interface configuration mode, you can enable the IP address of the bridge, which corresponds to the index, to be reported to ONU.

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>[no] serial-bridge remote</b> <i>index address A.B.C.D</i>	Sets the correlation of the bridge's IP address and the index.  <b>index</b> stands for the index of the serial bridge;  <b>A.B.C.D</b> stands for the IP address of the serial bridge.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

## Chapter 2 Remote Global Control Commands of ONU

### 2.1 Global Remote ONU Management Configuration Tasks

Remote global ONU management configuration tasks include:

- Restarting ONU
- Updating the ONU Version
- Updating ONU EEPROM
- Resuming the Default Settings of ACE ONU
- Switching over the ONU with Dual PON Ports
- Encrypting ONU
- Configuring the Static MAC Address of ONU
- Removing the Dynamic MAC Address of ONU
- Configuring the Learning Mode of the ONU MAC Address Table
- Setting the Aging Time of the MAC Address Table of ONU
- Setting the Schedule Policy of the ONU CoS Priority Queue
- Setting the Schedule Policy of the CoS Priority Queue of the ONU PON Port
- Setting the Bandwidth of the ONU CoS Priority Queue
- Setting the Bandwidth of the CoS Priority Queue of the ONU PON Port
- Setting the ONU CoS Priority Queue
- Setting the CoS Priority Queue ONU PON Port
- Setting the Isolation of the ONU Port
- Setting the ONU IP Address
- Setting the ONU Mirror
- Setting the Attack Prevention of ONU
- Setting the Serial Interface Mode of ONU
- Setting the IP Address of the Serial Bridge of ONU

- Creating VLAN on ONU
- Displaying the Basic ONU Information
- Displaying the CTC-defined Basic ONU Information
- Displaying the ONU MAC Address Table

Remote ONU management is realized through OAM; OAM includes the CTC-defined OAM and the private OAM defined by the manufacturer.

## 2.2 Restarting ONU

To restart an ONU, you can use this command, **epon reset onu {mac-address value | interface epon slot/port: sequence}**.

This command can be realized through CTC OAM, and all ONUs that support CTC OAM support this command.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>epon reboot onu {mac-address value   interface epon slot/port:sequence}</b>	Restarts an ONU.
<b>exit</b>	Exits from the privileged configuration mode.

## 2.3 Updating the ONU version

IEP3310/3314 supports to update the ONU version remotely from OLT. The ONU update software need be downloaded to the flash memory of IEP3310/3314. 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:

**epon update onu image image\_name interface epon slot/port[:sequence]**。

The detailed procedure is shown below:

Command	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>epon update onu image image_name interface epon slot/port[:sequence]</b>	Updates the ONU version. If the <b>port</b> parameter is the EPON port, all ONU software on this port can be upgraded synchronously; if the <b>port</b> parameter is the LLID port, a single ONU software will be upgraded.
<b>epon commit-onu-image-update</b>	Confirms the upgrade of this version after ONU is restarted

<b>interface epon</b> <i>slot/port[:sequence]</i>	and registered again.
<b>exit</b>	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 `epon commit-onu-image-update` on OLT to confirm the ONU version.

## 2.4 Updating ONU EEPROM

The ONU EEPROM file has saved the MAC address and the sequence ID of ONU. If the information need be altered, the ONU EEPROM file need be updated. IEP3310/3314 supports to update the ONU EEPROM configuration file remotely from OLT and the command is **epon update onu eeprom-image *file-name* interface epon *slot/port:sequence***.

This command is realized through the private OAM and only ONU supports this kind of version download.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>epon update onu eeprom-image <i>file-name</i> interface epon <i>slot/port:sequence</i></b>	Updates the ONU EEPROM file.
<b>epon reboot onu {<i>mac-address value</i>   interface epon <i>slot/port:sequence</i>}</b>	Restarts an ONU.
<b>exit</b>	Exits from the privileged configuration mode.

Note:

1. After the ONU EEPROM file is updated, ONU need be restarted and then the newly configured information takes effect.
2. During the update process of ONU software, do not cut off the power of ONU.

## 2.5 Resuming the Default Settings of ACE ONU

At its first registration ACE ONU needs to resume its default settings through the private OAM. The resuming of the default settings can be conducted automatically in normal cases, or can be realized through the **epon ace-recover** command.

This command is realized through the private OAM and only ACE ONU supports this command.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>epon ace-recover</b> <b>{mac-address</b> <i>value</i>   <b>interface</b> <b>epon</b> <i>slot/port:sequence</i> }	Resumes the default settings.
<b>exit</b>	Exits from the privileged configuration mode.

Note:

After the default settings is resumed, ONU need be restarted.

## 2.6 Switching over the ONU with Dual PON Ports

ONU with two PON ports can use this two commands, **epon switch-onu-pon** and **epon switch-onu-pon-and-back**, to conduct the switchover of the PON ports.

This command is realized through the private OAM and only ACE ONU supports this command.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>epon switch-onu-pon</b> <b>interface epon</b> <i>slot/port:sequence</i>	Switches over one PON port to the other one.
<b>epon</b> <b>switch-onu-pon-and-back</b> <b>interface epon</b> <i>slot/port:sequence</i>	Switches ONU to use the other PON port, conducts registration on this PON port successfully and then switches back to the original PON port.
<b>exit</b>	Exits from the privileged configuration mode.

## 2.7 Encrypting ONU

ONU has to enable its encryption function and its encryption mode must be the same as that of OLT, so the downlink packets can be encrypted.

This command is realized through the private OAM and only ONU supports this command.

In general, the encryption function of ONU is enabled by default. You can enable or disable the encryption function of ONU on OLT and this need not be set.

The detailed procedure is shown below:

Procedure	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>config</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>epon onu</b> <b>encryption</b> <b>triple-churning</b>	Enables the Triple Churning encryption of ONU in LLID interface configuration mode.
<b>exit</b>	Exits from the LLID interface configuration mode.
<b>exit</b>	Exits from the global configuration mode.
<b>exit</b>	Exits from the privileged configuration mode.

## 2.8 Configuring the Static MAC Address of ONU

The static MAC address entries mean those MAC address entries that cannot be aged by ONU but only be removed manually. According to actual requirements of ONU, you can decide whether to add or remove static MAC addresses.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>configure</b>	Enters the global configuration mode.
<b>Interface epon 0/1:1</b>	Enters the LLID interface configuration mode.
<b>[no]epon onu mac address-table static</b> <i>mac-addr port port-num</i>	Configures the static MAC address of ONU. <b>mac-addr</b> means a MAC address. <b>port-num</b> stands for an egress. If it is the multicast packet, multiple egresses can be set at the same time.
<b>exit</b>	Goes back to the global configuration mode.

<b>exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

## 2.9 Removing the Dynamic MAC Address of ONU

In some cases, some learned MAC addresses on ONU need be removed.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>configure</b>	Enters the global configuration mode.
<b>interface EPON slot/port:llid</b>	Enters the LLID interface configuration mode.
<b>[no]epon onu clear mac address-table dynamic [address H.H.H   port port-num]</b>	Deletes a dynamic MAC address of ONU. <i>H.H.H</i> stands for the MAC address. <i>port-num</i> stands for the UNI port.
<b>exit</b>	Goes back to the global configuration mode.
<b>exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

## 2.10 Configuring the Learning Mode of the ONU MAC Address Table

MAC address learning can generally fall into three modes:

- **IVL:** Stands for the independent VLAN learning mode. In this mode, VLAN ID and SRC MAC will be used as indexes to add the entry of the MAC address; VLAN ID and DST MAC will be used as indexes to search the MAC address table.
- **SVL:** Stands for the sharing VLAN learning mode. In this mode, SRC MAC will be used as the index to add the entry of the MAC address; DST MAC will be used as the index to search the MAC address table.
- **No learning:** In this mode, the MAC address table will not be learned after the packets enter the system, but at packet forwarding the MAC address table will be searched according to VLAN ID and DST MAC.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

**Note:**

ONU 暂时不支持 IVL 模式。

Command	Purpose
<b>configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu mac address-table learning</b> <b>{ ivl   svl   disable }</b>	Configures the learning mode of ONU MAC address table.  <b>ivl</b> stands for the independent VLAN learning mode.  <b>svl</b> stands for the sharing VLAN learning mode.  <b>disable</b> means to shut down the learning function.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.11 Setting the Aging Time of the MAC Address Table of ONU

When a dynamically learned MAC address is not used during a designated aging time, ONU will remove this MAC address from the MAC address table. The MAC aging time of ONU can be set according to actual needs, and the default aging time is 300 seconds.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu mac address-table</b> <b>aging-time [0   15-3825]</b>	Sets the aging time of the ONU MAC address.  <b>0</b> means that the MAC addresses will not age.  <b>15-3828</b> means the value range of the MAC aging time, whose unit is second.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.12 Setting the Schedule Policy of the ONU CoS Priority Queue

ONU currently supports two kinds of port queue schedule algorithms: SP and WRR.

- **SP (Sheer Priority):** In this algorithm, only when the high-priority queue is null can the packets in the low-priority queue be forwarded, and if there are packets in the high-priority queue these packets will be unconditionally forwarded.
- **WRR (Deficit Round Robin):** Each priority queue is distributed with a certain bandwidth and each priority queue will be provided service from high priority to low priority in turn; when the high-priority queue uses up its own bandwidth, the next-priority queue will be provided with service.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu scheduler policy { sp   wrr }</b>	Sets the queue schedule mode of ONU to <b>sp</b> or <b>wrr</b> .
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.13 Setting the Schedule Policy of the CoS Priority Queue of the ONU PON Port

The PON port of ONU currently supports two kinds of port queue schedule algorithms: SP and WRR.

- **SP (Sheer Priority):** In this algorithm, only when the high-priority queue is null can the packets in the low-priority queue be forwarded, and if there are packets in the high-priority queue these packets will be unconditionally forwarded.
- **WRR (Deficit Round Robin):** Each priority queue is distributed with a certain bandwidth and each priority queue will be provided service from high priority to low priority in turn; when the high-priority queue uses up its own bandwidth, the next-priority queue will be provided with service.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu scheduler-pon policy { sp   wrr }</b>	Sets the uplink queue schedule mode of ONU to <b>sp</b> or <b>wrr</b> .
<b>Exit</b>	Goes back to the global configuration mode.

<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.14 Setting the Bandwidth of the ONU CoS Priority Queue

If this command is run, the bandwidth of all priority queues on all interfaces are affected. This command validates only when the queue schedule mode is set to WRR. This command decides the bandwidth weight value of the CoS priority queue when the WRR schedule policy is used.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

### Note:

At present, ONU supports 4 priority queues but not the queue bandwidth settings; when the queue schedule mode is **wrr**, the bandwidth ratio of 4 queues is 1:2:4:8, so the following commands are invalid.

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu scheduler wrr bandwidth weight1...weightn</b>	Sets the bandwidth for each queue of ONU. <b>weight1~weightn</b> means the bandwidth of the corresponding queue.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.15 Setting the Bandwidth of the CoS Priority Queue of the ONU PON Port

If this command is run, the bandwidth of all priority queues on all interfaces are affected. This command validates only when the queue schedule mode is set to WRR. This command decides the bandwidth weight value of the CoS priority queue when the WRR schedule policy is used.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.

<b>[no] epon onu scheduler-pon wrr bandwidth weight1...weightn</b>	Sets the bandwidth for each uplink queue of ONU.  <b>weight1~weightn</b> means the bandwidth of the corresponding queue.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.16 Setting the ONU CoS Priority Queue

The function of the priority queue is to transmits the packets to the designated priority queue according to the CoS value of these packets. The packets of which CoS values are 0 or 1 will be sent to queue 1, those of which CoS values are 2 or 3 to queue 2, those of which CoS values are 4 or 5 to queue 3 and those of which CoS values are 6 or 7 to queue 4.

If this command is set, the correlation of the CoS value and the priority queue will be changed and the packets with the designated CoS value will be sent to the designated priority queue.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON slot/port:llid</b>	Enters the LLID interface configuration mode.
<b>[no] epon onu cos map quid cos1 ... cosn</b>	To set the ONU CoS priority queue, run <b>epon onu cos map quid cos1..cosn</b> .  <b>quid</b> stands for the priority queue.  <b>cos1...cosn</b> stand for the CoS values.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.17 Setting the CoS Priority Queue ONU PON Port

The function of the priority queue is to sent the packets to the designated priority queue according to the CoS value of the packets. By default, the packets of which CoS values are 0 will be sent to queue 1, those of which CoS values are 1 to queue 2, those of which CoS values are 2 to queue 3 and those of which CoS values are 3 to queue 4, and so on.

If this command is set, the correlation of the CoS value and the priority queue will be changed and the packets with the designated CoS value will be sent to the designated priority queue.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu cos-pon map</b> <i>quid cos1 ... cosn</i>	Sets the uplink CoS priority queue of ONU. <b>quid</b> stands for the priority queue. <b>cos1...cosn</b> stand for the CoS values.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.18 Setting the Isolation of the ONU Port

In normal cases the packets between different UNI ports of ONU can be freely forwarded. However, in some special cases, you have to set port isolation to forbid the data flows between UNI ports.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port-protect</b>	Configures ONU port isolation.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.19 Setting the IP Address of ONU

Before you access ONU through the telnet mode, you have to set the IP address of ONU.

The IP address is realized through the private OAM.

To conduct this settings on ONU, you need to run the commands in the following table:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu ip address { dhcp   static</b> <i>ip-address netmask}</i>	Sets the IP address of ONU.  <b>dhcp</b> means to obtain the IP address through the DHCP mode.  <b>static</b> means to set the IP address statically.  <b>ip-address</b> stands for the IP address.  <b>netmask</b> stands for the mask of the network.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

As to ONUs which locate at the bandwidth center, you need to run the commands in the following table:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu ip address A.B.C.D netmask</b> <i>A.B.C.D gateway A.B.C.D vlan value</i>	Sets the IP address of ONU.  <b>A.B.C.D</b> in this command in turn stands for the IP address, the mask and address of the network manager.  <b>Vlan</b> stands for the ID of VLAN.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.20 Setting the ONU Mirror

To make ONU management easy or to monitor the data of a UNI port, you can copy the data of a UNI port and save these data on another UNI port for storage or analysis.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown in the following table.

Note:

The mirror function supports the “multiple-to-one” relation, that is, one session has only one destination port but multiple source ports.

The answer of how many source ports are supported depends on the detailed ONU.

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu mirror session num destination dest-port source src-port [both   rx   tx]</b>	<p>Sets the ONU mirror.</p> <p><b>num</b> stands for the session ID.</p> <p><b>dest-port</b> stands for the destination port of the mirror, which is a port to connect the network analyzer.</p> <p><b>src-port</b> stands for the source port of mirror, which is always the client port.</p> <p><b>both   rx   tx</b> stands for the direction of the mirror packets, that is, <b>both</b> stands for the outgoing and incoming packets of the source port, <b>rx</b> stands for the packets getting in from the source port and <b>tx</b> stands for the packets sent out from the source port. The default settings is <b>both</b>.</p>
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.21 Setting the Attack Prevention of ONU

Network devices need to capture some protocol packets to make sure their normal running, such as BPDUs and IGMP packets; however, due to the limitation of CPU processing ability, the instant reception of lots of protocol packets will cause CPU to overload or the system to break down. Vicious users may transmit special protocol packets to attack network devices to cause the whole network to paralyze.

ONU supports the rate limit of the special packets. If the received flow exceeds the threshold value, this kind of flow will be limited for avoiding abnormality from occurring in this system.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu filter {icmp   arp   bpdu   igmp} threshold value</b>	<p>Sets the attack prevention of ONU.</p> <p><b>value</b> stands for the number of the packets which are received in a second.</p>
<b>Exit</b>	Goes back to the global configuration mode.

<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.22 Setting the Serial Interface Mode of ONU

Some ONUs support the serial interface. ONU encapsulates the data of the serial interface as the Ethernet packets and transmits them to the serial bridge, and then the serial bridge decapsulates into the data of the serial interface for storage and display.

The communication between ONU and serial bridge is conducted through TCP or UDP. In TCP mode, ONU can work as the client or in server mode. In total, ONU has three working modes:

- **TCP-Server:** In this mode, the TCP connection will be established between ONU and serial interface, and ONU works as the server to wait for the serial bridge to trigger the connection request.
- **TCP-Client:** In this mode, the TCP connection will be established between ONU and serial interface, and the serial bridge enables the TCP listening port and ONU positively triggers the connection request to the serial bridge.
- **UDP:** The packets will be transmitted between ONU and serial bridge through the UDP mode.

This command is realized through the private OAM and only ONU which supports the serial interface supports this command.

The detailed procedure is shown in the following table.

Note:

At present, both ONU and OLT supports only the TCP-Server mode.

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu serial-mode {tcp-server   tcp-client   udp} port</b> <i>port-value</i> [ <b>timeout</b> <i>timeout-value</i> ]	Sets the serial-interface working mode of ONU.  <b>port-value</b> stands for the ID of the TCP or UDP port.  <b>timeout-value</b> stands for the connection timeout time, which can be set only in tcp-server mode.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.23 Setting the IP Address of the Serial Bridge of ONU

When ONU is set to be in TCP-Client mode or UDP mode, the IP address of the remote serial bridge should be known. This command is used to notify ONU of the serial bridge's IP address.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu serial-remote</b> <i>index</i>	Sets the IP address of the serial bridge of ONU.  <b>index</b> stands for the index of the serial bridge.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.24 Creating VLAN on ONU

You have to create VLAN on ONU 1208 before the VLAN transparent transmission mode is realized on it.

This command is realized through the private OAM and only 1208 ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu vlan</b> <i>word</i>	Creates or deletes VLAN on an ONU.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

## 2.25 Displaying the Basic ONU Information

IEP3310/3314 supports the remote display of ONU's basic information on OLT. The detailed command is shown below:

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

The detailed procedure is shown below:

Command	Purpose
<b>enable</b>	Enters the global configuration mode.
<b>show epon interface</b> <i>slot/port:sequence onu basic-info</i>	Displays the basic ONU information.
<b>exit</b>	Exits from the privileged mode.

## 2.26 Displaying the CTC-defined Basic ONU Information

IEP3310/3314 supports the remote display of CTC-defined ONU's basic information on OLT. The detailed command is shown below:

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

The detailed procedure is shown below:

Command	Purpose
<b>enable</b>	Enters the privileged configuration mode.
<b>show epon interface</b> <i>slot/port:sequence</i> <b>onu ctc</b> <b>basic-info</b>	Displays the CTC-defined basic ONU information.
<b>exit</b>	Exits from the privileged configuration mode.

## 2.27 Displaying the ONU MAC Address Table

During the operation of ONU, we, due to debugging or management, want to know the content of the MAC address table of ONU. Run the following command to display the content in the MAC address table of ONU:

This command is realized through the private OAM and only ONU supports this command.

Command	Purpose
<b>show epon interface <i>interface-id</i> onu mac address-table</b>	Displays the content in the MAC address table of ONU.  <b>interface-id</b> means the ID of the LLID port that ONU corresponds to.

## Chapter 3 Remote UNI Control Configuration of ONU

### 3.1 Remote UNI Management Configuration Tasks

Remote UNI control configuration tasks include:

- Setting the VLAN Mode of ONU
- Setting the VLAN Translation Entry of the ONU Port
- Setting the VLAN Aggregation Entry of the ONU Port
- Setting Flow Control on the ONU Port
- Limiting the Maximum Number of MAC addresses of the ONU Port
- Setting Storm Control on the ONU Port
- Setting the Rate Limit of the ONU Port
- Setting Loopback Detection of the ONU Port
- Setting the Duplex Mode of the ONU Port
- Setting the Speed of ONU Port
- Setting the Auto-Negotiation of the ONU Port
- Setting the Frame Filtration of the ONU Port
- Setting the Default CoS Value of the ONU Port
- Enabling or Disabling the ONU UNI Port
- Applying the Standard CTC QoS Policy on the ONU Port
- Applying the QoS Policy on the ONU Port
- Applying the MAC Access List on the ONU Port
- Applying the IP Access List on the ONU Port
- Setting the Attributes of a Serial Interface of ONU
- Setting the Buffer of the Serial Interface of ONU
- Setting the Keepalive of the Serial Interface of ONU
- Setting Loopback Detection of the Serial Interface of ONU

- Displaying Packet Statistics on the ONU Port
- Displaying the Status of the ONU Port
- Displaying the VLAN Information on the ONU Port

### 3.2 Setting the VLAN Mode of ONU

The UNI VLAN tag of ONU has four kinds of modes to be processed: Transparent, Tag, Translation, and STACKING

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

- The define of the transparent mode is shown as follows:

Direction	Having the tag in the Ethernet packet or not	Processing mode
Uplink	Having the VLAN tag	Make no change of the Ethernet packet (the previous VLAN tag is preserved) and forward it.
	Not having the VLAN tag	Make no change of the Ethernet packet and forward it.
Downlink	Having the VLAN tag	Make no change of the Ethernet packet (the previous VLAN tag is preserved) and forward it.
	Not having the VLAN tag	Make no change of the Ethernet packet and forward it.

- The definition of the tag mode is shown as follows:

Direction	Having the tag in the Ethernet packet or not	Processing mode
Uplink	Having the VLAN tag	Discard
	Not having the 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 VLANConfig Parameters domain of the received VLAN VariableContainer, can be omitted and the tagged TPID and Pri can be set to the default values (TPID=0x8100, Pri

		=0).
Downlink	Having the 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.
	Not having the VLAN tag	Discard

- The define of the transparent mode is shown as follows:

Direction	Having the tag in the Ethernet packet or not	Processing mode
Uplink	Having the 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 <b>VLANConfig Parameters</b> domain of the received <b>VLAN Variable Container</b> , 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 the 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.
	Not having the VLAN tag	Discard

- The STACKING mode is shown in the following table:

Direction	Having the tag in the Ethernet packet or not	Processing mode
Uplink	Having the 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.
	Not having the VLAN tag	Adds the PVID of the port and sends it to OLT.
Downlink	Having the VLAN tag	If it is in the translation list or the tag is equal to PVID, the tag will be removed, or dropped.
	Not having the VLAN tag	Discard

- The aggregation mode is shown in the following table:

Direction	Having the tag in the Ethernet packet or not	Processing mode
Uplink	Having the VLAN tag	<p>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.</p> <p>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 <b>VLANConfig Parameters</b> domain of the received <b>VLAN Variable Container</b> and set the transformed TPID to be the default</p>

		value (TPID=0x8100), but keep <b>pri</b> to be the original value.
	Not having the VLAN tag	Adds the default VLAN to the untagged packets and forwards them.
Downlink	Having the VLAN tag	<p>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.</p> <p>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 <b>VLANConfig Parameters</b> 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.</p>
	Not having the VLAN tag	Discard

The four modes are realized through CTC OAM, and ONUs, if they support CTC OAM, support this command.

STACKING is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown in the following table:

Procedure	Purpose
<b>Enable</b>	Enters the privileged configuration mode.
<b>Config</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>epon onu port</b> <i>port-num ctc vlan</i> <b>mode {transparent</b> <b>  tag pvid value  </b> <b>translation pvid</b> <i>value  </i>	<p>Sets the processing mode of the ONU UNI VLAN Tag.</p> <p><b>port-num</b> stands for the ID of the UNI port.</p> <p><b>transparent</b> stands for the transparent transmission mode.</p> <p><b>tag</b> stands for the tag mode.</p>

<b>vlan-stacking pvid</b> <i>value</i>   <b>aggregation</b> <b>pvid</b> <i>value</i> }	<p><b>translation</b> stands for the translation mode.</p> <p><b>vlan-stacking</b> stands for the STACKING mode.</p> <p><b>aggregation</b> stands for the aggregation mode.</p> <p><b>value</b> stands for the pvid of a port.</p>
<b>exit</b>	Exits from the privileged configuration mode.

### 3.3 Setting the VLAN Translation Entry of the ONU Port

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.

The detailed procedure is shown in the following table.

**Note:**

The mode of the ONU port must first be set to the translation mode.

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface epon</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>epon onu port num ctc vlan</b> <b>translation-entry</b> <i>old-vid new-vid</i>	<p>Sets the VLAN translation entry of the ONU port.</p> <p><b>num</b> stands for the UNI port number.</p> <p><b>old-vid</b> stands for the previous vlan, also called as cvlan.</p> <p><b>new-vid</b> stands for the translated vlan, also called as svlan.</p>
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.4 Setting the VLAN Aggregation Entry of the ONU Port

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

The detailed procedure is shown in the following table.

**Note:**

The mode of the ONU port must first be set to the translation mode.

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.

<b>Interface epon slot/port:llid</b>	Enters the LLID interface configuration mode.
<b>epon onu port num ctc vlan translation-entry old-vid-range new-vid</b>	Sets the VLAN translation entry of the ONU port.  <b>num uni</b> stands for the port number.  <b>old-vid-range</b> stands for the range of the previous vlan.  <b>new-vid</b> stands for the translated vlan, also called as svlan.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.5 Setting Flow Control on the ONU Port

The flow control in full duplex mode is realized through the 802.3X-defined PAUSE frame, while the flow control in half duplex mode is realized through the backpressure.

This command can be realized through CTC OAM, and all ONUs that support CTC OAM support this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface epon 0/1:1</b>	Enters the LLID interface configuration mode.
<b>[no] epon onu port num ctc flow-control</b>	Enables or disables flow control on the ONU UNI port.  <b>num</b> stands for the ID of the ONU UNI port.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.6 Limiting the Maximum Number of MAC addresses of the ONU Port

The security port can control the port access, enabling a port to be used in an allowable range that you set. You can enable the security function of a port by setting the maximum number (threshold) of secure MAC addresses and enabling the secure MAC address; if the MAC addresses which enters the port exceed the threshold and the MAC addresses are not the secure MAC addresses, we define this phenomenon as port security violation; if this phenomenon happens, different actions will be acted according to different violation modes.

The security port has two functions: setting the maximum number of MAC addresses for the security port and setting the static secure MAC address. If the security port has no static secure MAC address or the number of the static secure MAC addresses is smaller than that of the secure MAC addresses, the dynamic learning of the secure MAC addresses will be conducted. If security port violation appears, the packets will be dropped until security port violation disappears.

At present, ONU only supports the setting of the number of secure MAC addresses.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>port-num mac address-table dynamic maximum addr-num</i>	Limits the maximum number of MAC addresses of the ONU port.  <i>port-num</i> stands for the UNI port.  <i>addr-num</i> means the maximum number of MAC addresses that are allowed to pass through.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.7 Setting Storm Control on the ONU Port

The port of ONU may bear continuous and abnormal impact from unicast (MAC address fails to be found), multicast or broadcast packets, and therefore gets paralyzed even to the extent that the whole ONU breaks down. Therefore it is necessary to provide a mechanism to constrain this phenomenon and limit the bandwidth in the allowable range.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown in the following table.

**Note:**

Due to the limitation of the hardware, among four storm control modes (the broadcast storm control, the broadcast and multicast storm control, the “broadcast + multicast + unknown unicast” storm control and the storm control for all packets) you can choose only one storm control mode.

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.

<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>port-num storm-control mode mode-num threshold count</i>	<p>Sets storm control on an ONU port.</p> <p><b>port-num</b> stands for the UNI port.</p> <p>mode-num means the mode:</p> <p>1: broadcast</p> <p>2: broadcast and multicast</p> <p>3: broadcast, multicast and unknown unicast</p> <p>4: all packets</p> <p><b>count</b> stands for the threshold of storm control.</p>
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.8 Setting the Rate Limit of the ONU Port

The limitation of the rate of the ONU UNI port is used to limit the packet transmission rate of the UNI port.

This command can be realized through CTC OAM, and all ONUs that support CTC OAM support this command.

The detailed procedure is shown below:

Command	Purpose
<b>configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>port-num ctc rate-limit band { ingress   egress}</i>	<p>SetS the rate limit of the ONU port.</p> <p><b>port-num</b> stands for the ID of the UNI port.</p> <p><b>band</b> stands for the threshold of the rate limit.</p>
<b>exit</b>	Goes back to the global configuration mode.
<b>exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

### 3.9 Setting Loopback Detection of the ONU Port

You can confirm whether there is loopback occurring on a port by transmitting a special packet on this port and detecting whether this packet comes back to this port from which it is sent out.

Due to the continuous change of the network, it is certain that the loopback detection is a continuous process, that is, loopback detection will be conducted every a fixed time.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>port-num loopback detect</i>	Sets loopback detection of the ONU port. <i>port-num</i> stands for the UNI port.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.10 Setting the Duplex Mode of the ONU Port

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>port-num duplex { half   full   auto }</i>	Sets the duplex mode of the ONU UNI port. <i>port-num</i> stands for the UNI port.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.11 Setting the Speed of ONU Port

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
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<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>port-num</i> <b>speed</b> { 10   100   auto }	Sets the speed of ONU port. <i>port-num</i> stands for the UNI port.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.12 Setting the Auto-Negotiation of the ONU Port

ONUs that are not produced by do not support to set the rate and duplex mode of the UNI port, but this command helps these ONUs to enable or disable the auto-negotiation of this port.

This command can be realized through CTC OAM, and all ONUs that support CTC OAM support this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>port-num</i> <b>ctc auto-negotiation</b>	Sets the auto-negotiation of the ONU port. <i>port-num</i> stands for the UNI port.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.13 Setting the Frame Filtration of the ONU Port

This function can limit some illegal users to access the network or some services by limiting the source or destination MAC address.

The detailed procedure is shown in the following table.

Note:

ONU only supports the frame filtration of the source MAC address.

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>port-num</i> <b>block mac</b> {src H.H.H   dest H.H.H}	Sets the frame filtration of the ONU port.

	<i>port-num</i> stands for the UNI port. <b>H.H.H</b> means an MAC address.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.14 Setting the Default CoS Value of the ONU Port

If the UNI port is set to be in tag or translation mode and the uplink packets do not carry the tag when they enters the UNI port, ONU has to add the default tag of this UNI port to these packets and then sends them to OLT. In this case, the CoS value of the tag is the default CoS value of the UNI port.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>port-num default-cos value</i>	Sets the default CoS value of the ONU port. <i>port-num</i> stands for the UNI port. <b>value</b> means the default CoS value.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.15 Enabling or Disabling the ONU UNI Port

You can disable the ONU UNI port to disable all functions on this port, and then all monitor commands will label this port as unavailable. This information can be transmitted to other devices through the dynamic routing protocol. The modification on any route will not affect this port.

This command can be realized through CTC OAM, and all ONUs that support CTC OAM support this command.

The detailed procedure is shown below:

Command	Purpose
<b>configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port</b> <i>num shutdown</i>	Enables or disables the ONU UNI port.

	<b>num</b> stands for the ID of the ONU UNI port.
<b>exit</b>	Goes back to the global configuration mode.
<b>exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

### 3.16 Applying the Standard CTC QoS Policy on the ONU Port

This function is used to classify and queue the uplink flows, modify the priority of the packets, designate the incoming queue of packets and schedule the packets by setting the queue schedule algorithm.

Some ONUs only support the incoming queue but not to modify the CoS value. As to supporting which functions, it depends on ONU.

This command can be realized through CTC OAM, and all ONUs that support CTC OAM support this command.

The detailed procedure is shown below:

Command	Purpose
<b>configure</b>	Enters the global configuration mode.
<b>Interface EPON slot/port:llid</b>	Enters the LLID interface configuration mode.
<b>[no] epon onu port num ctc qos policy name</b>	Applies the QoS policy on the ONU UNI port. <b>num</b> stands for the ID of the UNI port. <b>name</b> stands for the name of QoS policy map.
<b>exit</b>	Goes back to the global configuration mode.
<b>exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

### 3.17 Applying the QoS Policy on the ONU Port

This function realizes the classification of uplink flows; it helps to conduct the following actions to the packets: forward, drop, rate limit and modify the out-layer VLAN tag.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>configure</b>	Enters the global configuration mode.
<b>Interface EPON slot/port:llid</b>	Enters the LLID interface configuration mode.
<b>[no] epon onu port num qos policy name</b>	Applies the QoS policy on the ONU UNI port. <b>num</b> stands for the ID of the UNI port.

	<b>name</b> stands for the name of QoS policy map.
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

### 3.18 Applying the MAC Access List on the ONU Port

The MAC access control list is used to match such attributes as special source MAC addresses, destination MAC addresses, vlan tag or Ethernet types to realize packet filtration which is based on these attributes.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port num mac access-group name</b>	Applies the MAC access list on the ONU port. <b>num</b> stands for the ID of the UNI port. <b>name</b> stands for the name of the MAC access list.
<b>exit</b>	Goes back to the global configuration mode.
<b>exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

### 3.19 Applying the IP Access List on the ONU Port

The IP access control list is used to realize the filtration of special packets by matching the L3/L4 attributes of the packets.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu port num ip access-group name</b>	Applies the IP access list on the ONU UNI port. <b>num</b> stands for the ID of the UNI port. <b>name</b> stands for the name of the IP access

	list.
<b>exit</b>	Goes back to the global configuration mode.
<b>exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

### 3.20 Setting the attributes of a Serial Interface of ONU

The serial interface of ONU supports the following attributes: speed, databits, stopbits, parity and flow-control.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu serial num serial-attribute {speed speed-value   databits databits-value   stopbits stopbits-value   parity {none   odd   even   space   mark}   flow-control {none   software   hardware}   bus-type { RS232   RS485}   duplex {half   full}}</b>	<p>Sets the attributes of a serial interface of ONU.</p> <p><b>num</b> stands for the number of a serial interface.</p> <p><b>speed-value</b> stands for the speed of the serial interface.</p> <p><b>databits-value</b> stands for the value of the data bit of the serial interface.</p> <p><b>stopbits-value</b> stands for the value of the stop bit of the serial interface.</p> <p><b>none   odd   even   space   mark</b> stands for five checkup modes of the serial interface, among which <b>none</b> means no checkup.</p> <p><b>none   software   hardware</b> stands for the flow control modes, among which <b>none</b> means no flow control.</p> <p>RS232   RS485 stands for the serial interface mode.</p> <p><b>half   full</b> stands for the duplex mode.</p>
<b>exit</b>	Goes back to the global configuration mode.
<b>exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

### 3.21 Setting the Buffer of the Serial Interface of ONU

When the data of the serial interface arrives at ONU, these data will be temporally stored in the local, encapsulated into the Ethernet packets and then sent out. The detailed buffer is up to the time and bytes. If the bytes of the local buffer reach a certain number (read-bytes), or the interval of the buffer reaches to a certain time (read-interval), ONU will send all the data out for just one time.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu serial num serial-buffer {read-interval time   read-bytes bytes}</b>	Sets the buffer of the ONU serial interface.  <b>num</b> stands for the number of a serial interface.  <b>time</b> stands for the maximum buffer time.  <b>bytes</b> stands for the bytes of the maximum buffer.
<b>exit</b>	Goes back to the global configuration mode.
<b>exit</b>	Goes back to the EXEC mode.
<b>write</b>	Saves the settings.

### 3.22 Setting the Keepalive of the Serial Interface of ONU

To confirm whether the link between serial bridge and ONU is normal, you should monitor the status the link continuously. ONU can monitor this link continuously through its keepalive function. If there is no packet transmission between ONU and serial bridge at the designated time (idle), ONU will positively transmit the keepalive packets; if ONU does not receive the keepalive packets or data packets from the serial bridge in a certain time (timeout), ONU continues transmitting the keepalive packets; if ONU does not receive the keepalive packets from the serial bridge after a designated times (count), the link will be cut off and OLT will be reported of the network interruption event.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu serial num serial-keepalive</b>	Sets the keepalive function of the serial

<b>idle</b> <i>idle-value</i> <b>timeout</b> <i>timeout-value</i> <b>count</b> <i>count-value</i>	<p>interface of ONU.</p> <p><b>num</b> stands for the number of a serial interface.</p> <p><b>idle-value</b> stands for the maximum idle time between ONU and serial bridge; if there is no packets to be transmitted between ONU and serial bridge during the idle-value time, ONU will transmit the keepalive packet to monitor the status of the link.</p> <p><b>timeout-value</b> stands for the timeout time of the keepalive packet; if onu still receives no response packets from the serial bridge after the keepalive-value time, ONU will transmit the next keepalive packet.</p> <p><b>count</b> stands for the transmission times of the keepalive packet; if the response packet from the serial bridge is still not received after <b>count</b> packets are being transmitted, ONU regards that the network is interrupted and notifies OLT.</p>
<b>Exit</b>	Goes back to the global configuration mode.
<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.23 Setting Loopback Detection of the Serial Interface of ONU

You can confirm whether there is loopback occurring on a port by transmitting a special packet on this port and detecting whether this packet comes back to this port from which it is sent out.

When the loopback on the serial interface is detected by ONU, ONU will report this loopback to the current serial interface.

This command is realized through the private OAM and only ONU supports this command.

The detailed procedure is shown below:

Command	Purpose
<b>Configure</b>	Enters the global configuration mode.
<b>Interface EPON</b> <i>slot/port:llid</i>	Enters the LLID interface configuration mode.
<b>[no] epon onu serial</b> <i>serial-num</i> <b>loopback detect</b>	<p>Sets loopback detection of the ONU port.</p> <p><b>serial-num</b> stands for the ID of the serial interface.</p>
<b>Exit</b>	Goes back to the global configuration mode.

<b>Exit</b>	Goes back to the EXEC mode.
<b>Write</b>	Saves the settings.

### 3.24 Displaying 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. Packet statistics includes the total number of packets, the number of multicast packets, the number of the broadcast packets, pause frames, error frames and so on.

Command	Purpose
<b>show epon interface</b> <i>interface-id</i> <b>onu</b> { <b>port</b>   <b>serial</b> } <i>num</i> <b>statistics</b>	Displays packet statistics on the ONU port.  <b>interface-id</b> means the ID of the LLID port that ONU corresponds to.  <b>num</b> stands for the ID of the ONU port or the serial interface.

### 3.25 Displaying the Status of the ONU Port

During the operation of ONU, the administrator needs to know the information about the configuration and state of the current ONU port through related commands.

The displayed information includes the port type, the link's state, shutdown or not, flow control, the duplex mode, the rate limit and the storm control. Different ONUs have different information to show.

Command	Purpose
<b>show epon interface</b> <i>interface-id</i> <b>onu</b> { <b>port</b>   <b>serial</b> } <i>num</i> <b>state</b>	Displays the state of the ONU port.  <b>interface-id</b> means the ID of the LLID port that ONU corresponds to.  <b>num</b> stands for the ID of the ONU port or the serial interface.

### 3.26 Displaying the VLAN Information on the ONU Port

During the operation of ONU, the administrator needs to know the information about VLAN configuration and the state of the current ONU port through related commands.

Command	Purpose
<b>show epon interface</b> <i>interface-id</i> <b>onu</b> { <b>port</b>   <b>serial</b> } <i>num</i> <b>ctc</b> <b>vlan</b>	Displays the VLAN information of the ONU port.  <b>interface-id</b> means the ID of the LLID port that ONU corresponds to.  <b>num</b> stands for the ID of the ONU port.

## Chapter 4 Basic EPON Networking Examples

### 4.1 Networking Requirements

The EPON0/1 port of OLT connects two ONUs: ONU1 and ONU2. After ONU registration the information about the two ONUs will be displayed.

### 4.2 Network Topology

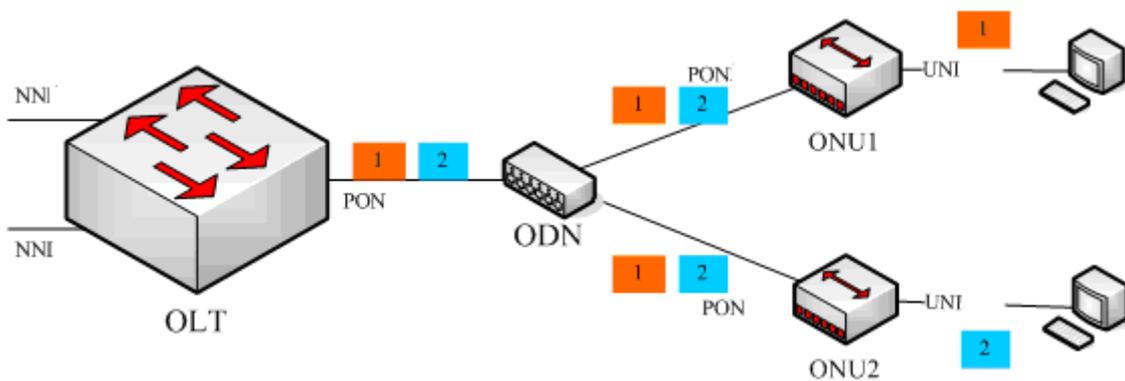


Figure 4-1 Basic EPON network topology

### 4.3 Configuration Procedure

By default OLT does not enable the ONU MAC checkup and the manual authentication. ONU registration means to pass through the authentication and add the MAC-LLID binding table.

Run **show epon onu-information** in any OLT mode. The following information is shown:

Intf Name distance(m)	MAC Address	ONU Type	Bind Type	Status
E0/1:1	00e0.0f00.0001	1208	Static	auto_configured 32
E0/1:2	00e0.0f00.0002	1004	Static	auto_configured 33

Table 4-1 Described ONU Information

Field	Description
Intf Name	Stands for the LLID that ONU is bound to.
MAC Address	Stands for the MAC address of ONU.

ONU Type	Stands for the ONU type.
Bind Type	Stands for the ONU binding type.
Status	Stands for the status of ONU.