



Optical Line Terminal Equipment

Element Management System

User Manual

V1.6
22-4-2019

As our products undergo continuous development the specifications are subject to change without prior notice.

The element management system is an integrated broadband access management platform, which can perform the effective and unified management of multiple types of broadband access equipment developed.

This manual mainly introduces the installation and basic configuration both of the GPON and EPON OLT's element management system. It aims to help users in understanding the equipment's technologies, functions and practical application capacity and to provide technical support for the users.

Intended Readers

This manual is intended for the following readers:

- Commissioning engineers
- Operation and maintenance engineers

To utilize this manual, these prerequisite skills are necessary:

- Access network technology
- EPON principles
- Ethernet switch technology
- Computer network technology
- Symbol Conventions
- GPON network technology

The symbols that may be found in this document are defined as follows.

Symbol	Class	Description
	Notice	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
	Warning	Indicates a hazard with a medium or low level of risk, which if not avoided, could result in minor or moderate injury.
	Note	Provides additional information to emphasize or supplement important points of the main text.

List of Glossary

AUX	Auxiliary
CATV	Cable Television
CFI	Canonical Format Indicator
CIR	Committed Information Rate
CLI	Command Line Interface
CoS	Class of Service
CVLAN	Customer VLAN
DA	Destination Address
DBA	Dynamic Bandwidth Allocation
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
EMS	Element Management System
EPON	Ethernet Passive Optical Network

FE	Fast Ethernet
FEC	Forward Error Correction
FIR	Fixed Information Rate
GE	Gigabit Ethernet
HGU	Home Gateway Unit
IAD	Integrated Access Device
IGMP	Internet Group Management Protocol
IMS	IP Multimedia Subsystem
IP	Internet Protocol
IPTV	Internet Protocol Television
LOID	Logical ONU Identifier
LoS	Loss of Signal
MAC	Medium Access Control
MDU	Multi-Dwelling Unit
MIB	Management Information Base
MPCP	Multi-point control protocol
OAM	Operation, Administration & Maintenance
ODN	Optical Distribution Network
OLT	Optical Line Terminal
OMA	Optical Modulation Amplitude
ONT	Optical Network Terminal
ONU	Optical Network Unit
PIR	Peak Information Rate
PON	Passive Optical Network
POTS	Plain Old Telephone Service
PPPoE	Point-to-Point Protocol over Ethernet
QoS	Quality of Service
SFU	Single Family Unit
SIP	Session Initiation Protocol

SN	Serial Number
SNMP	Simple Network Management Protocol
SP	Strict Priority
SVLAN	Service VLAN
UCT	Un-condition transition
UDP	User Datagram Protocol
UNI	User Network Interface
VLAN	Virtual Local Area Network
VoIP	Voice over IP
WLAN	Wireless Local Area Network
WRR	Weighted Round Robin
GPON	Gigabit-Capable Passive Optical Network
OMCI	ONU Management and Control Interface
TCONT	Transmission Container
GEM	G-PON Encapsulation Mode

Contents

Preface	
Revision History	I
Intended Readers	II
List of Glossary	III
Contents	VI
1 System Description	1
1.1 Interface Types	1
1.2 Working Mode	1
1.3 Installation Requirements	2
1.4 EMS Installation Files	3
2 EMS Installation	4
2.1 Installation of the Server	4
2.2 Installation of the Client	8
3 EMS Quick Start	12
3.1 Preparatory Work	12
3.2 Starting Sequence	13
3.3 Frame Introduction	14
3.4 Add OLT Device	17
3.5 Scan Device	20
3.6 Delete Device	21
3.7 Add Splitter	22
4 Security Management	25
4.1 User Management	25
4.2 Role Management	27
4.3 Permission Management	29
4.4 Online User	30
4.5 Operation Log	31
5 EMS System Management	33
5.1 Lock Client	33
5.2 Modify Password	34
5.3 Database Backup and Restore	34

5.4 Exit System.....	35
6 OLT Management	36
6.1 OLT Basic Information	36
6.2 System Configuration.....	37
6.2.1 OLT Upgrade.....	38
6.2.2 ONU Upgrade--EPON	40
6.2.3 Config File	41
6.2.4 Configure Aux Port	42
6.2.5 DNS Parameter	43
6.2.6 System Time.....	44
6.2.7 FAN Configuration	46
6.2.8 System Mirror	46
6.3 OLT Configuration	47
6.3.1 VLAN Configuration	48
6.3.1.1 VLAN Port	49
6.3.1.2 QinQ/Translation.....	51
6.3.2 Port Configuration	51
6.3.2.1 Uplink Port Traffic Statistics.....	51
6.3.2.2 Uplink Port Configuration.....	52
6.3.2.3 PON Port Traffic Statistics.....	55
6.3.2.4 PON Ports Configuration	55
6.3.3 MAC Configuration.....	57
6.3.3.1 MAC Table	57
6.3.3.2 Aging Time.....	58
6.3.3.3 Port MAC Limit	59
6.3.4 LACP Configuration	60
6.3.5 QoS Configuration	61
6.3.6 ACL Configuration.....	64
6.3.6.1 Standard IP Filter	65
6.3.6.2 Extend IP Filter	66
6.3.6.3 MAC Filter.....	67
6.3.6.4 Base Port Filter	68
6.3.6.5 Base QoS Filter	69
6.3.6.6 Effect Filter	70
6.3.7 IGMP Configuration.....	71
6.3.7.1 Group Member.....	71

6.3.7.2 IGMP Basic Configuration.....	72
6.3.7.3 Port Mroute.....	73
6.3.7.4 IGMP Port Configuration	74
6.3.7.5 Multicast VLAN.....	75
6.3.7.6 Port User VLAN.....	76
6.3.7.7 Static Group.....	77
6.3.8 RSTP Configuration	78
6.3.8.1 Global Information	78
6.3.8.2 Global Configuration	79
6.3.8.3 Port Information.....	80
6.3.8.4 Port Configuration	81
6.3.9 DHCP Configuration	82
6.3.9.1 Server Configuration	82
6.3.9.2 Lease Table	83
6.3.9.3 Relay Server.....	84
6.3.9.4 Snooping Global	85
6.3.9.5 Snooping Port.....	86
6.3.9.6 Snooping Binding	87
6.3.10 Route Configuration	88
6.3.10.1 VLAN IP	88
6.3.10.2 ARP Proxy	89
6.3.10.3 Static Route	90
6.4 OLT Maintenance Management	91
6.4.1 Save Device Config.....	91
6.4.2 Restart.....	92
6.4.3 OLT Rename.....	93
6.4.4 Clear Port Statistics	94
6.4.5 Clear Flash	95
7. ONU Authentication--EPON.....	97
7.1 ONU Authentication.....	97
7.1.1 Authentication Mode	97
7.1.2 MAC Black List.....	98
7.1.3 MAC White List.....	99
7.1.4 LOID White List.....	100
7.2 ONU List.....	101
7.2.1 Authenticated ONU.....	101

7.2.2 Unauthenticated ONU.....	102
8 Profile Configuration--EPON.....	103
8.1 Profile Configuration.....	104
8.1.1 DBA Profile	104
8.1.2 Service Profile	105
8.1.2.1 LAN Count	106
8.1.2.2 Global	107
8.1.2.3 Port.....	107
8.1.2.4 VLAN.....	108
8.1.2.5 QoS.....	109
8.1.2.6 IGMP.....	110
8.1.2.7 WAN	111
8.1.2.8 WIFI	112
8.1.3 VoIP Profile.....	113
8.1.3.1 POTS Count.....	114
8.1.3.2 VoIP	114
8.1.3.3 SIP	115
8.1.3.4 POTS	116
8.1.4 Alarm Profile.....	117
8.1.4.1 ONU Alarm	117
8.1.4.2 PON Alarm.....	118
8.1.4.3 Port Alarm	119
8.1.4.4 POTS Alarm.....	120
8.2 Binding Configuration	121
9 ONU Management--EPON.....	124
9.1 ONU Basic Information	124
9.2 ONU Maintenance Management	126
9.2.1 ONU Rename.....	126
9.2.2 Reregister ONU.....	127
9.2.3 Reset ONU	128
9.2.4 Unauthorize ONU.....	129
9.2.5 Load Factory Default.....	129
9.2.6 Clean MAC Address List.....	130
9.2.7 Save ONU Configuration.....	131
9.3 ONU Configuration	131

9.3.1 Information	132
9.3.2 Bandwidth.....	133
9.3.3 Port.....	133
9.3.4 VLAN.....	135
9.3.4.1 Transparent Mode	135
9.3.4.2 Tag Mode.....	136
9.3.4.3 Trunk Mode	137
9.3.4.4 Translation Mode	139
9.3.4.5 Aggregation Mode.....	140
9.3.5 QoS.....	141
9.3.6 IGMP.....	143
9.3.7 VoIP.....	145
9.3.8 SIP	146
9.3.9 POTS.....	146
9.3.10 Private Function.....	147
9.3.11 WIFI.....	148
9.3.12 WAN	149
9.3.13 DHCP.....	150
9.3.14 Advance	151
10. ONU Authentication--GPON	153
10.1 ONU AuthList.....	153
10.1.1 ONU List	153
10.1.2 ONU manual add	154
10.2 ONU AutoFind.....	155
10.2.1 Discover ONU.....	155
10.2.2 ONU Detail.....	156
10.3 ONU AutoLearn	157
10.3.1 Automatic Learn.....	157
10.3.2 Automatic Bind	158
10.4 ONU Upgrade.....	159
10.4.1 Upload Image.....	159
10.4.2 ONU Batch Upgrade.....	160
10.4.3 ONU Auto Upgrade.....	162

11 Profile Configuration--GPON	164
11.1 Profile Configuration.....	165
11.1.1 ONU Profile.....	165
11.1.2 DBA Profile	167
11.1.3 Traffic Profile.....	168
11.1.4 Line Profile.....	169
11.1.5 Service Profile	173
11.1.6 Alarm Profile.....	176
11.2 Binding Configuration.....	178
12 ONU Management--GPON.....	180
12.1 ONU Configuration	180
12.1 .1 ONU Information	181
12.1 .1 .1 Detail Info	181
12.1 .1 .2 Optical Info	181
12.1.2 ONU Configuration.....	182
12.1 .2 .1 T-CONT	182
12.1 .2 .2 Gemport	183
12.1 .2 .3 Service	184
12.1 .2 .4 Service Port	184
12.1 .2 .5 Port vlan	185
12.1 .2 .6 Multicast vlan	186
12.1 .2 .7 Multicast vlan strip	186
12.2 ONU Rename	187
12.3. Maintenance Management	188
12.3.1 Reset ONU	188
12.3.2 Delete ONU.....	189
13 Alarm Management.....	190
13.1 Alarm Configuration	191
13.1.1 Alarm Process Rule.....	191
13.1.2 Alarm Sound.....	193
13.2 Alarm and Event Query.....	194
13.3 Real Time Alarm	196
13.4 OLT Alarm Management.....	197
13.4.1 OLT Alarm Configuration.....	197

13.4.1.1 OLT PON alarm	198
13.4.1.2 Alarm Control	199
13.4.1.3 Threshold Alarm	200
13.4.1.4 System Log Server	201
13.4.2 View OLT Alarm	202
13.4.2.1 View Current Alarm.....	202
13.4.2.2 View History Alarm.....	204
13.5 ONU Alarm Manangement.....	207
13.5.1 ONU Alarm Configuration.....	207
13.5.2 View ONU Alarm	207
13.5.2.1 View Current Alarm.....	207
13.5.2.2 View History Alarm.....	209
14 Performance Management.....	211
14.1 OLT Performance	211
14.2 ONU performance—EPON	212

1 System Description

1.1 Interface Types

EPON OLT provides various types of network interface, service interface and maintenance interface to adapt to different network environments. All the interfaces could comply with the relevant telecommunications standards.

Type	Interface	Remarks
PON interface	PON optical interface	The point-to-multipoint architecture and the passive fiber transmission mode are used. The downstream rate and upstream rate can reach up to 1.25 Gbps.
Uplink interface	GE Copper interface	Connect RJ45 copper cable to Ethernet directly.
	SFP optical interface	Connect fiber to Ethernet with SFP module inserted.
Maintenance interface	Console port	It is used for local maintenance.
	AUX port	It is used for remote maintenance.

1.2 Working Mode

The EMS uses the Client-Server working mode. When network maintenance

engineers are far from both the access equipment and the network element management system server, this Client -Server working mode can be used to access the server via the client for achieving the purpose of managing the equipment.

In this case, the client and the server can be installed on one computer, or respectively on two computers. When both the client and server are installed on a computer, this is also called a stand-alone mode.

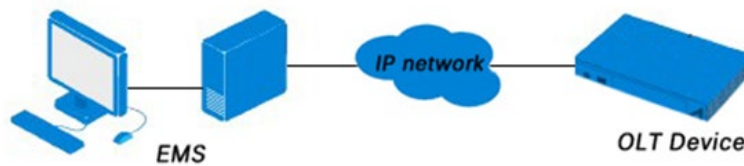


Figure 1-1 Working Connection

1.3 Installation Requirements

The requirements of the hardware configuration for the EMS' Server depend on the network scale.

	CPU	Memory	DISK	Video Card	Operating System
Server	Frequency above 2GHz	2GB	20GB		Windows2008 /XP/7/8/10
Client	Frequency above 2GHz	1GB	10GB	65000 color resolving capability 1024*768 or above	Windows2008 /XP/7/8/10

1.4 EMS Installation Files

The installation file contains two files:

EMS-client.exe and EMS-server.exe



Figure 1-2 Installation File

2 EMS Installation

This chapter introduces the procedures of EMS installation.

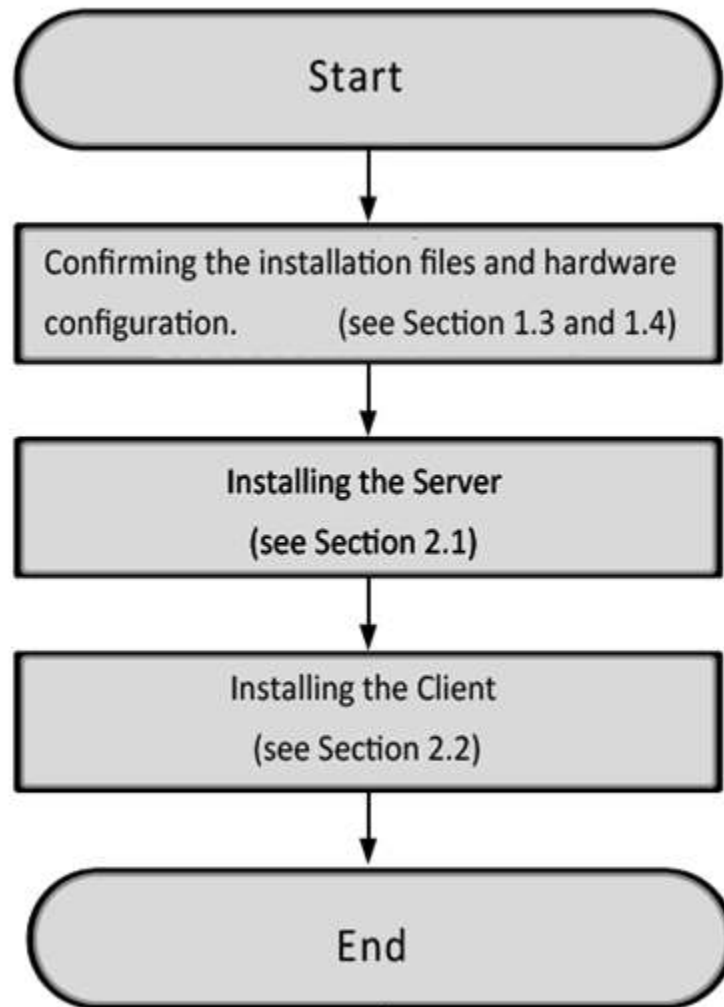


Figure 2-1 Installation Procedures

2.1 Installation of the Server



Double-click **EMS-server.exe** to launch installation.



Figure 2-2 Select Installation Language

Select "English" and click "OK".

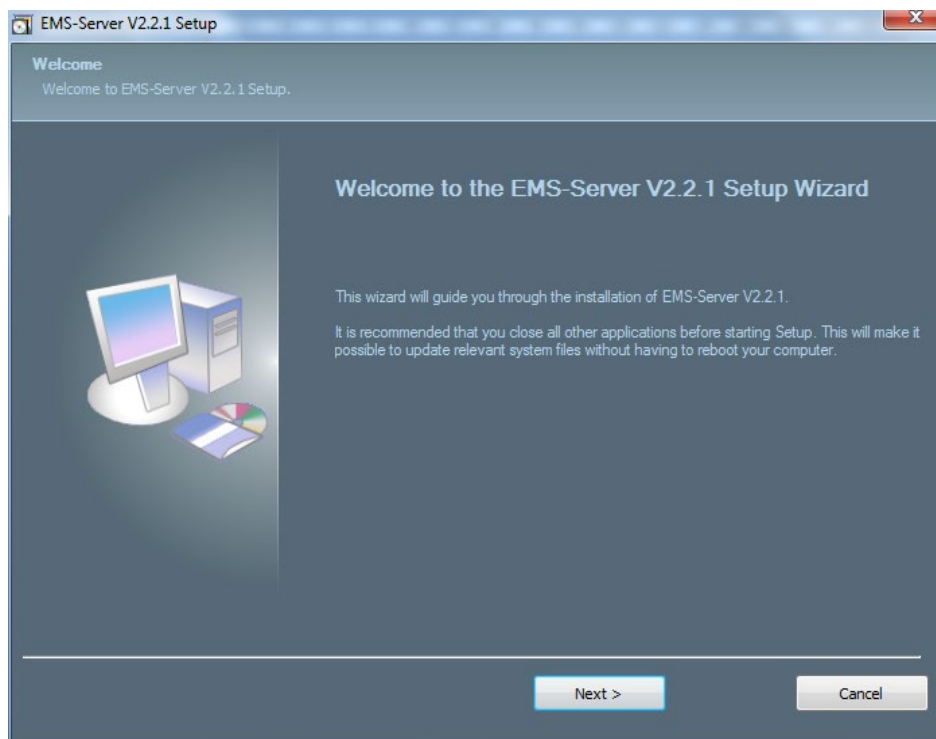


Figure 2-3 Installation Introductions

Click "Next" to proceed.

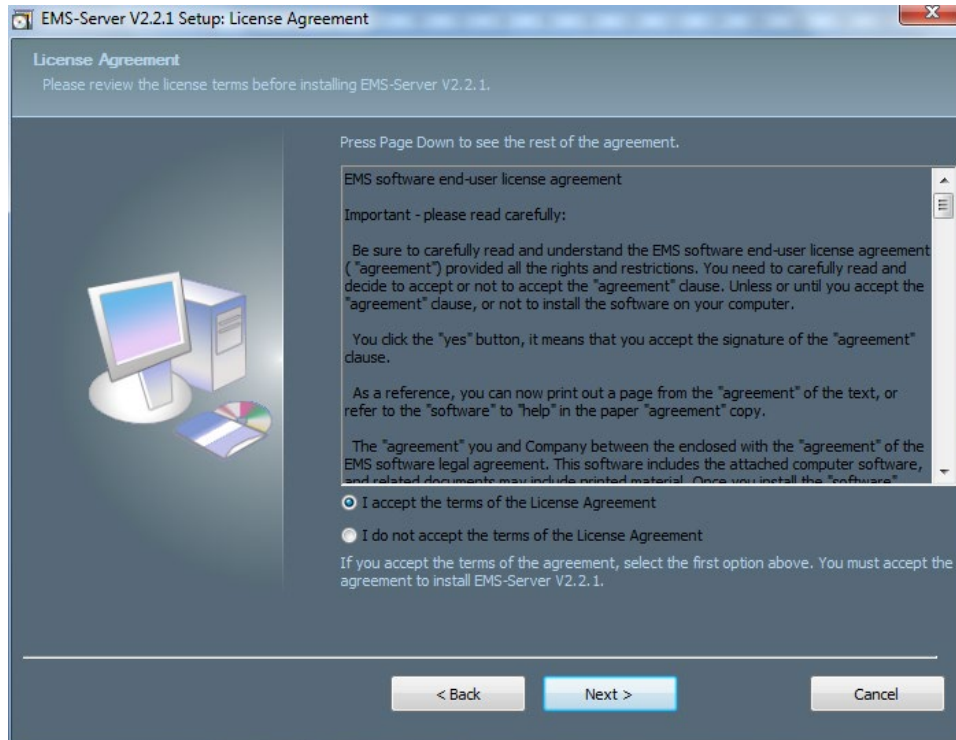


Figure 2-4 Accept the Software Agreement

Select "I accept the terms of the License Agreement" and click "Next" to proceed.

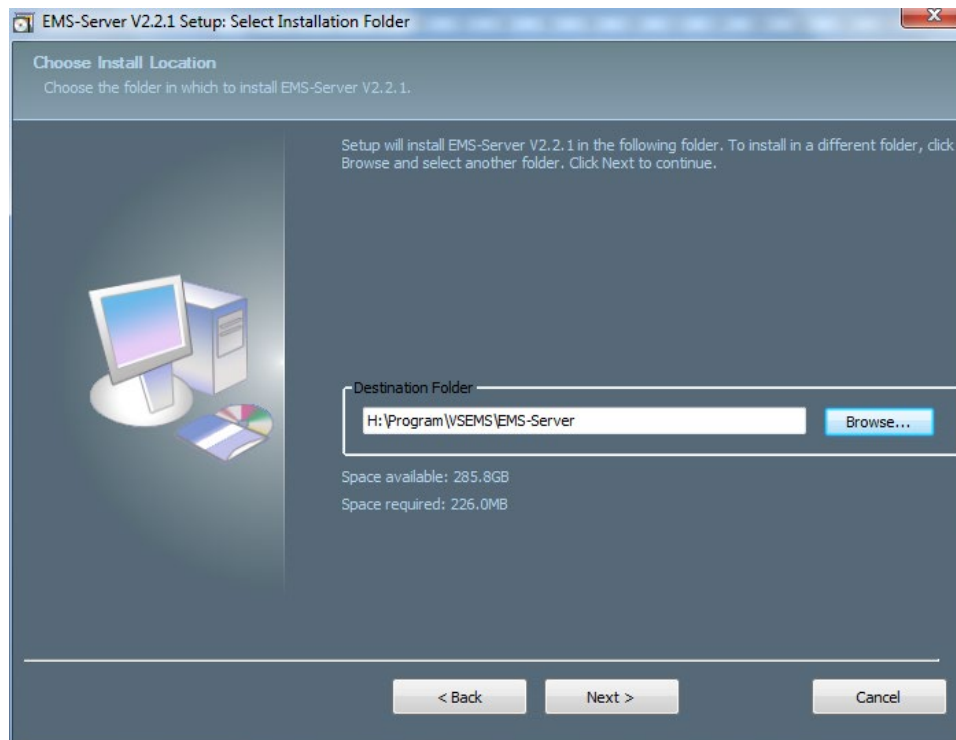


Figure 2-5 Set Installation Path

Set the installation path and click "Next" to proceed.

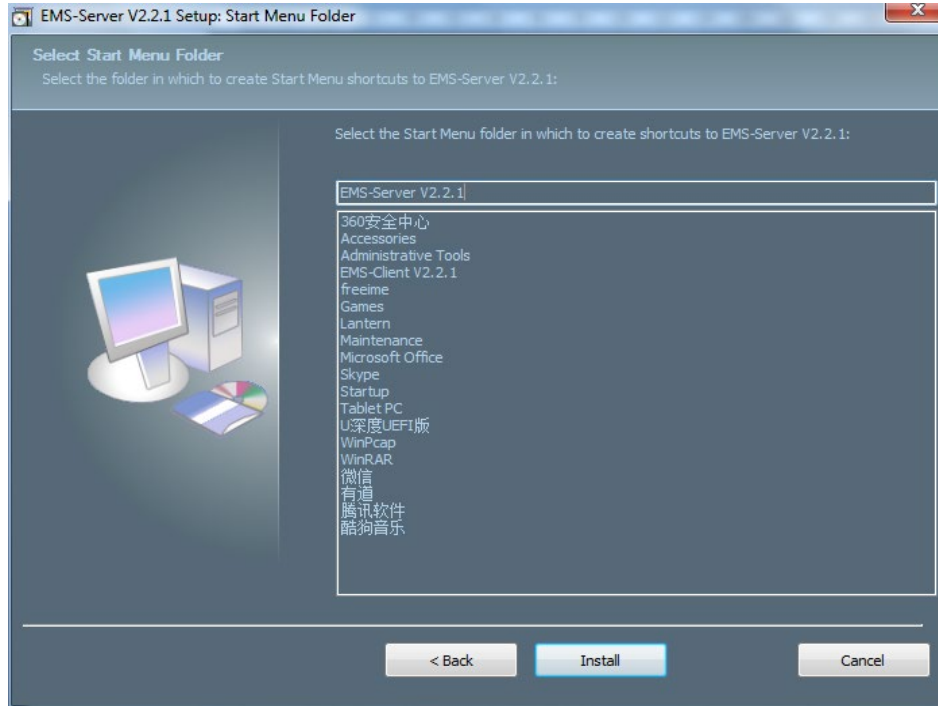


Figure 2-6 Select Start Menu Folder

Click "Install" to start installing the server.

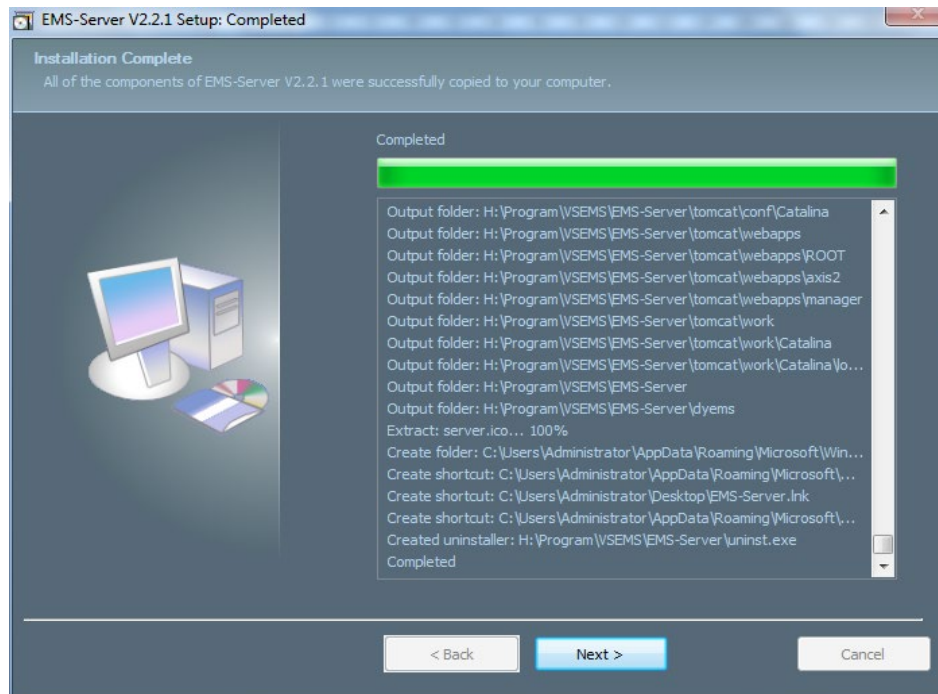


Figure 2-7 Software Installation

Click "Next" to proceed.

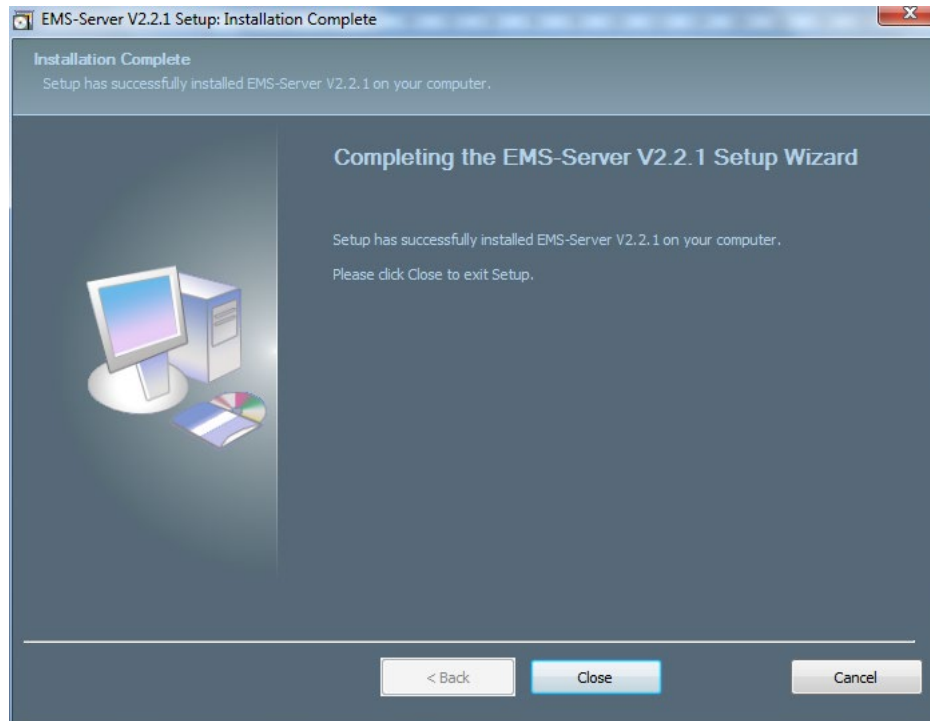
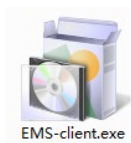


Figure 2-8 Complete Installation

Click "Close" to complete the installation.

2.2 Installation of the Client



Double-click **EMS-client.exe** to make the Language dialog box appear.



Figure 2-9 Select Installation Language

Select "English" and click "OK".

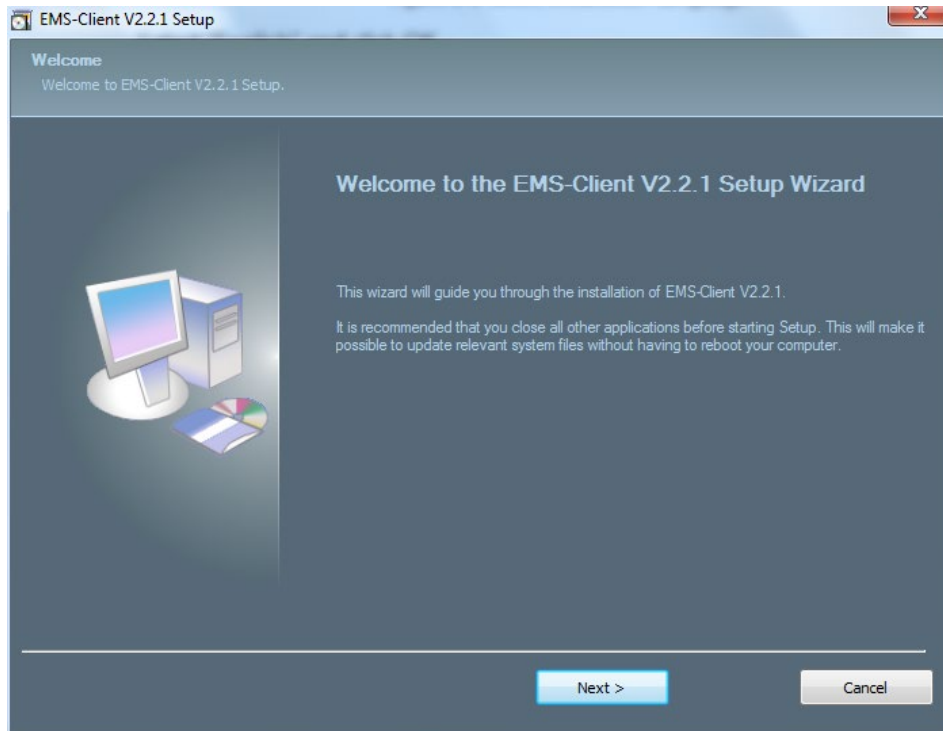


Figure 2-10 Installation Introductions

Click "Next" to proceed.

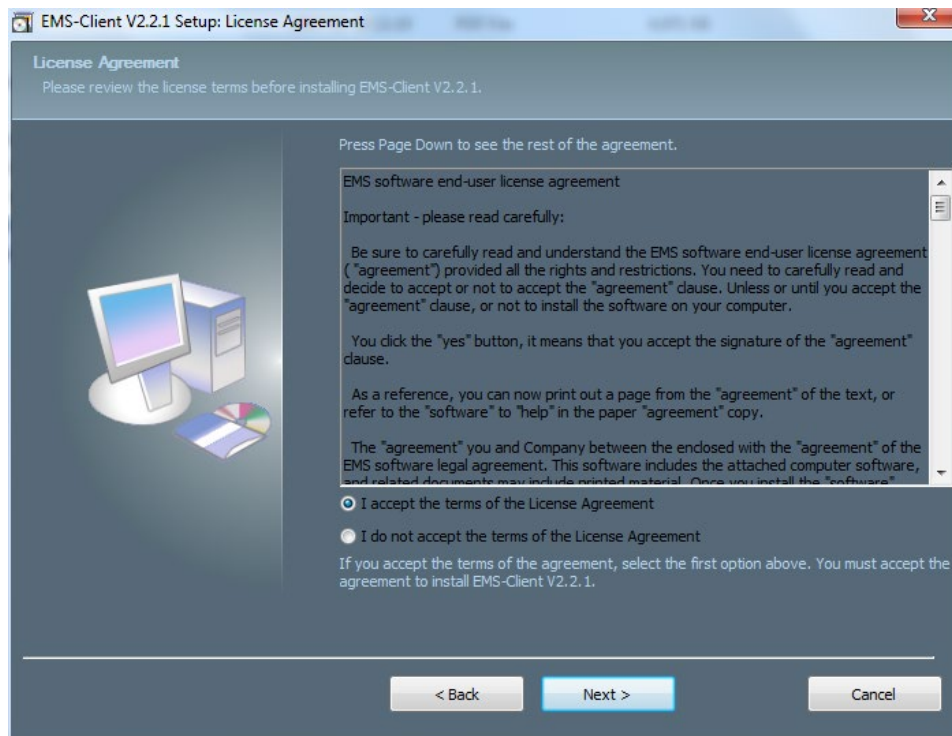


Figure 2-11 Accept the Software Agreement

Select "I accept the terms of the License Agreement" and click "Next" to proceed.

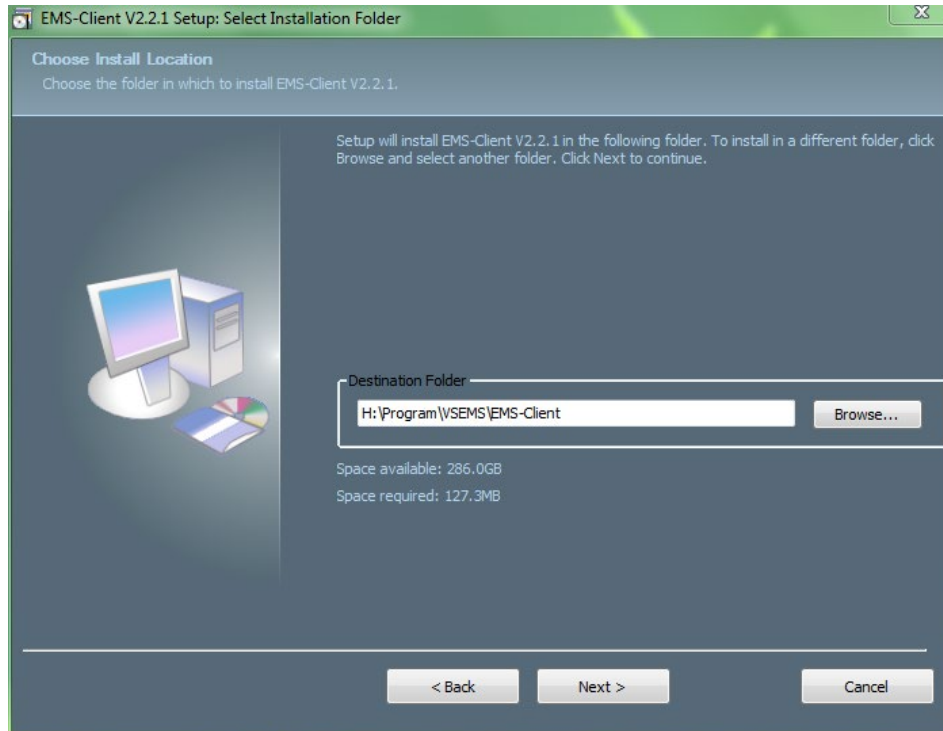


Figure 2-12 Set Installation Path

Set the installation path and click “Next” to proceed.

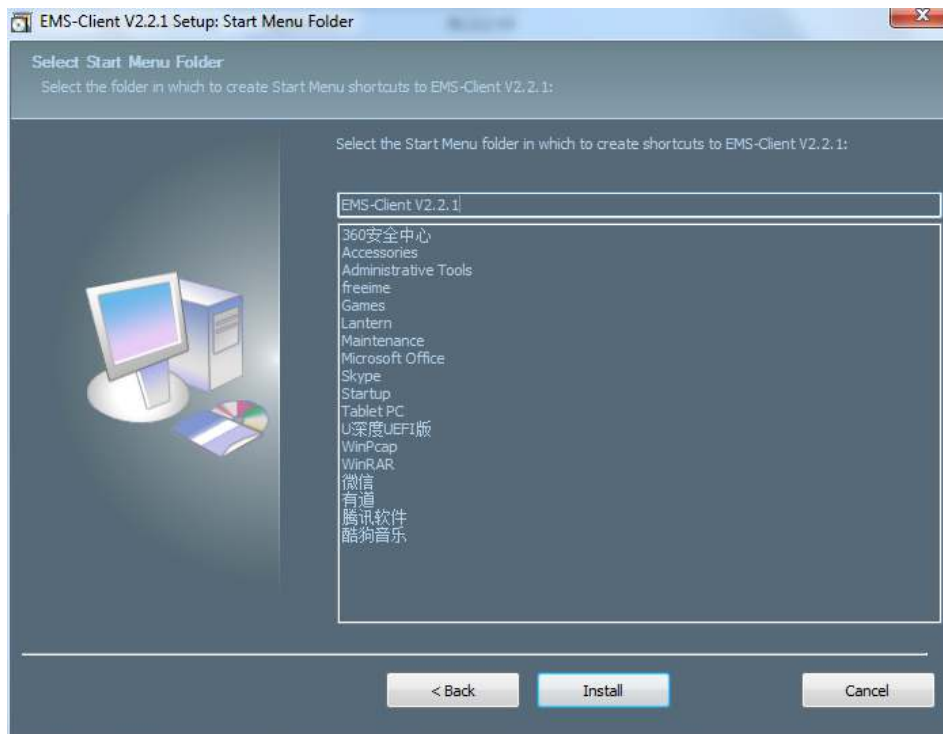


Figure 2-13 Select Start Menu Folder

Click “Install” to start installing the server.

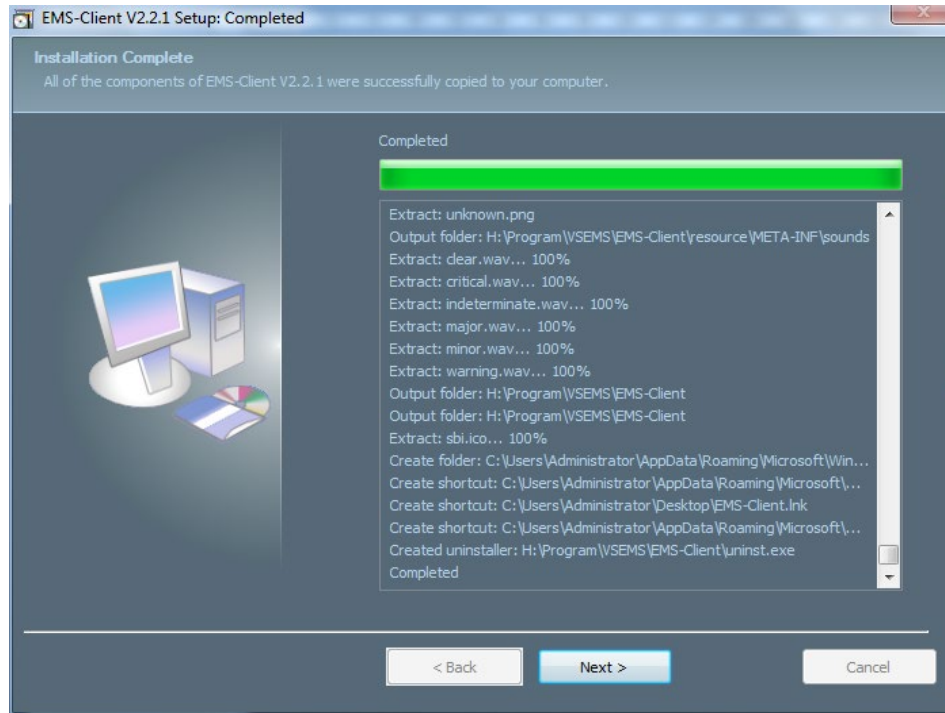


Figure 2-14 Software Installation

Click "Next" to proceed.

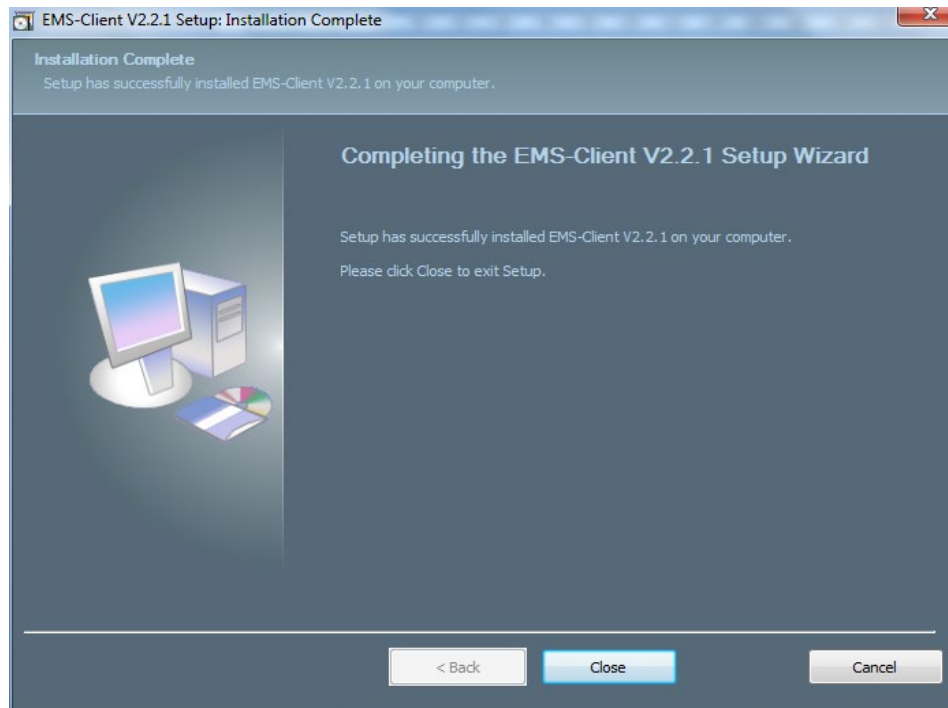


Figure 2-15 Complete Installation

Click "Close" to complete the installation.

3 EMS Quick Start

This chapter introduces the procedure for starting the EMS quickly. It mainly includes the following contents:

- Ensure smooth network to OLT
- Starting sequence
- Add device
- Synchronous OLT configuration.

3.1 Preparatory Work

Connect server PC to the OLT's AUX port with CAT5 cable. Configure IP address of the server PC with the same network segment of OLT management IP such as 192.168.8.X (e.g. 192.168.8.10).

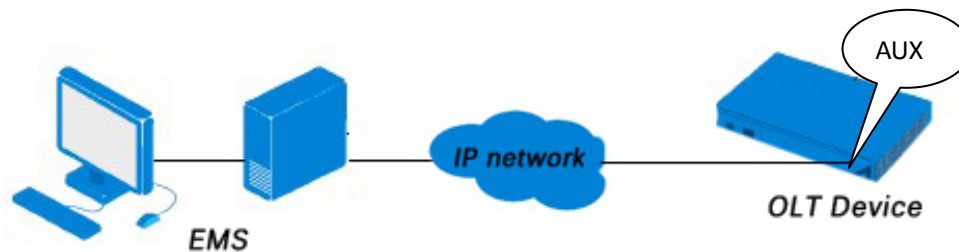


Figure 3-1 Connection Diagram



The OLT default management IP: EPON 192.168.8.100

GPON 192.168.8.200

3.2 Starting Sequence



Double-click icon **EMS-Server** to start the EMS server.

Click "Start" button and wait a moment, you can see the button changes to "Stop".

This indicates that the server starts successfully.

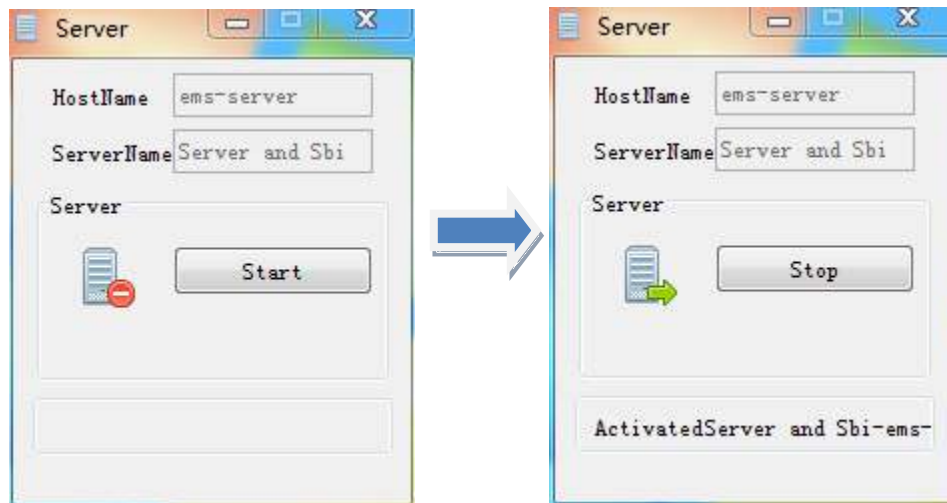


Figure 3-2 Start Server



After the server started completely, double-click icon **EMS-Client** to start the EMS client. Input username and password of the EMS, server IP address and port of the server. Then click Login.

The default username and default password both are root.

The port is 5188.

The server IP address is your PC (server) IP address or 127.0.0.1.

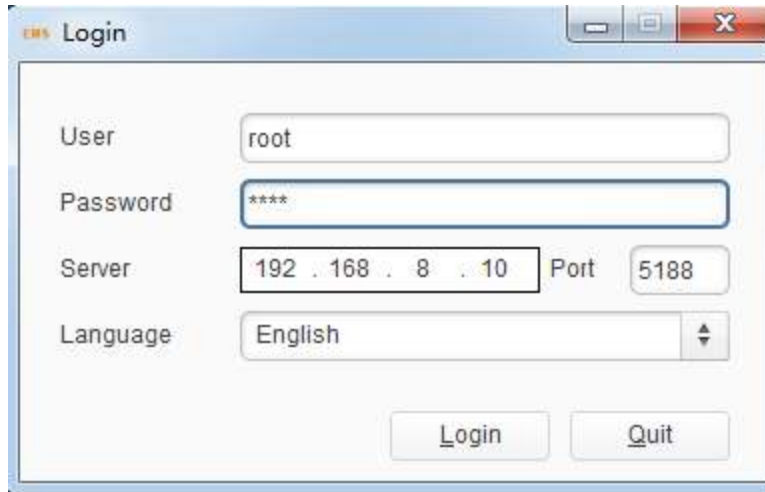


Figure 3-3 Login Dialog Box

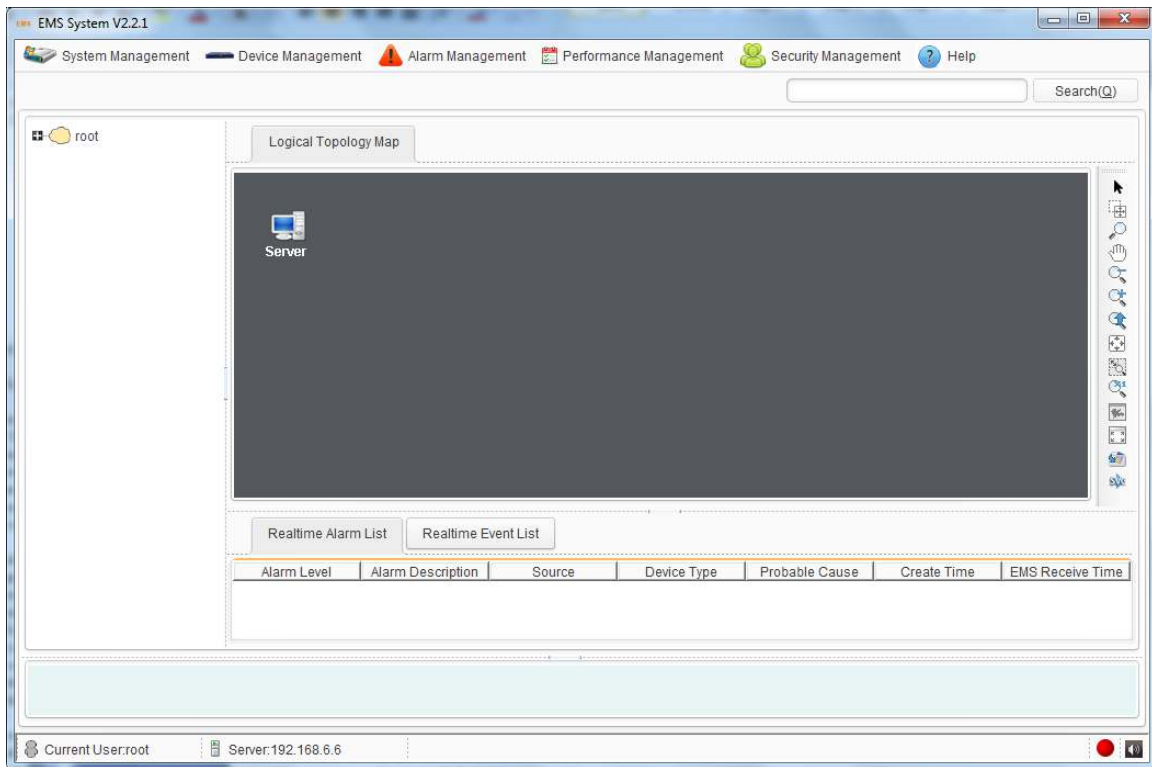


Figure 3-4 EMS Main Interface

3.3 Frame Introduction

This chapter introduces the main interfaces of the EMS. It mainly includes the following contents:

- Main interface
- Main menu
- Main toolbar
- Rolling log
- Status bar

After successfully login, enter the main frame interface of EMS. The main interface is composed by "Title bar", "Menu bar", "Toolbar", "Topological navigation tree", "Topology", "Current alarm event" and "Rolling log", etc. The bottom of the interface is composed by "Status bar", "Alarm light" and "Alarm sound switch".

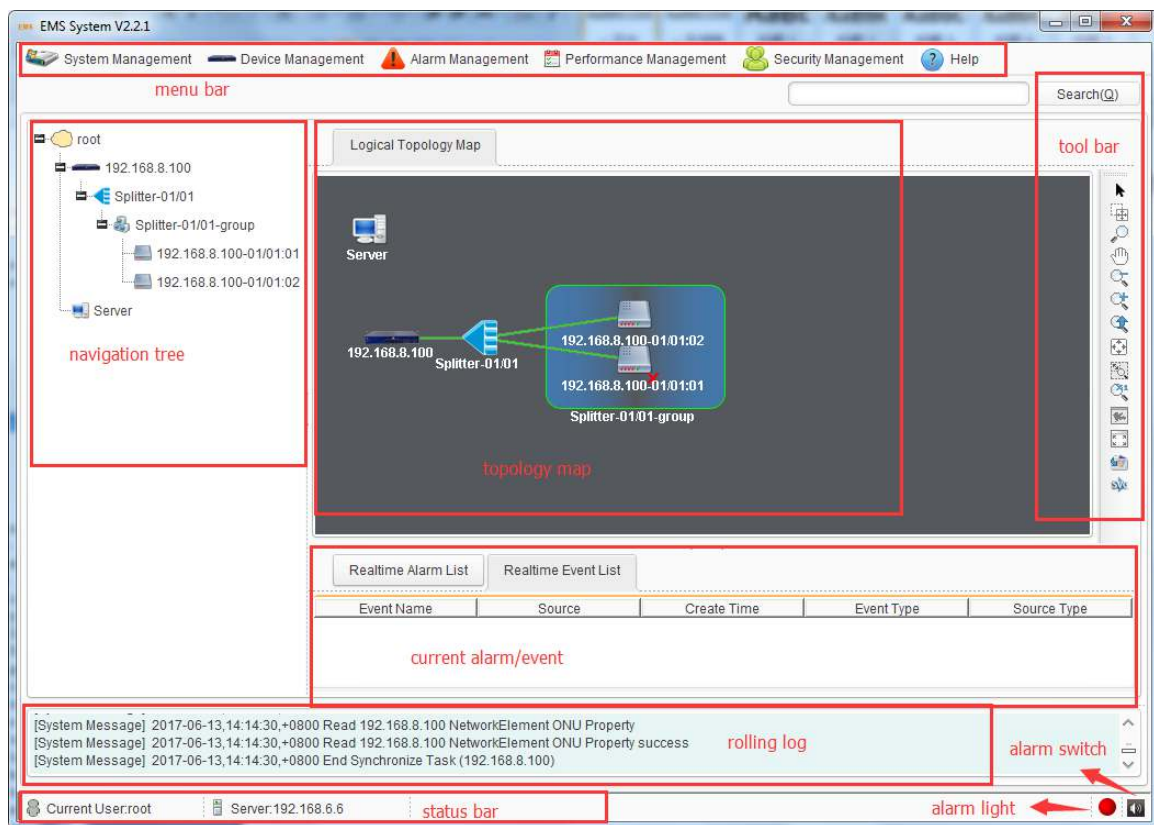


Figure 3-5 Main Frame Overview

As shown in Figure 3-5, main frame contains following several parts:

1. Main menu

The main menu includes: System, Device management, Alarm, Performance and Security parts.

2. Topological navigation tree

The tree is Domain -> Device (OLT) -> Group (splitter) -> Device (ONU). Through the tree, manager can add, delete and manage the node. Click the OLT or ONU node, can operate the device.

3. Topological map

The Topological map is the main area of EMS. In the blank, Click the right mouse button, manager can add an OLT device, change layout, show name, etc. For convenience of managing, manager can move device icons to appropriate locations.

When an OLT device is added to the map, EMS will auto synchronization ONUs which connect to the OLT device. Now, in the map, manager can operate the OLT and ONU device.

4. Current alarm event

This window located on the bottom of the main frame, including Alarm Log and Operation Log page.

Alarm log page shows and records the real time alarm information, including alarm object, occur time and alarm content.

Operation log page shows and records the manager's operation records, in order to trace back when needed.

5. Search and Shortcut bar

Toolbar includes: search box. You can search or locate a network element by the keywords (IP, MAC address or name) in the search box.

6. Status bar

The status bar includes state information, alarm light and alarm sound switch.

3.4 Add OLT Device

At interface of topological diagram, right-click the blank to open a menu and choose "Add Device".

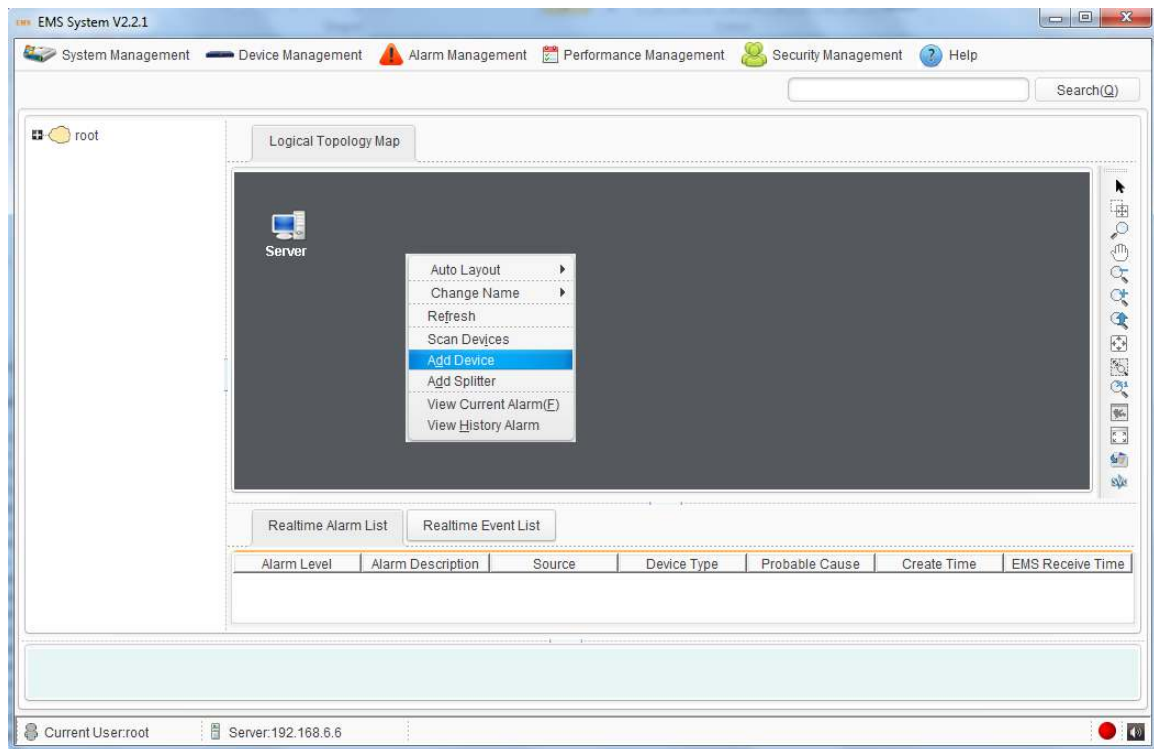


Figure 3-6 Add Device

In the pop-up window, input the management IP of OLT. The OLT default IP is 192.168.8.100.



Please select Read community public, and write community private.

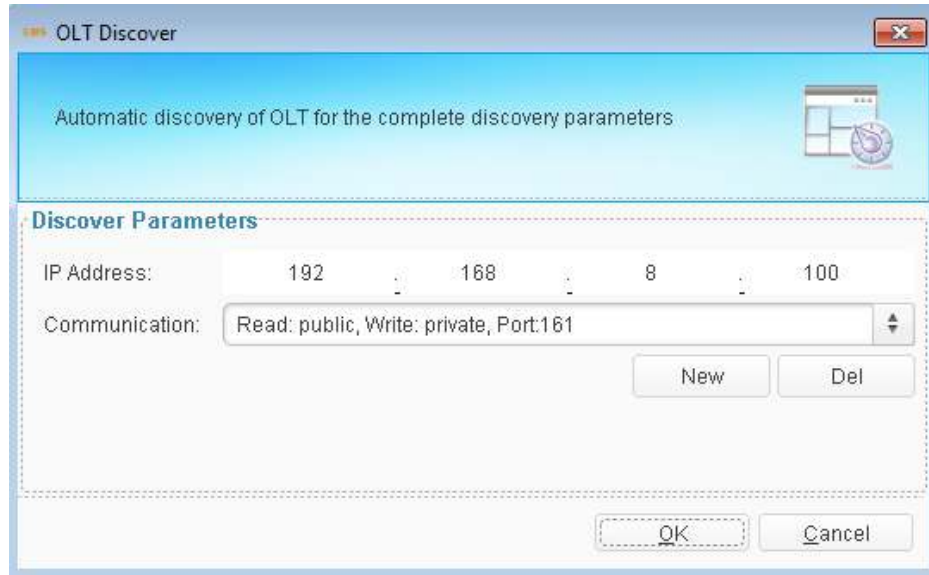


Figure 3-7 Select Community Parameters

If there is no option in communication list, please add new community parameters.

Only when the computer ping OLT, the device can be added successful.

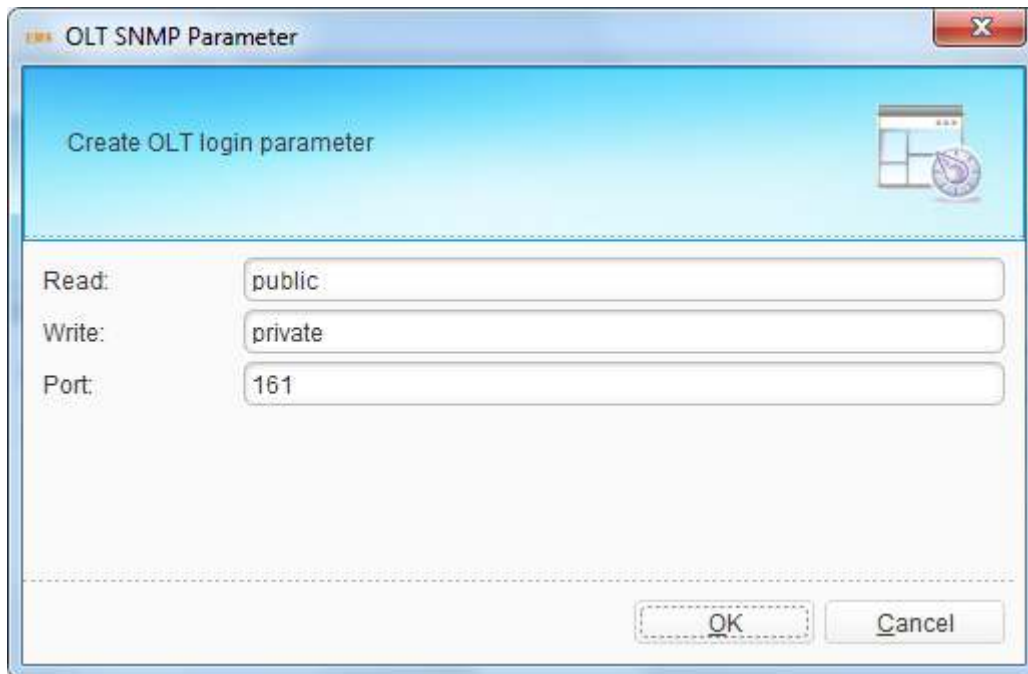


Figure 3-8 Add Community Parameters

After adding device, there will be a device icon in the topological diagram.

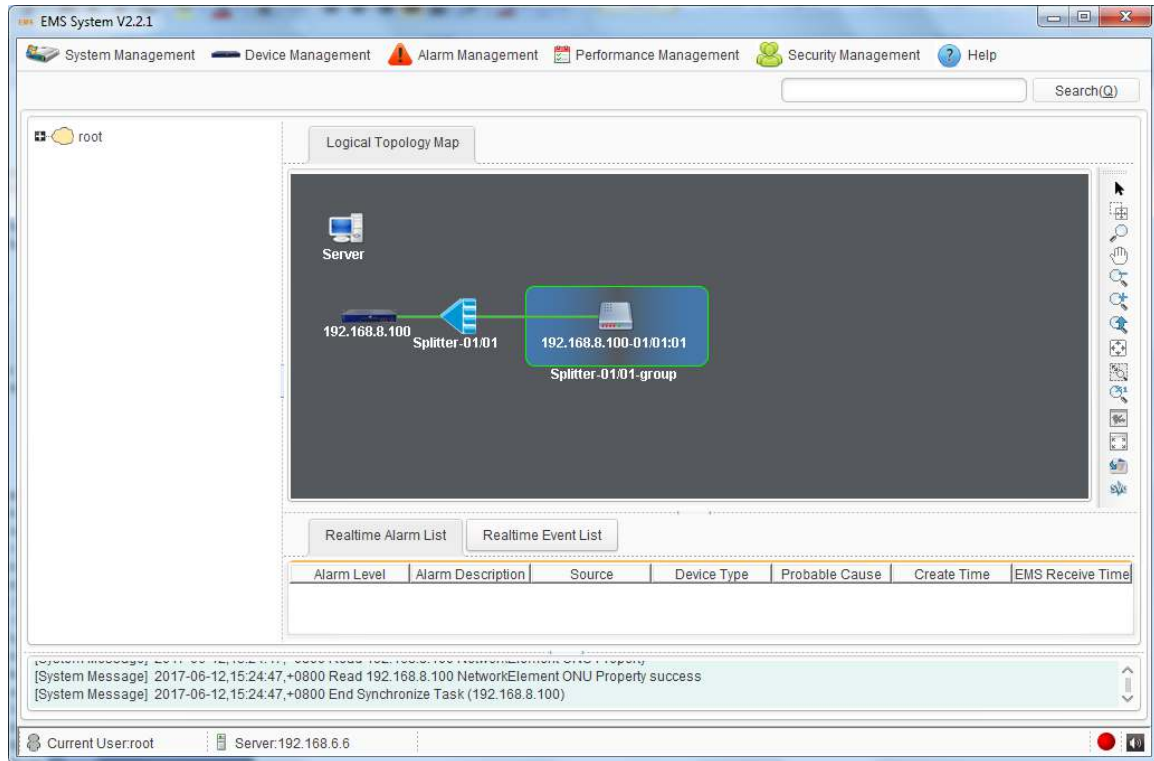


Figure 3-9 Device icons in the topological diagram

The device will sync automatically. You can also sync manually. Sync device ensure device configuration consistent with EMS configuration.

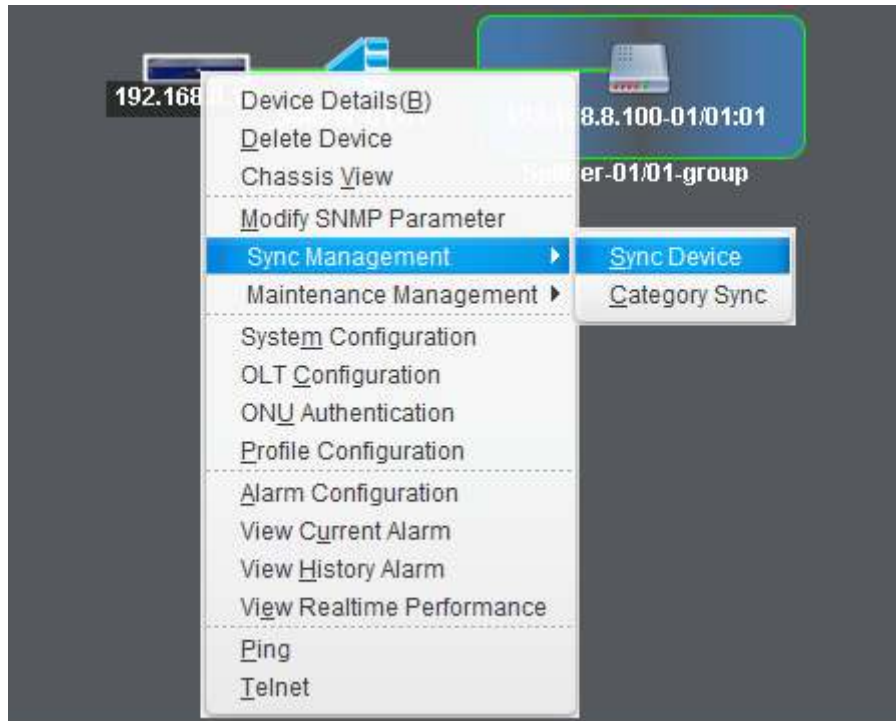
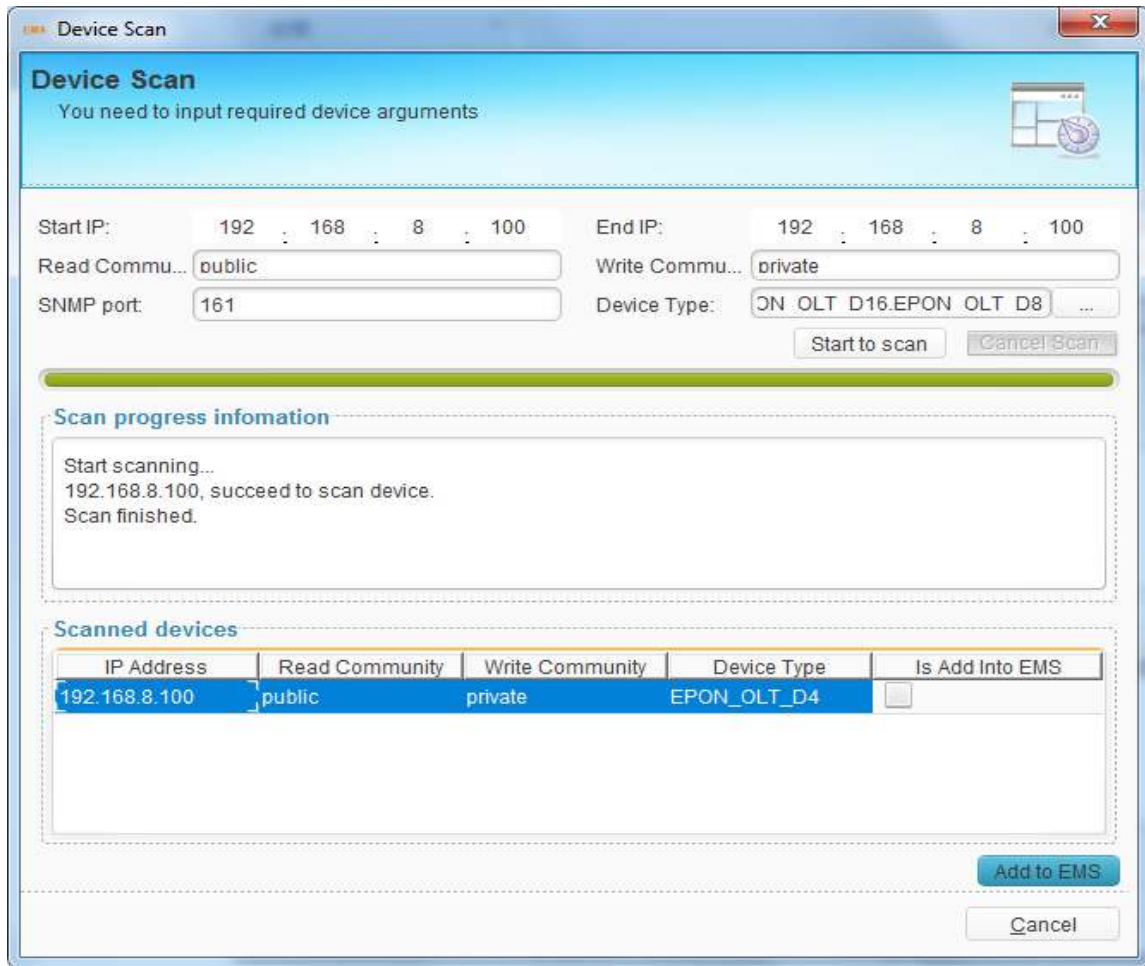


Figure 3-10 Sync Device

3.5 Scan Device

If there are more than one OLT in the network, you can use Scan Device to add them into EMS at the same time. Right-click the blank and choose “Scan Devices” on the menu to scan devices in the network. Input IP range, device type and click “start to scan”, all devices which match the device type will be found. Select them and add to EMS.



Device Scan
You need to input required device arguments

Start IP: 192 : 168 : 8 : 100 End IP: 192 : 168 : 8 : 100
 Read Commu... public Write Commu... private
 SNMP port: 161 Device Type: ON OLT D16.EPON OLT D8 ...

Start to scan Cancel Scan

Scan progress information

Start scanning...
 192.168.8.100, succeed to scan device.
 Scan finished.

Scanned devices

IP Address	Read Community	Write Community	Device Type	Is Add Into EMS
192.168.8.100	public	private	EPON_OLT_D4	☐

Add to EMS
Cancel

Figure 3-11 Scan Device

3.6 Delete Device

This command is used to delete needless OLT device in topology map.

Select OLT device which you want to delete, right click "Delete Devices".

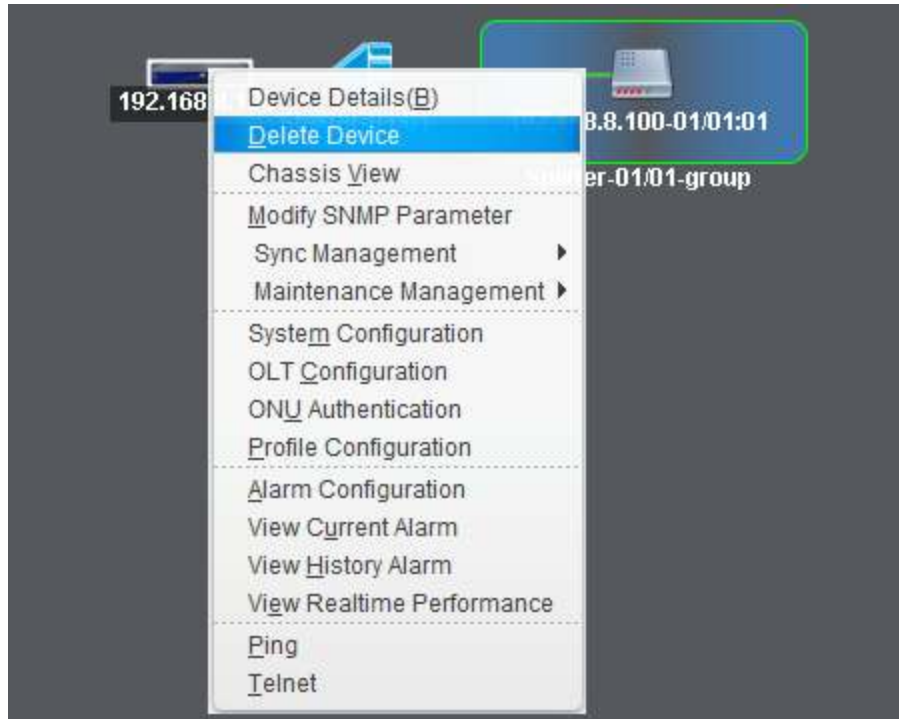


Figure 6-12 Delete Device

Click "OK", the OLT device will be deleted.

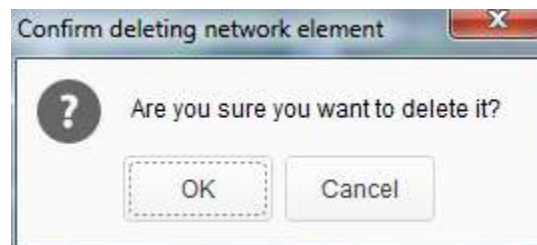


Figure 6-13 Delete Device Dialog Box

3.7 Add Splitter

By default, there is at least one splitter is connected between OLT and ONU. You can also add another one between existed splitter and ONU. This, in some way, can help to edit or good to manage the network topology.

At the primary topological diagram, right-click any of the blanks, choose "Add Splitter". Fill in the name and click "OK".

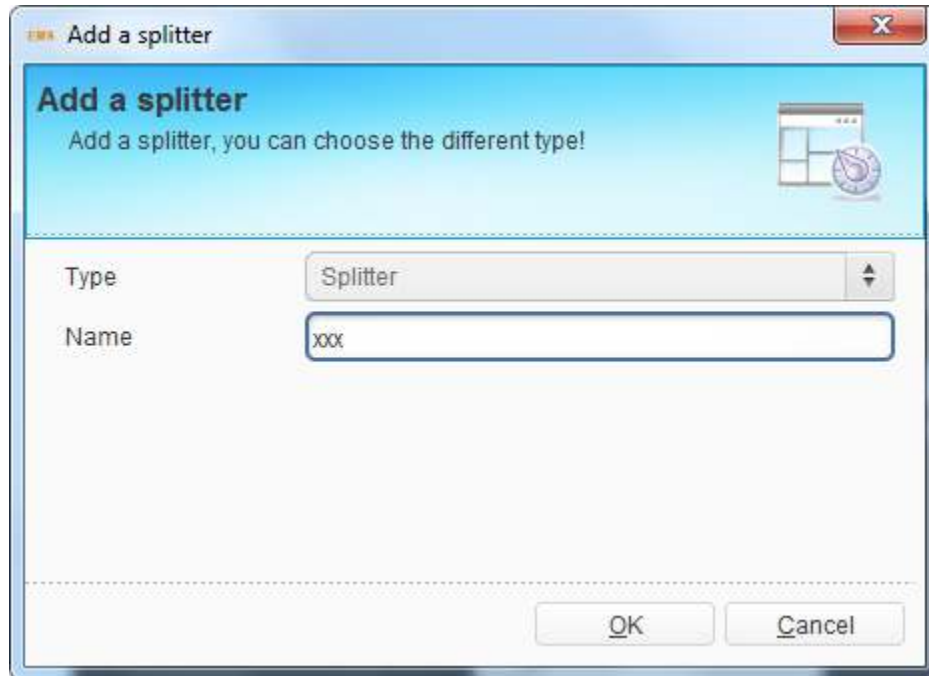


Figure 3-14 Set Splitter Name

Right click the new splitter, choose "Parent Link", choose the relevant parent node, and then click "OK".

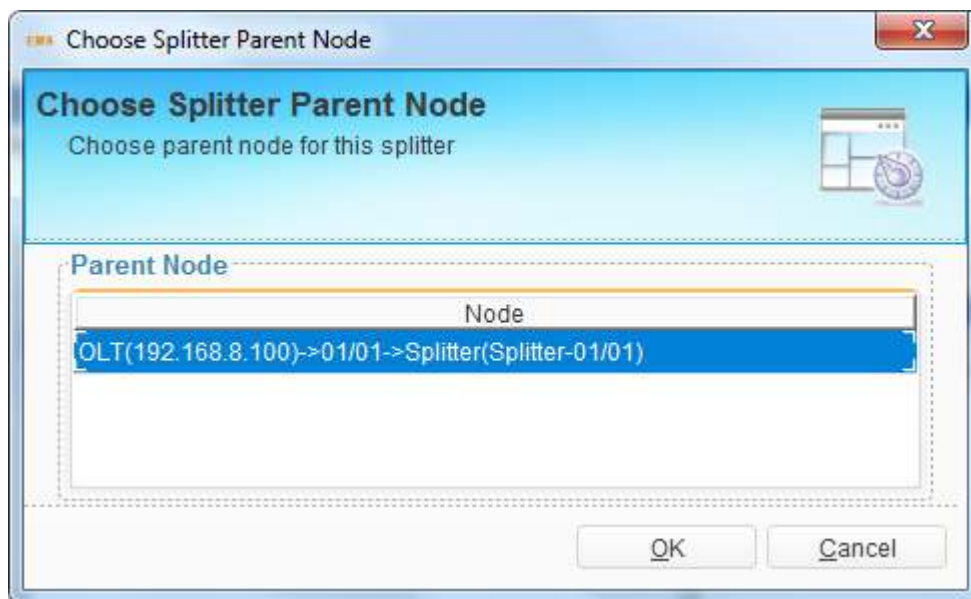


Figure 3-15 Set Parent Node

Right click the new splitter, choose "Sub Link", choose the relevant sub node, and then click "OK".

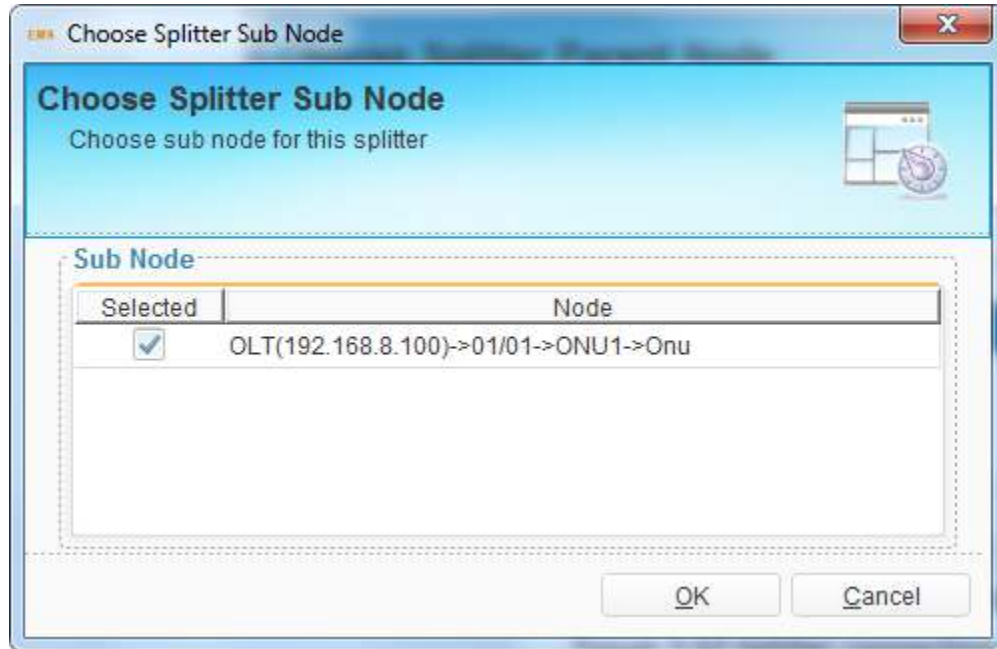


Figure 3-16 Set Sub Node

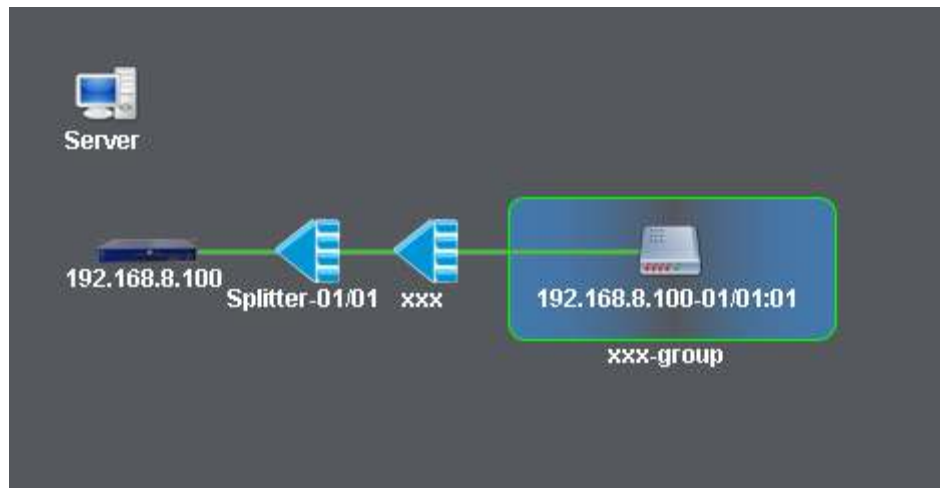


Figure 3-17 Connect Splitter Successful

4 Security Management

This chapter mainly introduces EMS username management, which contains username, user role, operation permission and operation log.

Click any option of "Security Management" menu, enter security management interface.

4.1 User Management

The username is used to login EMS. All existing users will display in the table.

Default user root cannot be deleted and edited except modifying its own password and contact information. Added usernames can be modified, deleted and prohibited by administrator root, but cannot by other users. Each user can only modify its own information.

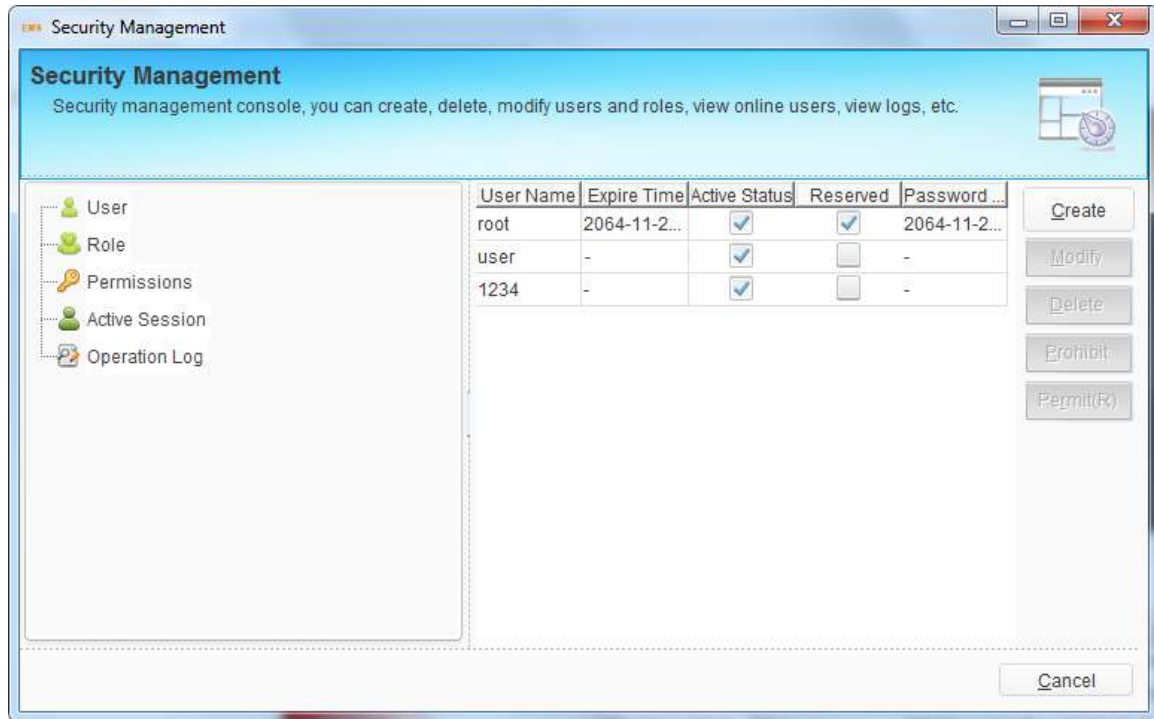
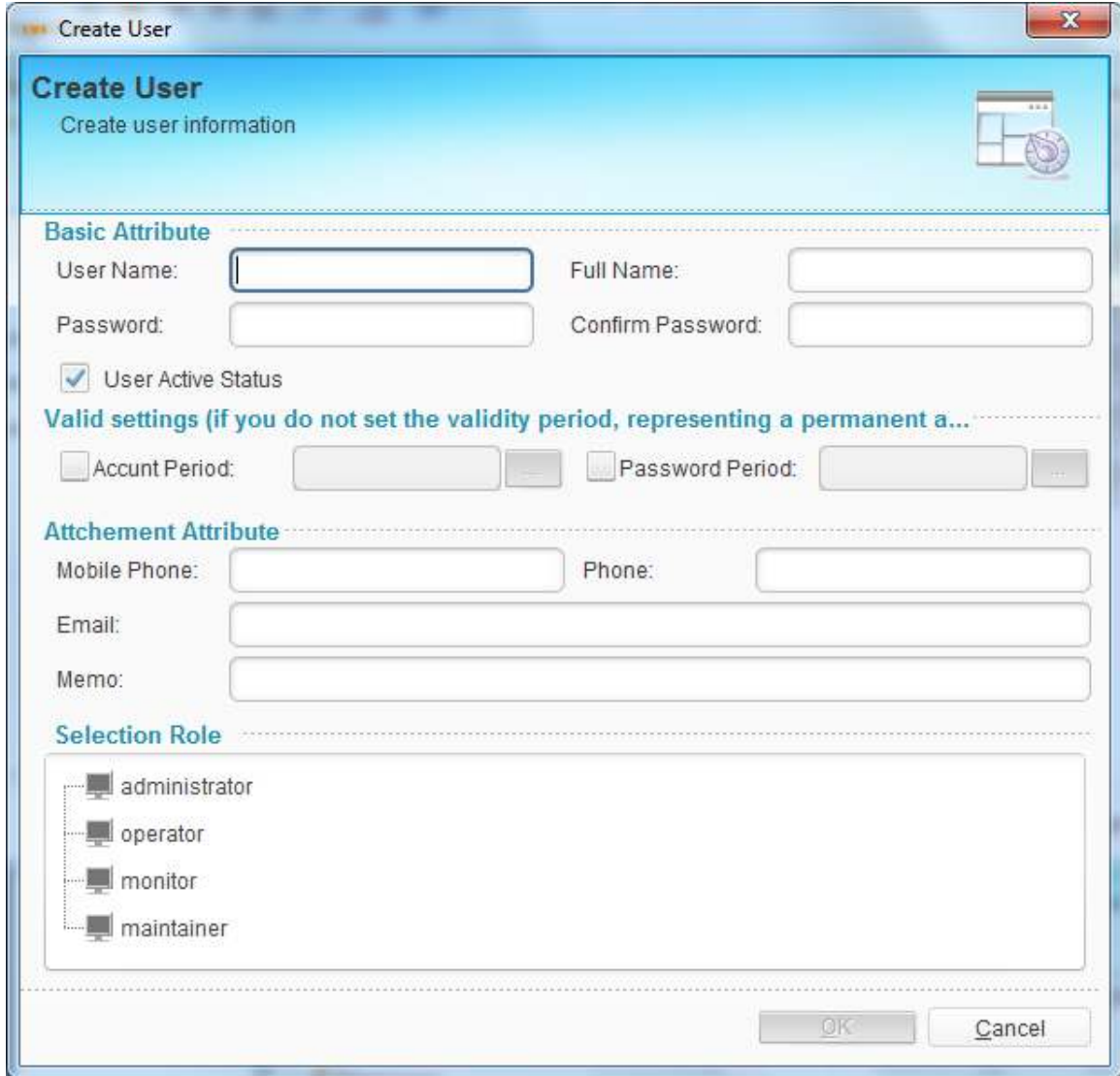


Figure 4-1 User Management

Click "Create" button to open a dialog box, fill in new username and its password, select role for this username and click "OK" button to apply configurations. Other parameters or information are optional. If you have configured period, the user is available in the period. If the user is deleted or prohibited by root, it will not login EMS any more.



The 'Create User' dialog box is titled 'Create User' and contains the subtitle 'Create user information'. It is divided into several sections: 'Basic Attribute' with fields for 'User Name', 'Full Name', 'Password', and 'Confirm Password', and a checked 'User Active Status' checkbox; 'Valid settings (if you do not set the validity period, representing a permanent a...)' with 'Accunt Period' and 'Password Period' fields; 'Attchement Attribute' with fields for 'Mobile Phone', 'Phone', 'Email', and 'Memo'; and 'Selection Role' with a list of roles: 'administrator', 'operator', 'monitor', and 'maintainer'. At the bottom right are 'OK' and 'Cancel' buttons.

Create User
Create user information

Basic Attribute

User Name: Full Name:

Password: Confirm Password:

☒ User Active Status

Valid settings (if you do not set the validity period, representing a permanent a...)

☐ Accunt Period: ☐ Password Period:

Attchement Attribute

Mobile Phone: Phone:

Email:

Memo:

Selection Role

- ☒ administrator
- ☐ operator
- ☐ monitor
- ☐ maintainer

Figure 4-2 Create User

4.2 Role Management

The role specifies user operation permission. Default roles cannot be modified and deleted.

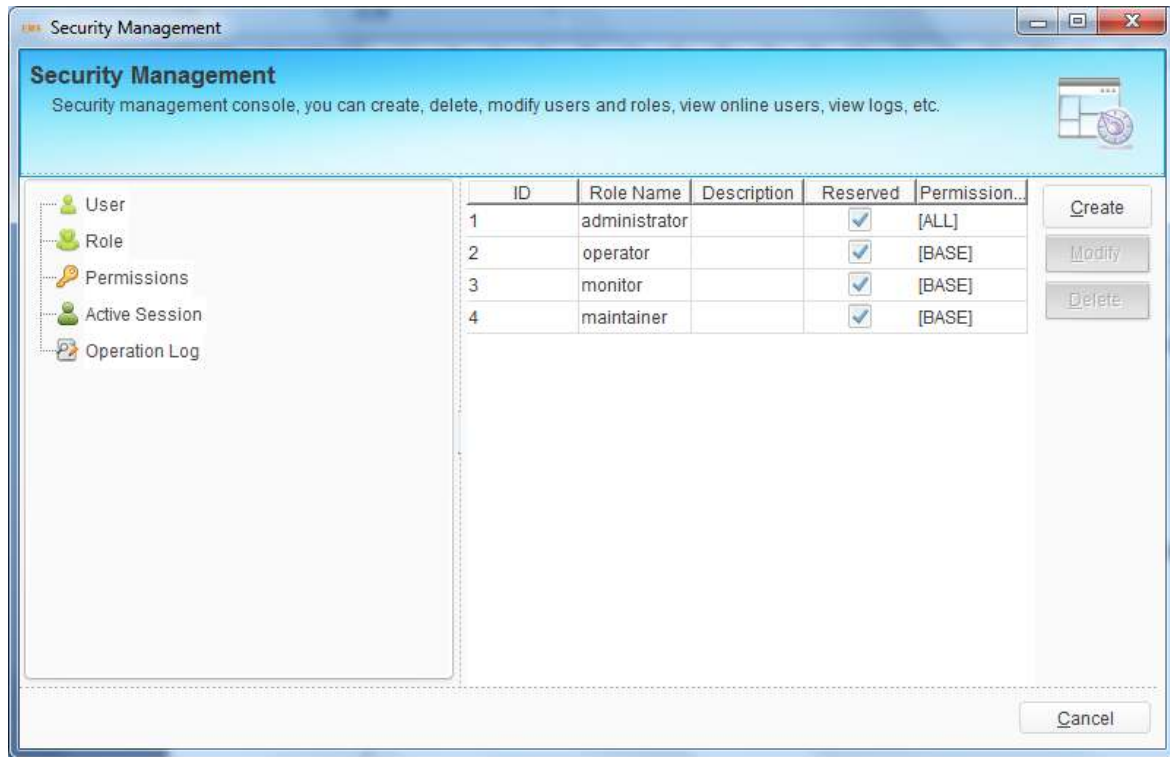


Figure 4-3 Role Management

Click "Create" button to open a dialog box, fill in role name and select operation permission, then click "OK" button to apply the configurations.

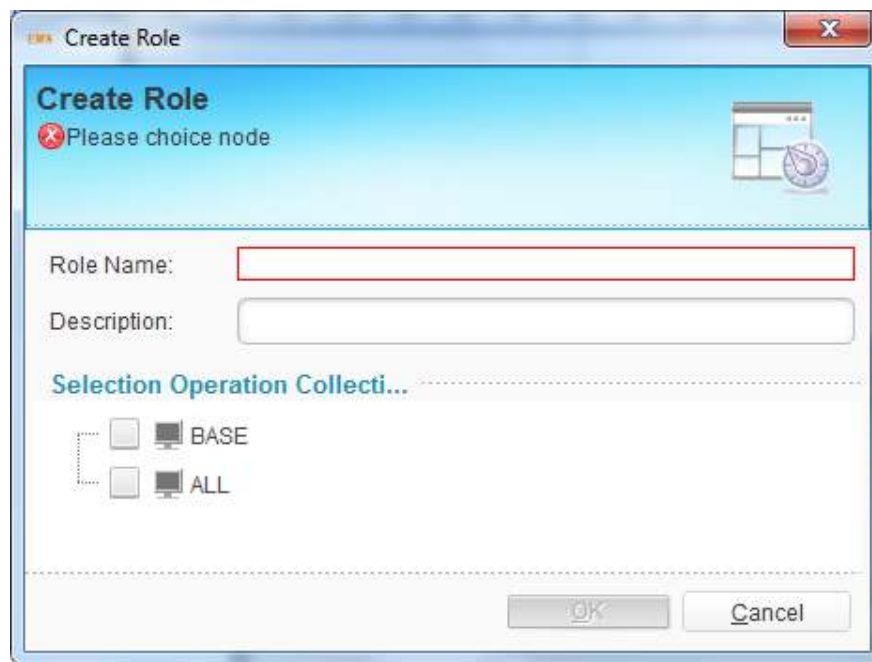


Figure 4-4 Create Role

4.3 Permission Management

Permission group specifies which operations can be done by users. Default permission cannot be modified and deleted.

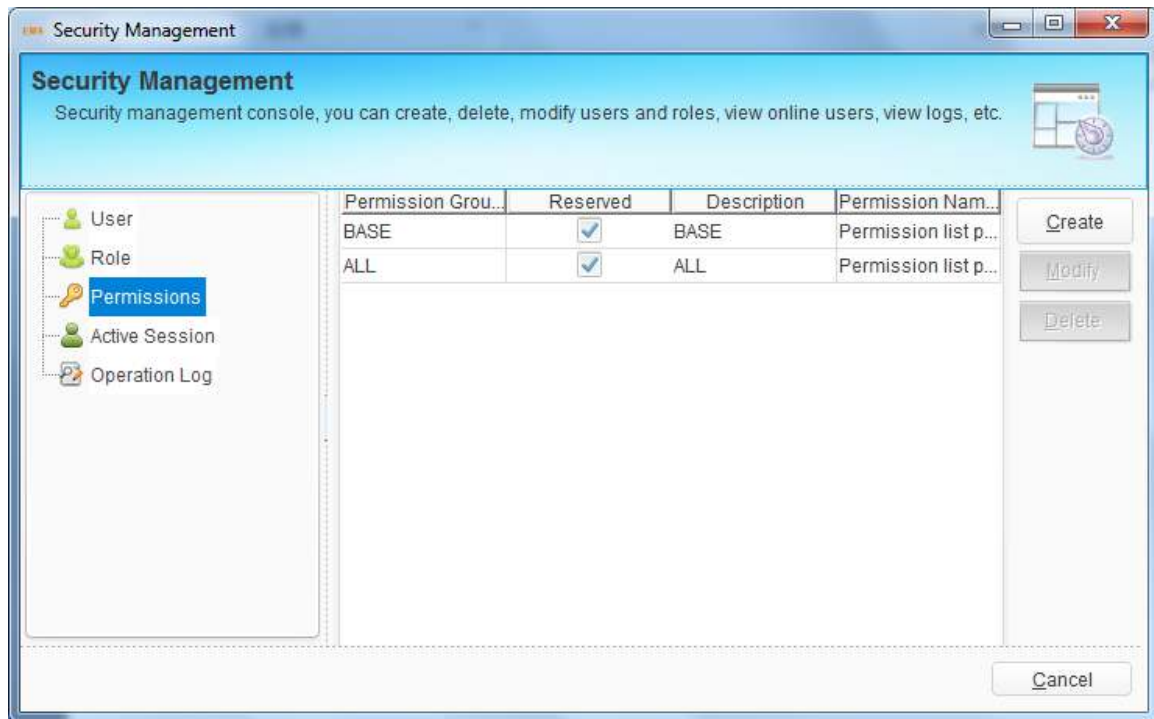


Figure 4-5 Permission Management

Click "Create" button to open a dialog box, fill in permission name and select operation options, then click "OK" button to apply the configurations.

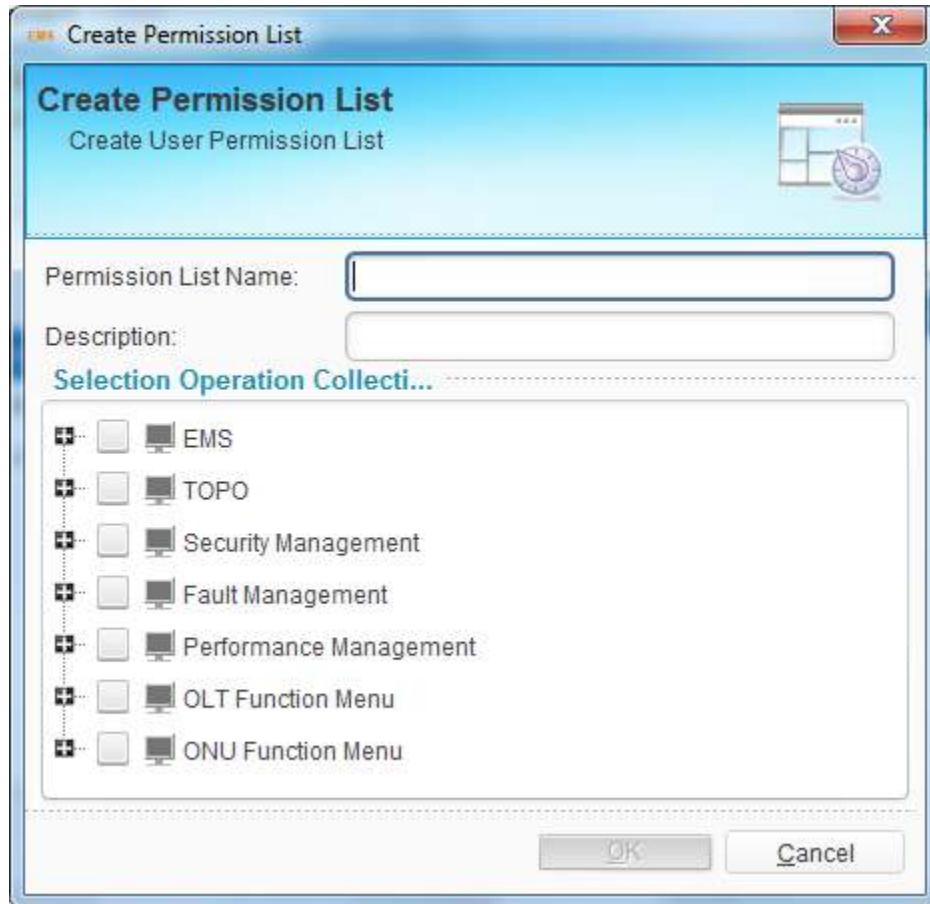


Figure 4-6 Create Permission

4.4 Online User

This interface displays users who are logging in. it displays client IP, username and login time. If the user is not administrator, it can be kicked out.

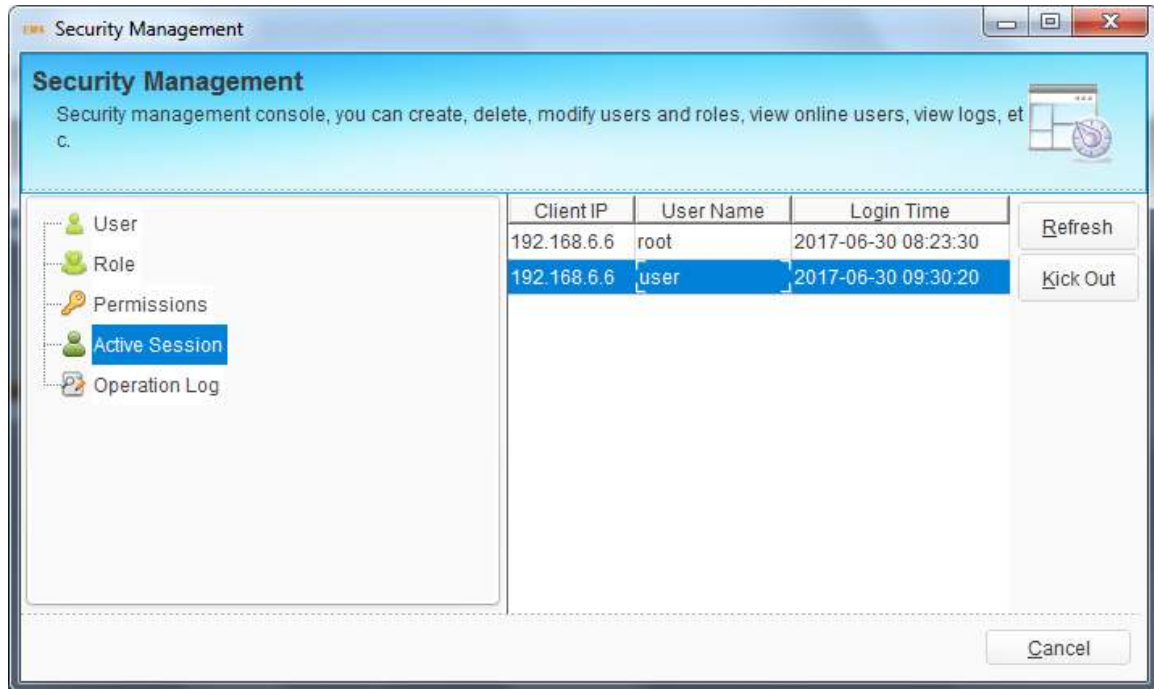


Figure 4-7 Online User

4.5 Operation Log

Operation log displays logs of all users' operations. It contains operation type, operation source, login time, operation result, user, login IP, operation catalog and so on, which can be set as search conditions for log query.

User

Role

Permissions

Active Session

Operation Log

User: All User

Begin Time:

Log Category: All

Source: All Object

Operation Result: All Result

End Time:

Log Type: All Type

Query

Export

1/1Page 1-66/66Row Remain 0 Items

Size All Page 1

Type	Source	Login Time	Result	User	Login IP	Operati...	Descript...
Logout		2017-06-30 09:32:01	Successed	user	192.168.6.6	Security	
Login	192.168.6.6	2017-06-30 09:30:20	Successed	user	192.168.6.6	Security	
Login	192.168.6.6	2017-06-30 08:23:30	Successed	root	192.168.6.6	Security	
Logout		2017-06-29 20:16:01	Successed	user	192.168.6.6	Security	
Logout		2017-06-29 20:15:51	Successed	root	192.168.6.6	Security	
Add User	ems	2017-06-29 19:43:44	Successed	root	192.168.6.6	Security	
Delete User	1234	2017-06-29 19:43:32	Successed	root	192.168.6.6	Security	
Login	192.168.6.6	2017-06-29 19:43:17	Successed	user	192.168.6.6	Security	
Logout		2017-06-29 19:42:01	Successed	user	192.168.6.6	Security	
Add User	ems	2017-06-29 19:40:29	Successed	user	192.168.6.6	Security	
Login	192.168.6.6	2017-06-29 19:39:52	Successed	user	192.168.6.6	Security	
Add User	ems	2017-06-29 19:33:55	Successed	root	192.168.6.6	Security	

Cancel

Figure 4-8 Operation Log

5 EMS System Management

This chapter introduces the system management function of EMS. It mainly includes the following contents:

- Lock client
- Modify password
- Database Backup and restore
- Polling switch configuration
- Exit

5.1 Lock Client

When administrator needs to leave the client computer but not wants to shut the client program, he/she can lock the client.

Click "System Management" > "Lock Client", the EMS client will be locked.

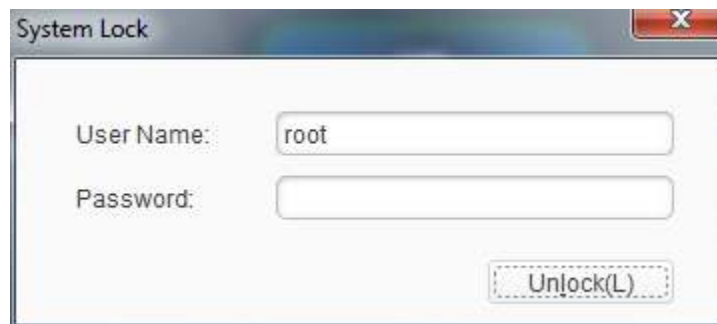


Figure 5-1 System Lock Dialog Box

Once the client is locked, others cannot use it. The current user can enter password to unlock when he/she comes back to the client.

5.2 Modify Password

Modify current user's password. Click "System Management">"Modify Password", open modify password dialog box.



Figure 5-2 Reset Password

Input old password and the new password in the password box, click "OK". The new password will take effect at next login.

5.3 Database Backup and Restore

Database stores OLT, ONU information, comment or location of the devices, EMS login username and password, etc. if you need to install EMS at another computer but not want to changes these information, you should backup the database and restore at the new EMS.

Click "System Management">" Db backup and restore ", open database backup

and restore dialog box. The backup file is named by the backup time by default and stored at EMS installation path. When you restore the database file, put the file at the path and choose it, then click "Restore". New data will take effect after restart EMS server.

EMS will backup database automatically if Timing is enabled.

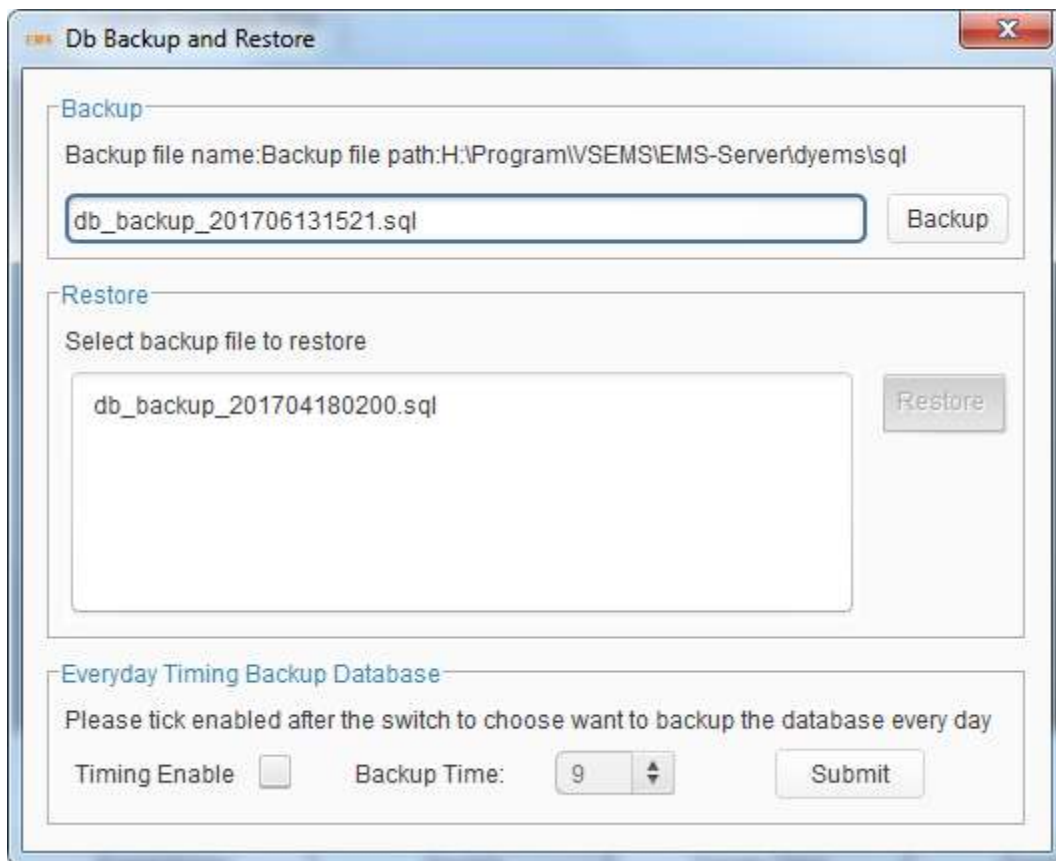


Figure 5-3 Database Backup

5.4 Exit System

Exit the element management system.

Click "System Management">"Exit", and click "Yes" to exit.

6 OLT Management

This chapter introduces the OLT management function of EMS.

6.1 OLT Basic Information

Choose OLT icon and open right-click menu; click “Device Details” to display OLT basic information, optical information and traffic statistics.

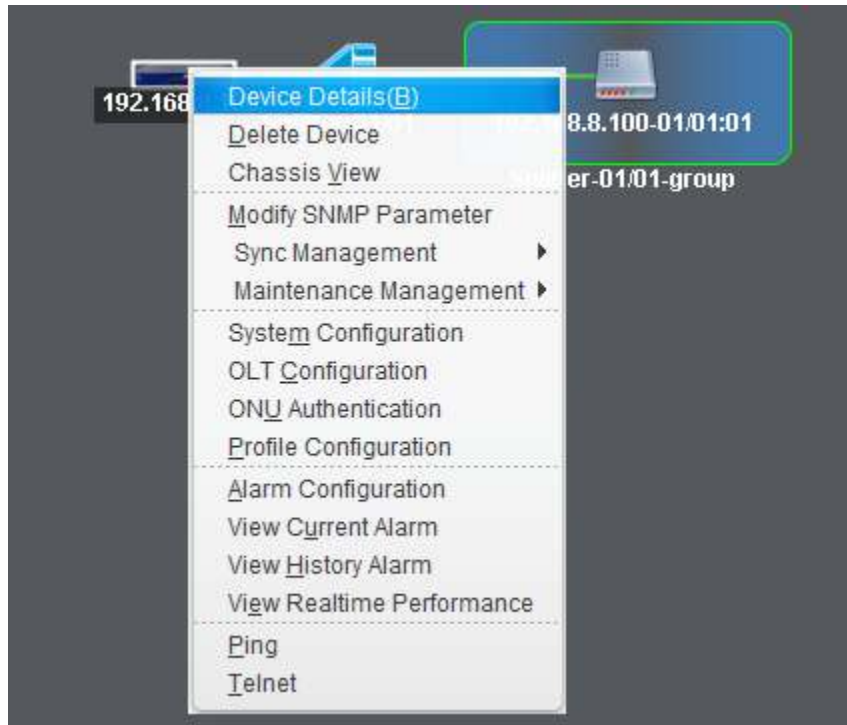


Figure 6-1 Open OLT Device Detail

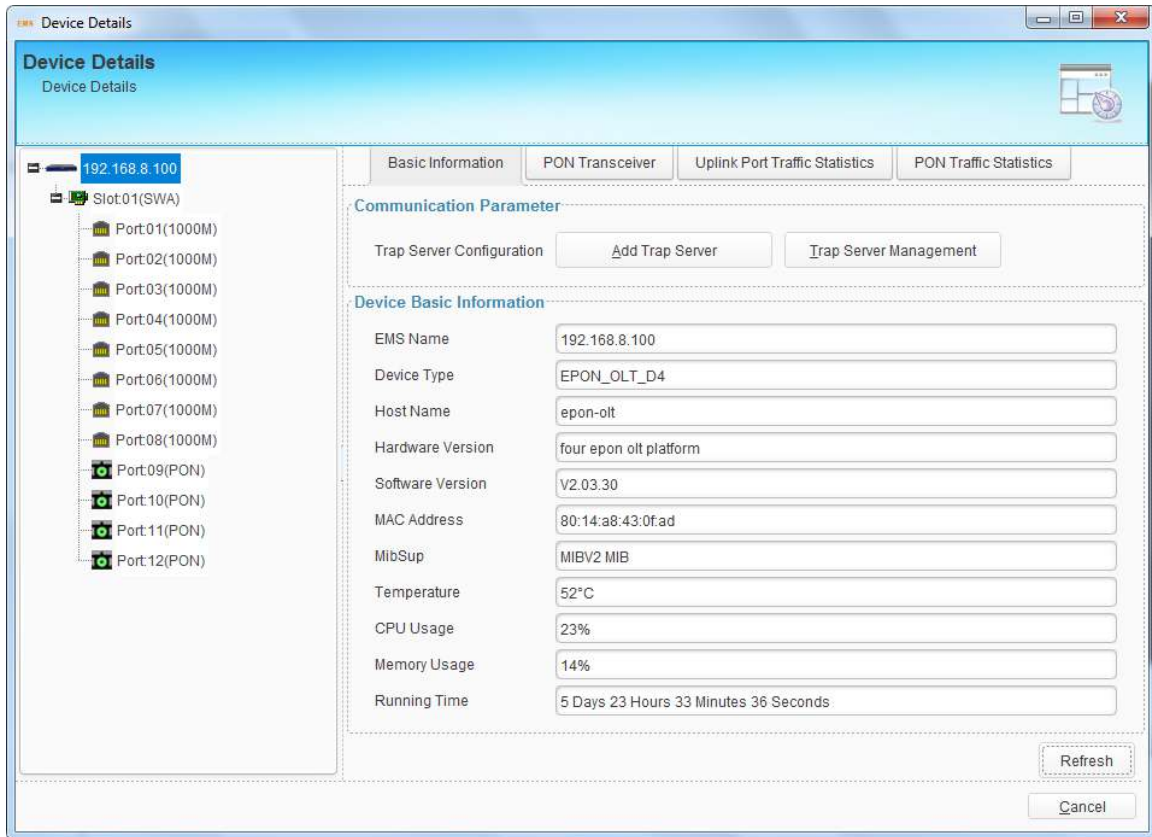


Figure 6-2 OLT Device Details

6.2 System Configuration

This section introduces OLT system configurations, such as OLT upgrade, configuration file backup or restores, management IP address, system time, mirroring and so on.

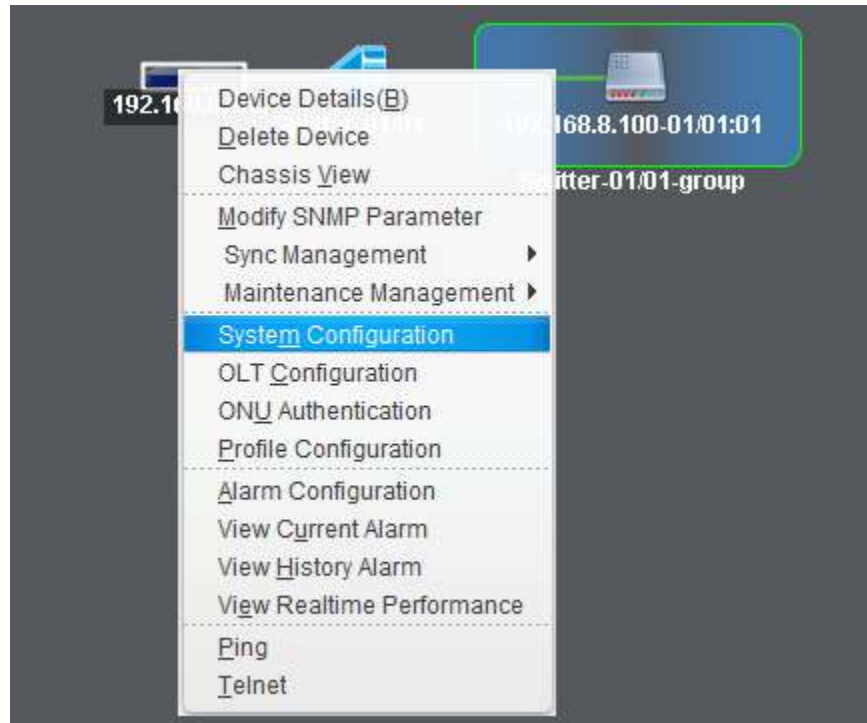


Figure 6-3 Enter System Configuration

6.2.1 OLT Upgrade

This operation is used to upgrade software of OLT (Uboot or Kernel). Before upgrading you are required to start the TFTP server, and put the upgrade files into the corresponding folder. Follow the steps below to upgrade OLT.

1. Set IP address of computer with the same network segment as that of OLT.

Connect the TFTP server with OLT by a CAT5 cable. Make sure the computer can ping OLT.

2. Run TFTP server in the computer. Current directory is where the firmware stores.

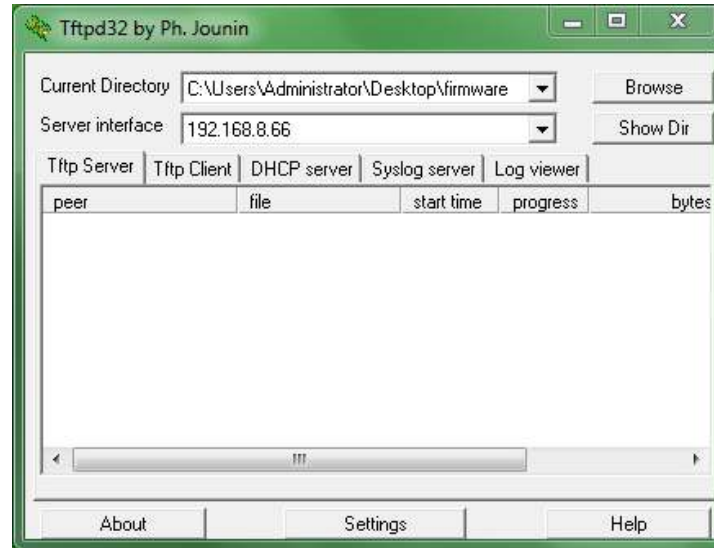


Figure 6-4 TFTP Server

- Fill in FTP server IP and file name which is not more than twenty characters.

Click the "Upgrade" to start upgrading.

- After completion of the upgrade, you must reboot the OLT device; the new upgrade file will take effect after the OLT device reboot.

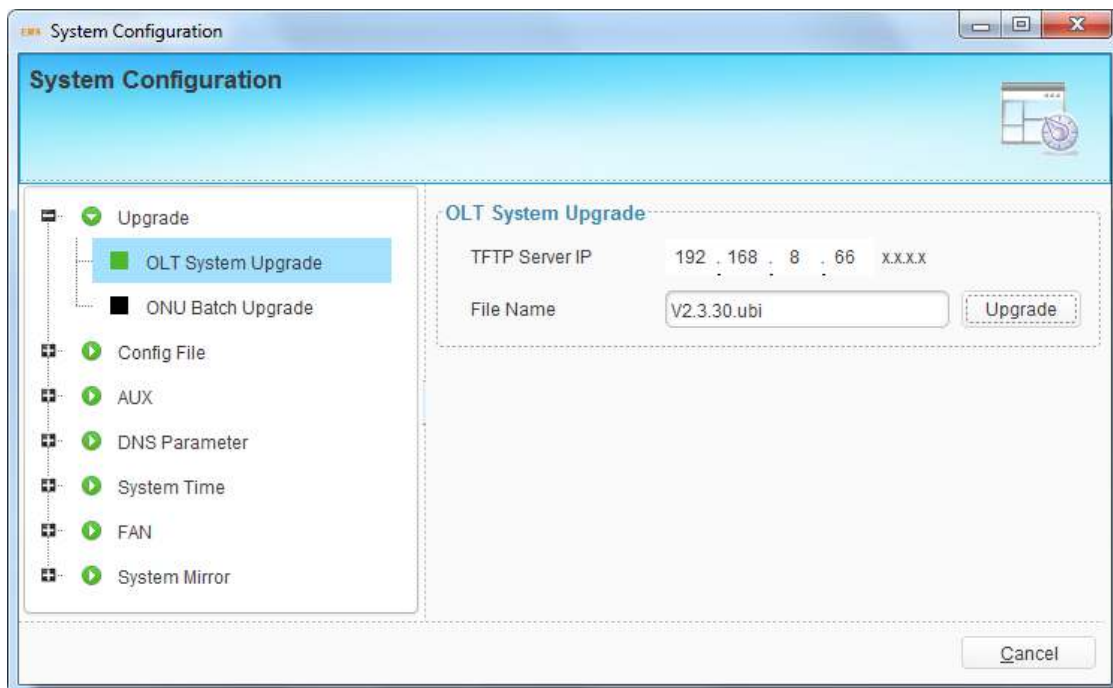


Figure 6-5 OLT System Upgrade

6.2.2 ONU Upgrade--EPON

You can upgrade one or many ONUs at the same time at this interface. But the ONUs need to be updated should be the same device type.

Follow the steps of TFTP settings which are shown above in OLT upgrade section.

Then fill in the firmware name and the TFTP server IP. And select the ONUs that need to be upgraded. You can only select the online ONUs.

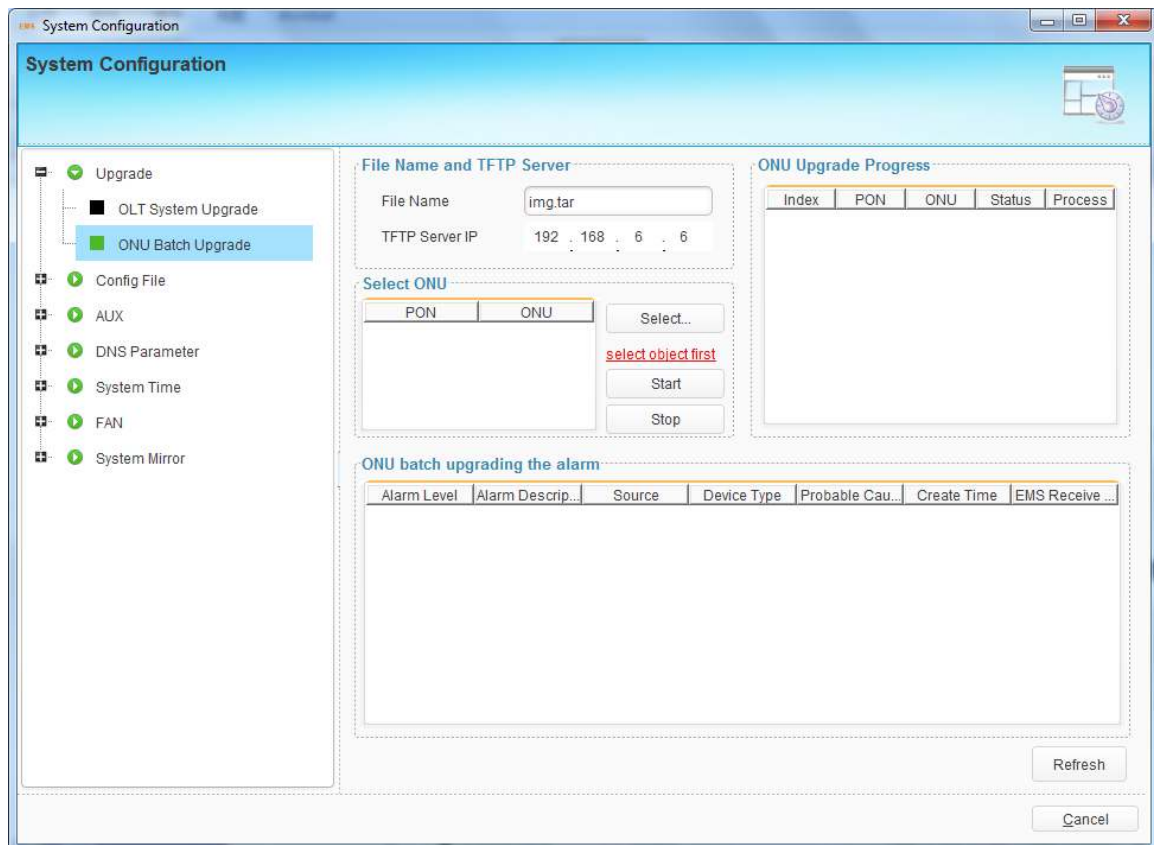


Figure 6-6 ONU Upgrade

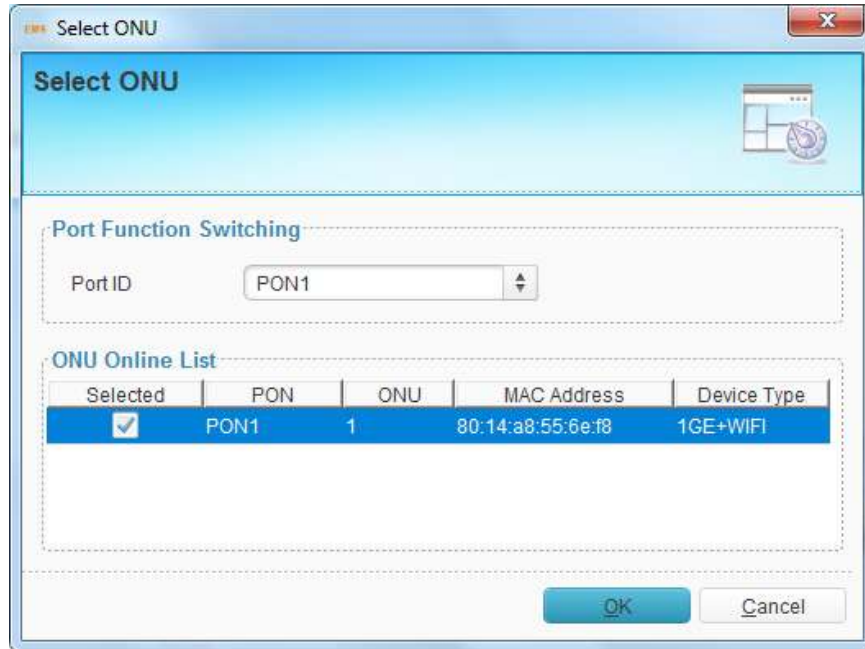


Figure 6-7 Select ONU

Click "Start" button to start upgrading. Upgrade process will display on the right of this interface. Click "Stop" button to stop upgrading.

6.2.3 Config File

This operation is used to upload the OLT configuration to the TFTP server or downloading configuration file from the TFTP server to the Flash of OLT.

Fill in TFTP server IP and file name which is not more than twenty characters, and click "Upload" or "download".

OLT will restart immediately after downloaded config file.

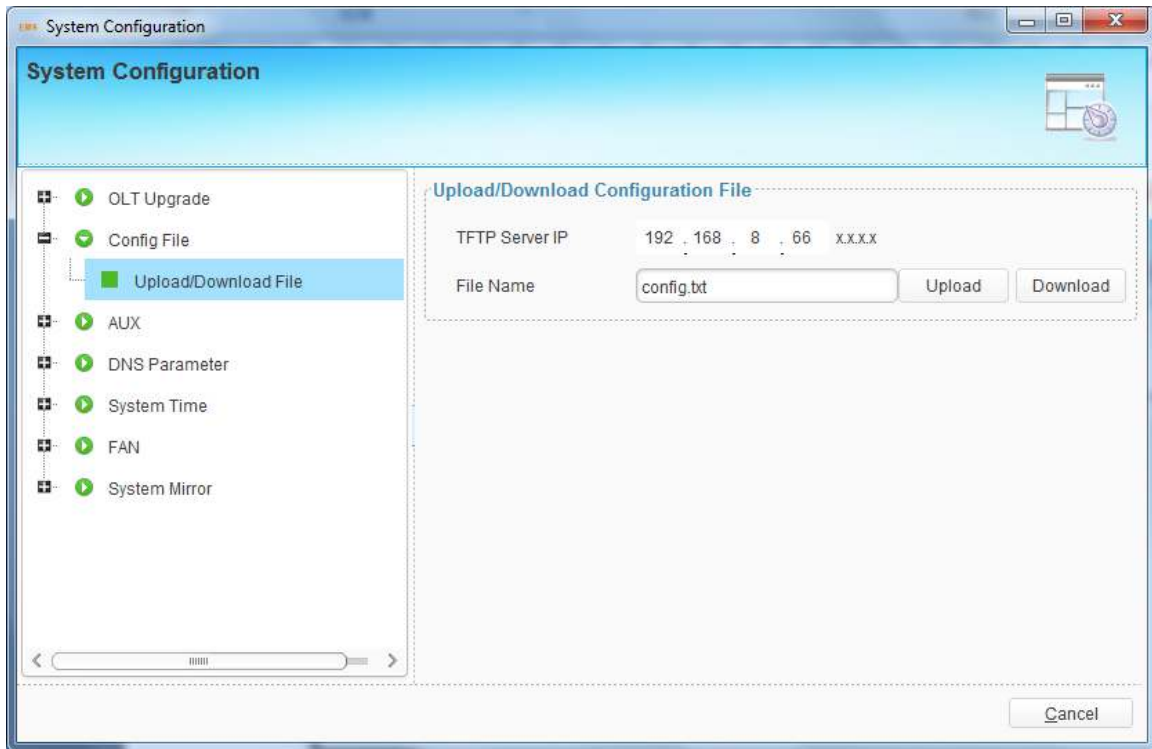


Figure 6-8 Config File Management

6.2.4 Configure Aux Port

This operation is used to configure IP address of aux port which is also called outband management IP.

Fill in the correct IP address and mask that you want to set, and click "Submit" to take effect.

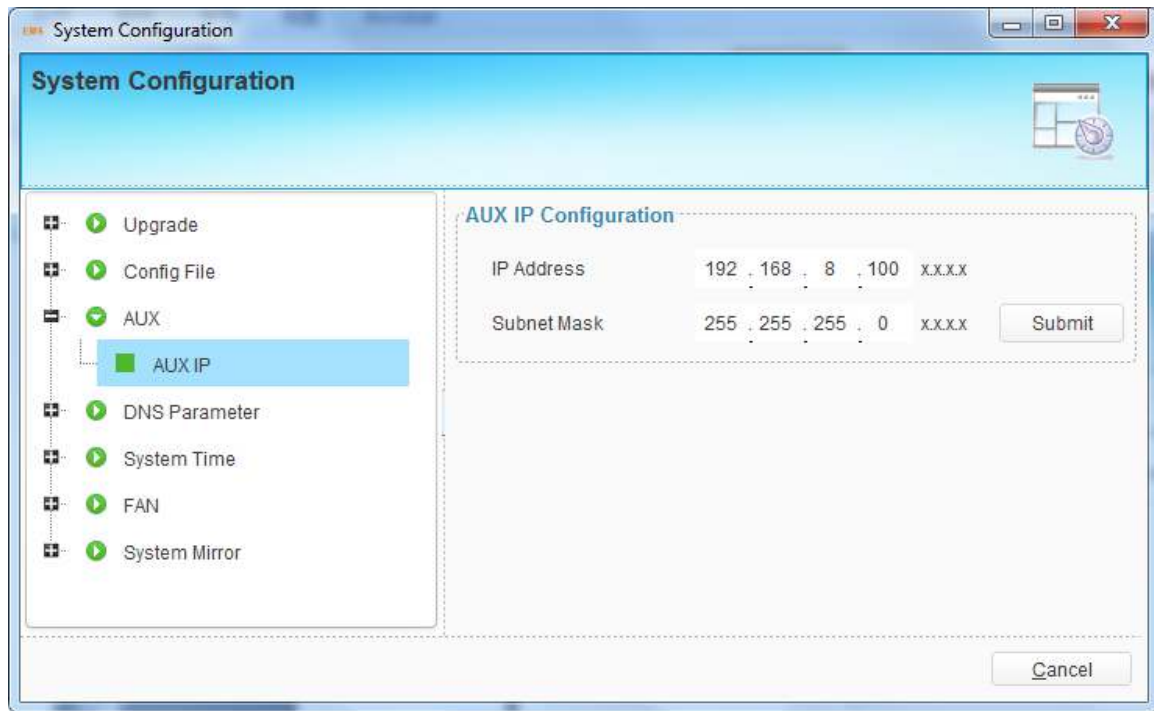


Figure 6-9 AUX Configuration

6.2.5 DNS Parameter

DNS (Domain Name Server) is used to resolve domain name. When OLT is configured NTP server with domain name, DNS is required. You can set at most two DNS servers.

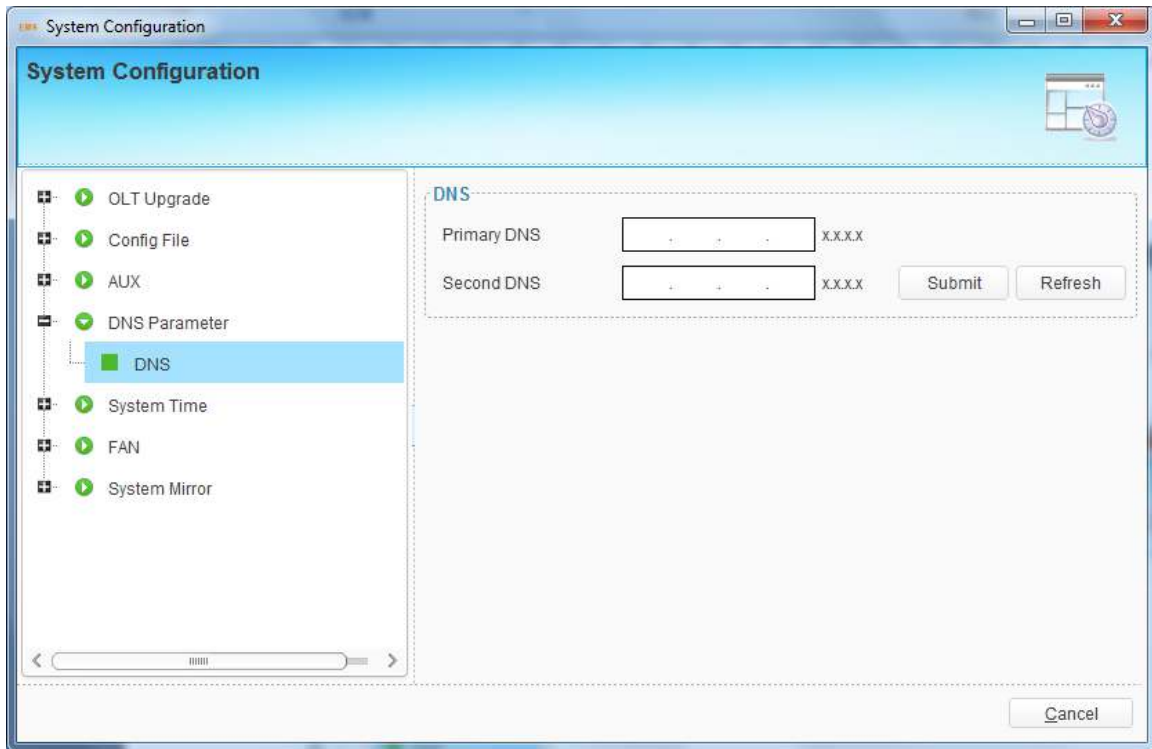


Figure 6-10 DNS Configuration

6.2.6 System Time

The OLT has its own system time. System time is helpful to check system log and alarms.

You can set system time manually. Fill in correct parameters and click "Submit".

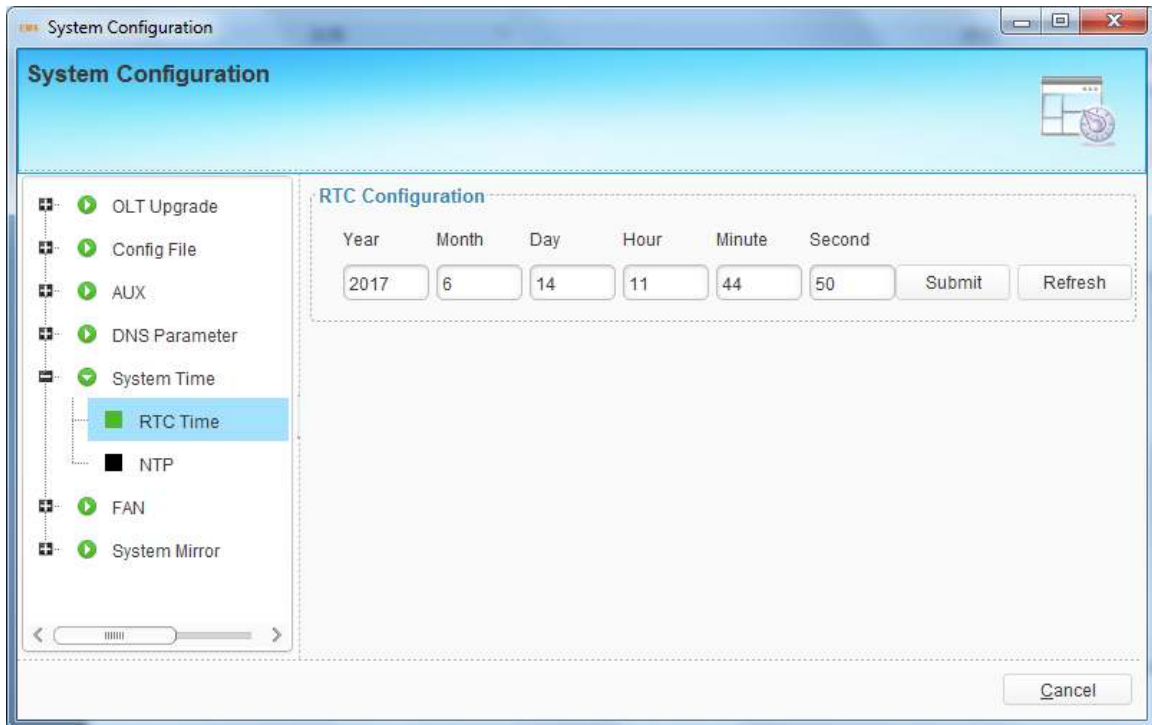


Figure 6-11 RTC Configuration

You can also set NTP server so that OLT can sync time from network.

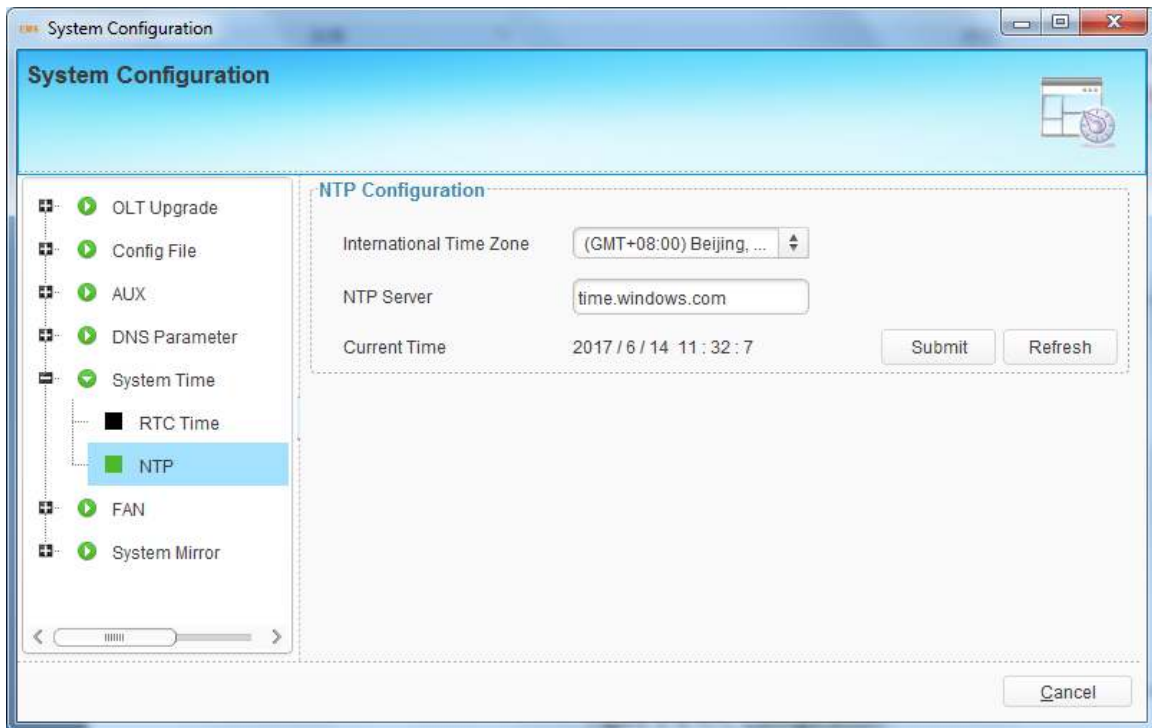


Figure 6-12 NTP Configuration

6.2.7 FAN Configuration

These settings are used to control the fans of OLT. The Fans can start or stop according to OLT temperature changes. You can set the fan start temperature.

There are three modes:

- Auto: The fans will start or stop automatically by detecting temperature.
- Open: The fans will always run.
- Close: The fans will not run.

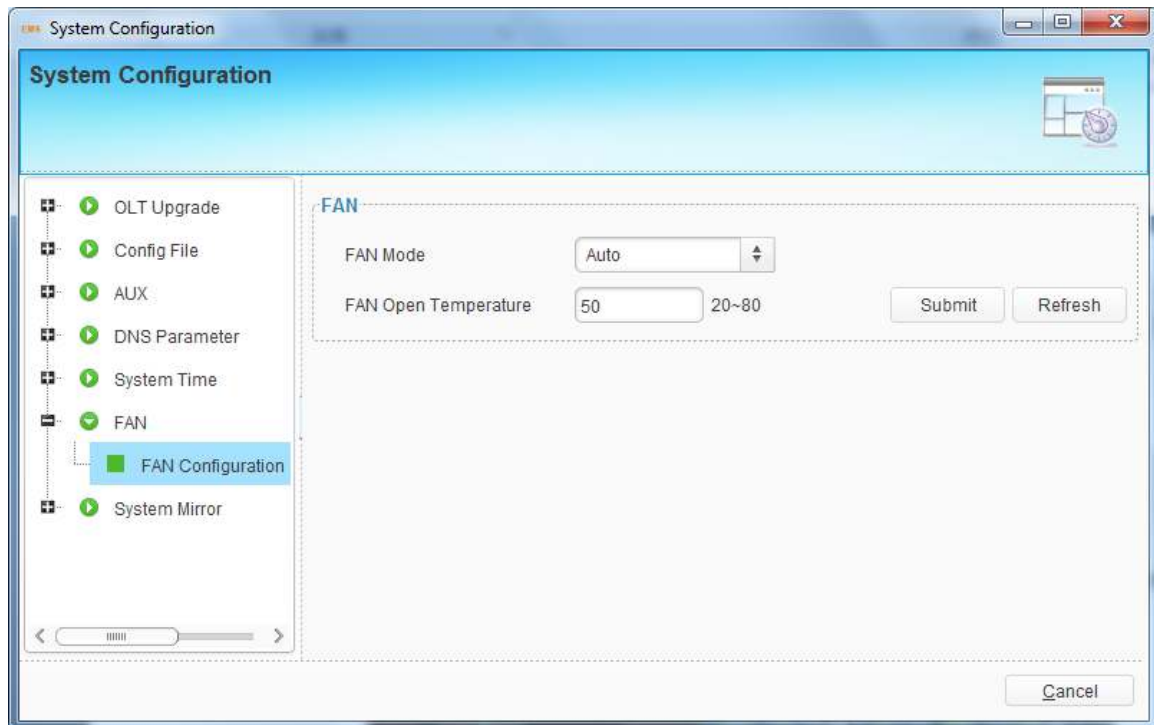


Figure 6-13 FAN Configuration

6.2.8 System Mirror

Mirror is to copy the data from one or more ports to a specified port, which can help for traffic analysis and network error diagnostics. OLT supports max 4 mirror

groups.

Add a session ID and choose destination port, source port and traffic direction of source port. Then click "Submit".

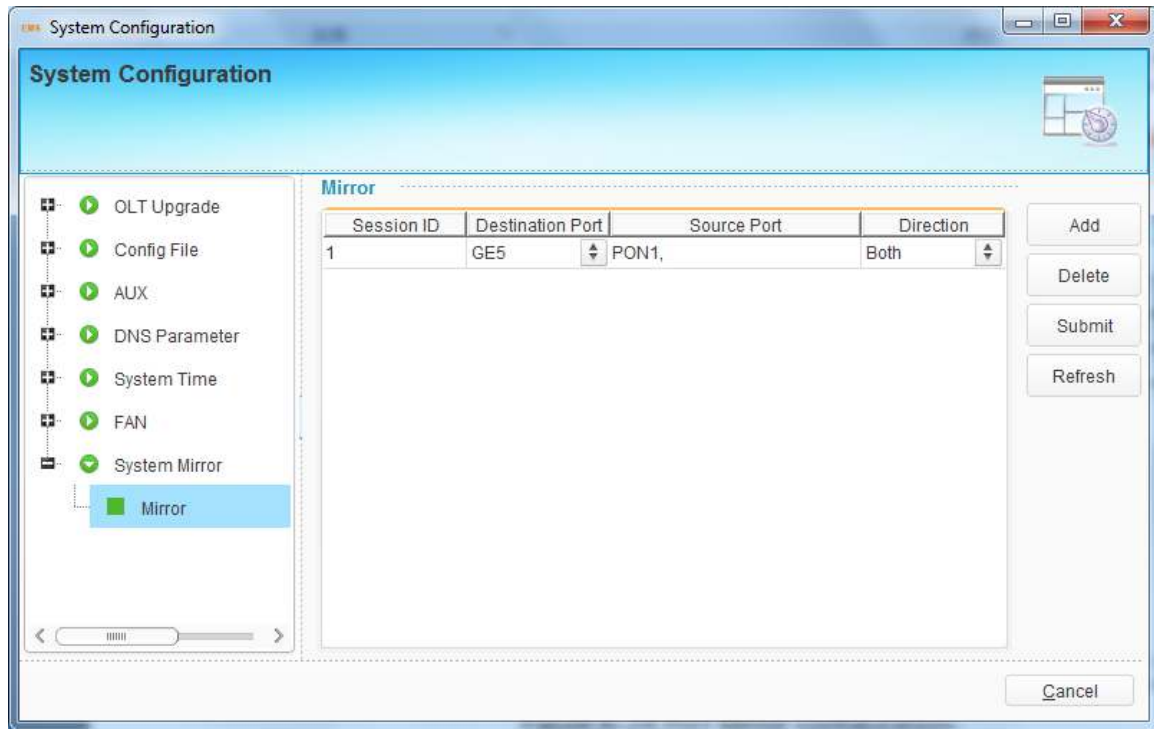


Figure 6-14 System Mirror Configuration

6.3 OLT Configuration

This section introduces OLT service configurations such as VLAN, ports, LACP, IGMP, DHCP, RSTP, ACL, and so on.

Right-click OLT icon, choose "OLT Configuration" and enter OLT configuration interface.

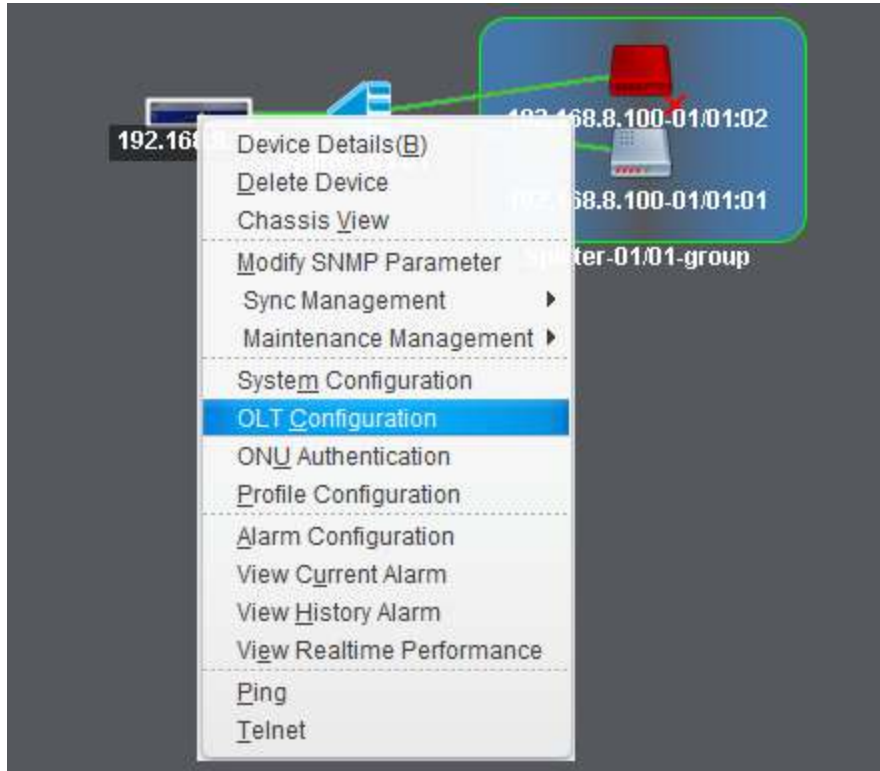


Figure 6-15 Enter OLT Configuration

6.3.1 VLAN Configuration

OLT equipment switch engine is fully compliant with the IEEE802.1Q VLAN standard and has the following main features:

- Support Port-based VLAN and IEEE802.1Q VLAN.
- Support full 4K VLAN group, VID range 1~4095.

All switch ports, including uplink ports and downlink ports, support VLAN partition.

VLAN 1 is the system reserved VLAN, it includes all switch ports which are UNTAG mode.

6.3.1.1 VLAN Port

This section is used to create VLAN and setting VLAN for OLT uplink ports and PON ports.

NOTE: For GPON, all vlan created will be added to all PON port, but just PON1 will be displayed, the user don't need to pay attention on it.

Create VLAN

Click "Add" button on the right of VLAN Port window to open a pop-up dialog box, fill in VLAN ID and select the ports to be assigned to this VLAN group in Ports list.

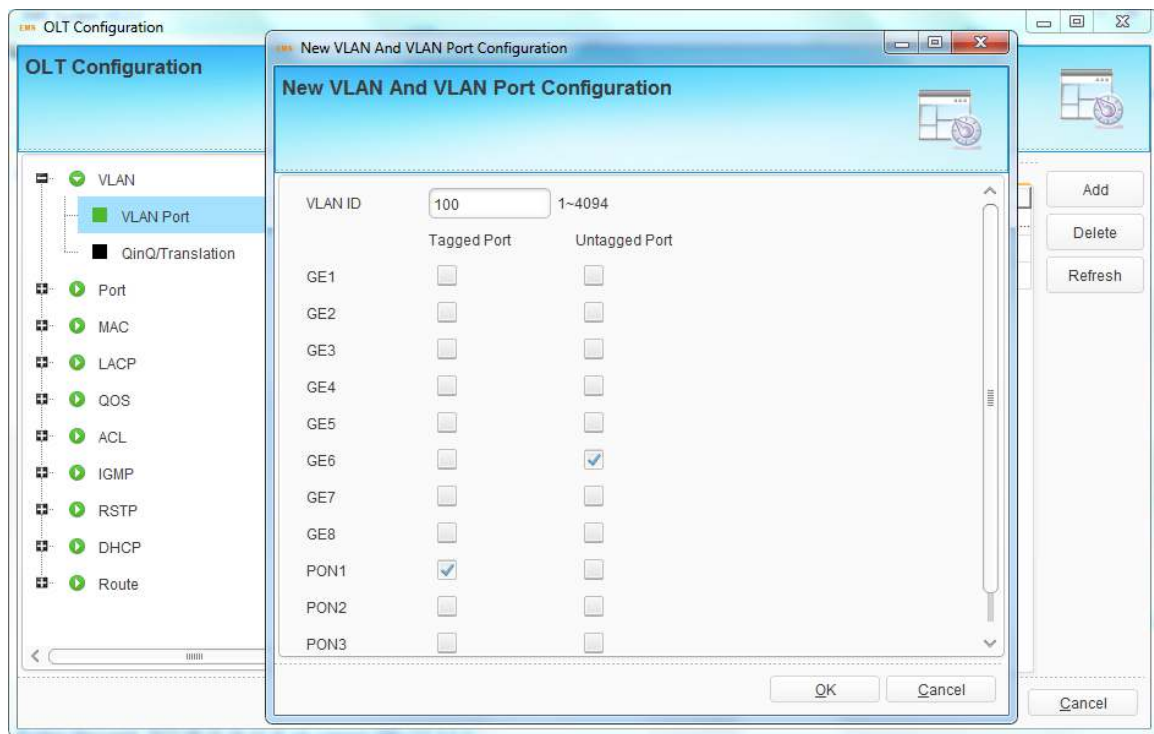


Figure 6-16 Add New VLAN

Click "OK" button, the VLAN will be created.

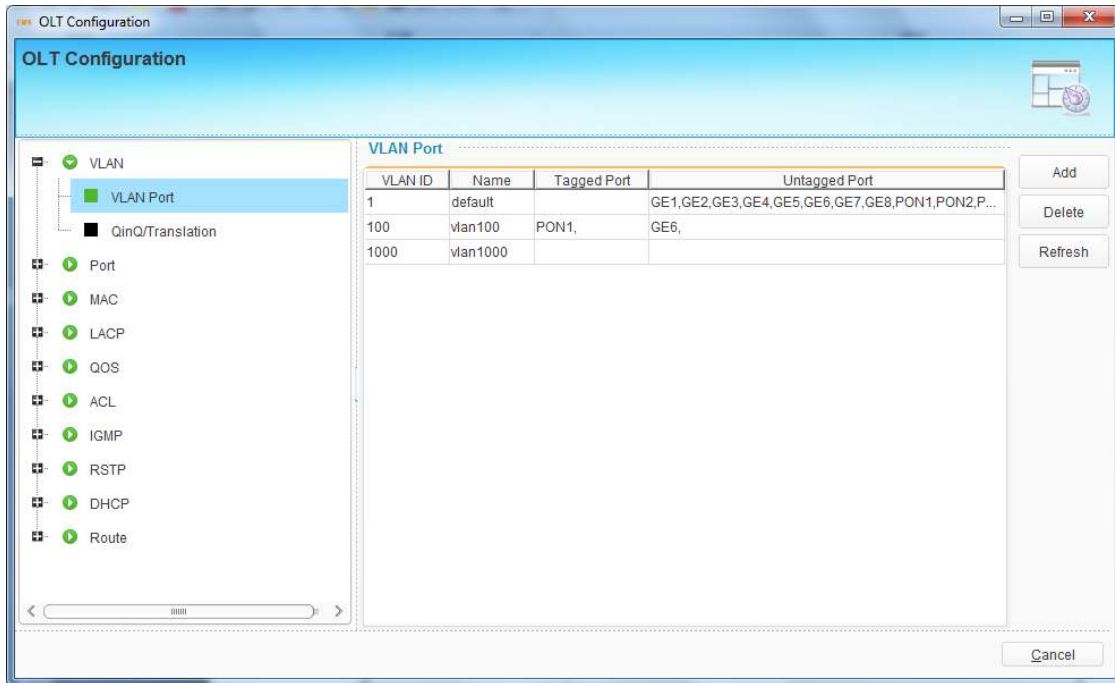


Figure 6-17 VLAN List

Delete VLAN

Select the VLAN ID in VLAN table and click "Delete" button to delete the selected VLAN.

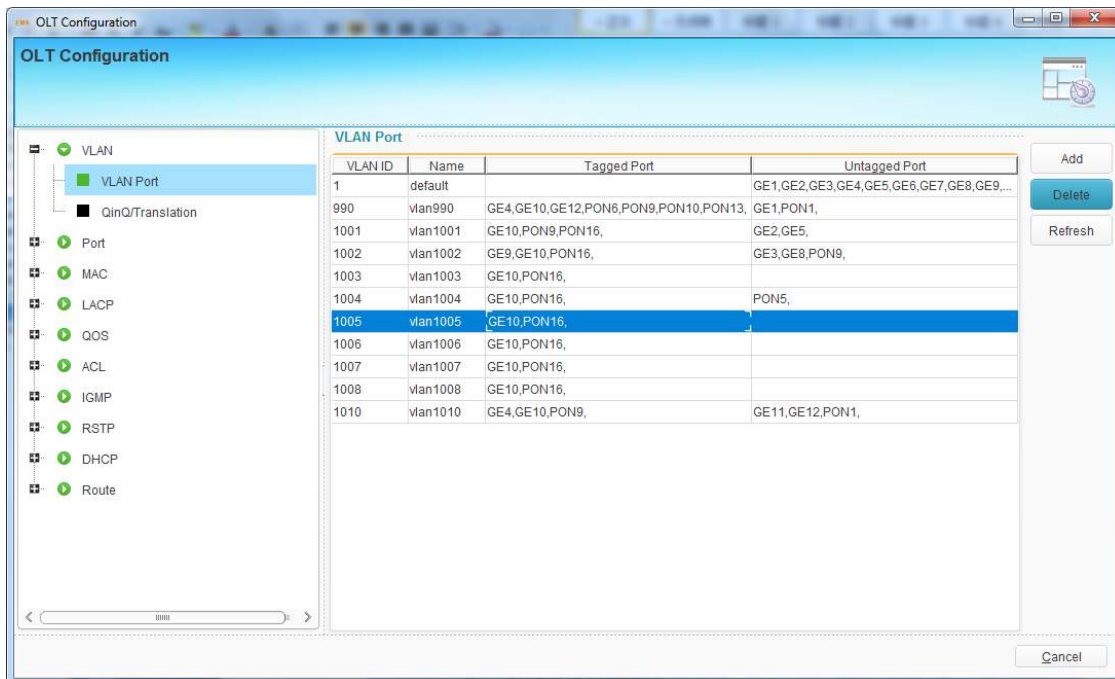


Figure 6-18 Delete VLAN

6.3.1.2 QinQ/Translation

In this user interface, VLAN QinQ and VLAN translation can be configured. VLAN QinQ and translation are effective for ingress.

Add an item and select port, client VLAN, service VLAN and the mode. Click "Submit" button to take effect.

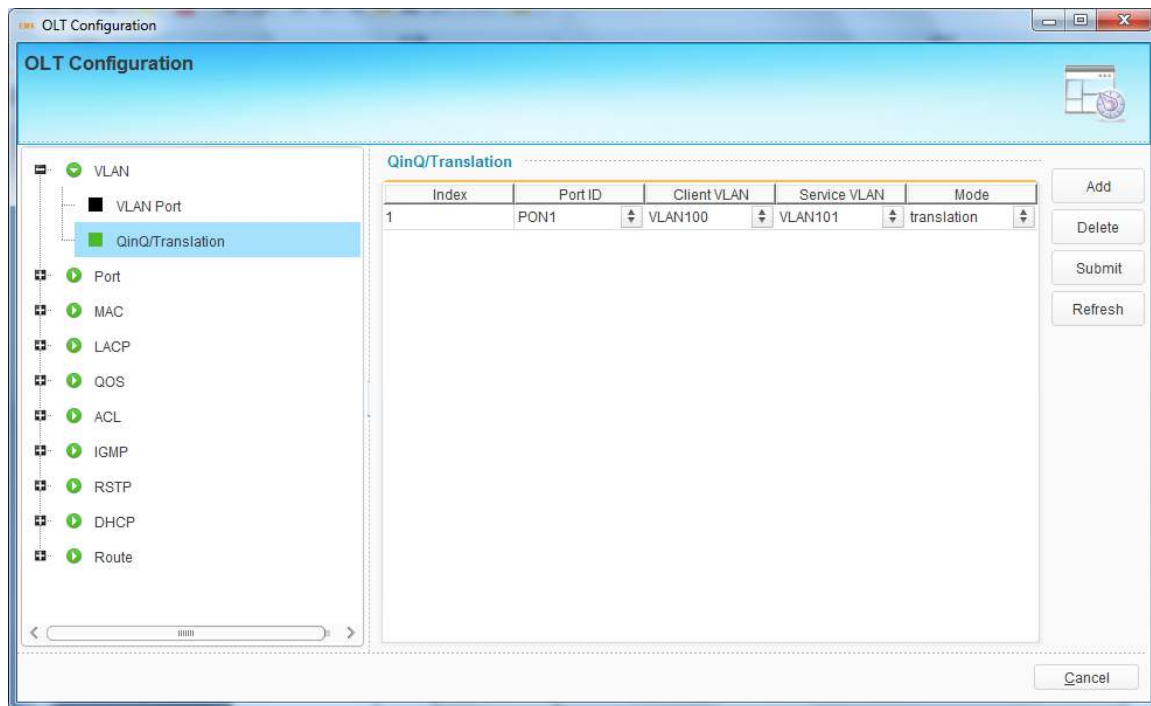


Figure 6-19 VLAN QinQ/Translation

6.3.2 Port Configuration

6.3.2.1 Uplink Port Traffic Statistics

This user interface displays traffic statistics of uplink ports.

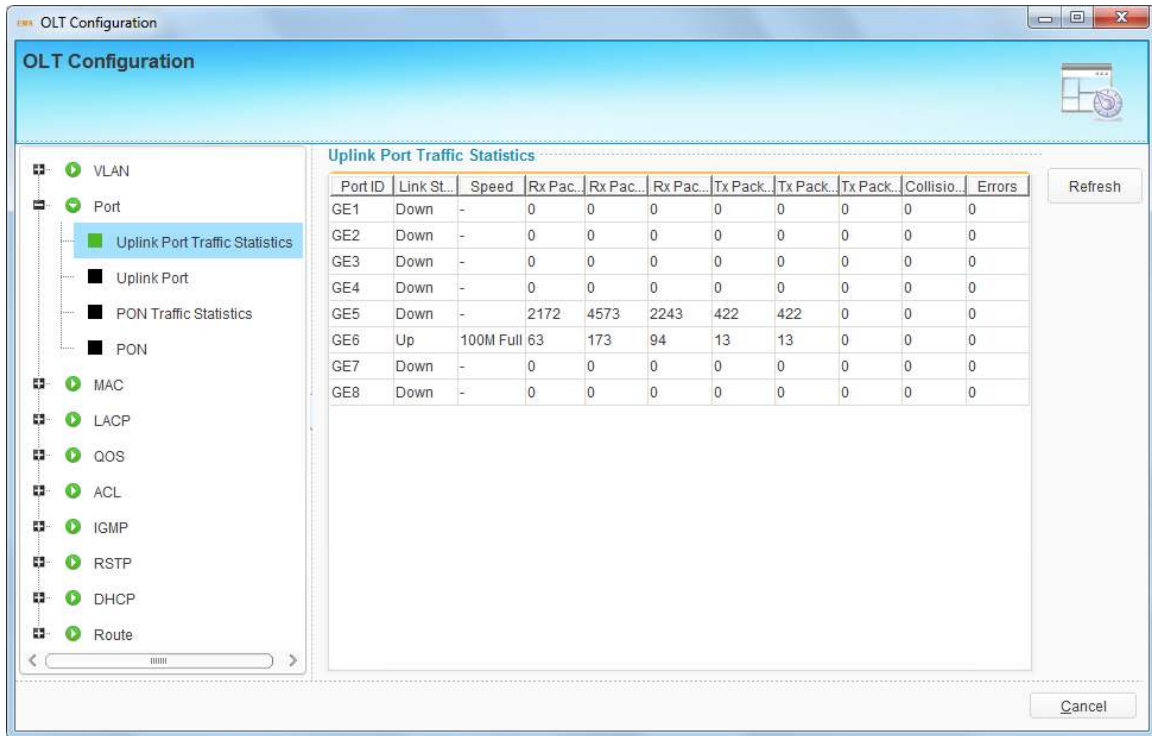


Figure 6-20 Uplink Ports Statistics

6.3.2.2 Uplink Port Configuration

This user interface is used to configure port related functions and characteristic parameters of uplink port, such as port attributes, PVID, flow control, rate limit, storm inhibition, port isolation and so on.

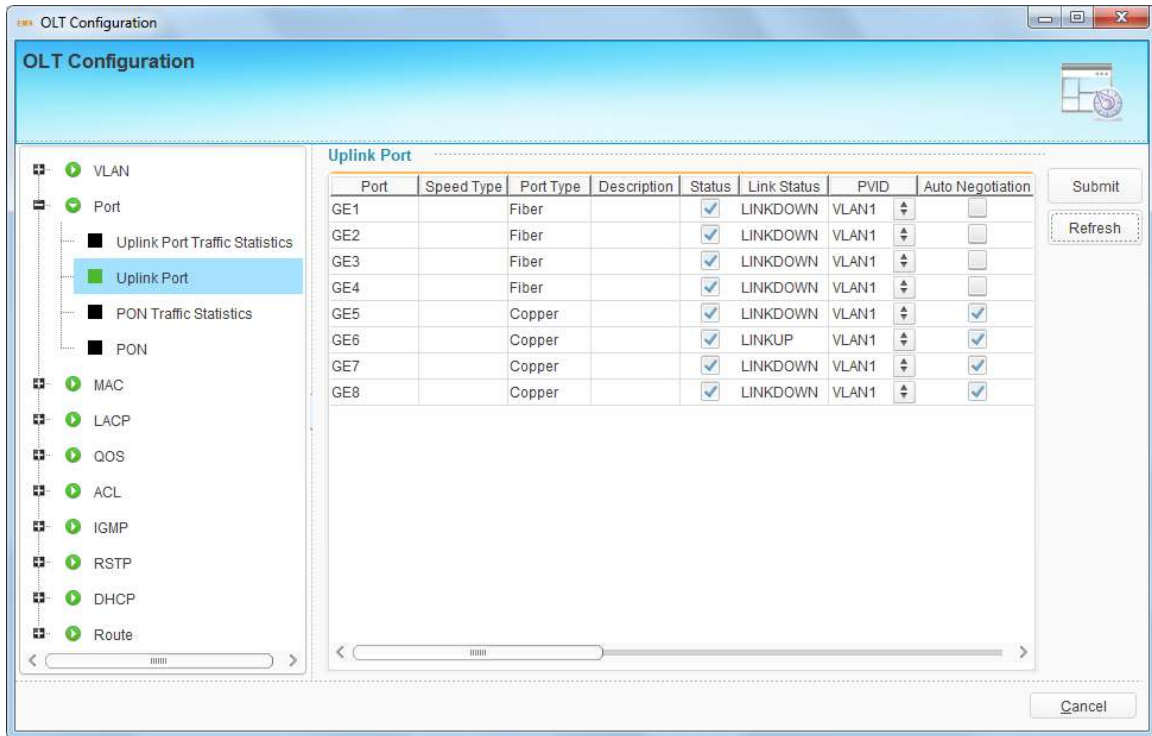


Figure 6-21 Uplink Ports Configuration

Illustrations of each parameter:

Parameters	Illustration
Type	GE port has two types, fiber and copper.
Description	Descriptions or remarks of port.
Status	Active or inactive status of port. It is "Enable" by default. Only when the port is enabled can continue to configure the subsequent parameters.
Link Status	Link status of uplink port. When the port is connected with another active port, it displays link up, otherwise displays link down.
PVID	Default VLAN ID of the port.

Auto-negotiation	Enable or disable auto negotiation of uplink port. It is "Enable" by default. Uplink port will negotiate with the connected port when it is enabled. The two connected ports will reach the largest possible transmission rate.
Speed	Uplink port link speed. There are three options, which are 10Mbps, 100Mbps and 1000Mbps, for copper ports. Speed of optical ports cannot be set. It is not configurable when auto negotiation is enabled.
Duplex	Uplink port duplex mode. There are full and half mode for copper ports. Duplex of optical ports cannot be set. It is not configurable when auto negotiation is enabled.
Flow Control	Enable or disable flow control function of uplink port to control congestion. It is "disable" by default.
Ingress Rate	Port ingress rate.
Egress Rate	Port egress rate.
Broadcast	Broadcast storm inhibition.
Multicast	Multicast storm inhibition.
Unknown Unicast	Unknown unicast storm inhibition.
Isolate	Port isolation with each other.
Jumbo Frame	Enable jumbo frame to pass through the port.

6.3.2.3 PON Port Traffic Statistics

This user interface displays traffic statistics of uplink ports.

NOTE: For GPON, all PON ports statistics will be showed in one line, the user don't need to pay attention on it.

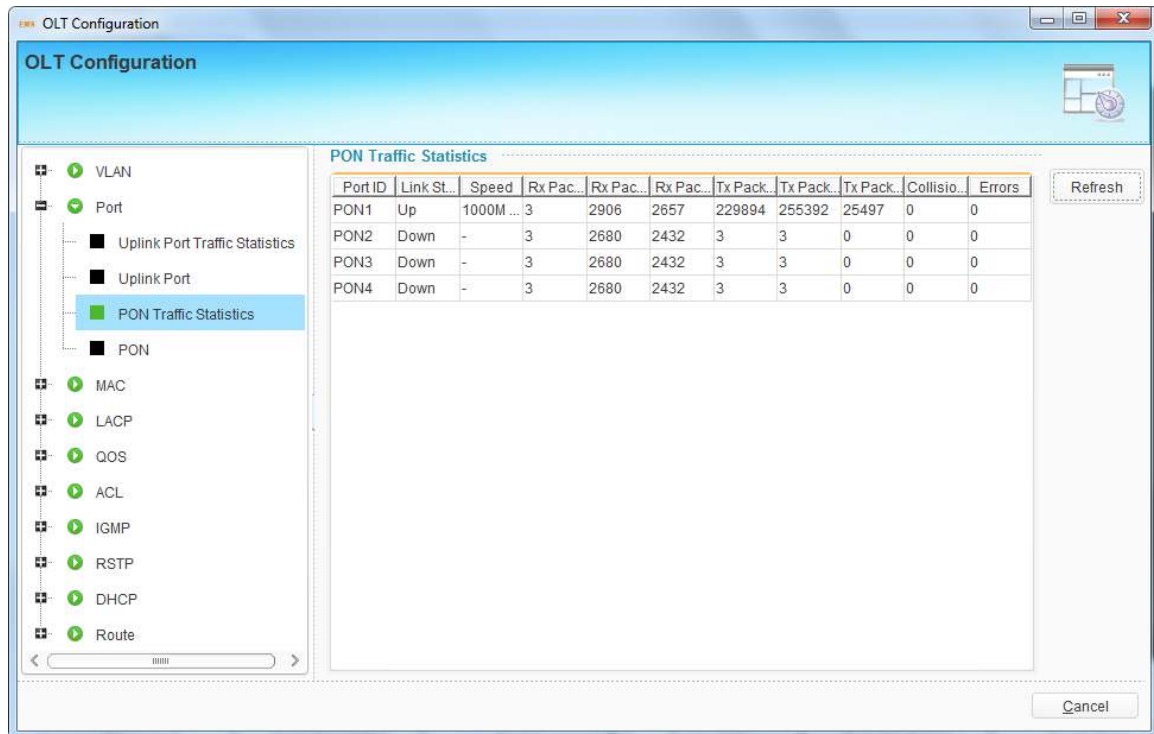


Figure 6-22 PON Ports Statistics

6.3.2.4 PON Ports Configuration

This user interface is used to configure port related functions and characteristic parameters of PON port, such as port attributes, PVID, triple churning, flow control, rate limit, storm inhibition, port isolation and so on.

NOTE: For GPON, only port's status will be operation able.

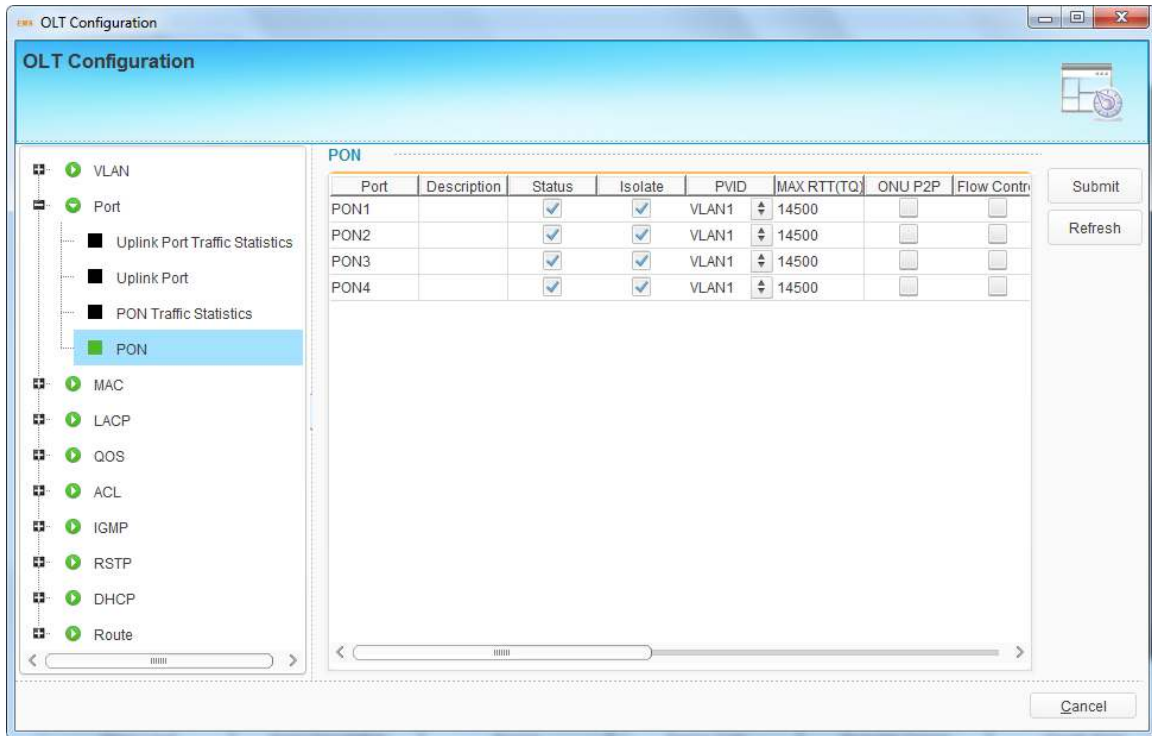


Figure 6-23 PON Ports Configuration

Illustrations of each parameter:

Parameters	Illustration
Description	Descriptions or remarks of port.
Status	Active or inactive status of port. It is "Enable" by default. Only when the port is enabled can continue to configure the subsequent parameters.
PVID	Default VLAN ID of the port.
Encryption time	This is the key timer of the triple churning. (Range: 774~786426)
Max RTT	Configuring Max RTT can refrain from ONUs' signal reaching OLT at the same time. Default value is 14500. (Range:

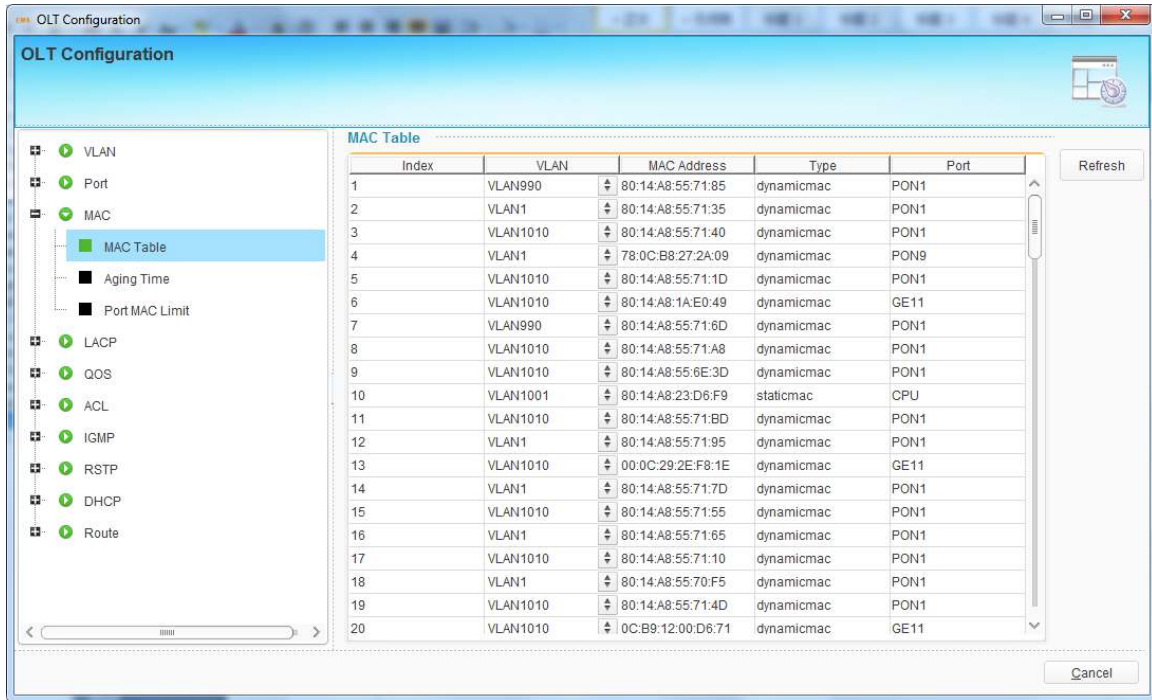
	2000~32000)
ONU P2P	Switch of intercommunication among ONUs under the same PON.
Flow Control	Enable or disable flow control function of PON port to control congestion. It is "disable" by default.
Ingress Rate	Port ingress rate.
Egress Rate	Port egress rate.
Broadcast	Broadcast storm inhibition.
Multicast	Multicast storm inhibition.
Unknown Unicast	Unknown unicast storm inhibition.
Isolate	Port isolation with each other.
Jumbo Frame	Enable jumbo frame to pass through the port.

6.3.3 MAC Configuration

In this section, you can check MAC address table of OLT, set MAC aging time and MAC limit of the ports.

6.3.3.1 MAC Table

This table displays MAC addresses that OLT has learnt at PON port and GE port.



The screenshot shows the 'OLT Configuration' window with the 'MAC Table' selected in the left sidebar. The table displays 20 entries with columns for Index, VLAN, MAC Address, Type, and Port. A 'Refresh' button is located to the right of the table, and a 'Cancel' button is at the bottom right.

Index	VLAN	MAC Address	Type	Port
1	VLAN990	80:14:A8:55:71:85	dynamicmac	PON1
2	VLAN1	80:14:A8:55:71:35	dynamicmac	PON1
3	VLAN1010	80:14:A8:55:71:40	dynamicmac	PON1
4	VLAN1	78:0C:B8:27:2A:09	dynamicmac	PON9
5	VLAN1010	80:14:A8:55:71:1D	dynamicmac	PON1
6	VLAN1010	80:14:A8:1A:E0:49	dynamicmac	GE11
7	VLAN990	80:14:A8:55:71:6D	dynamicmac	PON1
8	VLAN1010	80:14:A8:55:71:A8	dynamicmac	PON1
9	VLAN1010	80:14:A8:55:6E:3D	dynamicmac	PON1
10	VLAN1001	80:14:A8:23:D6:F9	staticmac	CPU
11	VLAN1010	80:14:A8:55:71:BD	dynamicmac	PON1
12	VLAN1	80:14:A8:55:71:95	dynamicmac	PON1
13	VLAN1010	00:0C:29:2E:F8:1E	dynamicmac	GE11
14	VLAN1	80:14:A8:55:71:7D	dynamicmac	PON1
15	VLAN1010	80:14:A8:55:71:55	dynamicmac	PON1
16	VLAN1	80:14:A8:55:71:65	dynamicmac	PON1
17	VLAN1010	80:14:A8:55:71:10	dynamicmac	PON1
18	VLAN1	80:14:A8:55:70:F5	dynamicmac	PON1
19	VLAN1010	80:14:A8:55:71:4D	dynamicmac	PON1
20	VLAN1010	0C:B9:12:00:D6:71	dynamicmac	GE11

Figure 6-24 MAC Address Table

6.3.3.2 Aging Time

MAC address aging time, default value is 300s.

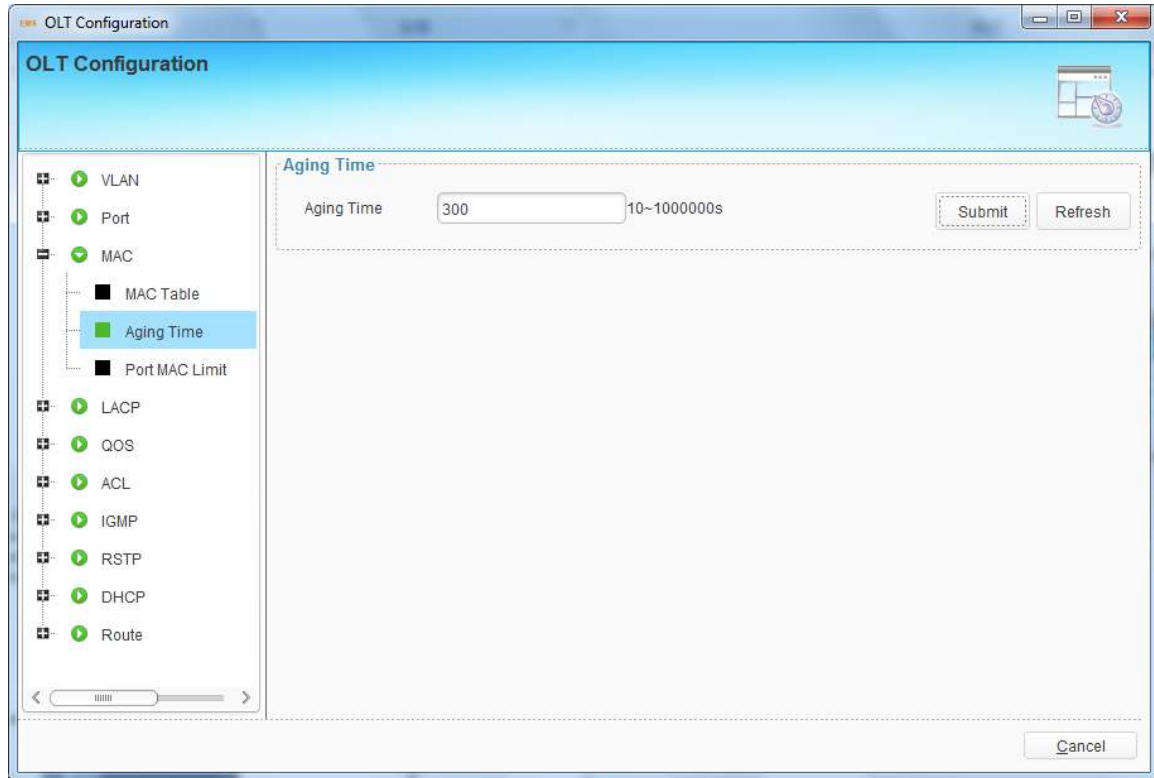


Figure 6-25 Aging Time

6.3.3.3 Port MAC Limit

Limit of learning MAC address at each port.

NOTE: For GPON, all PON port's limit in one, show as PON1.

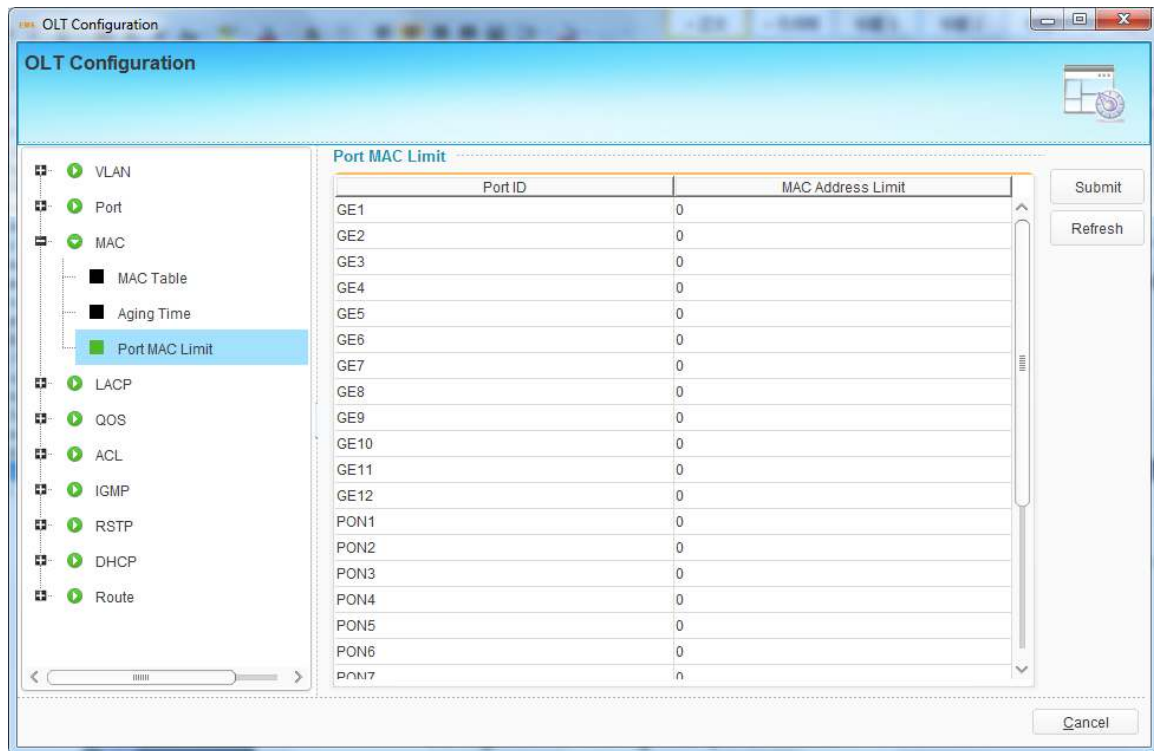


Figure 6-26 Port MAC Limit

6.3.4 LACP Configuration

In order to balance the loads at the member ports of a trunk group and improve the reliability of connectivity, it is necessary to configure LACP of ports. There are static LACP and dynamic LACP. For static LACP, trunk group and member ports must be configured manually; for dynamic LACP, trunk group and member ports can be configured by system.

OLT only supports static LACP function. Add a group, select load balance mode and member ports, then click "Submit" button to apply the configurations. Only four member ports can be added into one group.

Select one group and click "Delete" button to delete it.

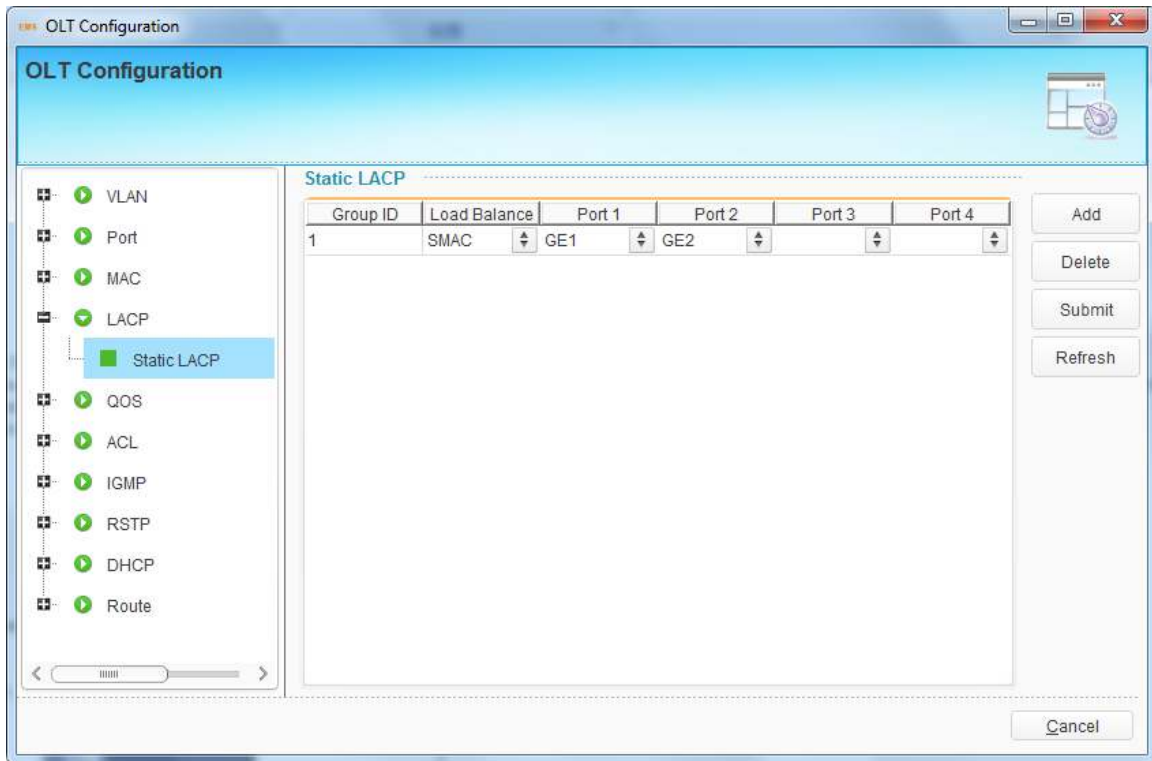


Figure 6-27 LACP Configuration

6.3.5 QoS Configuration

When bandwidth is not enough or there is congestion in the network, queue scheduling can make sure high priority data traffic passes through the device firstly. Traffic will map to queues according to their priorities and transmit in the queues.

OLT supports eight queues altogether. Queue scheduling mode includes strict priority (SP), weighted round robin (WRR) and hybrid mode (SP-WRR).

Strict priority scheduling guarantees high priority traffic occupy as much as bandwidth. The lower priority traffics pass though only when there is remaining bandwidth.

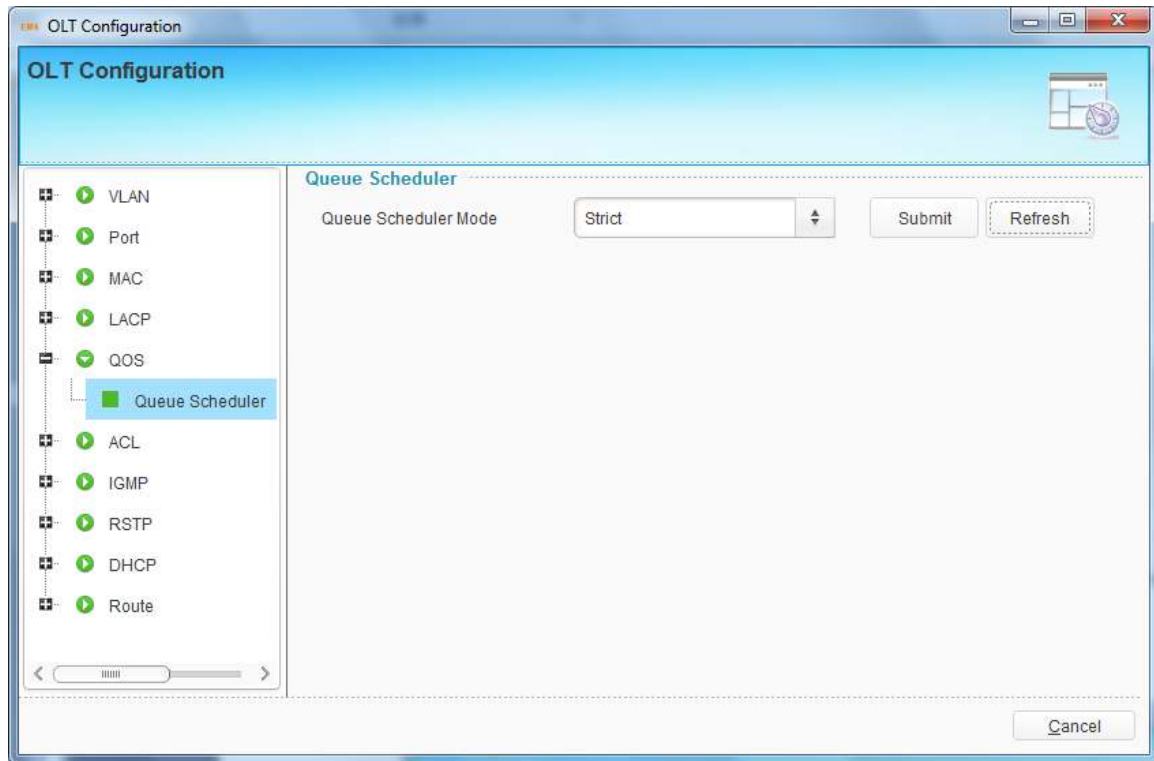


Figure 6-28 Strict Queue Schedule Mode

When working at WRR queue scheduling mode, OLT will assign bandwidth to traffic according to the weight of their corresponding queue.

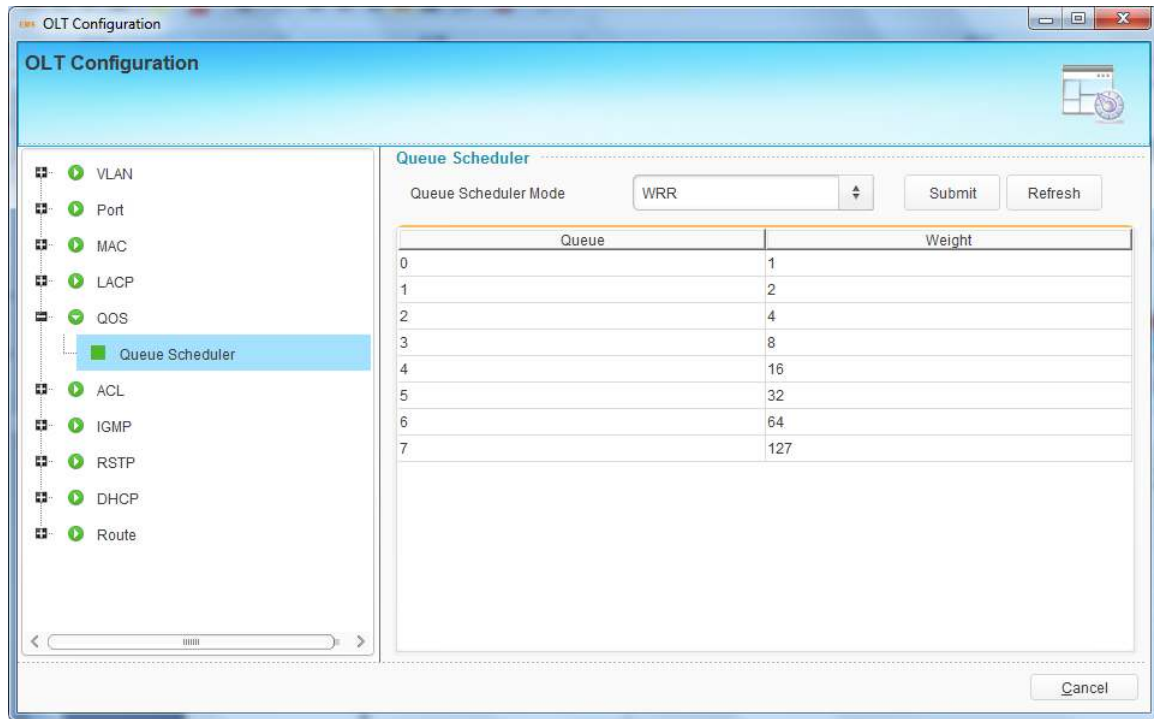


Figure 6-29 WRR Queue Schedule Mode

When working at SP-WRR queue scheduling mode, weight of queue 7 is 0, others are not. The queue with weight 0 which its regulation is strict priority scheduling mode, otherwise its regulation is weighted round robin scheduling mode.

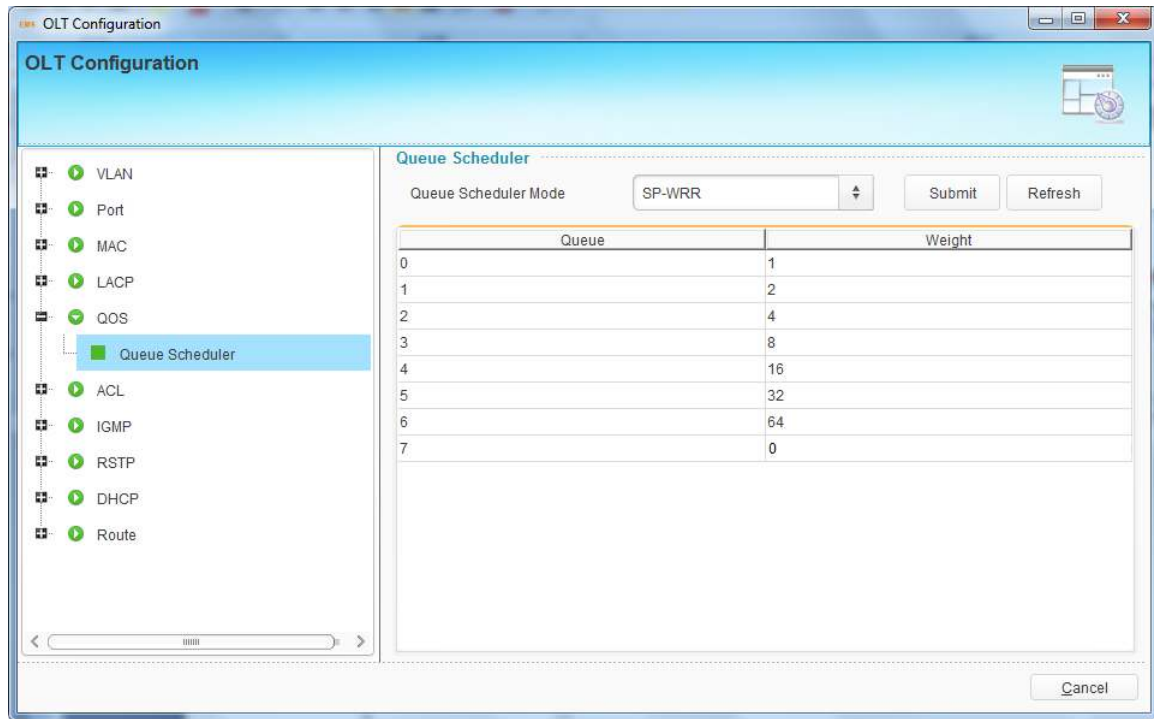


Figure 6-30 SP-WRR Queue Schedule Mode

6.3.6 ACL Configuration

In order to filter data packages, network equipments need to setup a series of rules for identifying what need to be filtered. Only matched with the rules the data packages can be filtered. ACL can achieve this function. Matched conditions of ACL rules can be source address, destination address, Ethernet type, VLAN, protocol port, and so on. These ACL rules also can be used in other situations, such as classification of stream in QoS. An ACL rule may contain one or several sub-rules, which have different matched conditions.

This device supports the following types of ACL.

- IP Standard ACL.

- IP Extended ACL.
- ACL based on MAC address
- ACL based on port binding.
- ACL based on QoS.

Numbers of each ACL rule:

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

6.3.6.1 Standard IP Filter

This type of ACL supports deny or permit source IP address of data traffic.

Click "Add" button, choose operation mode, and fill in IP address and mask. The mask is a little different from that we usually set to devices. For example, if you want to deny only the IP address 192.168.1.3, you should set the mask as 255.255.255.255, but not 255.255.255.0. If you set 192.168.1.3/255.255.255.0, all the IP addresses 192.168.1.x will be denied.

Click "Add" button, select mode and fill in source IP address and its mask, then click "Submit" button to apply the configurations.

Select an item and click "Delete" button to delete it.

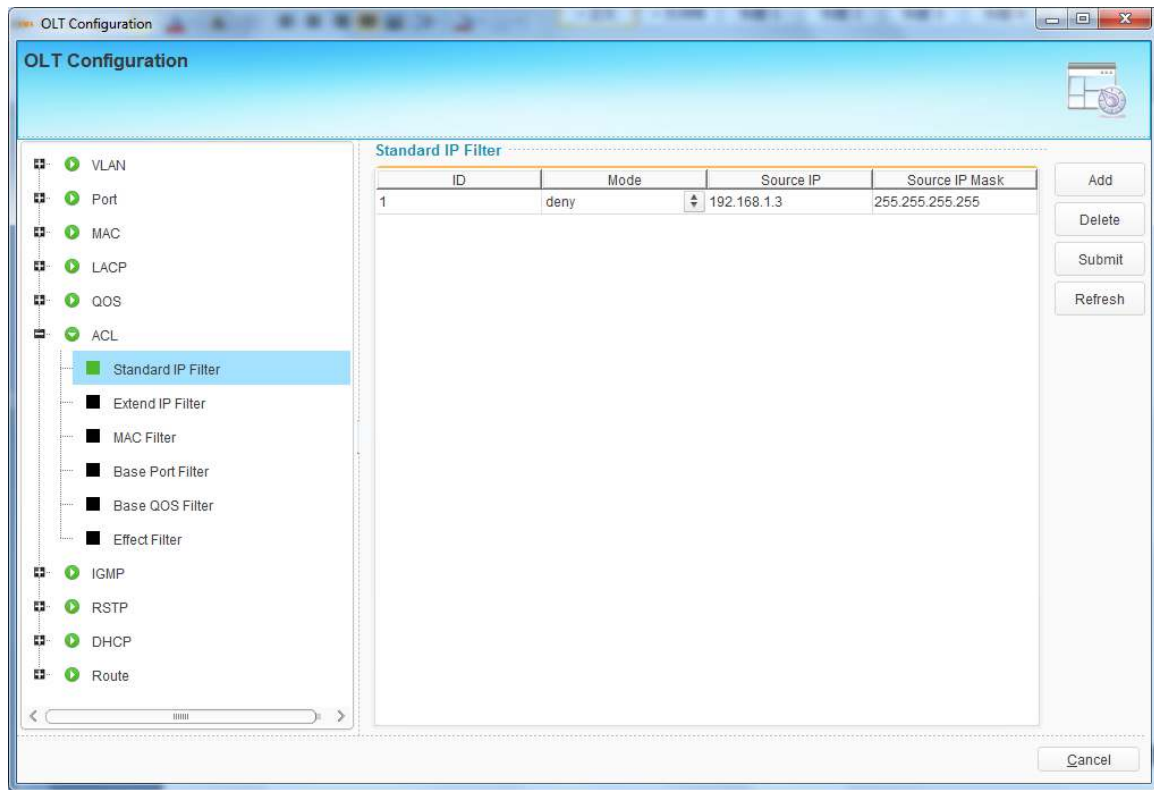


Figure 6-31 Standard IP Filter

6.3.6.2 Extend IP Filter

This type of ACL is the extended of standard IP filter. You can permit or deny both source and destination IP address. Other corresponding parameters such as protocol, DSPC and TCP/UDP port also can be set.

Click "Add" button to open a pop-up dialog box, fill in parameters, then click "OK" button to apply the configurations.

Select an item and click "Delete" button to delete it.

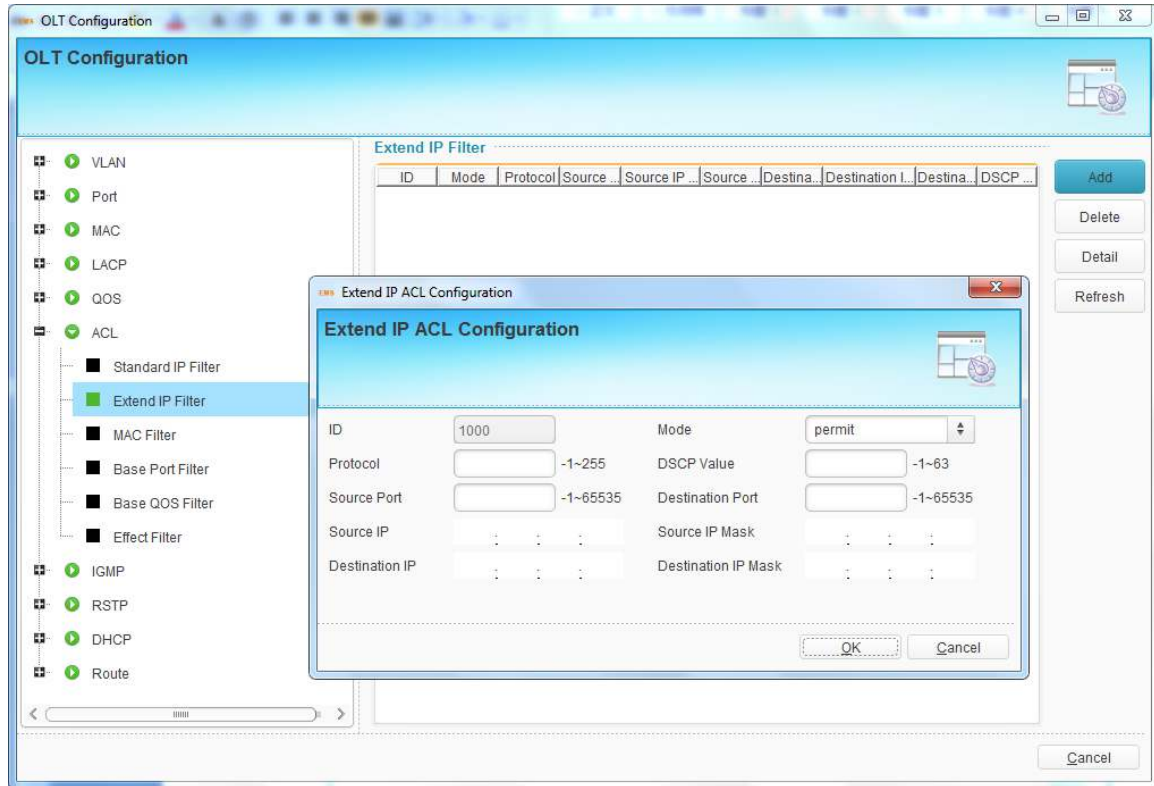


Figure 6-32 Extend IP Filter

6.3.6.3 MAC Filter

This type of ACL is based on MAC address. Filter conditions contains VLAN, cos, source MAC, destination MAC and Ethernet type.

Click "Add" button to open a pop-up dialog box, fill in parameters, then click "OK" button to apply the configurations.

Select an item and click "Delete" button to delete it.

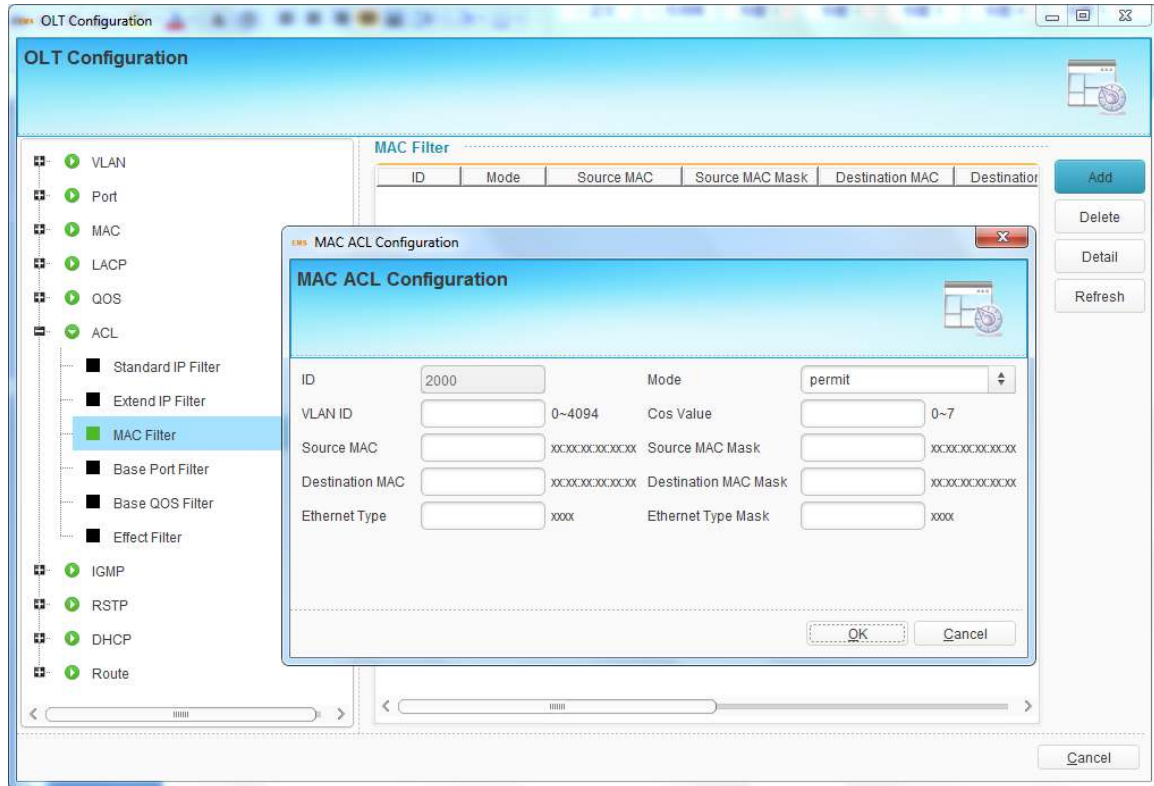


Figure 6-33 MAC Filter

6.3.6.4 Base Port Filter

This type of ACL is based on port. Nearly all the parameters related to port can be set as filter conditions. Such as MAC, IP address, VLAN, protocol and so on.

Click "Add" button to open a pop-up dialog box, fill in parameters, then click "OK" button to apply the configurations.

Select an item and click "Delete" button to delete it.

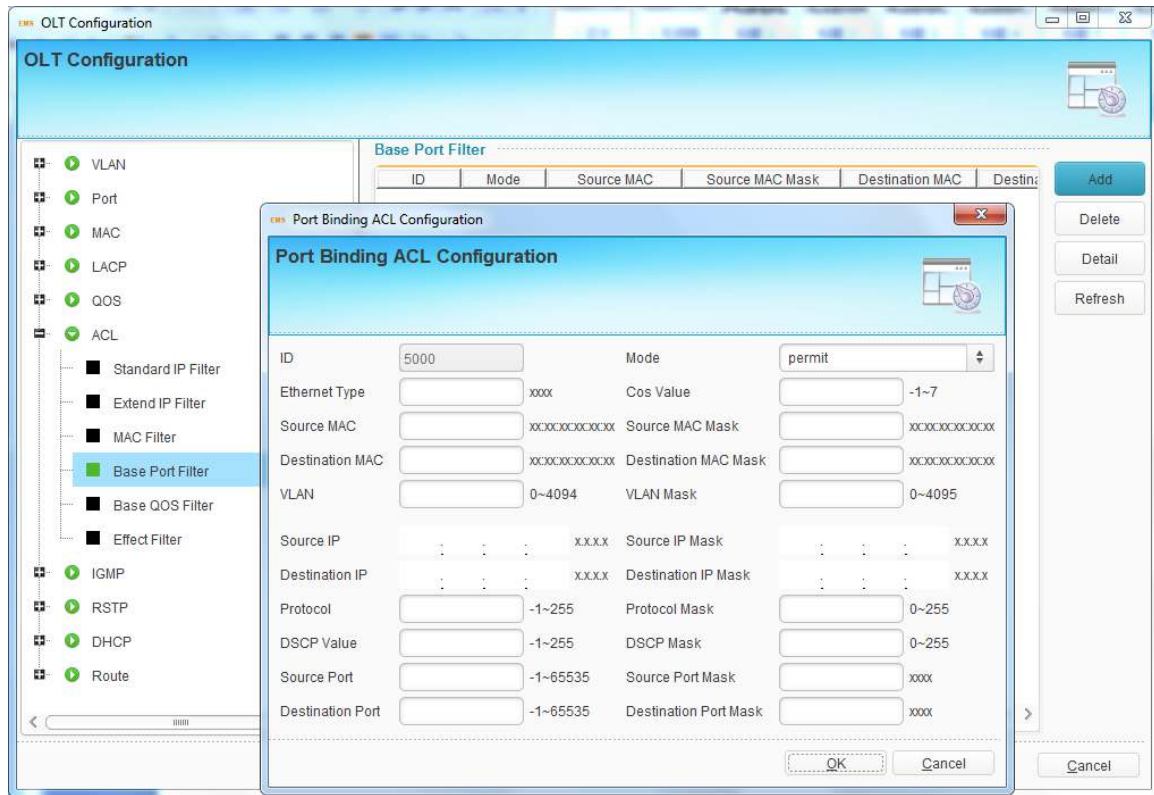


Figure 6-34 Base Port Filter

6.3.6.5 Base QoS Filter

Actually this is QoS function based on ACL. Traffic will abide by scheduling rules if it matches this type of ACL which binds to port.

Click "Add" button to open a pop-up dialog box, fill in parameters, then click "OK" button to apply the configurations.

Select an item and click "Delete" button to delete it.

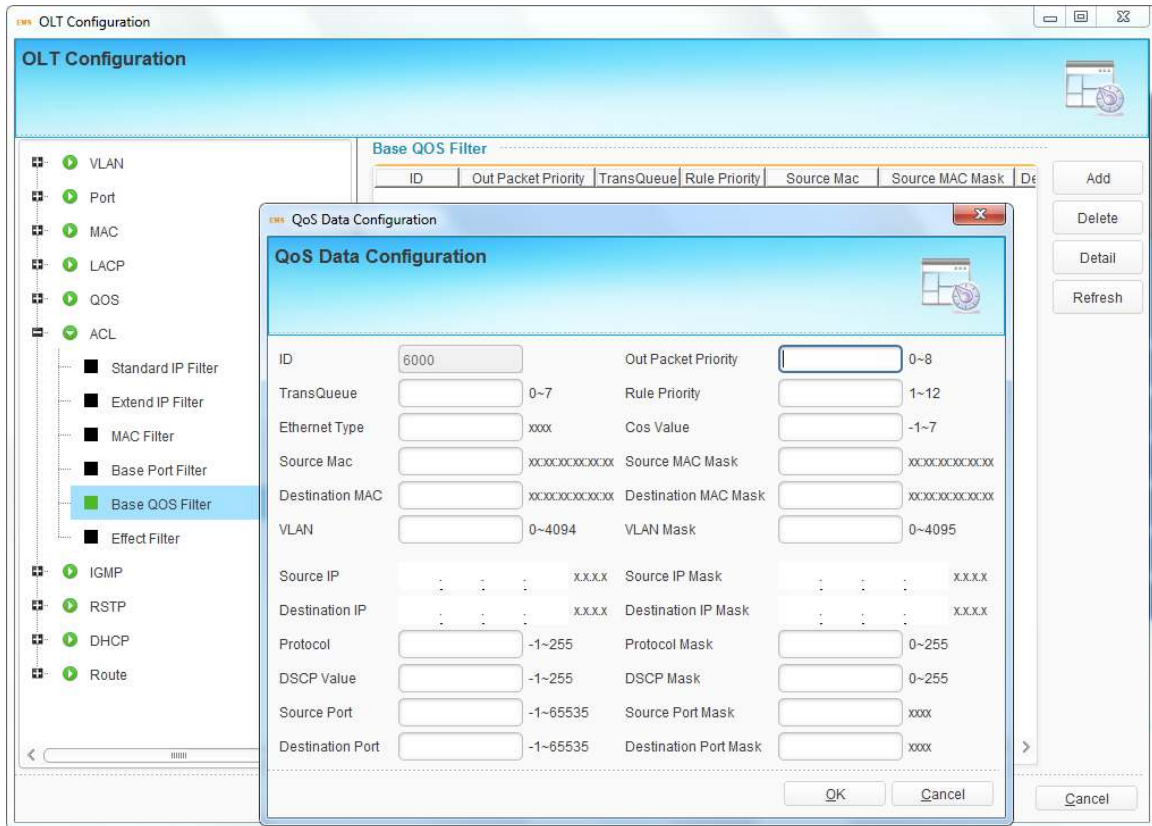


Figure 6-35 Base QoS Filter

6.3.6.6 Effect Filter

After created ACL rules, you need to bind then to ports so that the functions can take effect. The index displays automatically when ACL rule is created.

Select one ACL index, click "Select Port" button and open a pop-up dialog box, select the ports that need to bind ACL and click "OK" button. Click "Submit" to apply ACL configurations.

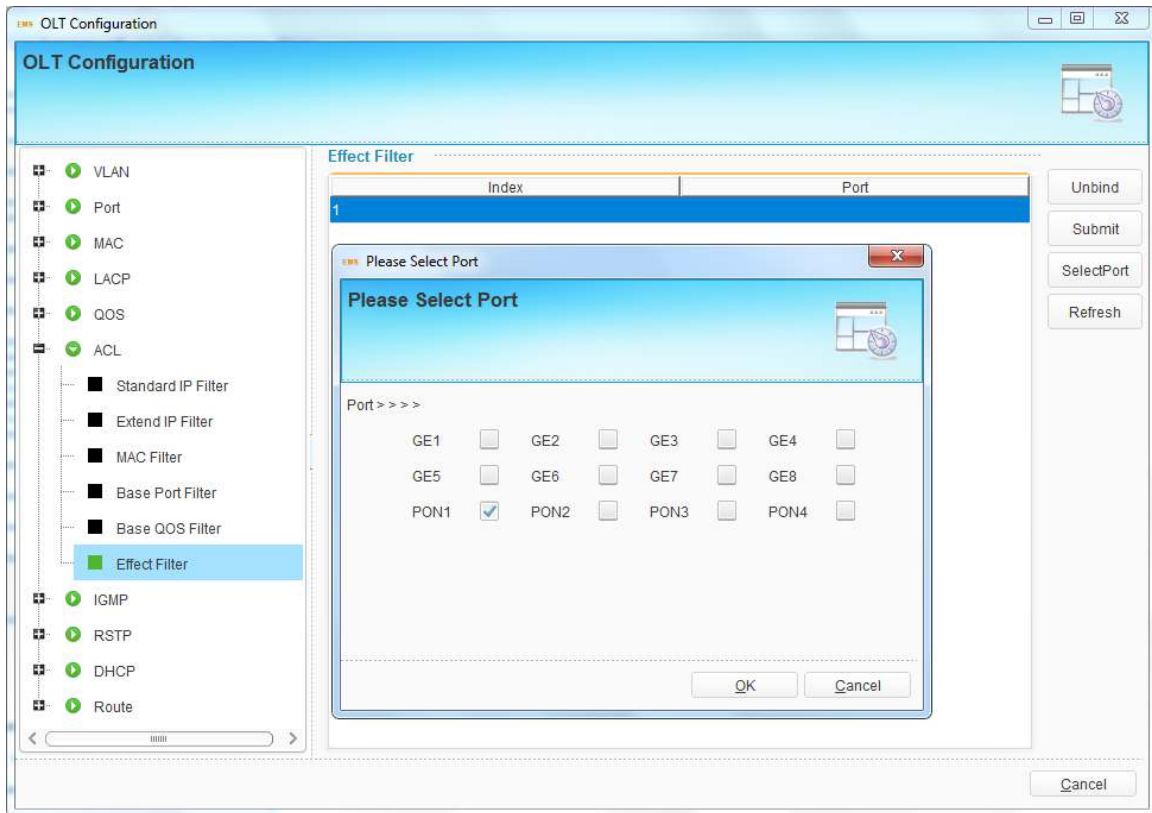


Figure 6-36 ACL Port Binding

6.3.7 IGMP Configuration

6.3.7.1 Group Member

When there is a multicast group produced, the group will display in this table.

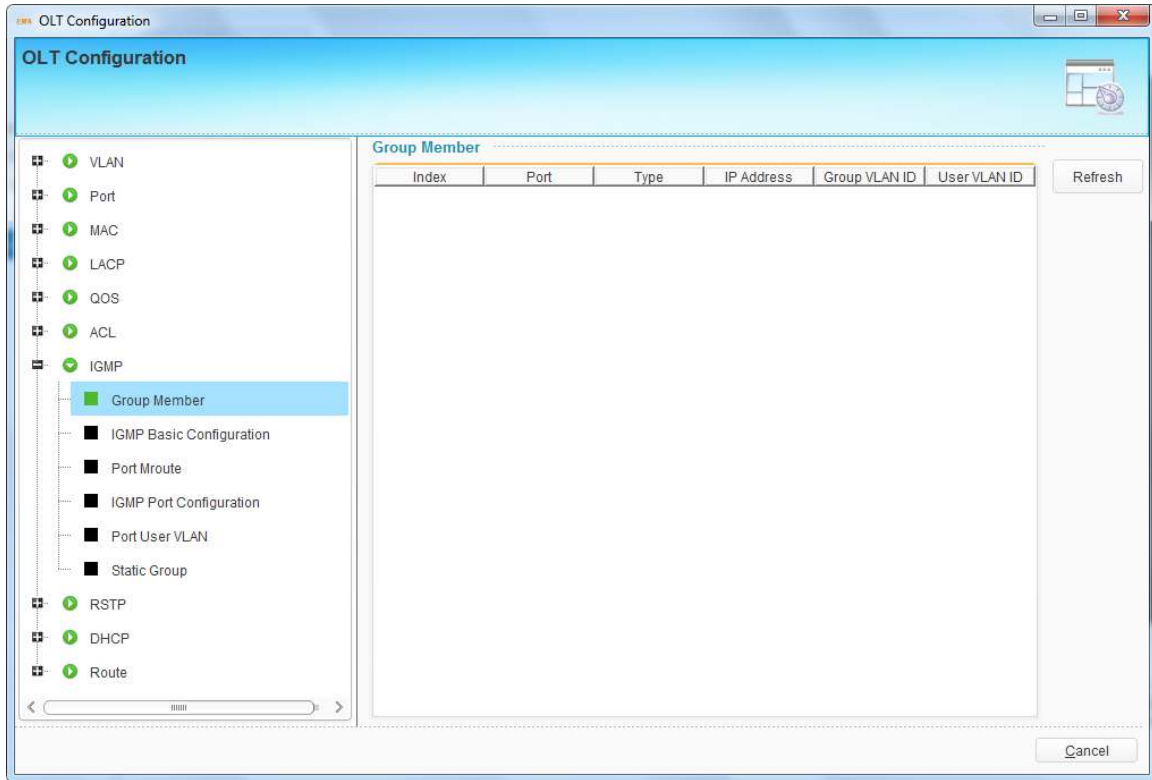


Figure 6-37 Multicast Group Member

6.3.7.2 IGMP Basic Configuration

IGMP basic configuration mainly contains parameters of query packet.

When IGMP status is checked, OLT works at IGMP snooping mode. IGMP snooping is the process of listening to Internet Group Management Protocol (IGMP) network traffic. The feature allows a network switch to "listen in" on the IGMP conversation between hosts and routers. By listening to these conversations, the switch maintains a map of which devices need which IP multicast streams. Multicasts may be filtered from the ports which do not need them and thus controls which ports receive specific multicast traffic. When IGMP status is unchecked, OLT works at transparent mode.

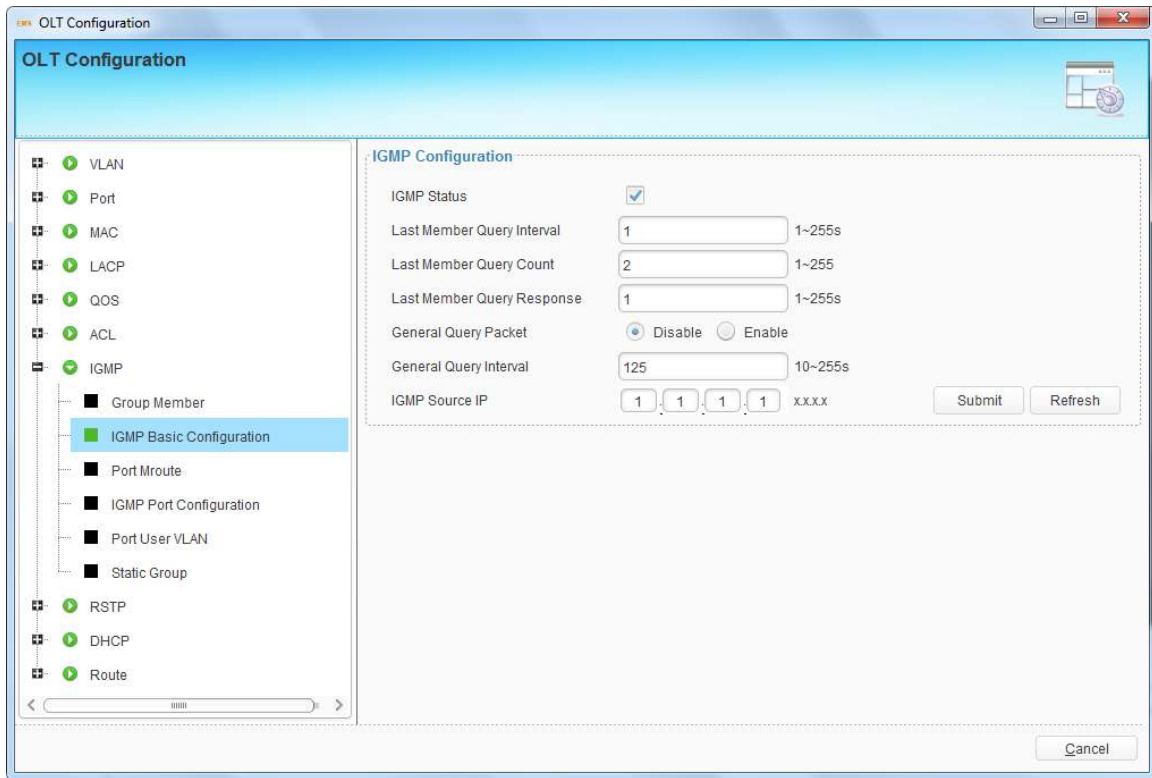


Figure 6-38 IGMP Basic Configuration

6.3.7.3 Port Mroute

Multicast router port is used to transmit IGMP signal messages. Generally, OLT uplink ports should be set as multicast router ports.

Click "Add" button, select a port and correct multicast VLAN, then click "Submit" button to apply the configurations.

Select an index and click "Delete" button to delete it.

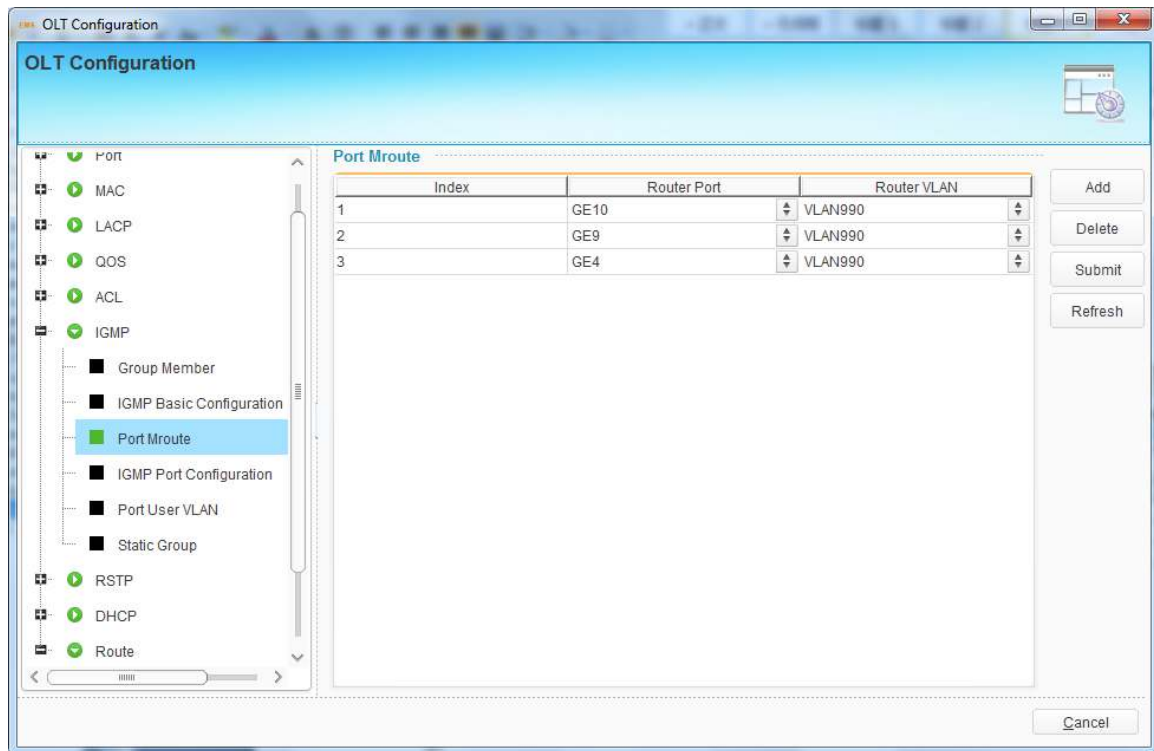


Figure 6-39 Multicast Router Port

6.3.7.4 IGMP Port Configuration

This configuration is used to set the maximum number of multicast groups, IGMP VLAN mode of ports and fast leave mode.

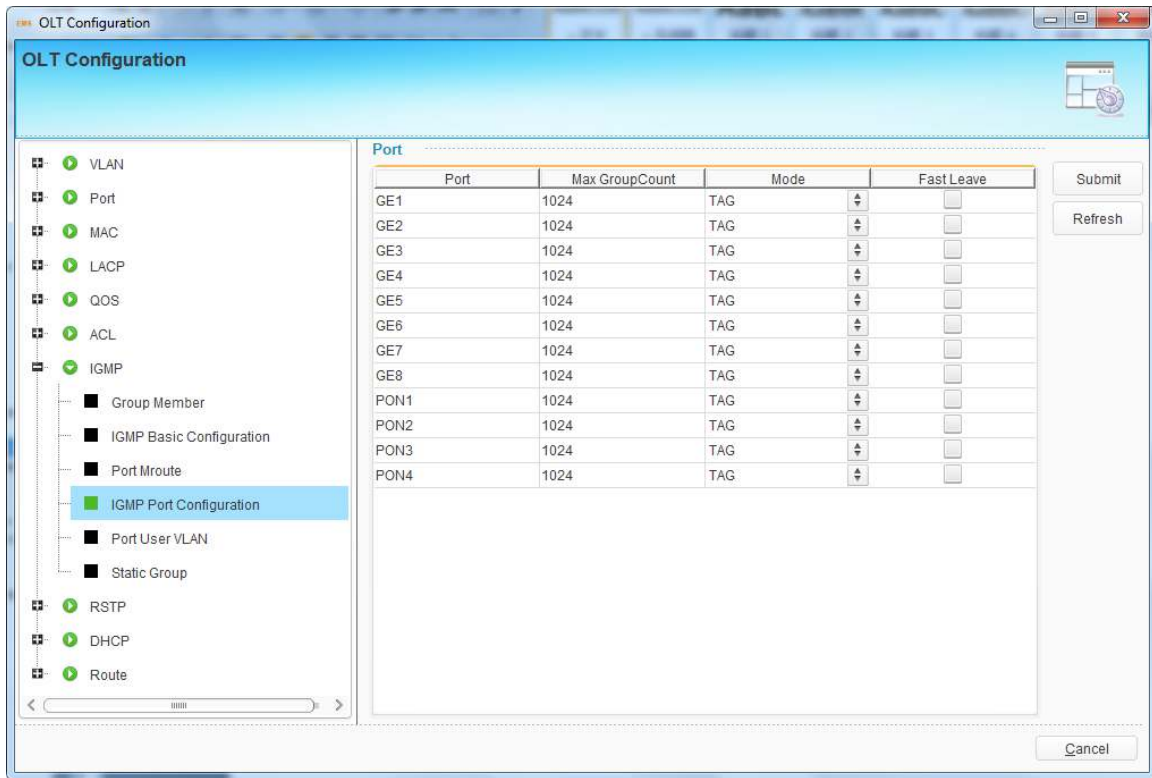


Figure 6-40 IGMP Port Configuration

6.3.7.5 Multicast VLAN—GPON

This configuration is used to set PON's unknown multicast and IGMP process mode.

Step1. Click 'Add' button to add a new multicast vlan operation record.

Step2. Click 'multicast vlan', enter the correct value.

Step3. Select unknown multicast packet process mode. Default value is drop.

Step4. Select igmp packet process mode. Default value is trap-to-cpu.

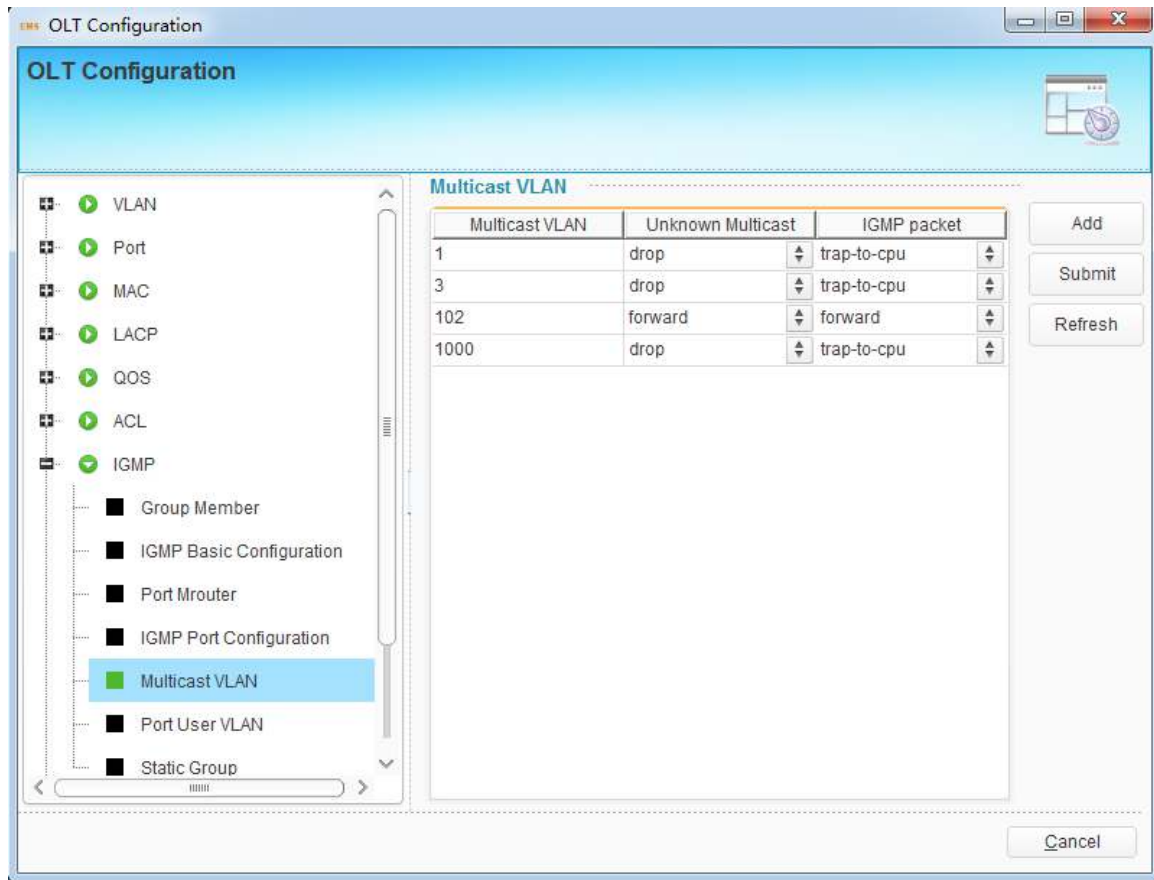


Figure 6-41 Multicast vlan operation

6.3.7.6 Port User VLAN

This configuration is used to configure IGMP VLAN for OLT. Generally, PON ports should be configured, and user VLAN and group VLAN are the same. If user VLAN and group VLAN are different, multicast VLAN will be translated.

Click "Add" button, select a port and correct user VLAN and group VLAN, then click "Submit" button to apply the configurations.

Select an index and click "Delete" button to delete it.

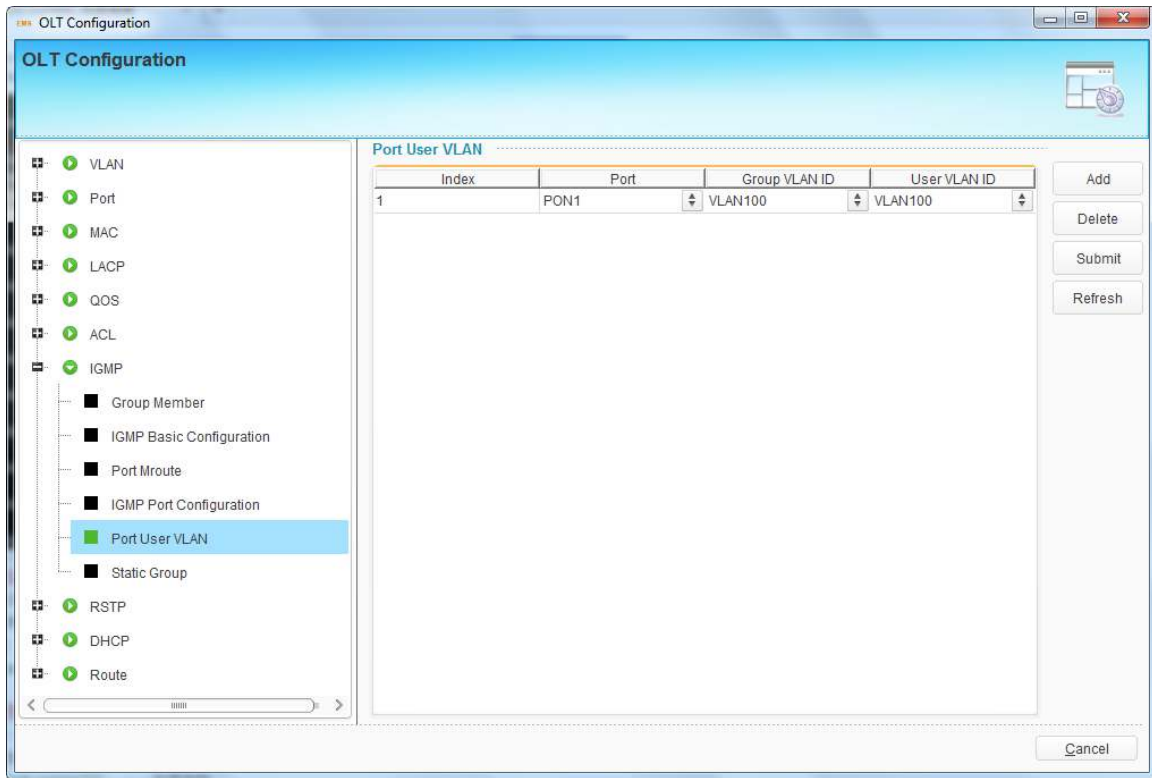


Figure 6-42 IGMP VLAN Configuration

6.3.7.7 Static Group

This configuration is used to bind multicast IP address and VLAN ID.

Click "Add" button, select a port and correct multicast VLAN, fill in multicast IP address, then click "Submit" button to apply the configurations.

Select an index and click "Delete" button to delete it.

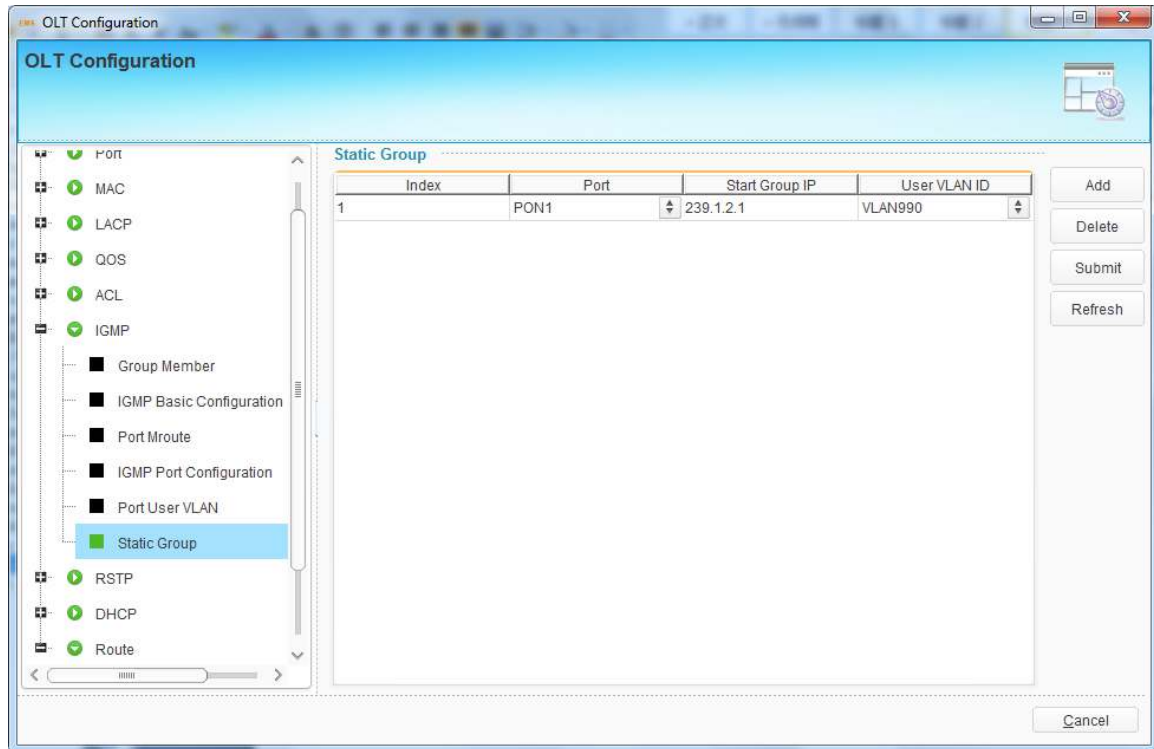


Figure 6-43 Static Group Configuration

6.3.8 RSTP Configuration

Spanning Tree Protocol is layer2 protocol, which is used to eliminate network loop by blocking network redundant links selectively. It has the feature of link backup as well.

6.3.8.1 Global Information

Global information mainly displays RSTP parameters of root bridge device.

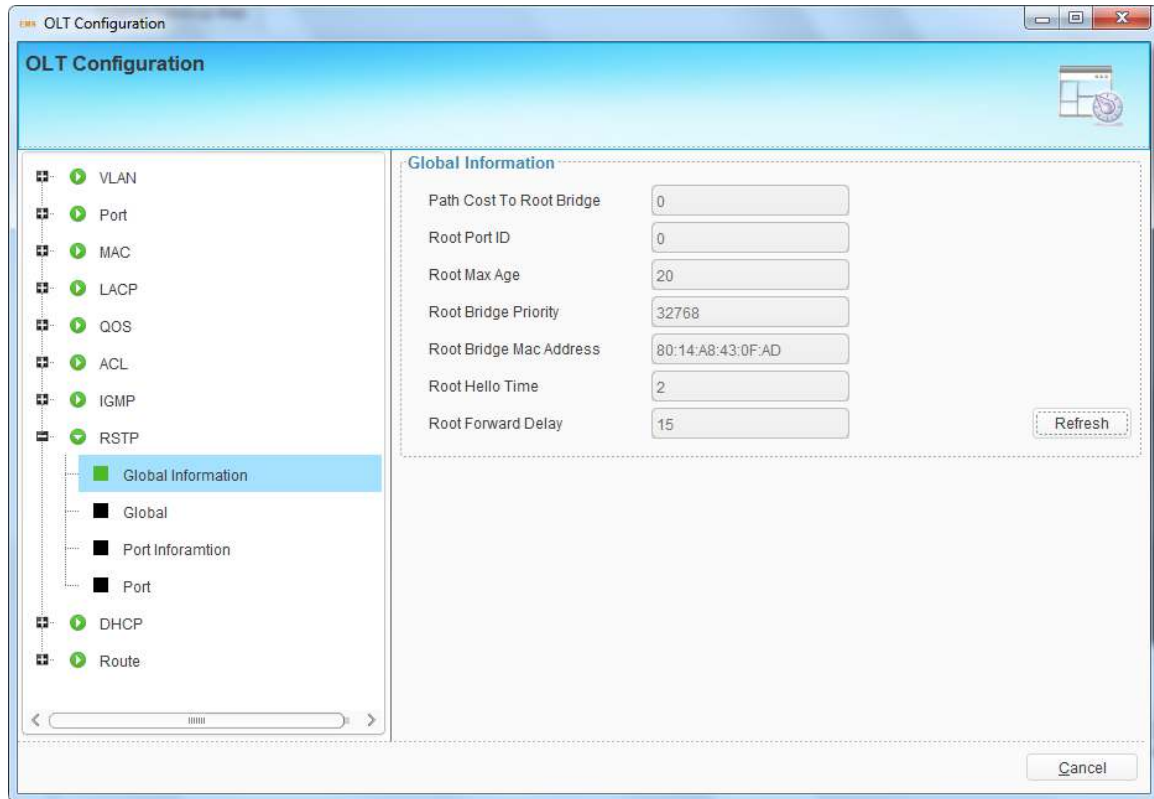


Figure 6-44 RSTP Global Information

6.3.8.2 Global Configuration

This configuration is used to set RSTP parameters of the device, which contains RSTP switch, priority, hello time, max age, forward delay and MAC address.

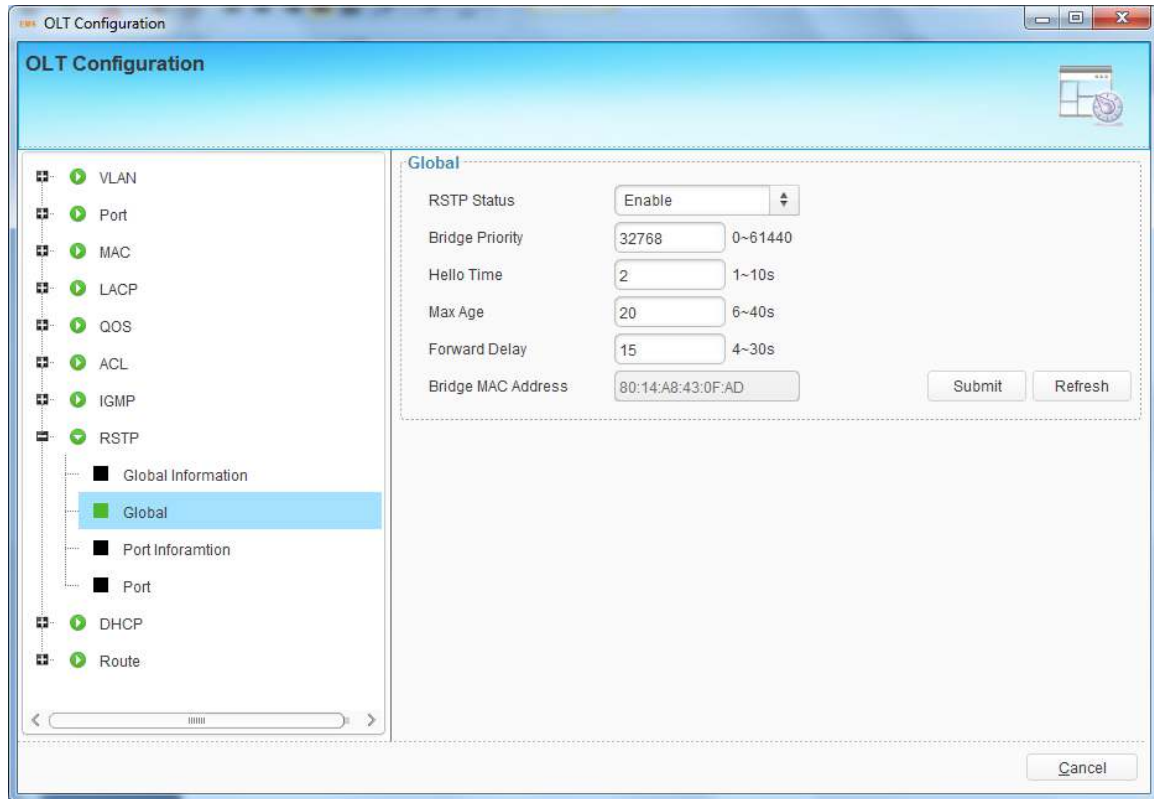


Figure 6-45 RSTP Global Configuration

6.3.8.3 Port Information

Port information displays the status and RSTP parameters of all active ports.

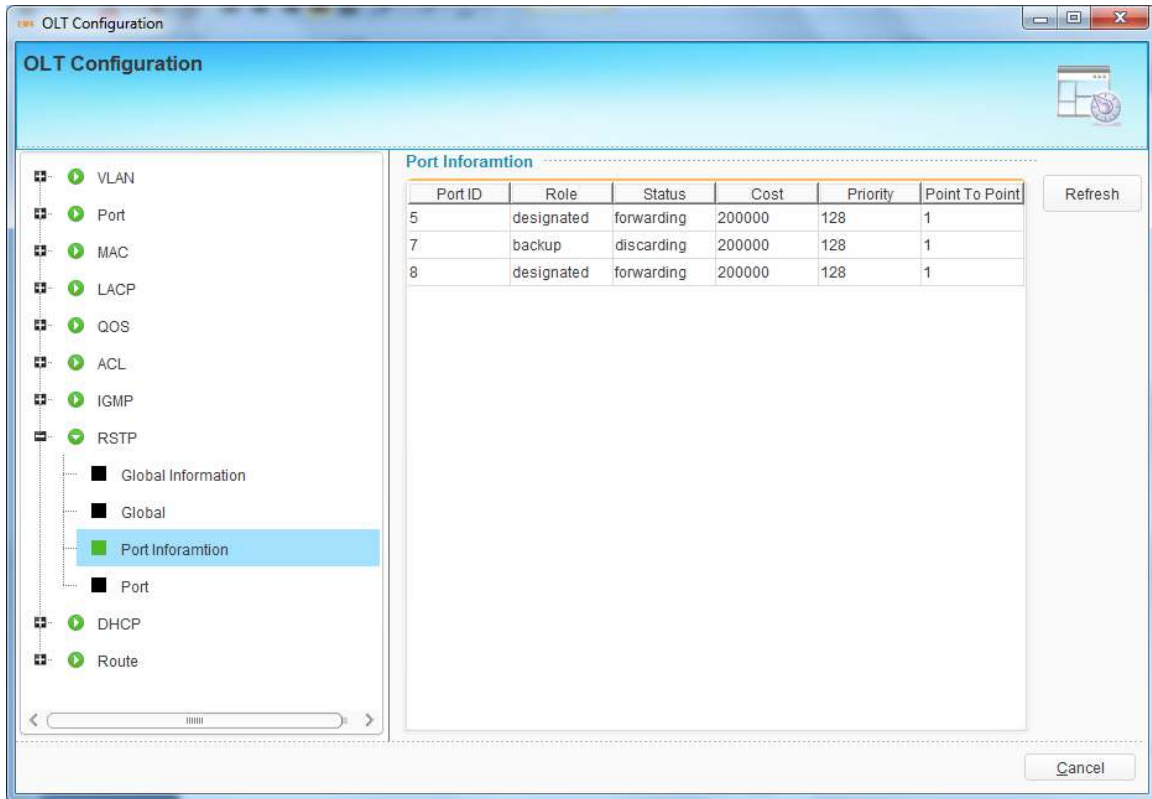


Figure 6-46 RSTP Port Information

6.3.8.4 Port Configuration

This user interface is used to set port RSTP parameters which contain RSTP switch, priority, cost, edge port and p2p port.

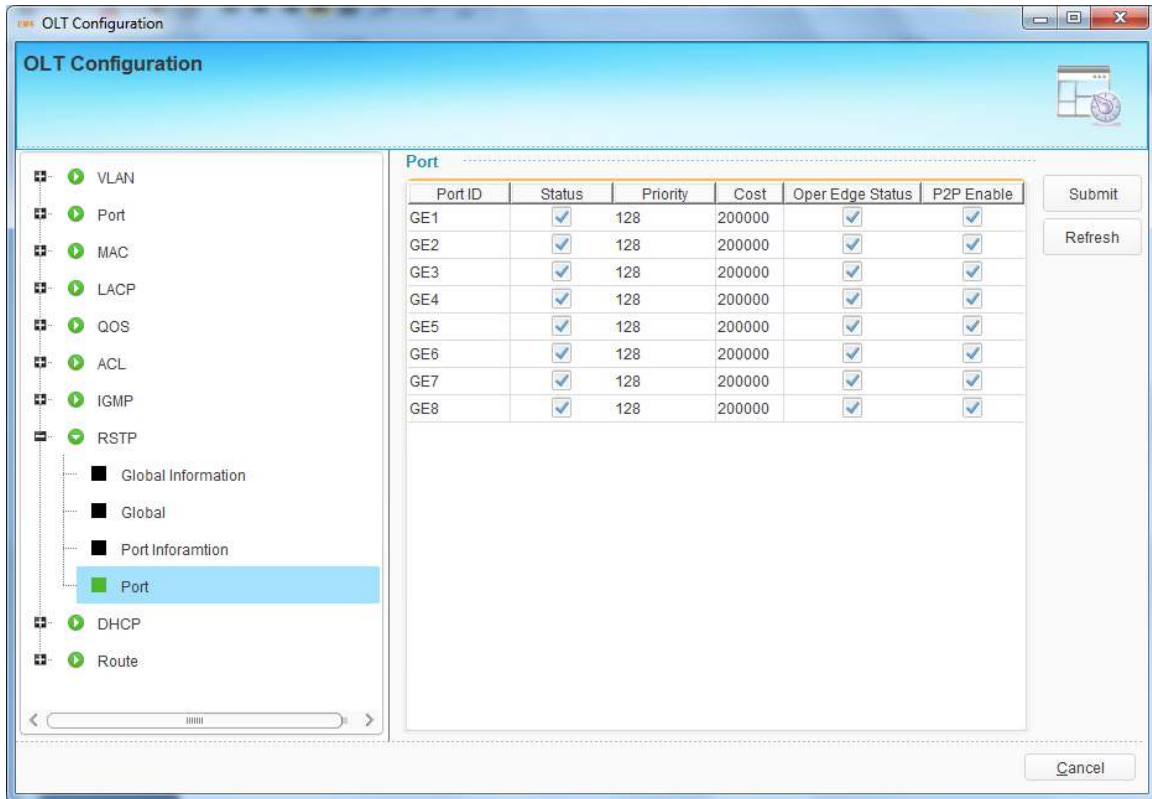


Figure 6-47 RSTP Port Configuration

6.3.9 DHCP Configuration

OLT can support the following DHCP functions.

- DHCP Server
- DHCP Relay
- DHCP Snooping

6.3.9.1 Server Configuration

Sometimes the devices need dynamic IP addresses, but there is no special DHCP server in network. These configurations can solve the problem. OLT will be a DHCP

server in network and assign IP addresses to other devices.

Before enabling DHCP server, you must configure IP address for the VLAN.

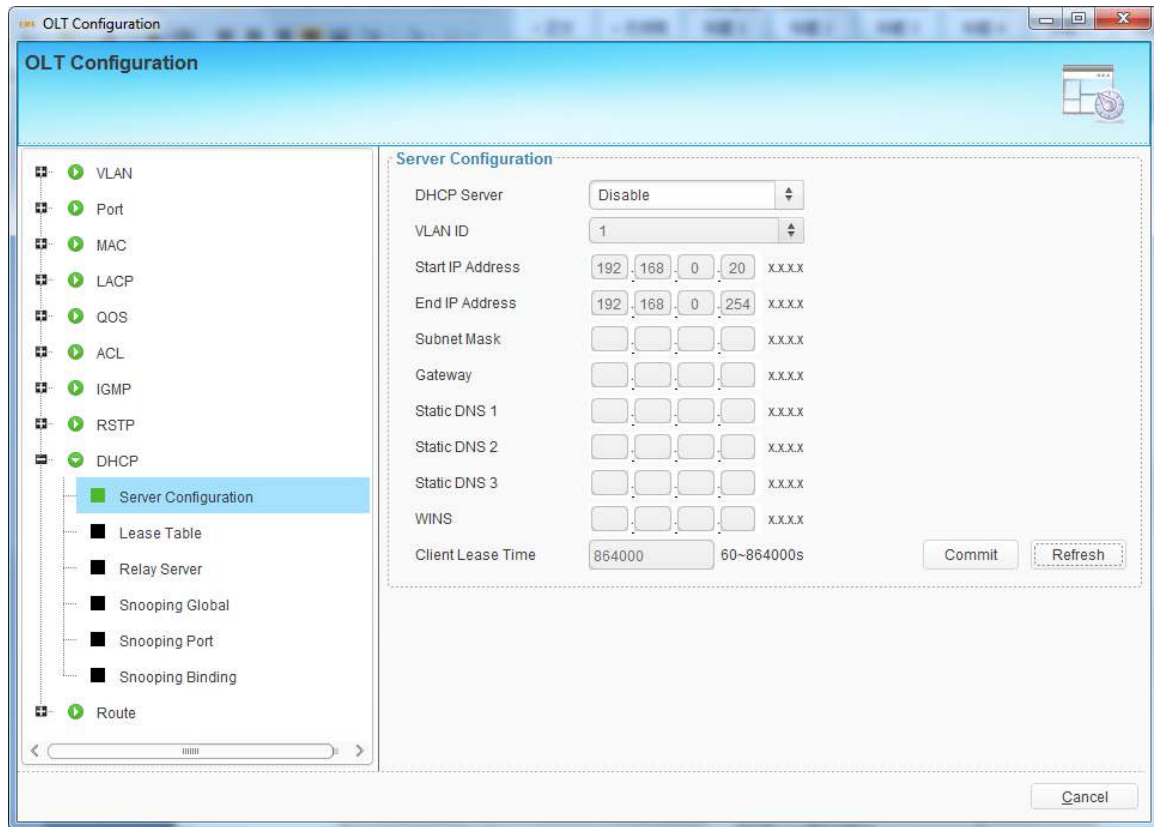


Figure 6-48 DHCP Server Configuration

6.3.9.2 Lease Table

This table displays IP addresses assigned and their MAC addresses, lease time.

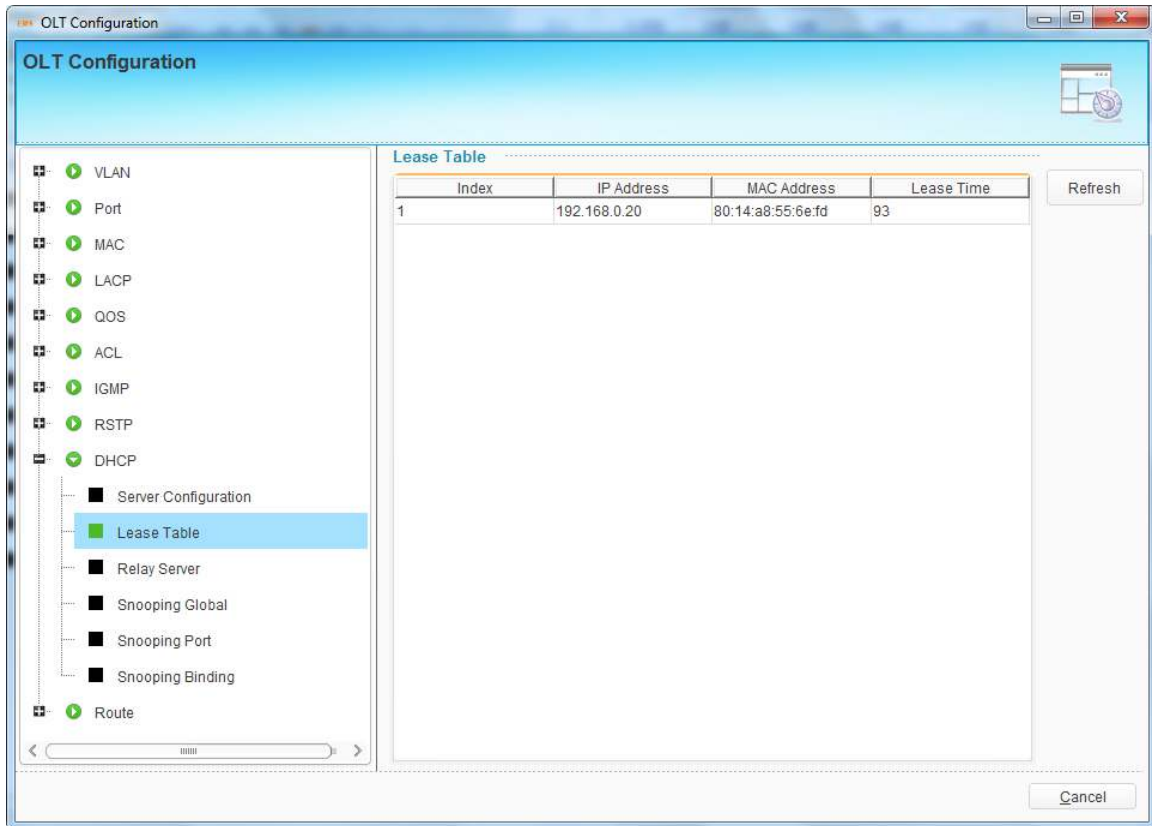


Figure 6-49 DHCP Lease Table

6.3.9.3 Relay Server

Because the DHCP service exists in one broadcast domain, the server and the client are usually in the same network segment. DHCP relay can solve the issue that DHCP server and client do not exist in the same network segment.

Click "Add" button, select a VLAN and fill in DHCP server IP address, then click "Submit" button to apply configurations.

Select an item and click "Delete" button to delete it.

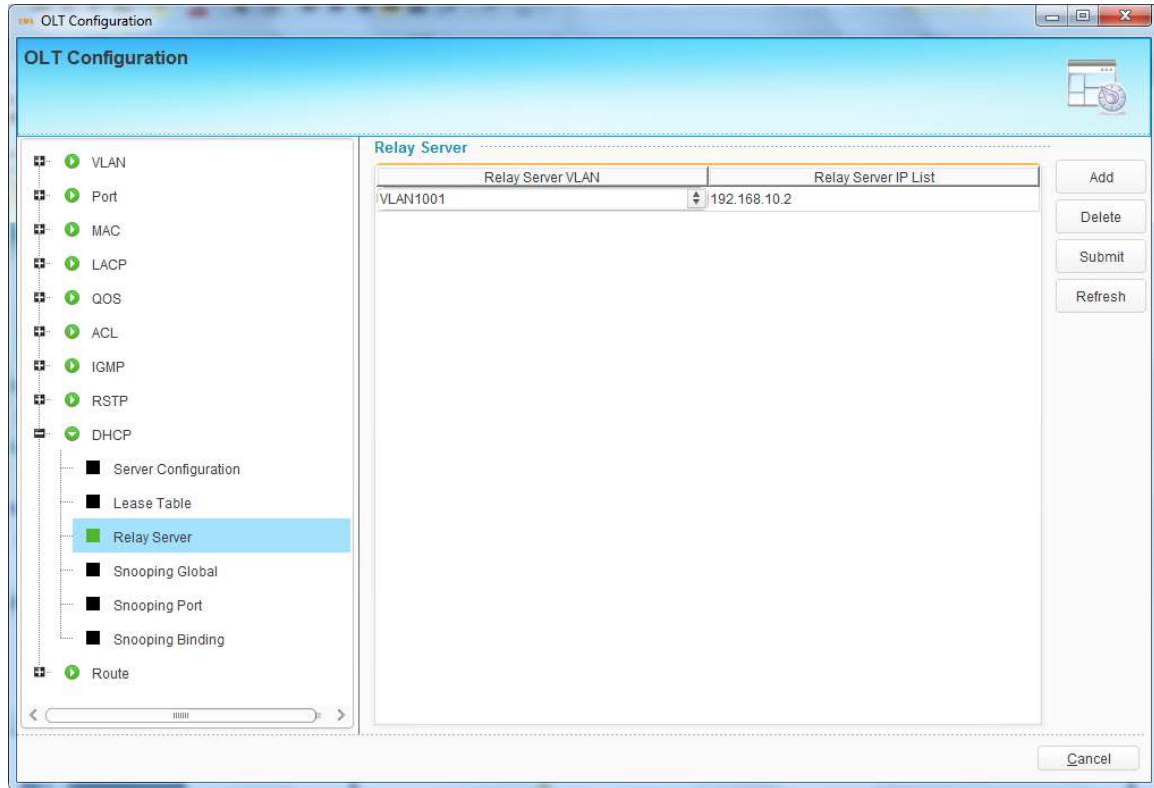


Figure 6-50 DHCP Relay Configuration

6.3.9.4 Snooping Global

DHCP Snooping is used to prevent the DHCP message attacking and guarantee network to get a correct IP address.

DHCP snooping global configuration mainly contains option 82 settings, DHCP traffic rate limit and snooping VLAN.

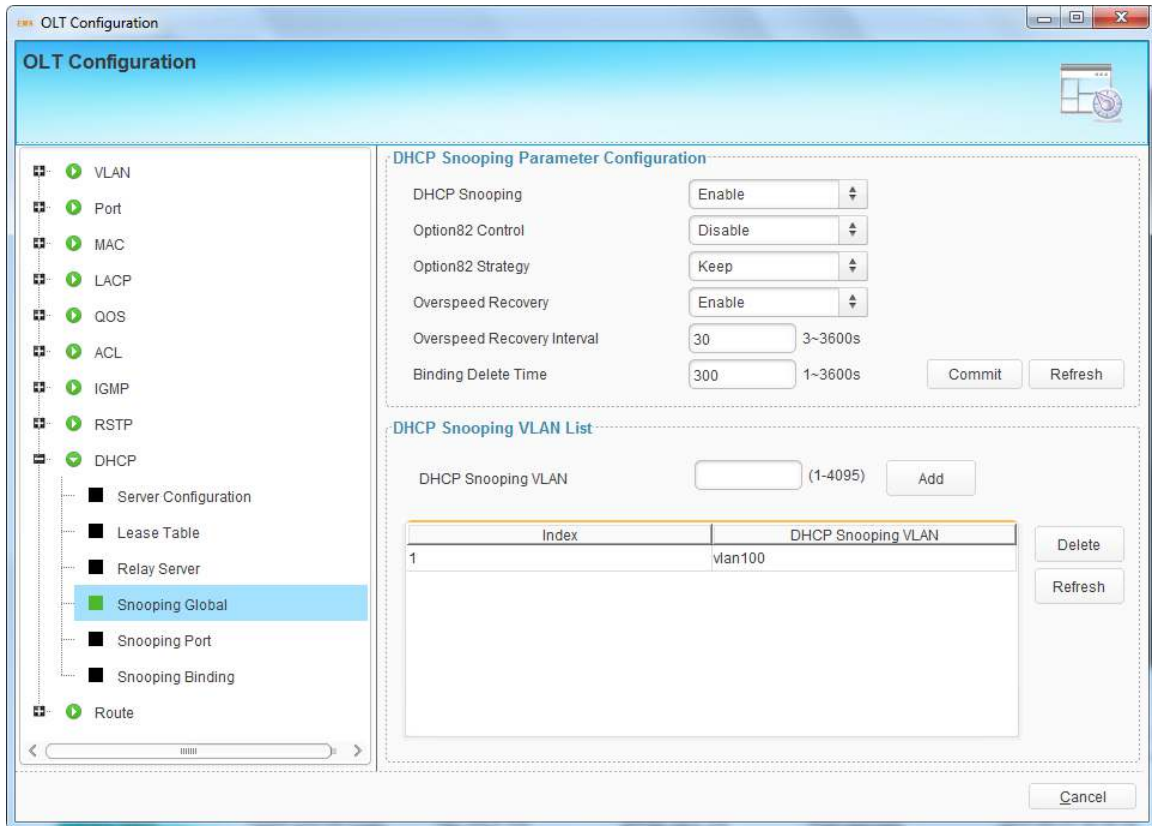


Figure 6-51 DHCP Snooping Global Configuration

6.3.9.5 Snooping Port

This user interface is used to configure DHCP snooping parameters of ports which contain port type, option 82 parameters and rate limit.

All the ports are untrust ports by default. Option82 parameters, "Option 82 Circuit ID" and "Option 82 Remote ID", are effective for untrust ports. "Limit Rate" is the ports' max speed of receiving DHCP packets.

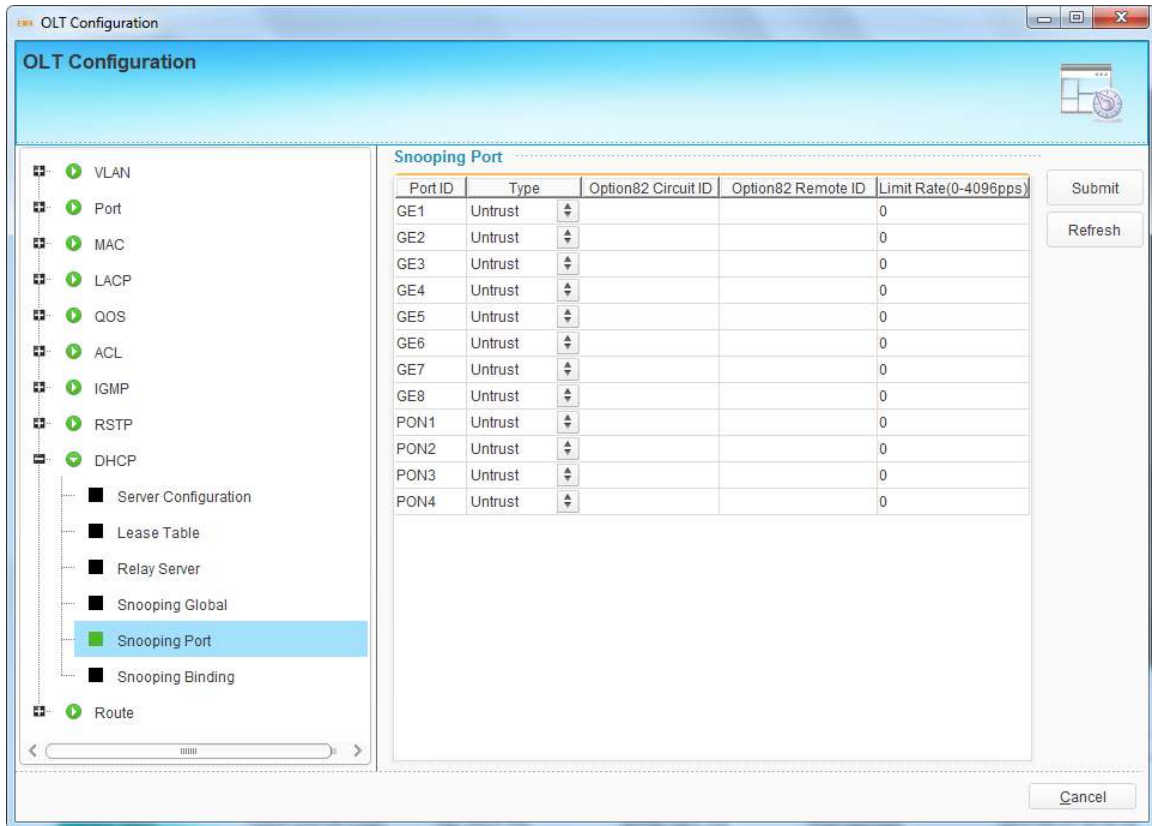


Figure 6-52 DHCP Snooping Port Configuration

6.3.9.6 Snooping Binding

DHCP snooping binding is useful when a host needs a fixed IP address assigned by DHCP server from the specific port.

Click "Add" button to open a pop-up dialog box, fill in all the parameters, select ports and click "OK" button to apply configurations.

Select an item and click "Delete" button to delete it.

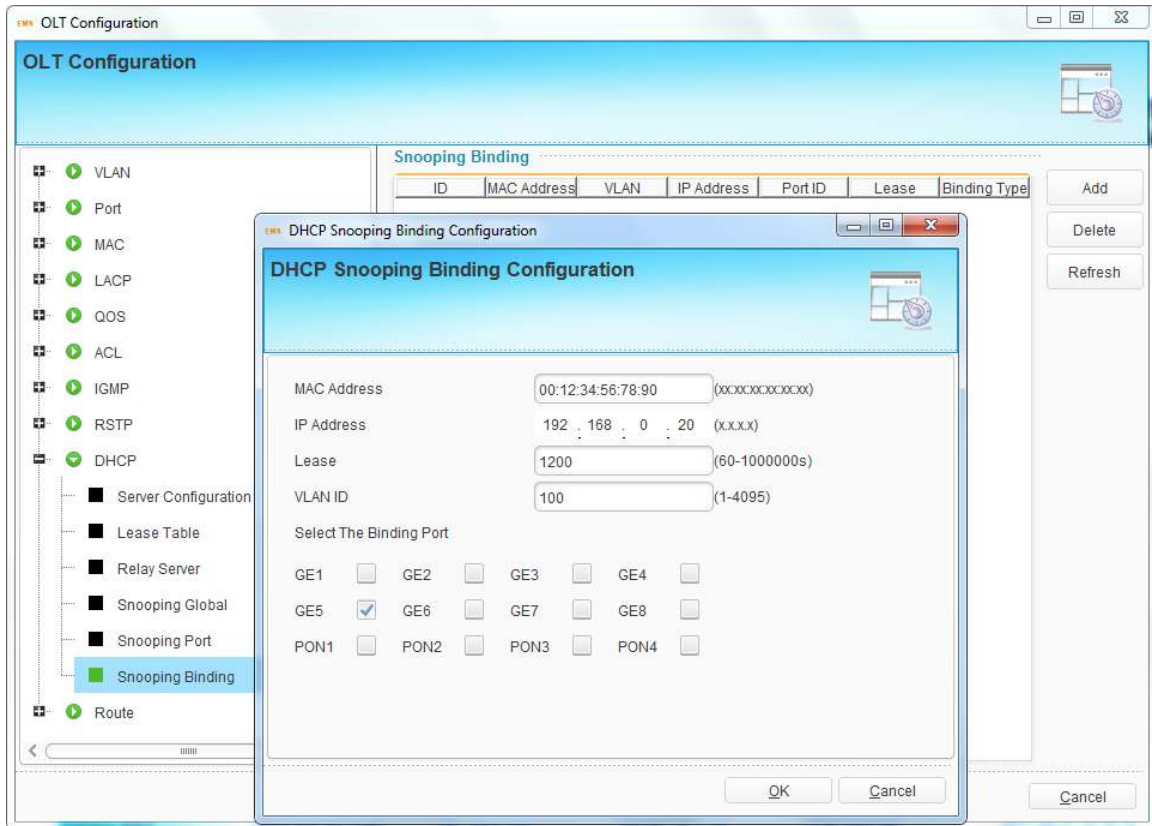


Figure 6-53 DHCP Snooping Binding

6.3.10 Route Configuration

6.3.10.1 VLAN IP

This configuration is used to configure IP address for VLAN. When the VLAN is added to a port, you can access OLT by the IP address from the port.

Click "Add" button, select a VLAN and fill in IP address and mask, then click "Submit" button to apply configurations.

Select an item and click "Delete" button to delete it.

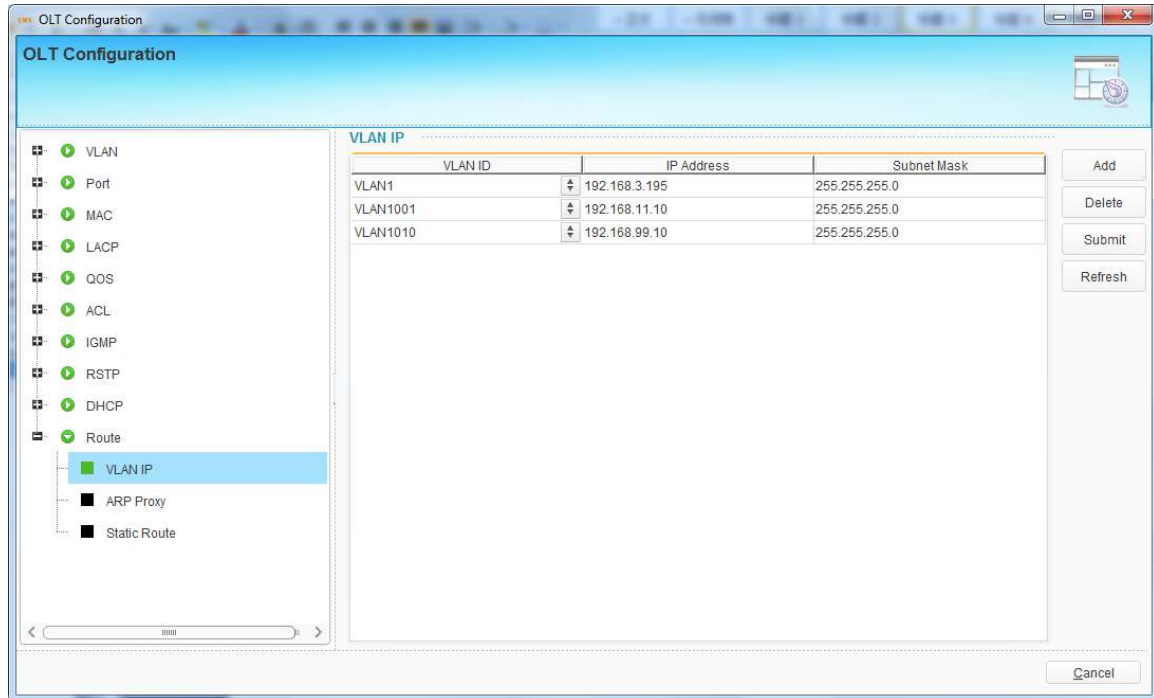


Figure 6-54 VLAN IP Configuration

6.3.10.2 ARP Proxy

ARP Proxy is a technique by which a device on a given network answers the ARP queries for a network address that is not on that network. The ARP Proxy is aware of the location of the traffic's destination, and offers its own MAC address as (ostensibly final) destination. The "captured" traffic is then typically routed by the Proxy to the intended destination via another interface or via a tunnel.

The process which results in the node responding with its own MAC address to an ARP request for a different IP address for proxying purposes is sometimes referred to as 'publishing'.

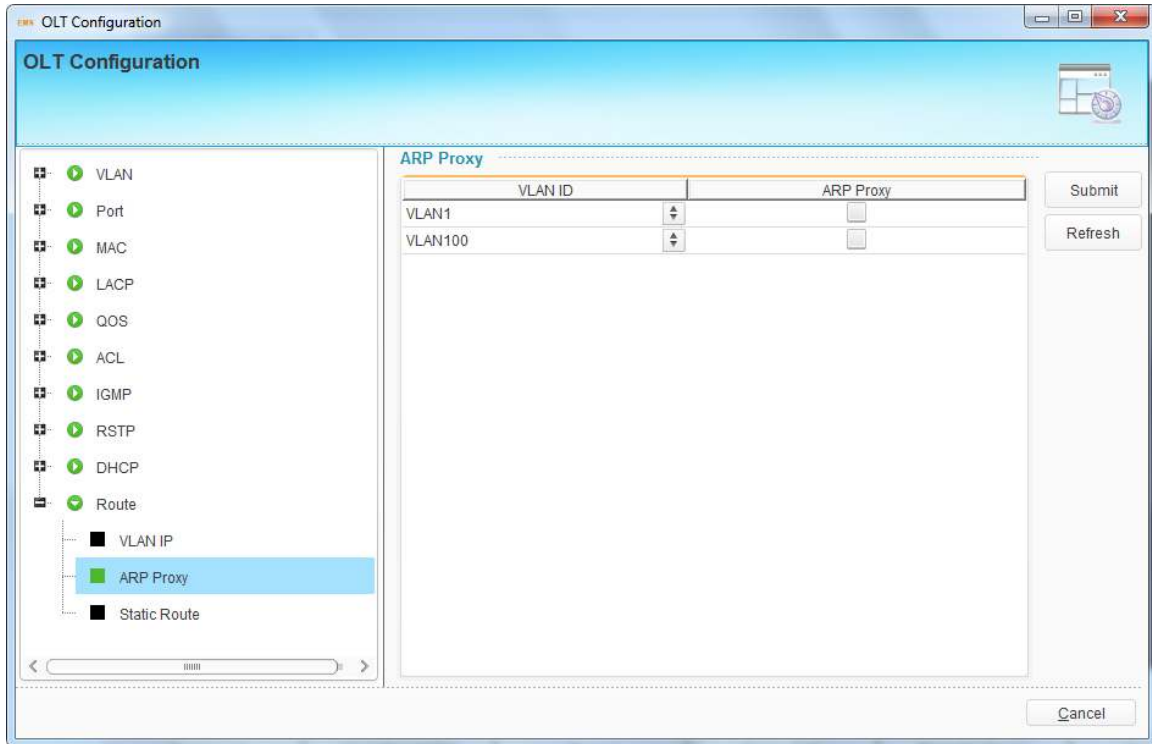


Figure 6-55 ARP Proxy

6.3.10.3 Static Route

Static route is a form of routing that a router uses a manually-configured routing entry. In many cases, static routes are manually configured by a network administrator. Unlike dynamic routing, static routes are fixed and do not change if the network is changed or reconfigured.

The OLT only supports static route. After configured VLAN IP address, add static routes to make the network on the different network segment communicate with each other.

Click "Add" button, fill in destination network address, mask, and gateway, then click "Submit" button to apply configurations.

Select an item and click "Delete" button to delete it.

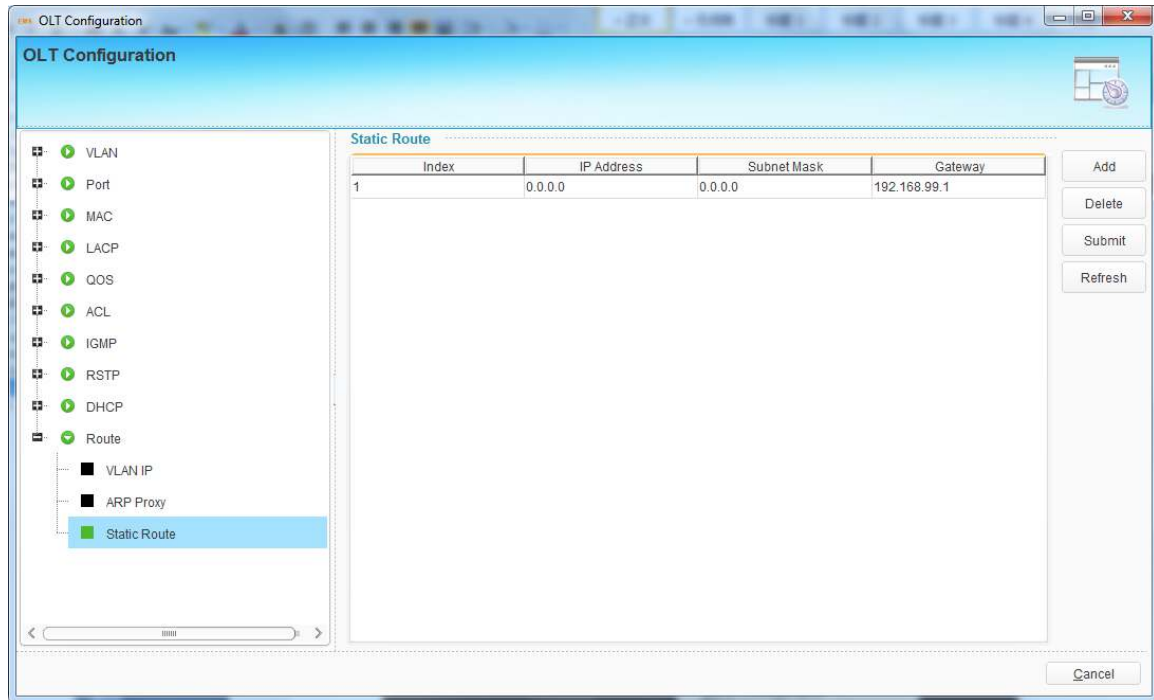


Figure 6-56 Static Route

6.4 OLT Maintenance Management

6.4.1 Save Device Config

When configurations are completed or changed, you should save them to flash so that they will not get lost after OLT restart or power off.

Right click OLT icon, choose "Maintenance Management" > "Save Device Config" to open a pop-up dialog box.

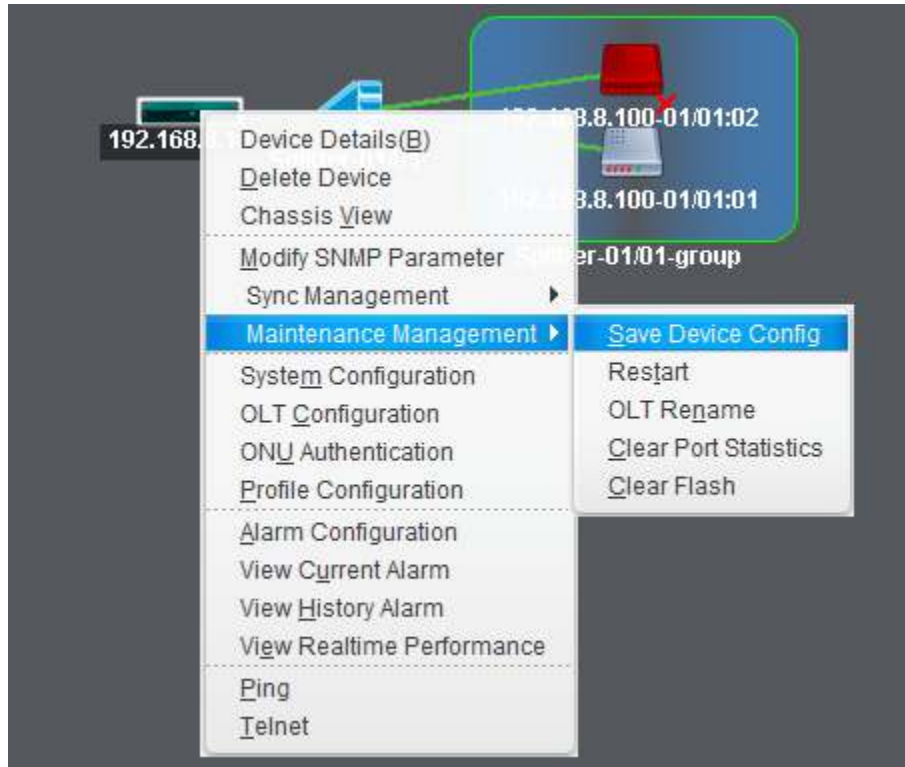


Figure 6-57 Save Device Configurations

Click "Yes" button to save the current device configuration.



Figure 6-58 Save Configurations Dialog Box

6.4.2 Restart

This command is used to restart OLT. It will cause all services interruption, be careful to execute.

Right click OLT icon, choose " Maintenance Management" >" Restart" to open a pop-up dialog box.

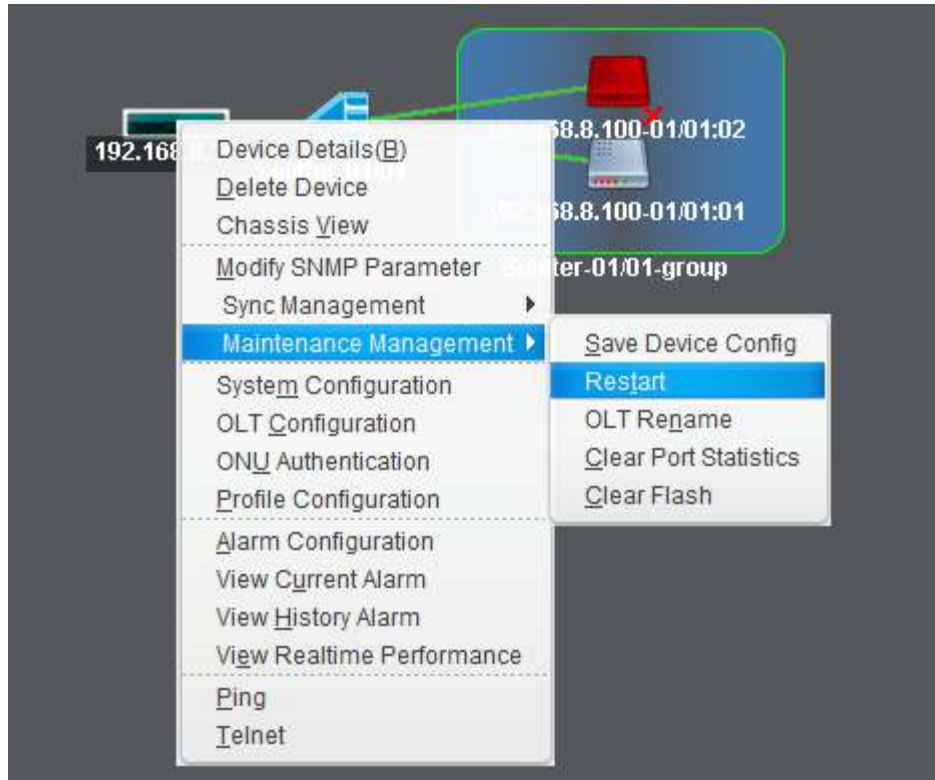


Figure 6-59 Restart Device

Click "Yes" button to restart OLT.



Figure 6-60 Restart Device Dialog Box

6.4.3 OLT Rename

You can change OLT name so that it is easily to be recognized when there are many devices in EMS.

Right click OLT icon, choose " Maintenance Management" >" OLT Rename" to open a pop-up dialog box.

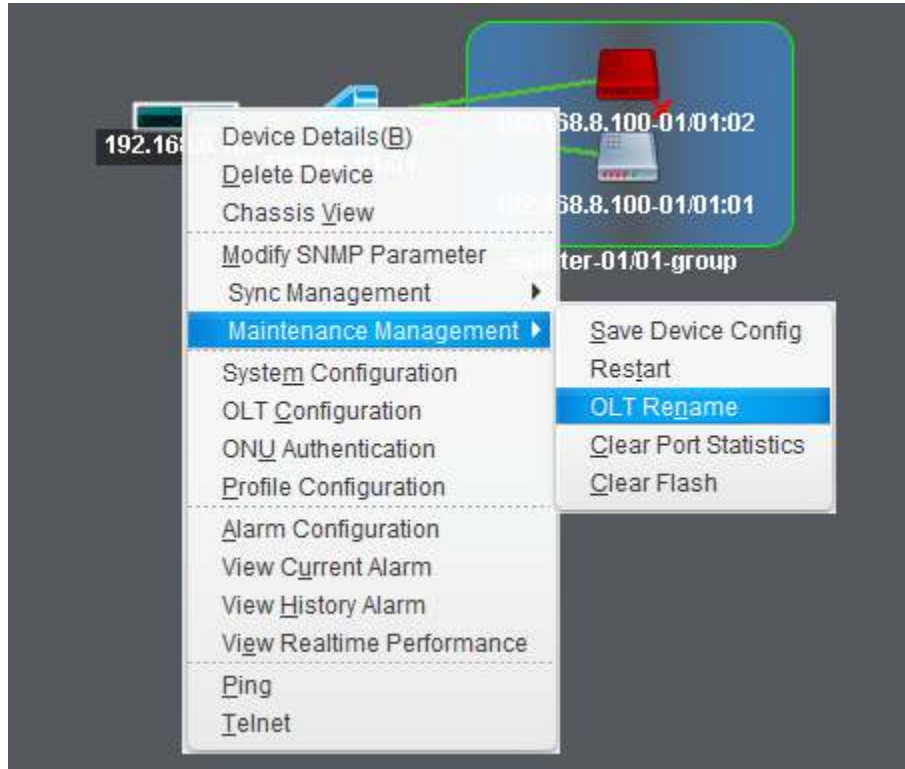


Figure 6-61 OLT Rename

Fill in OLT name and click "OK" button to apply.

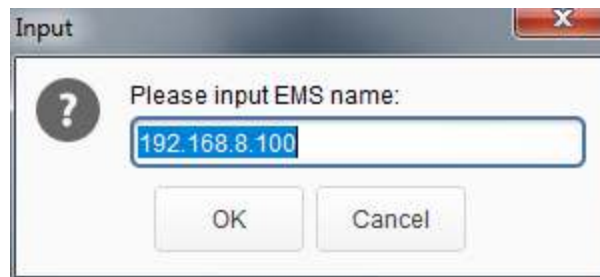


Figure 6-62 OLT Rename dialog Box

6.4.4 Clear Port Statistics

This command is used to clear statistics of all OLT ports.

Right click OLT icon, choose " Maintenance Management" > " Clear Port Statistics" to open a pop-up dialog box.

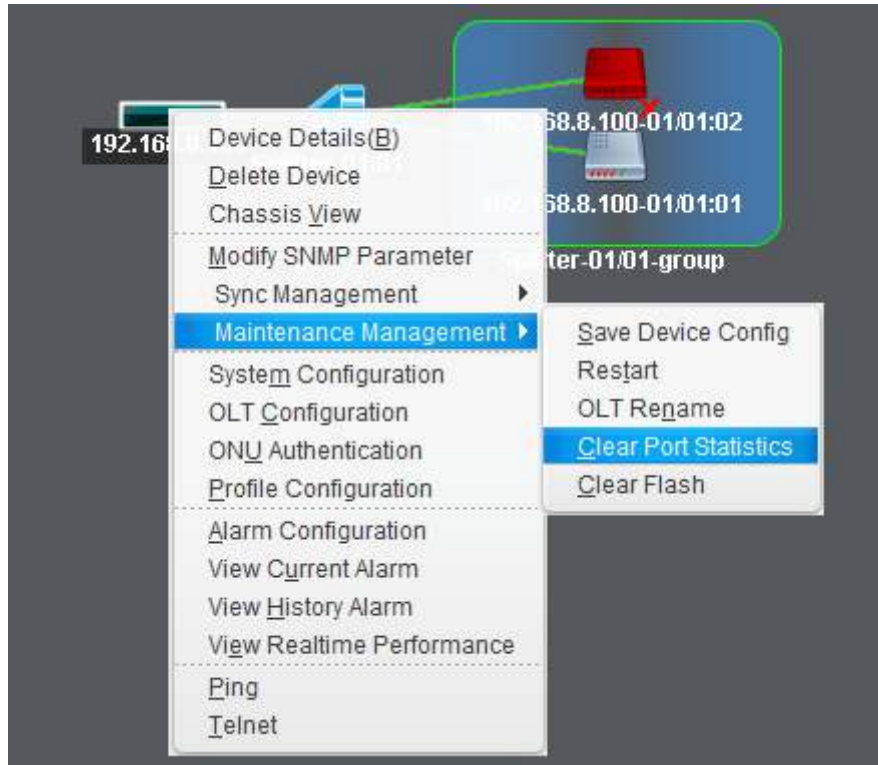


Figure 6-63 Clear Port Statistics

Click "Yes" button to clear statistics of all ports.

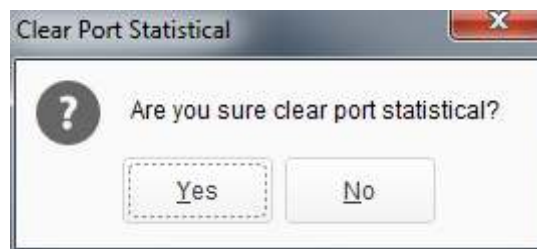


Figure 6-64 Clear Port Statistics Dialog Box

6.4.5 Clear Flash

This command is used to clear OLT configurations that have saved in flash. It will make OLT restore to factory default settings. OLT will restart automatically after configurations are cleared.

Right click OLT icon, choose " Maintenance Management" > " Clear Flash" to open

a pop-up dialog box.

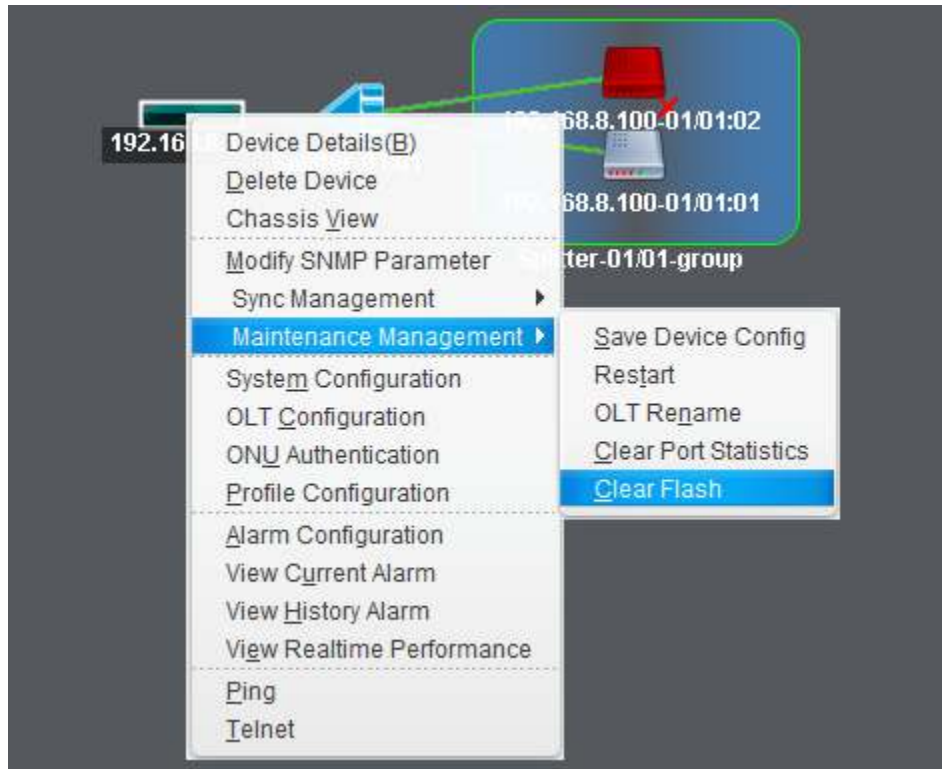


Figure 6-65 Clear Flash

Click "Yes" button to clear flash.

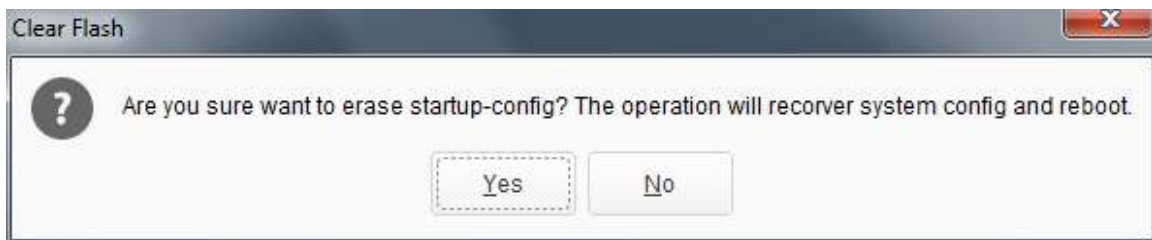


Figure 6-66 Clear Flash Dialog Box

7. ONU Authentication--EPON

This chapter mainly introduces ONU authentication.

Right click OLT icon, choose "ONU Authentication" to open the authentication configuration interface.

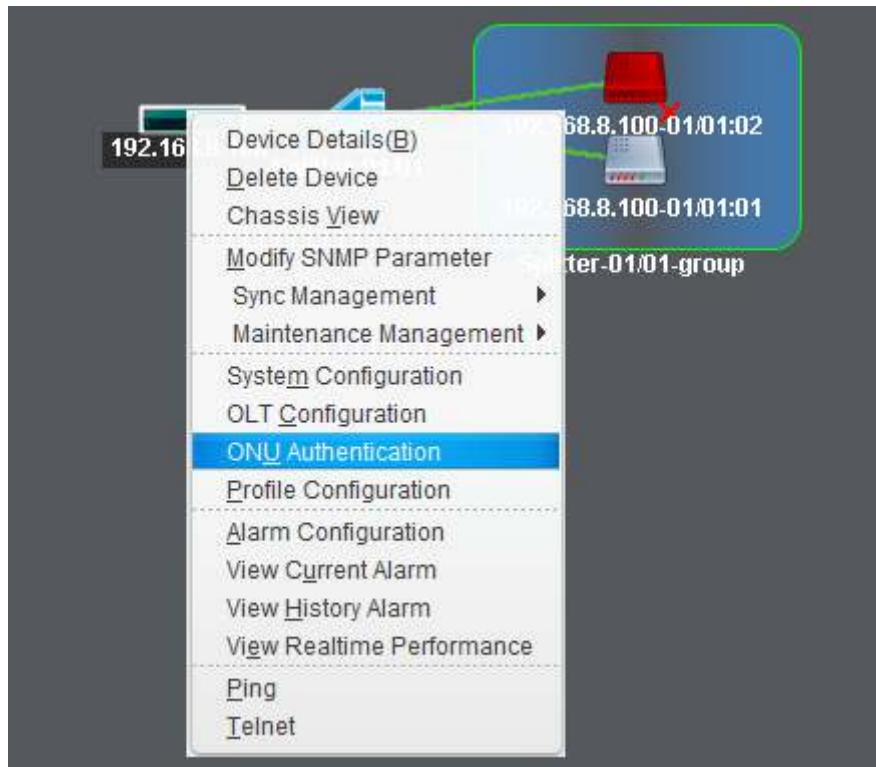


Figure 7-1 ONU Authentication

7.1 ONU Authentication

7.1.1 Authentication Mode

Authentication mode contains MAC, LOID, Hybrid mode and None. If don't want unknown ONU to register, you should select MAC, LOID or Hybrid mode. In this

case, ONU must be added into white list.

You must add MAC white list when using MAC authentication mode while add LOID white list when using LOID authentication mode. Add either MAC or LOID white list when using hybrid authentication mode.

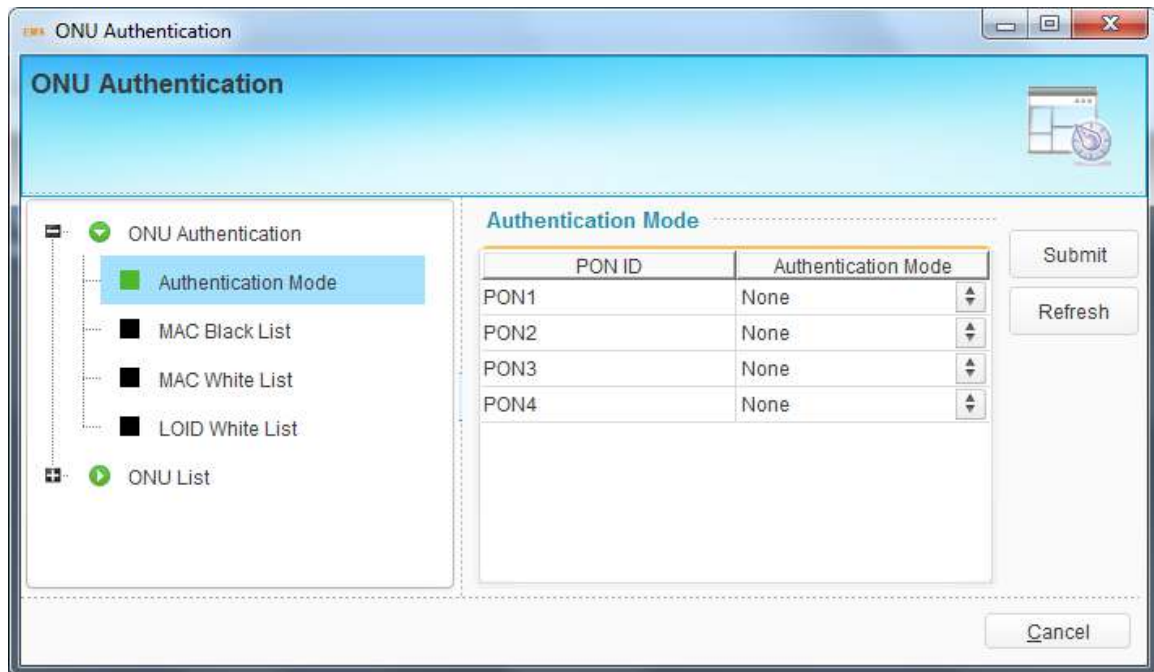


Figure 7-2 Authentication Mode

7.1.2 MAC Black List

MAC black list is used to block ONU to be authenticated even it has been added into white list. The MAC black list is also effective for LOID authentication mode and none authentication mode.

Click "Add" button, fill in MAC address, then click "Submit" button to apply the configurations.

Select an item and click "Delete" button to delete it.

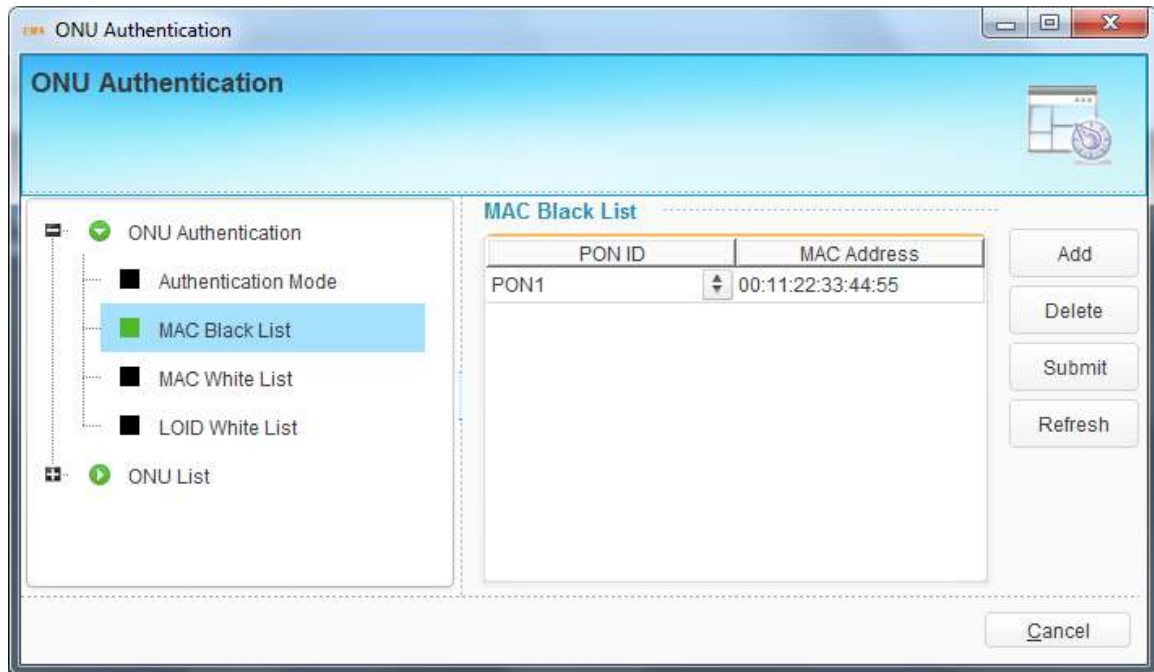


Figure 7-3 MAC Black List

7.1.3 MAC White List

When using MAC or hybrid authentication mode, the ONUs in MAC white list can be authenticated.

Click "Add" button, fill in MAC address, then click "Submit" button to apply the configurations.

Select an item and click "Delete" button to delete it.

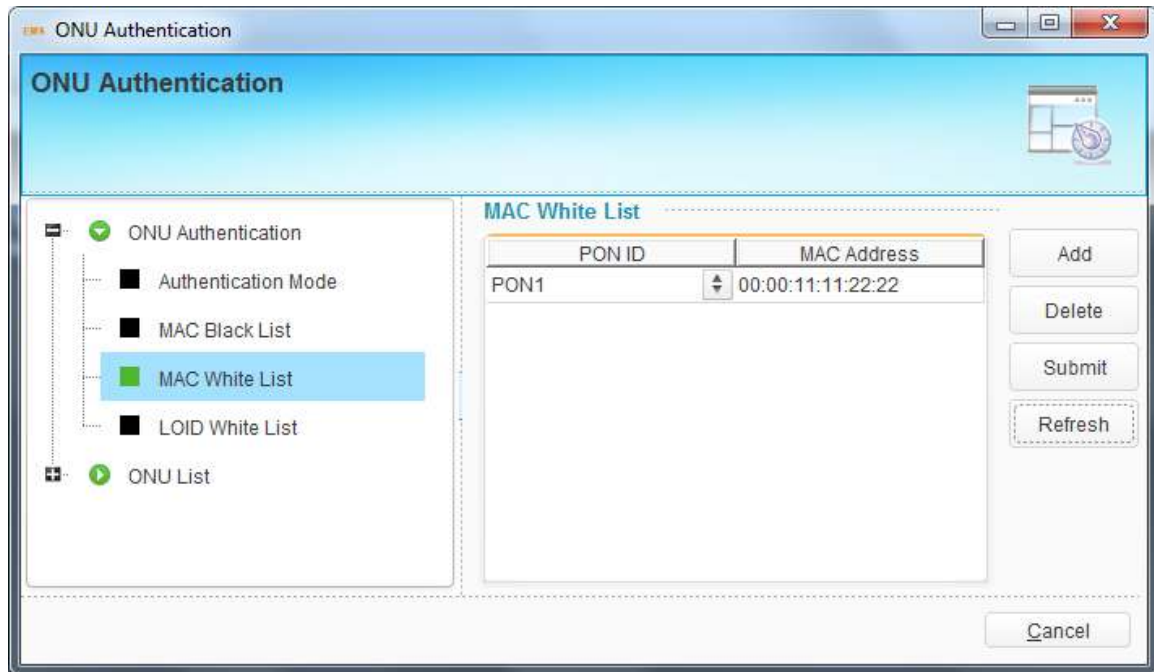


Figure 7-4 MAC White List

7.1.4 LOID White List

When using LOID or hybrid authentication mode, the ONUs in LOID white list can be authenticated. Both LOID and password are required, but OLT will not check if there is only LOID configured in ONU. Otherwise, OLT will check both.

Click "Add" button, fill in LOID and password, then click "Submit" button to apply the configurations.

Select an item and click "Delete" button to delete it.

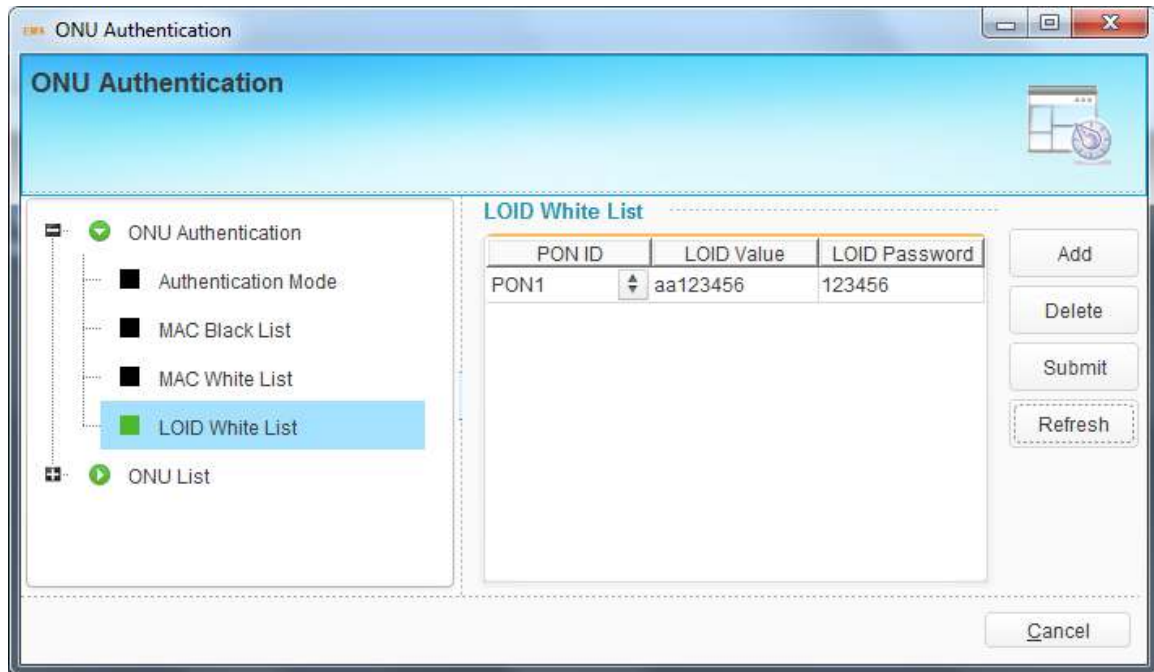


Figure 7-5 LOID White List

7.2 ONU List

7.2.1 Authenticated ONU

All ONUs which are authenticated successful will be displayed in this interface.

You can do some operations, such as reset, reregister or unauthenticate, to all ONUs that connect to the PON port.

Reset is to make all ONUs under the port restart. Reregister is to make all ONUs register again. UnAuth is to remove all ONUs from OLT.

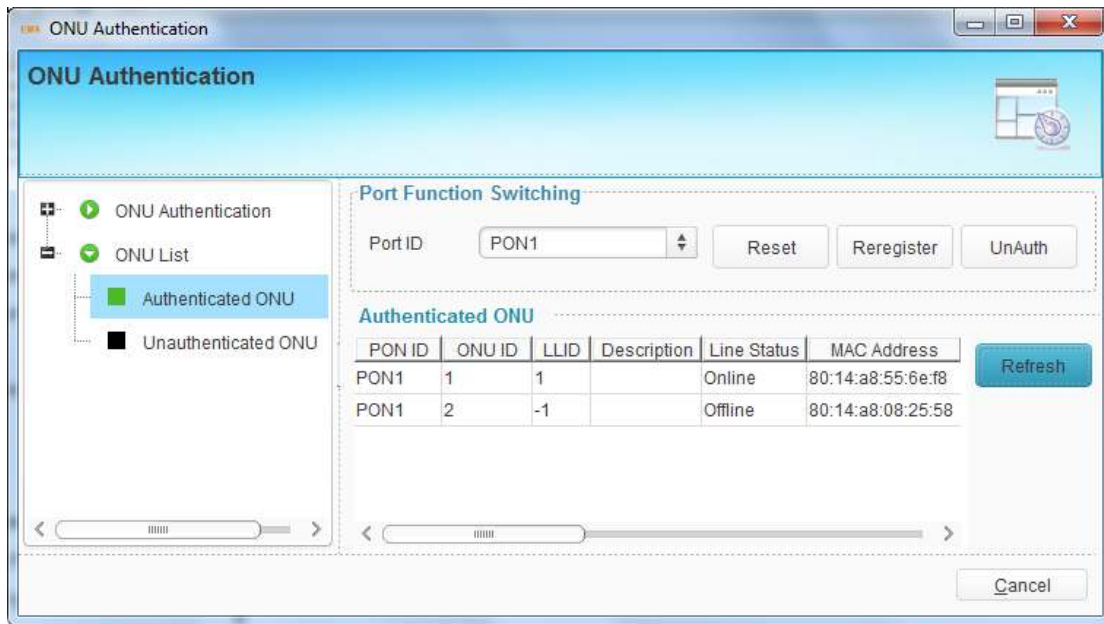


Figure 7-6 Authenticated ONU

7.2.2 Unauthenticated ONU

All ONUs which are authenticated failed or not authenticated will be displayed in this interface.

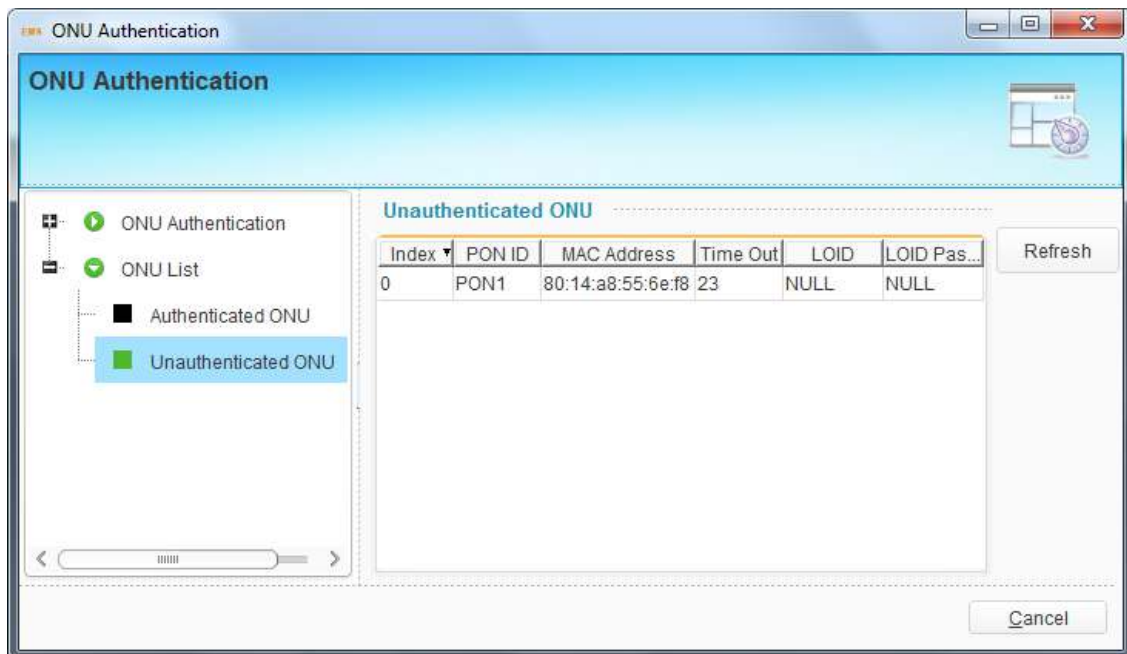


Figure 7-7 Unauthenticated ONU

8 Profile Configuration--EPON

This chapter introduces profile configuration of ONU. According to the characteristics of multiple services (data, voice, alarm) integrated in an ONU, and there would be huge quantity terminals but their configurations are similar, it is necessary to configure these similar configurations in a profile and bind it to ONU.

OLT supports the following profile:

- DBA profile
- Service profile
- VoIP profile
- Alarm profile

Right click OLT icon, choose "Profile Configuration" to open the configuration interface.

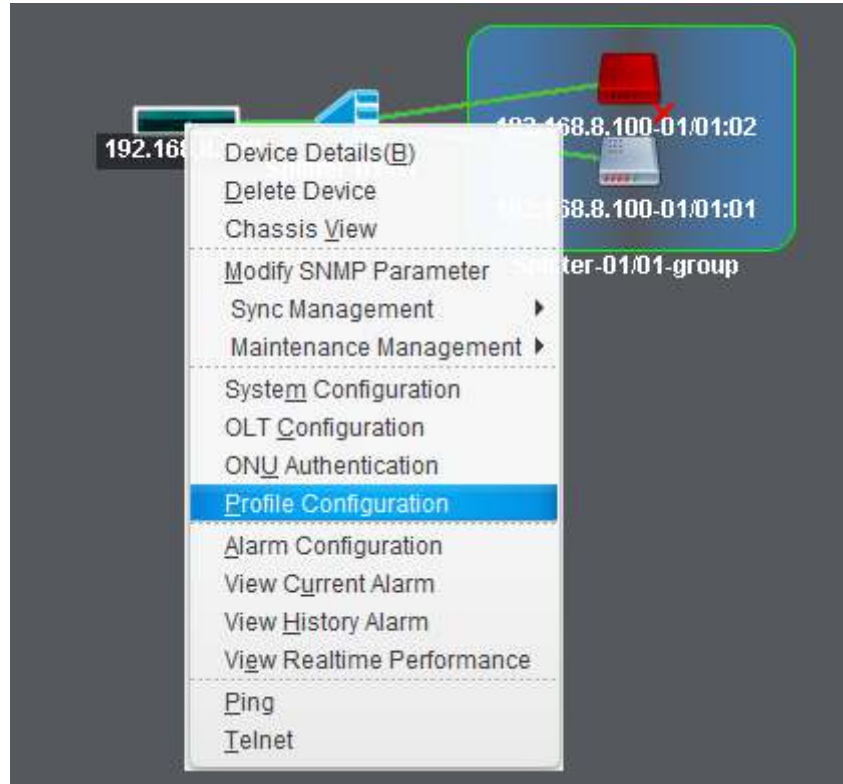


Figure 8-1 Profile Configuration

8.1 Profile Configuration

8.1.1 DBA Profile

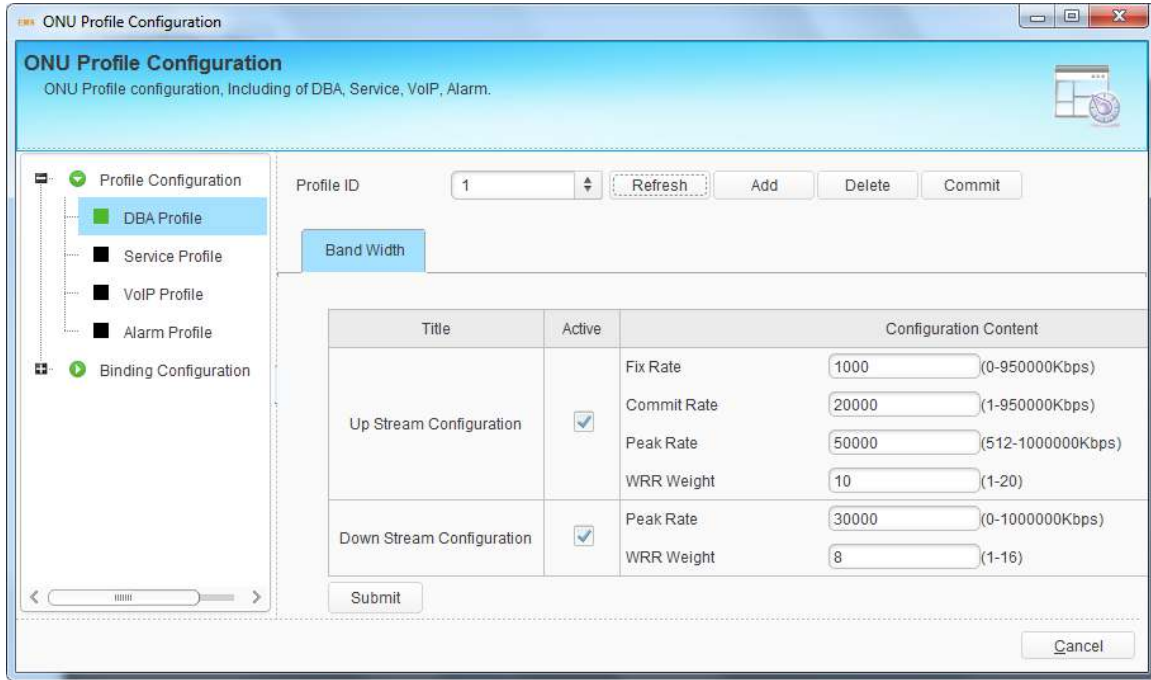
DBA is a bandwidth allocation strategy that changes uplink bandwidth assigned to each ONU in real time according to the instant service status of each ONU.

Click "Add" button to create profile ID, then select a profile ID and fill in bandwidth parameters. Click "Submit" button to apply the configurations. If the profile has been bound to ONU and DBA parameters are changed, you need to click "Commit" button to take effect.

The upstream WRR weight will be used to compute the remaining bandwidth

allocation after fixed rate of each ONU has been guaranteed. The downstream WRR weight will reference to the global 16 PON weights and only work when the ONU egress shaper is disabled.

When need to delete DBA profile, select the profile ID and click "Delete" button.



The screenshot shows the 'ONU Profile Configuration' window. The left sidebar has a tree view with 'Profile Configuration' expanded, showing 'DBA Profile' (selected), 'Service Profile', 'VoIP Profile', 'Alarm Profile', and 'Binding Configuration'. The main area is titled 'ONU Profile Configuration' and includes a subtitle 'ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.' Below this, there's a 'Profile ID' field with the value '1' and buttons for 'Refresh', 'Add', 'Delete', and 'Commit'. A 'Band Width' button is also present. The main configuration area is a table with columns 'Title', 'Active', and 'Configuration Content'.

Title	Active	Configuration Content
Up Stream Configuration	☒	Fix Rate: 1000 (0-950000Kbps)
		Commit Rate: 20000 (1-950000Kbps)
		Peak Rate: 50000 (512-1000000Kbps)
		WRR Weight: 10 (1-20)
Down Stream Configuration	☒	Peak Rate: 30000 (0-1000000Kbps)
		WRR Weight: 8 (1-16)

At the bottom of the main area are 'Submit' and 'Cancel' buttons.

Figure 8-2 DBA Profile

8.1.2 Service Profile

It can be configured most data services of ONU by service profile. Service profile applies to configurations of a batch of ONU which have similar data service configurations.

Click "Add" button to create profile ID, select a profile ID and configure service parameters of the profile. Click "Submit" button to apply the configurations. If the profile has been bound to ONU and service parameters are changed, you need to

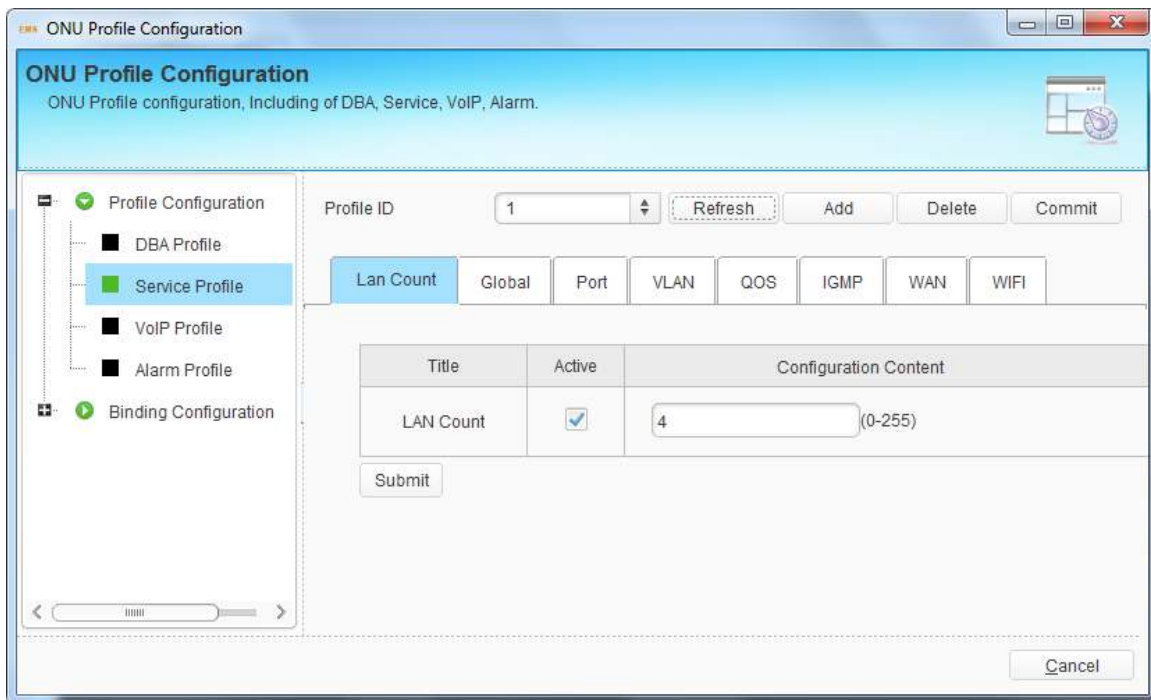
click "Commit" button to take effect.

The sections below will introduce service configurations related to ONU port, QoS, IGMP, WAN connection, WIFI and so on.

8.1.2.1 LAN Count

This configuration specifies the number of ONU LAN port. It must be configured before configuring other parameters related to LAN port.

Fill in the LAN count and click "Submit" button to apply configuration.



The screenshot shows the "ONU Profile Configuration" window. On the left, a tree view shows "Profile Configuration" expanded, with "Service Profile" selected. The main area shows "Profile ID" as 1. Below this, there are tabs: "Lan Count", "Global", "Port", "VLAN", "QOS", "IGMP", "WAN", and "WIFI". The "Lan Count" tab is active. It contains a table with the following data:

Title	Active	Configuration Content
LAN Count	☒	4 (0-255)

Below the table is a "Submit" button. At the top right of the main area are buttons: "Refresh", "Add", "Delete", and "Commit". At the bottom right is a "Cancel" button.

Figure 8-3 LAN Count Configuration

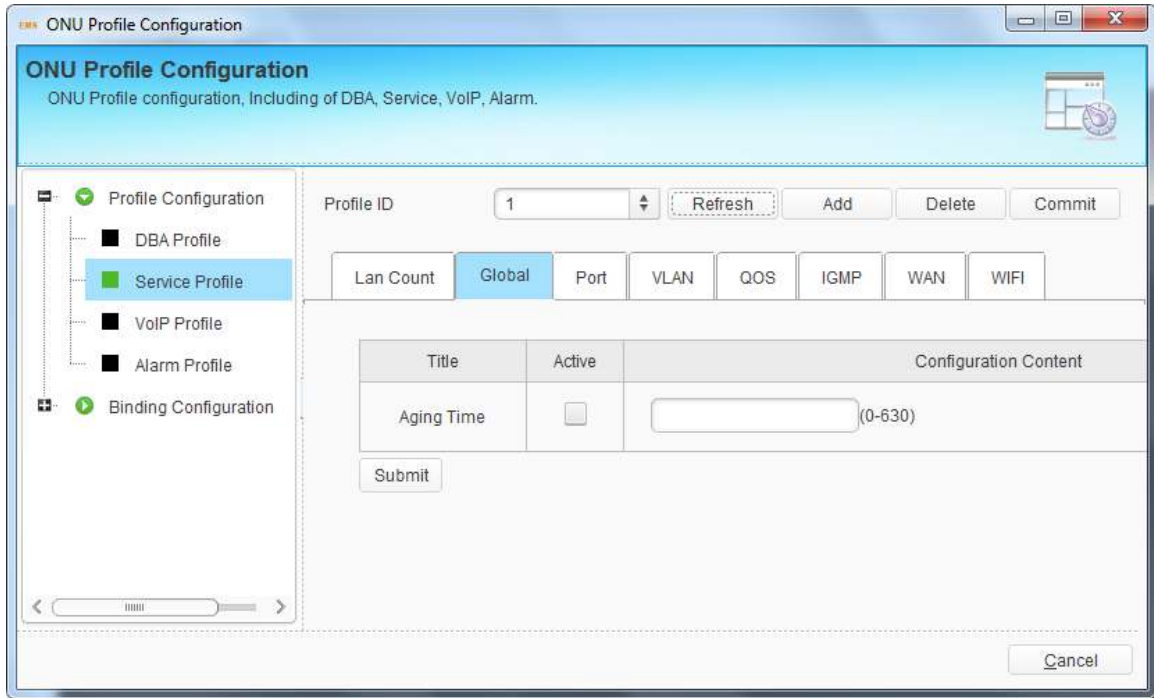


LAN count must be configured before configuring other parameters related to LAN port.

8.1.2.2 Global

This configuration is used to configure ONU global parameters.

Fill in the aging time and click "Submit" button to apply configuration.



The screenshot shows the 'ONU Profile Configuration' window. The title bar says 'ONU Profile Configuration'. The main header area says 'ONU Profile Configuration' and 'ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.' Below this, there's a left sidebar with a tree view containing 'Profile Configuration' (expanded), 'DBA Profile', 'Service Profile' (selected), 'VoIP Profile', 'Alarm Profile', and 'Binding Configuration'. The main area shows 'Profile ID' as '1' with 'Refresh', 'Add', 'Delete', and 'Commit' buttons. Below this are tabs: 'Lan Count', 'Global' (selected), 'Port', 'VLAN', 'QOS', 'IGMP', 'WAN', and 'WIFI'. The 'Global' tab displays a table with columns 'Title', 'Active', and 'Configuration Content'. The table has one row: 'Aging Time', an 'Active' checkbox, and a text input field with '(0-630)' next to it. Below the table is a 'Submit' button. At the bottom right is a 'Cancel' button.

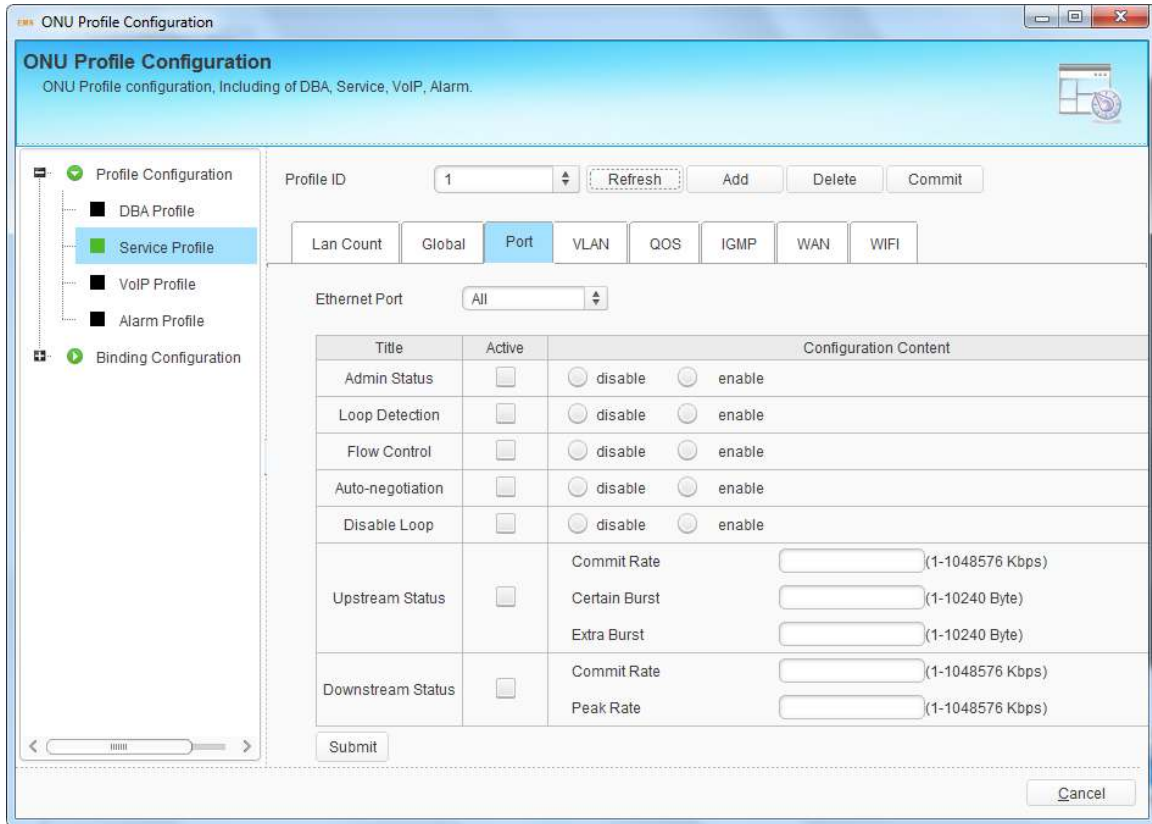
Title	Active	Configuration Content
Aging Time	☐	(0-630)

Figure 8-4 Global Configuration

8.1.2.3 Port

Port configuration is mainly used to configure Ethernet port attributes. These configurations contain administration status, flow control, loop, auto-negotiation and rate.

Select one port or all, activate the option which needs to configure. Click "Submit" button to apply configurations.



ONU Profile Configuration
ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Refresh] [Add] [Delete] [Commit]

Tab: Lan Count | Global | **Port** | VLAN | QOS | IGMP | WAN | WIFI

Ethernet Port: All

Title	Active	Configuration Content	
Admin Status	☐	☐ disable	☐ enable
Loop Detection	☐	☐ disable	☐ enable
Flow Control	☐	☐ disable	☐ enable
Auto-negotiation	☐	☐ disable	☐ enable
Disable Loop	☐	☐ disable	☐ enable
Upstream Status	☐	Commit Rate	(1-1048576 Kbps)
		Certain Burst	(1-10240 Byte)
		Extra Burst	(1-10240 Byte)
Downstream Status	☐	Commit Rate	(1-1048576 Kbps)
		Peak Rate	(1-1048576 Kbps)

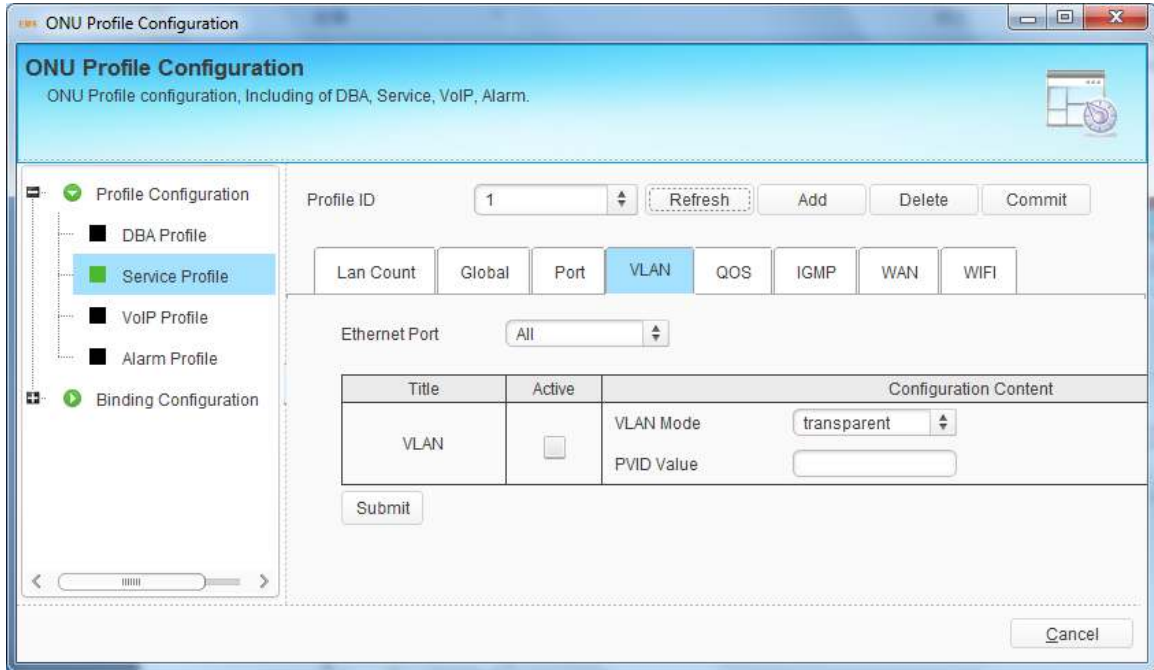
[Submit] [Cancel]

Figure 8-5 Port Configuration

8.1.2.4 VLAN

This is VLAN profile for ONU LAN port. There are transparent, tag, translation, aggregation and trunk mode. Maximum eight VLAN rules can be configured for each port when choosing translation, aggregation and trunk mode.

Select one port or all, activate VLAN option and configure VLAN mode and VLAN ID. Click "Submit" button to apply configurations.



ONU Profile Configuration
ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.

Profile ID:

Ethernet Port:

Title	Active	Configuration Content
VLAN	☐	VLAN Mode: transparent PVID Value:

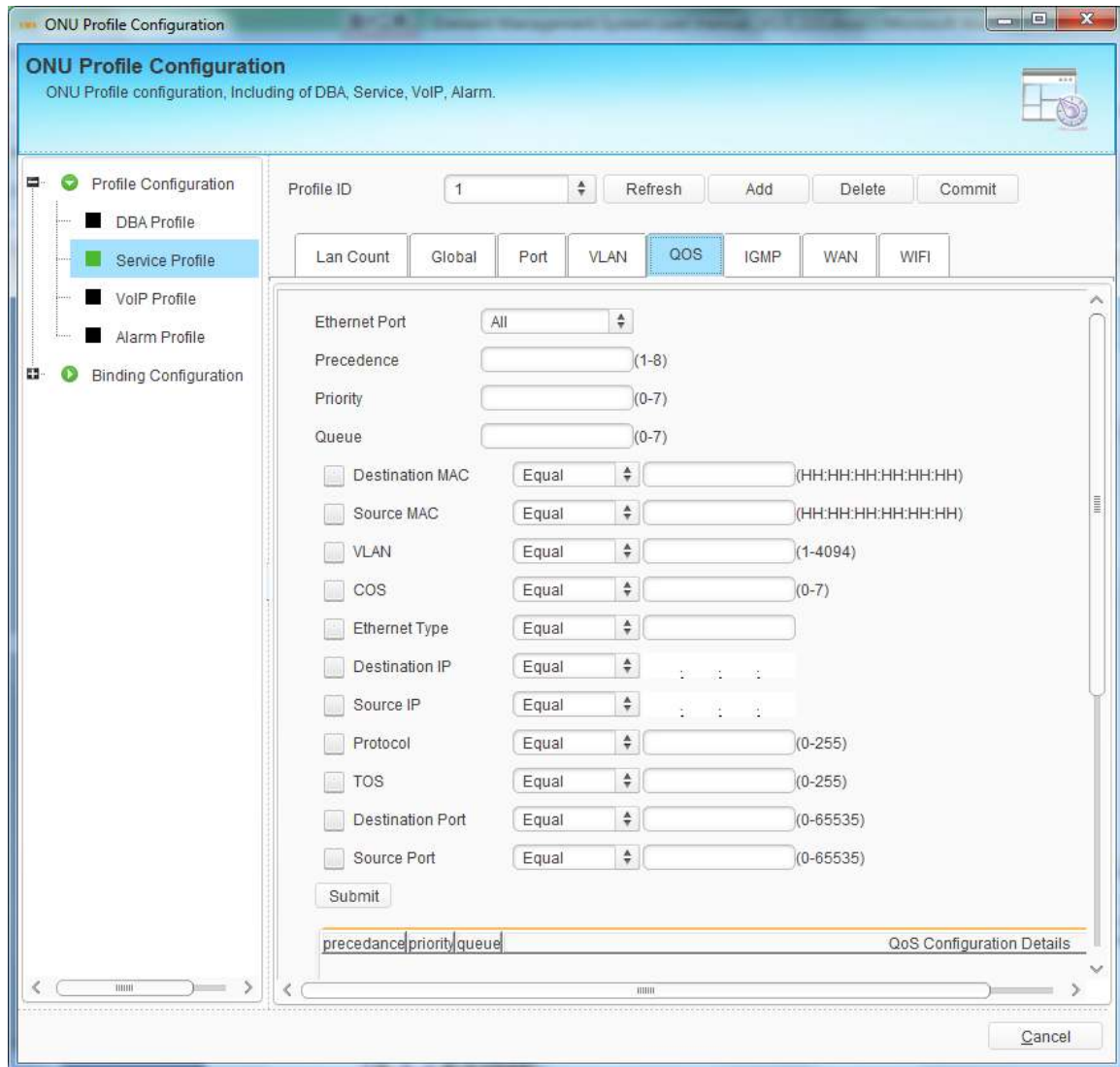
Figure 8-6 VLAN Configuration

8.1.2.5 QoS

This is QoS profile for ONU LAN port. When matches the conditions that have been configured, the data traffic will be set with new priority and mapped to the queue. When bandwidth is not enough or there is congestion, QoS configurations can make sure high priority data traffic passes through the device firstly. The conditions include MAC address, IP address, VLAN, Ethernet type, TCP/UDP port, etc. You can select one or more options to configure.

Click "Submit" button to apply the configurations. QoS rules will display in the table at the bottom of the interface.

Select QoS rule in the table and click "Delete" to delete it.



ONU Profile Configuration
ONU Profile configuration, including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Refresh] [Add] [Delete] [Commit]

Navigation: Lan Count | Global | Port | VLAN | **QOS** | IGMP | WAN | WIFI

Ethernet Port: All

Precedence: (1-8)

Priority: (0-7)

Queue: (0-7)

☐ Destination MAC: Equal (HH:HH:HH:HH:HH:HH)
☐ Source MAC: Equal (HH:HH:HH:HH:HH:HH)
☐ VLAN: Equal (1-4094)
☐ COS: Equal (0-7)
☐ Ethernet Type: Equal
☐ Destination IP: Equal
☐ Source IP: Equal
☐ Protocol: Equal (0-255)
☐ TOS: Equal (0-255)
☐ Destination Port: Equal (0-65535)
☐ Source Port: Equal (0-65535)

[Submit]

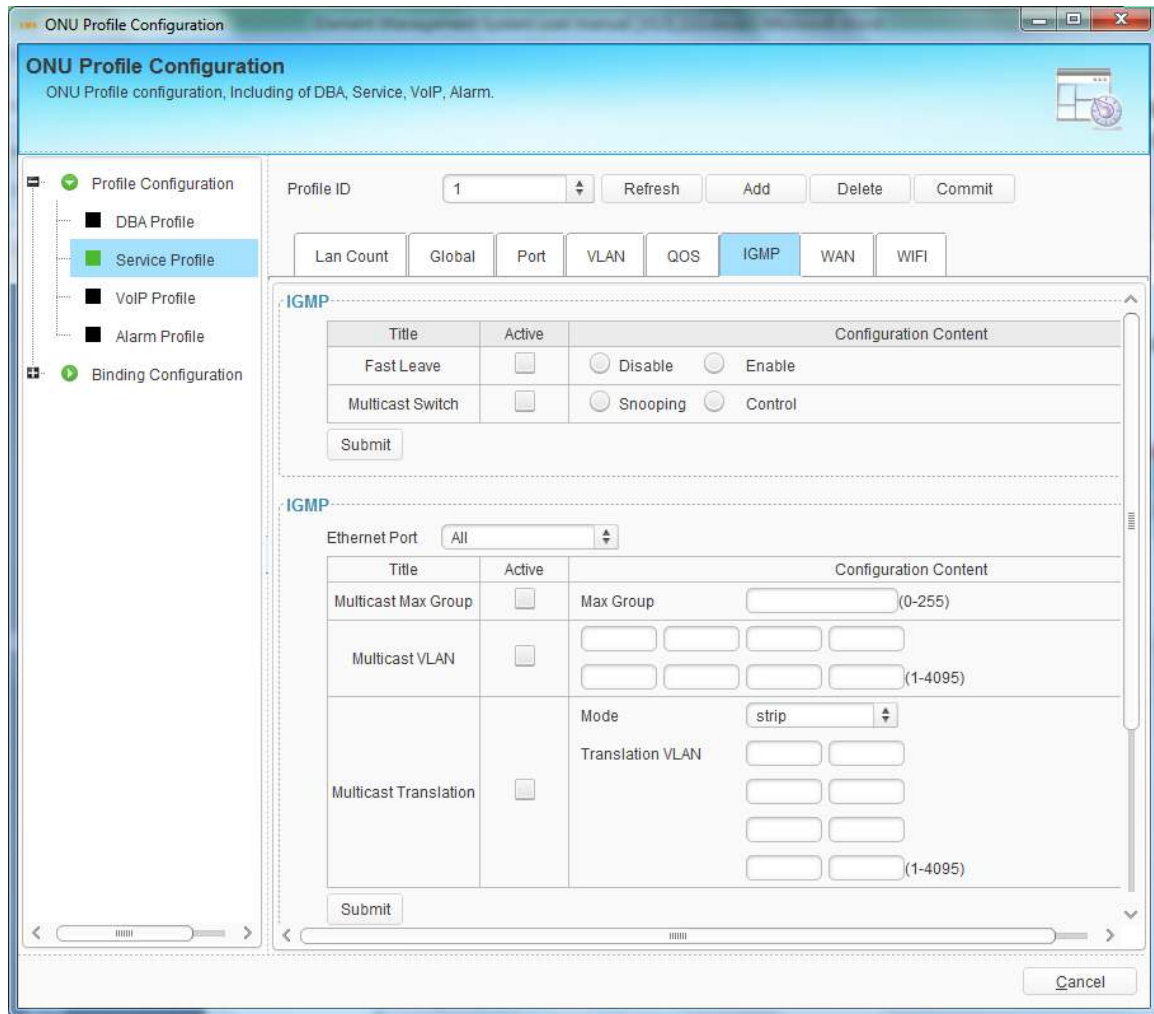
precedence|priority|queue QoS Configuration Details

[Cancel]

Figure 8-7 QoS Configuration

8.1.2.6 IGMP

This is IGMP profile for ONU. When the ONU is used for IPTV service, IGMP configurations are required. IGMP global configurations contain fast leave mode and multicast mode. IGMP port configurations contain multicast VLAN and maximum group. Maximum eight VLAN rules can be configured for each port.



ONU Profile Configuration
ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Refresh] [Add] [Delete] [Commit]

Tabs: Lan Count | Global | Port | VLAN | QOS | **IGMP** | WAN | WIFI

IGMP Configuration

Title	Active	Configuration Content
Fast Leave	☐	☐ Disable ☐ Enable
Multicast Switch	☐	☐ Snooping ☐ Control

[Submit]

IGMP Configuration (Ethernet Port: All)

Title	Active	Configuration Content
Multicast Max Group	☐	Max Group: [0-255]
Multicast VLAN	☐	[] [] [] [] (1-4095)
Multicast Translation	☐	Mode: strip [] Translation VLAN: [] [] [] [] (1-4095)

[Submit] [Cancel]

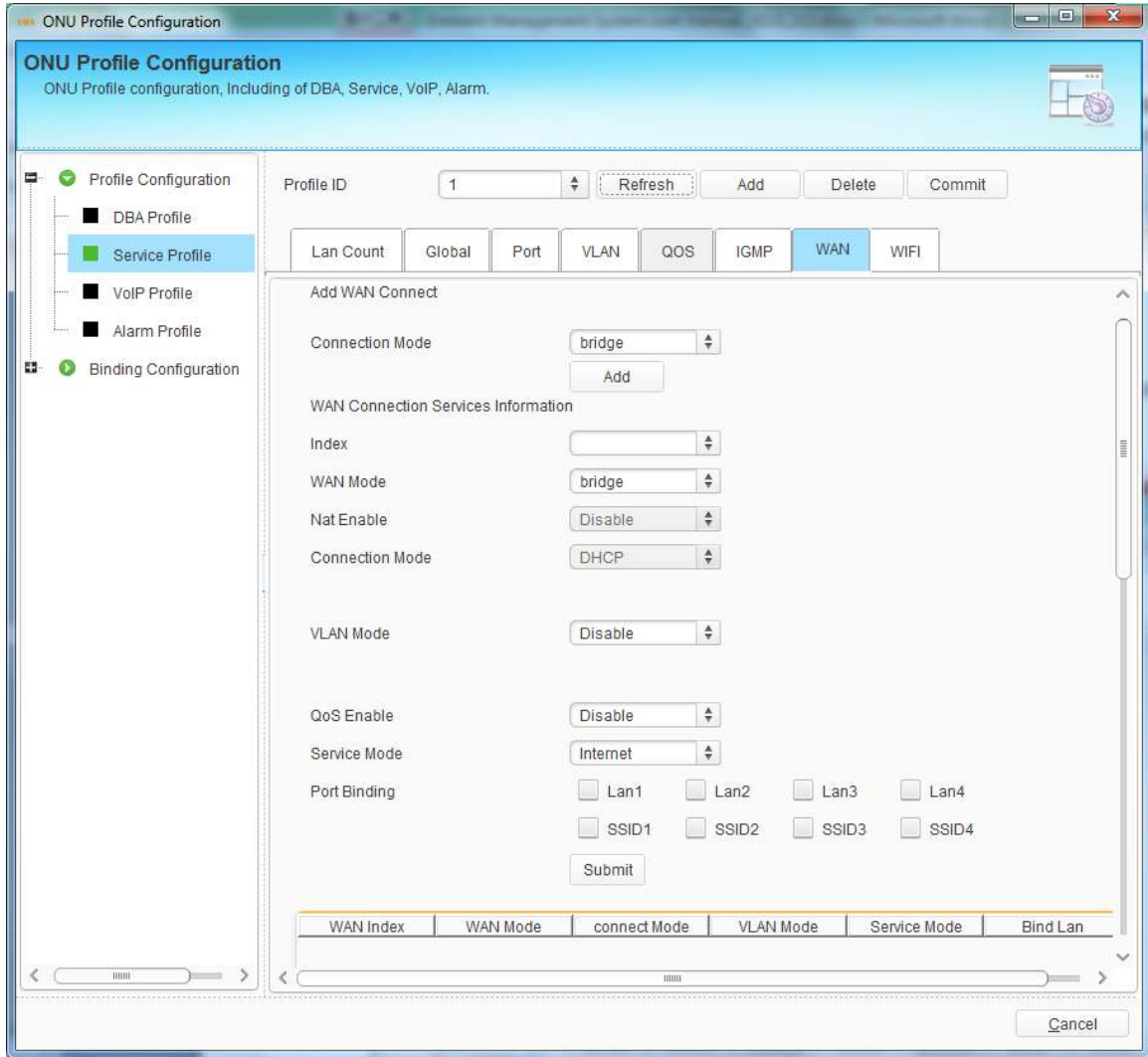
Figure 8-8 IGMP Configuration

8.1.2.7 WAN

This is WAN profile for HGU. You should add a bridge mode or router mode WAN connection firstly, and then configure other parameters of the WAN connection. It doesn't apply to a batch of ONU when using static IP address.

The WAN connections will display in the table at the bottom of the interface.

Select WAN connection in the table and click "Delete" to delete it.



ONU Profile Configuration
ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Refresh] [Add] [Delete] [Commit]

Navigation: Lan Count | Global | Port | VLAN | QOS | IGMP | **WAN** | WIFI

Add WAN Connect

Connection Mode: bridge [Add]

WAN Connection Services Information

Index: []

WAN Mode: bridge []

Nat Enable: Disable []

Connection Mode: DHCP []

VLAN Mode: Disable []

QoS Enable: Disable []

Service Mode: Internet []

Port Binding

☐ Lan1 ☐ Lan2 ☐ Lan3 ☐ Lan4

☐ SSID1 ☐ SSID2 ☐ SSID3 ☐ SSID4

[Submit]

WAN Index	WAN Mode	connect Mode	VLAN Mode	Service Mode	Bind Lan
[Empty table body]					

[Cancel]

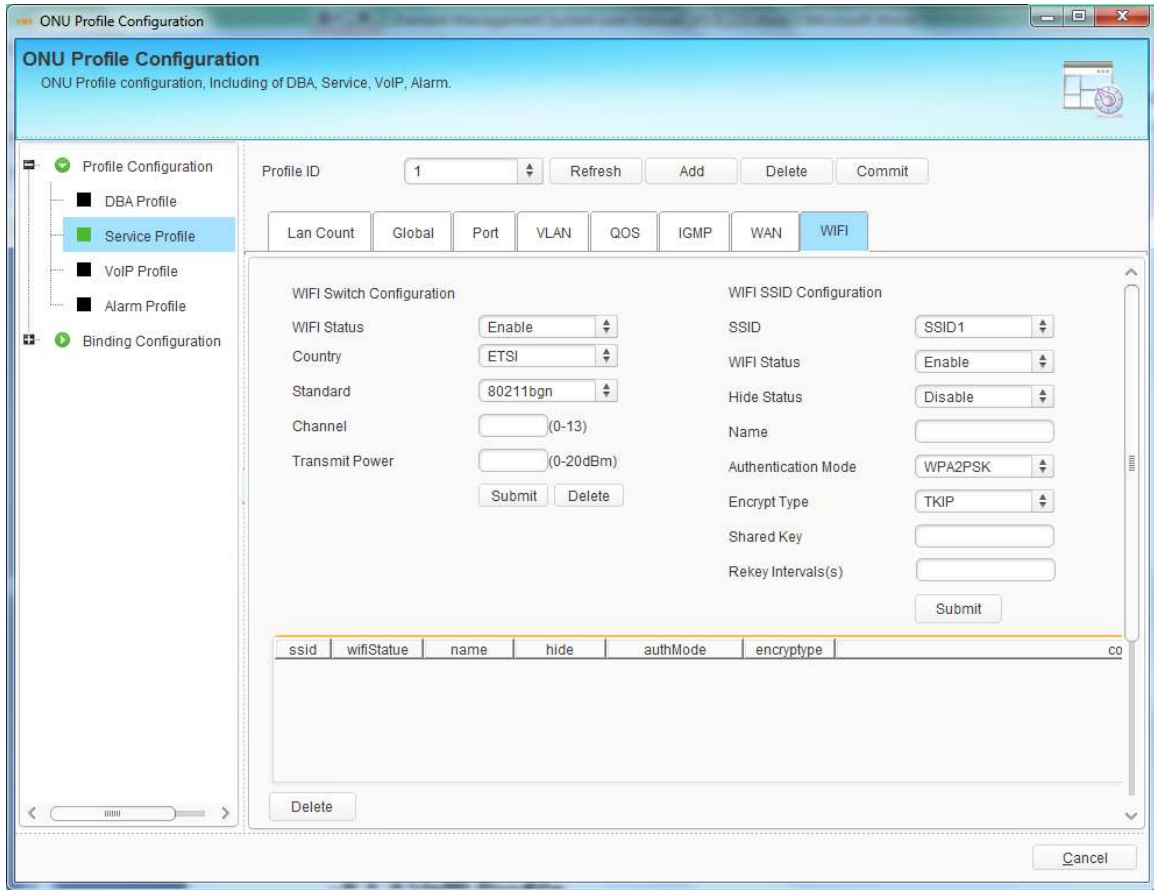
Figure 8-9 WAN Configuration

8.1.2.8 WIFI

This is WIFI profile for ONU. WIFI switch configuration mainly contains WIFI administration status, country, standard, channel and transmit power. WIFI SSID configuration mainly contains SSID name and encryption for each SSID.

Configurations of each SSID will display in the table at the bottom of the interface.

Select SSID in the table and click "Delete" to delete it.



ONU Profile Configuration
ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Refresh] [Add] [Delete] [Commit]

Navigation: Lan Count | Global | Port | VLAN | QOS | IGMP | WAN | **WIFI**

WIFI Switch Configuration
WIFI Status: Enable
Country: ETSI
Standard: 80211bgn
Channel: (0-13)
Transmit Power: (0-20dBm)
[Submit] [Delete]

WIFI SSID Configuration
SSID: SSID1
WIFI Status: Enable
Hide Status: Disable
Name:
Authentication Mode: WPA2PSK
Encrypt Type: TKIP
Shared Key:
Rekey Intervals(s):
[Submit]

ssid	wifiStatus	name	hide	authMode	encryptype
ssid1	enable		hide	WPA2PSK	TKIP

[Delete] [Cancel]

Figure 8-10 WIFI Configuration

8.1.3 VoIP Profile

VoIP profile applies to configuration of a batch ONU which have similar VoIP configurations.

Click "Add" button to create profile ID, select a profile ID and configure VoIP parameters of the profile. Click "Submit" button to apply the configurations. If the profile has been bound to ONU and VoIP parameters are changed, you need to click "Commit" button to take effect.

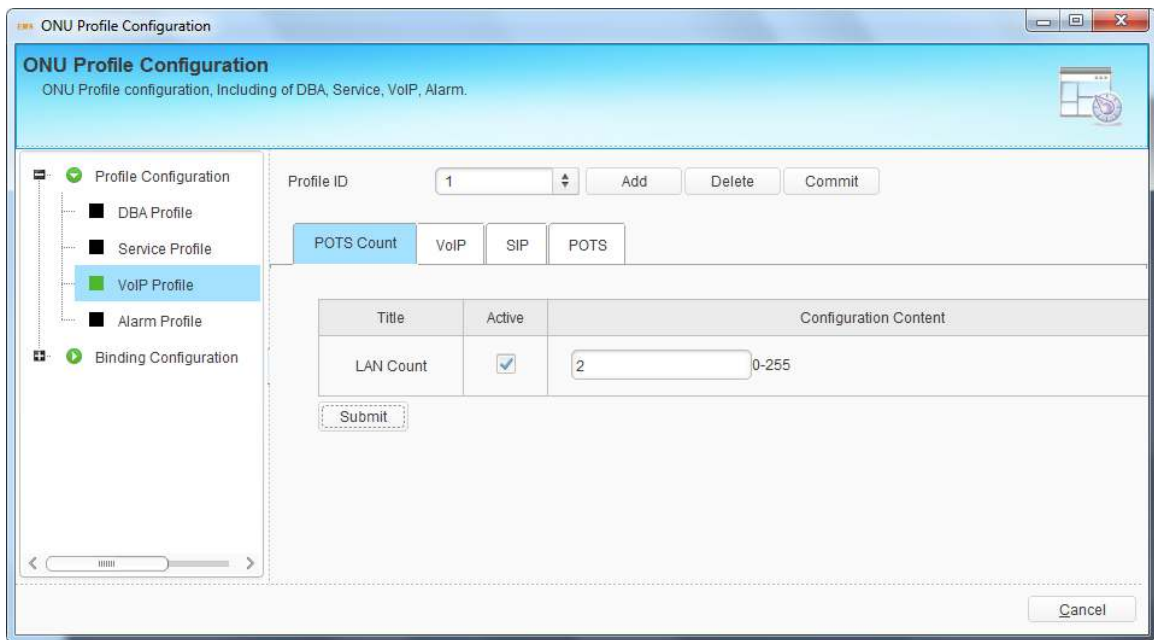
The sections below will introduce VoIP configurations. The parameters of profile

except POTS count are optional configurations.

8.1.3.1 POTS Count

This configuration specifies the number of ONU POTS port. It must be configured before configuring other VoIP parameters related to POTS port.

Fill in the POTS count and click "Submit" button to apply configuration.



The screenshot shows the 'ONU Profile Configuration' window. On the left is a tree view with 'Profile Configuration' expanded, containing 'DBA Profile', 'Service Profile', 'VoIP Profile' (selected), and 'Alarm Profile'. Below it is 'Binding Configuration'. The main area shows 'Profile ID' as 1 with 'Add', 'Delete', and 'Commit' buttons. Below this are tabs for 'POTS Count', 'VoIP', 'SIP', and 'POTS'. The 'POTS Count' tab is active, displaying a table with the following content:

Title	Active	Configuration Content
LAN Count	☒	2 0-255

Below the table is a 'Submit' button. At the bottom right of the window is a 'Cancel' button.

Figure 8-11 POTS Count Configuration

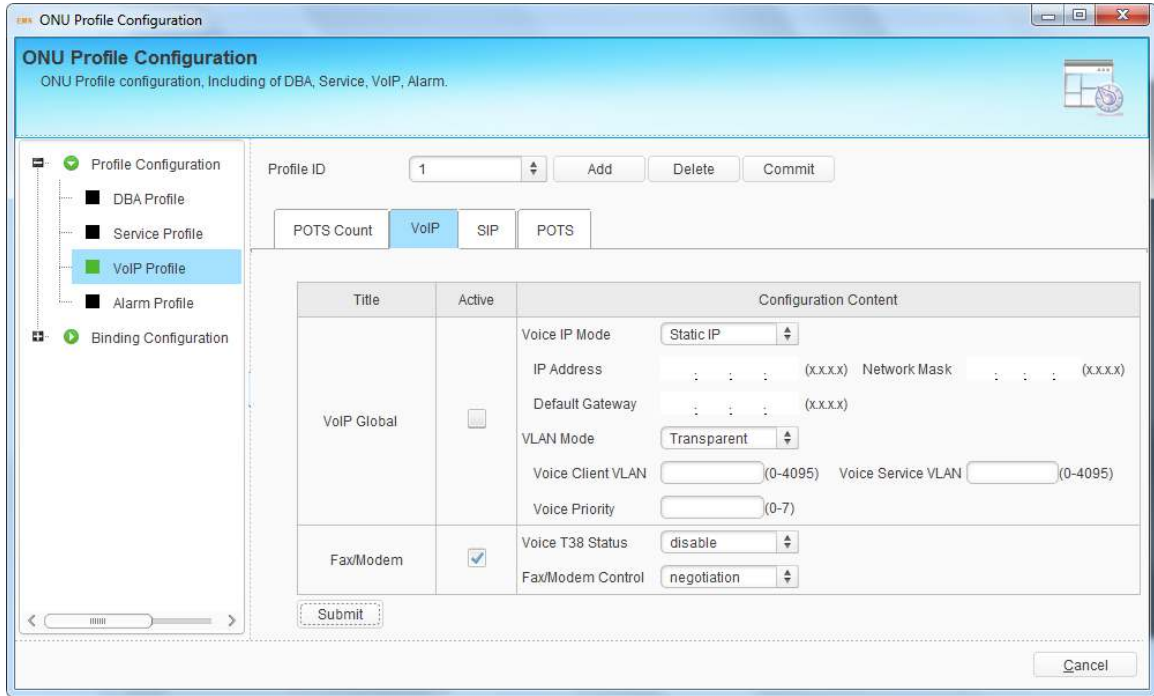


POTS count must be configured before configuring other VoIP parameters related to POTS port.

8.1.3.2 VoIP

This interface is used to configure VoIP global parameters. It mainly contains IP address, VLAN and fax mode. It doesn't apply to a batch of ONU when using static

IP address.



ONU Profile Configuration
ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Add] [Delete] [Commit]

POTS Count [VoIP] SIP POTS

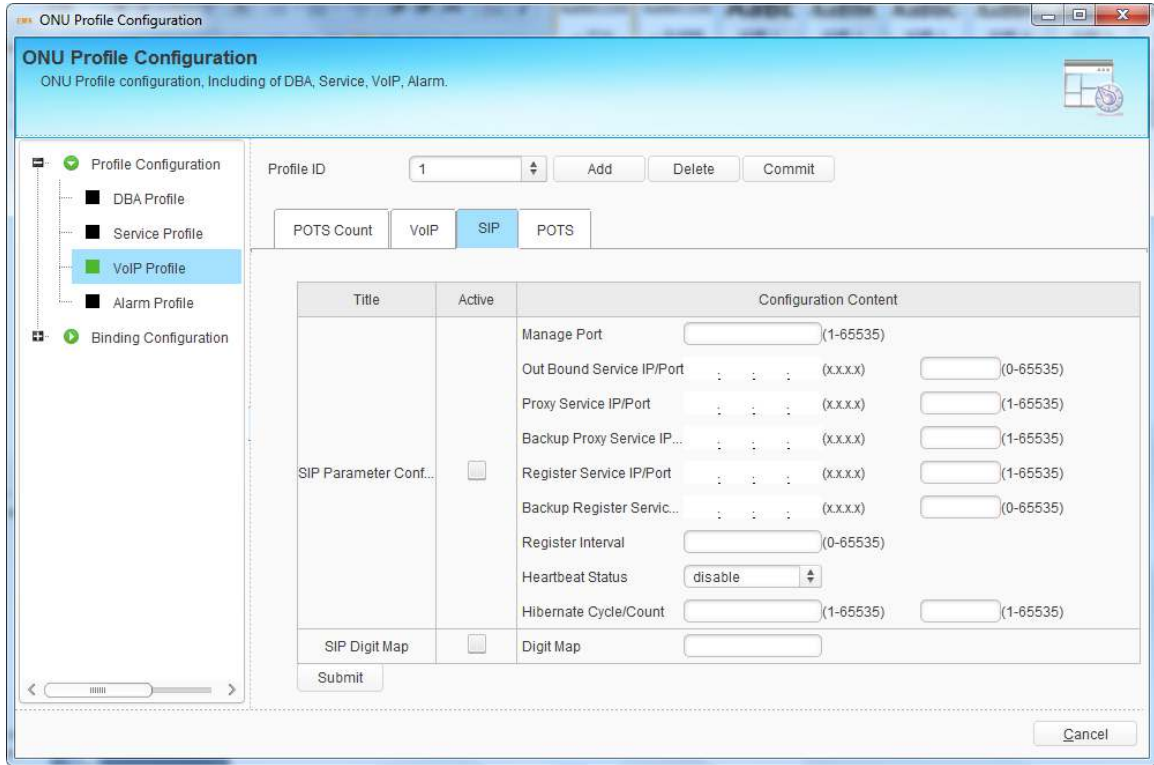
Title	Active	Configuration Content
VoIP Global	☐	Voice IP Mode: Static IP IP Address: . . . (xxxx) Network Mask: . . . (xxxx) Default Gateway: . . . (xxxx) VLAN Mode: Transparent Voice Client VLAN: (0-4095) Voice Service VLAN: (0-4095) Voice Priority: (0-7)
Fax/Modem	☒	Voice T38 Status: disable Fax/Modem Control: negotiation

[Submit] [Cancel]

Figure 8-12 VoIP Global Configuration

8.1.3.3 SIP

This interface is used to configure SIP global parameters such as SIP server, proxy server, port, heartbeat, digit map and so on.



ONU Profile Configuration
ONU Profile configuration, including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Add] [Delete] [Commit]

POTS Count | VoIP | **SIP** | POTS

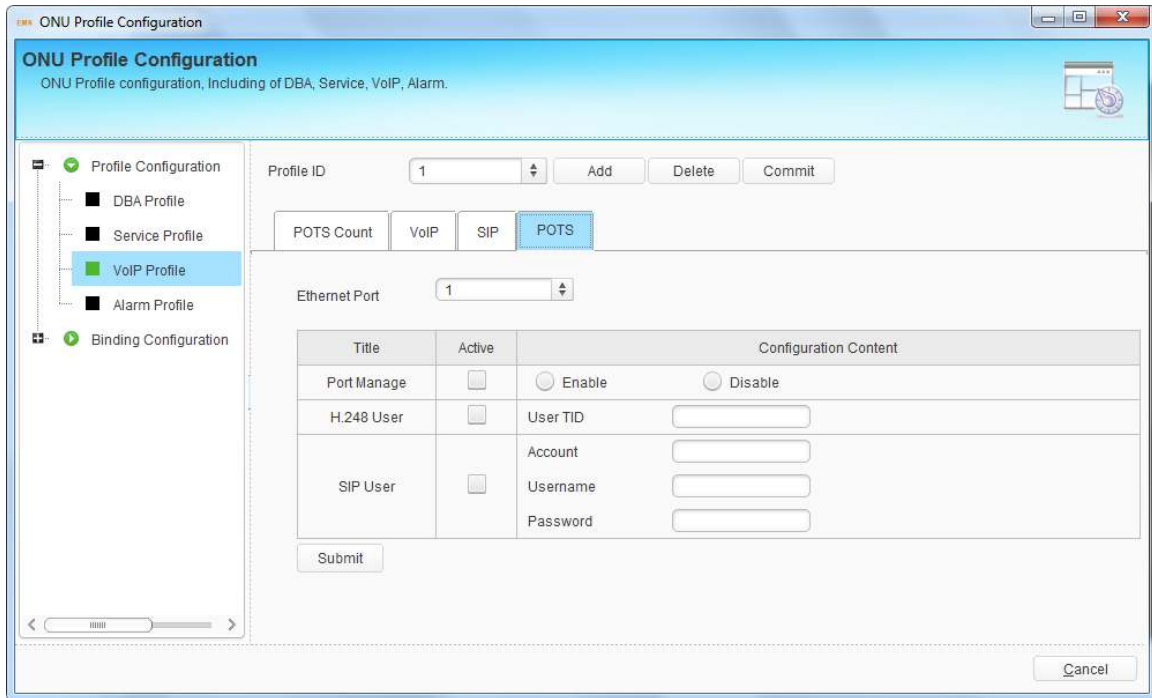
Title	Active	Configuration Content
SIP Parameter Conf...	☐	Manage Port: [] (1-65535) Out Bound Service IP/Port: [] (x.xxx) [] (0-65535) Proxy Service IP/Port: [] (x.xxx) [] (1-65535) Backup Proxy Service IP...: [] (x.xxx) [] (1-65535) Register Service IP/Port: [] (x.xxx) [] (1-65535) Backup Register Servic...: [] (x.xxx) [] (0-65535) Register Interval: [] (0-65535) Heartbeat Status: [disable] Hibernate Cycle/Count: [] (1-65535) [] (1-65535)
	☐	SIP Digit Map: [] Digit Map: []

[Submit] [Cancel]

Figure 8-13 SIP Configuration

8.1.3.4 POTS

This interface is used to configure ONU POTS port. The configurations contain POTS port administration status and VoIP account. Because each POTS port has its own VoIP account, POTS profile doesn't apply to a batch of ONU.



ONU Profile Configuration
ONU Profile configuration, including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Add] [Delete] [Commit]

POTS Count [VolP] [SIP] **POTS**

Ethernet Port: 1

Title	Active	Configuration Content	
Port Manage	☐	☐ Enable	☐ Disable
H.248 User	☐	User TID	
SIP User	☐	Account	
		Username	
		Password	

[Submit] [Cancel]

Figure 8-14 POTS Configuration

8.1.4 Alarm Profile

Alarm profile is used to configure all kinds of ONU alarm.

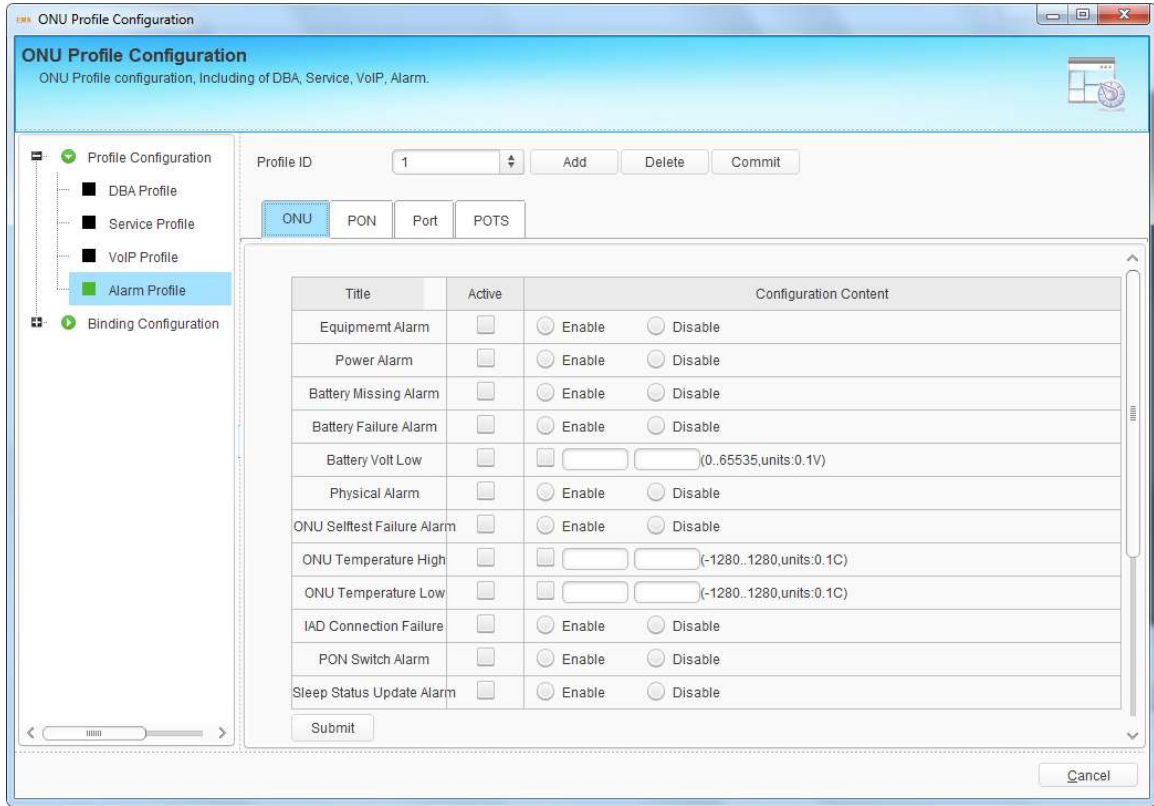
Click "Add" button to create profile ID, select a profile ID and configure alarm of the profile. Click "Submit" button to apply the configurations. If the profile has been bound to ONU and alarm configurations are changed, you need to click "Commit" button to take effect.

The sections below will introduce alarm configurations.

8.1.4.1 ONU Alarm

This interface is used to configure alarms of ONU. Activate alarm type, select enable or disable, or input alarm threshold if needed and click "Submit" button to

apply the configurations.



ONU Profile Configuration
ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Add] [Delete] [Commit]

Tab: **ONU** | PON | Port | POTS

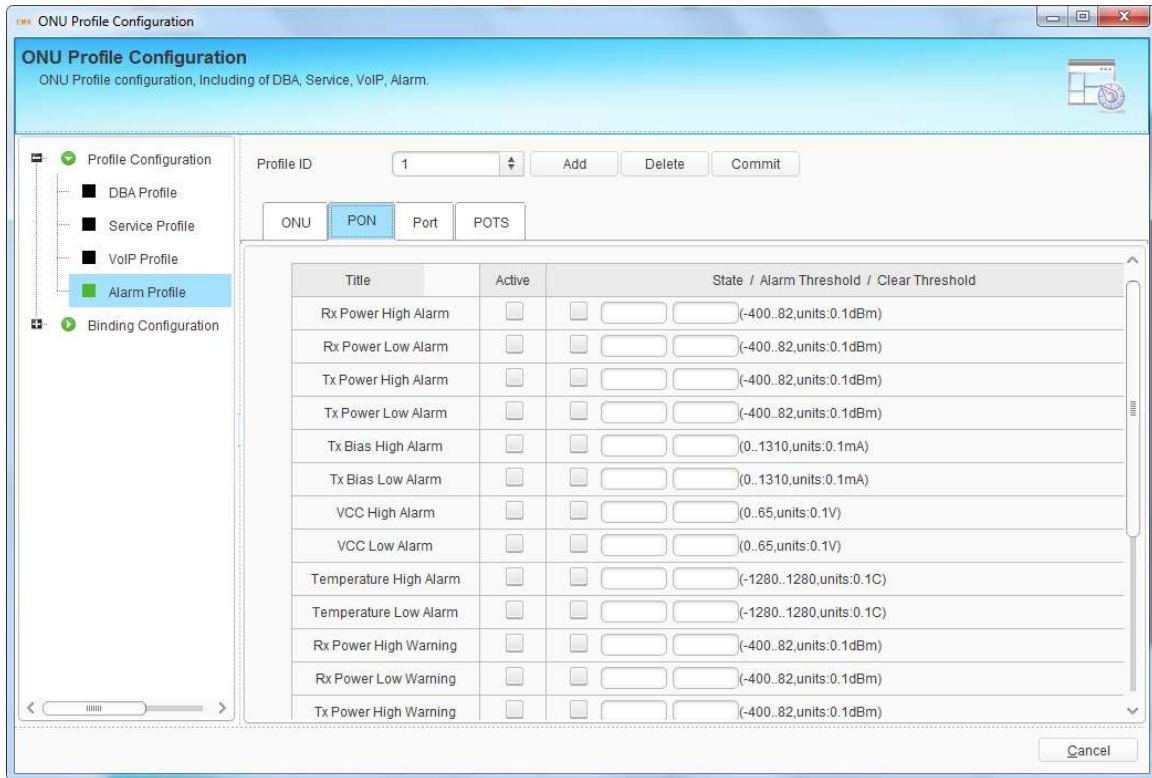
Title	Active	Configuration Content
Equipment Alarm	☐	☐ Enable ☐ Disable
Power Alarm	☐	☐ Enable ☐ Disable
Battery Missing Alarm	☐	☐ Enable ☐ Disable
Battery Failure Alarm	☐	☐ Enable ☐ Disable
Battery Volt Low	☐	☐ (0..65535,units:0.1V)
Physical Alarm	☐	☐ Enable ☐ Disable
ONU Selftest Failure Alarm	☐	☐ Enable ☐ Disable
ONU Temperature High	☐	☐ (-1280..1280,units:0.1C)
ONU Temperature Low	☐	☐ (-1280..1280,units:0.1C)
IAD Connection Failure	☐	☐ Enable ☐ Disable
PON Switch Alarm	☐	☐ Enable ☐ Disable
Sleep Status Update Alarm	☐	☐ Enable ☐ Disable

[Submit] [Cancel]

Figure 8-15 ONU Alarm

8.1.4.2 PON Alarm

This interface is used to configure alarms of ONU PON port. Activate alarm type, input alarm threshold and click "Submit" button to apply the configurations.



ONU Profile Configuration
ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.

Profile ID: 1 [Add] [Delete] [Commit]

ONU **PON** Port POTS

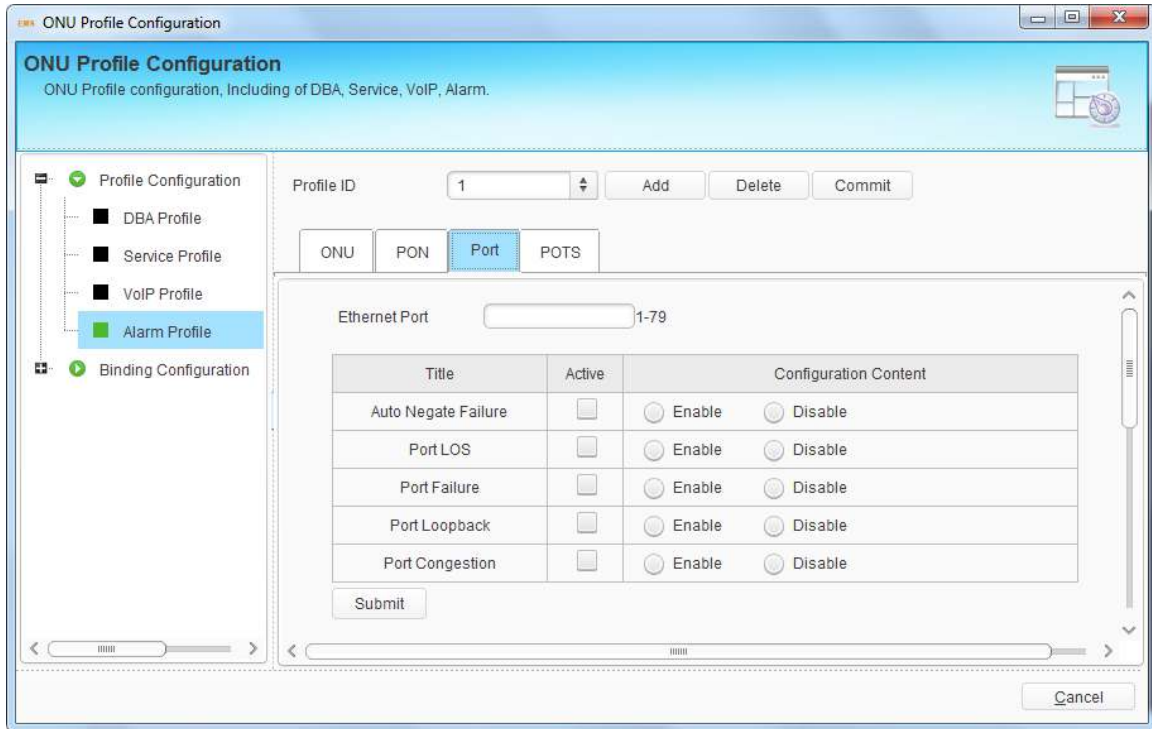
Title	Active	State / Alarm Threshold / Clear Threshold
Rx Power High Alarm	☐	☐ (-400..82,units:0.1dBm)
Rx Power Low Alarm	☐	☐ (-400..82,units:0.1dBm)
Tx Power High Alarm	☐	☐ (-400..82,units:0.1dBm)
Tx Power Low Alarm	☐	☐ (-400..82,units:0.1dBm)
Tx Bias High Alarm	☐	☐ (0..1310,units:0.1mA)
Tx Bias Low Alarm	☐	☐ (0..1310,units:0.1mA)
VCC High Alarm	☐	☐ (0..65,units:0.1V)
VCC Low Alarm	☐	☐ (0..65,units:0.1V)
Temperature High Alarm	☐	☐ (-1280..1280,units:0.1C)
Temperature Low Alarm	☐	☐ (-1280..1280,units:0.1C)
Rx Power High Warning	☐	☐ (-400..82,units:0.1dBm)
Rx Power Low Warning	☐	☐ (-400..82,units:0.1dBm)
Tx Power High Warning	☐	☐ (-400..82,units:0.1dBm)

[Cancel]

Figure 8-16 ONU PON Alarm

8.1.4.3 Port Alarm

This interface is used to configure alarms of ONU LAN port. Input LAN port number, activate alarm type, and select enable or disable, then click "Submit" button to apply the configurations.



ONU Profile Configuration
ONU Profile configuration, Including of DBA, Service, VoIP, Alarm.

Profile ID:

ONU **Port**

Ethernet Port:

Title	Active	Configuration Content	
Auto Negate Failure	☐	☐ Enable	☐ Disable
Port LOS	☐	☐ Enable	☐ Disable
Port Failure	☐	☐ Enable	☐ Disable
Port Loopback	☐	☐ Enable	☐ Disable
Port Congestion	☐	☐ Enable	☐ Disable

Figure 8-17 ONU Port Alarm

8.1.4.4 POTS Alarm

This interface is used to configure alarms of ONU. Input POTS port number, activate alarm type, and select enable or disable, then click "Submit" button to apply the configurations.

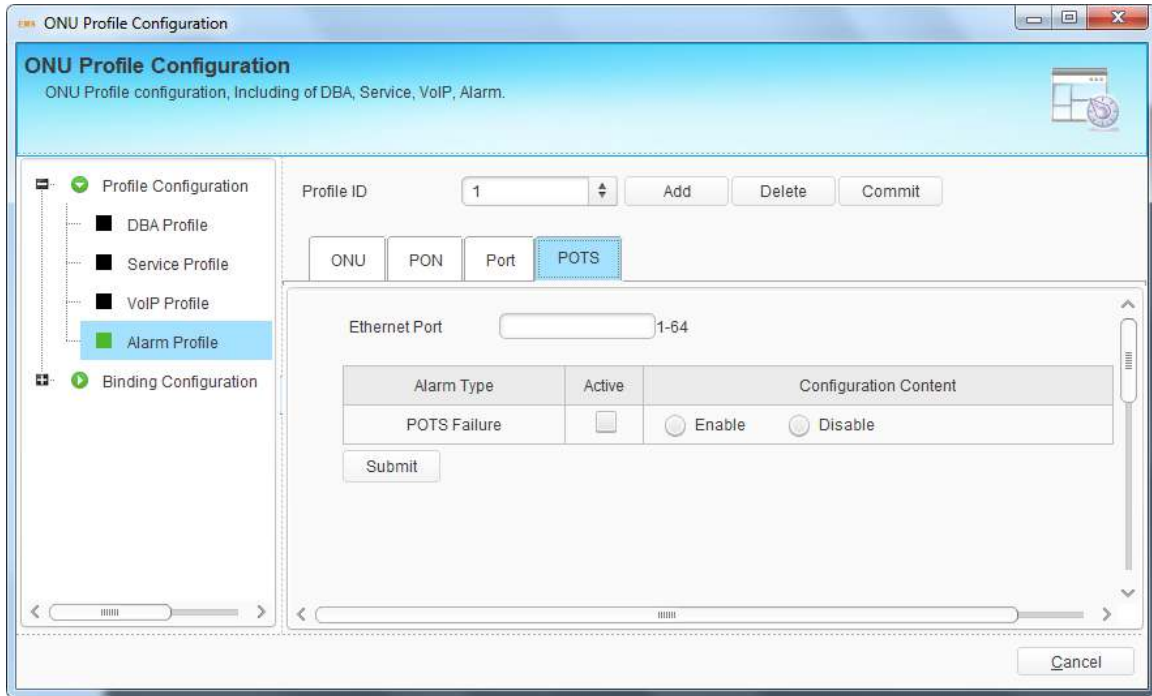


Figure 8-18 ONU POTS Alarm

8.2 Binding Configuration

After profile is configured, it is necessary to bind it to ONU.

Click "Select" button to open a pop-up dialog box, find out the ONU you want to bind and then click "OK" button, the ONU will list in the binding table.

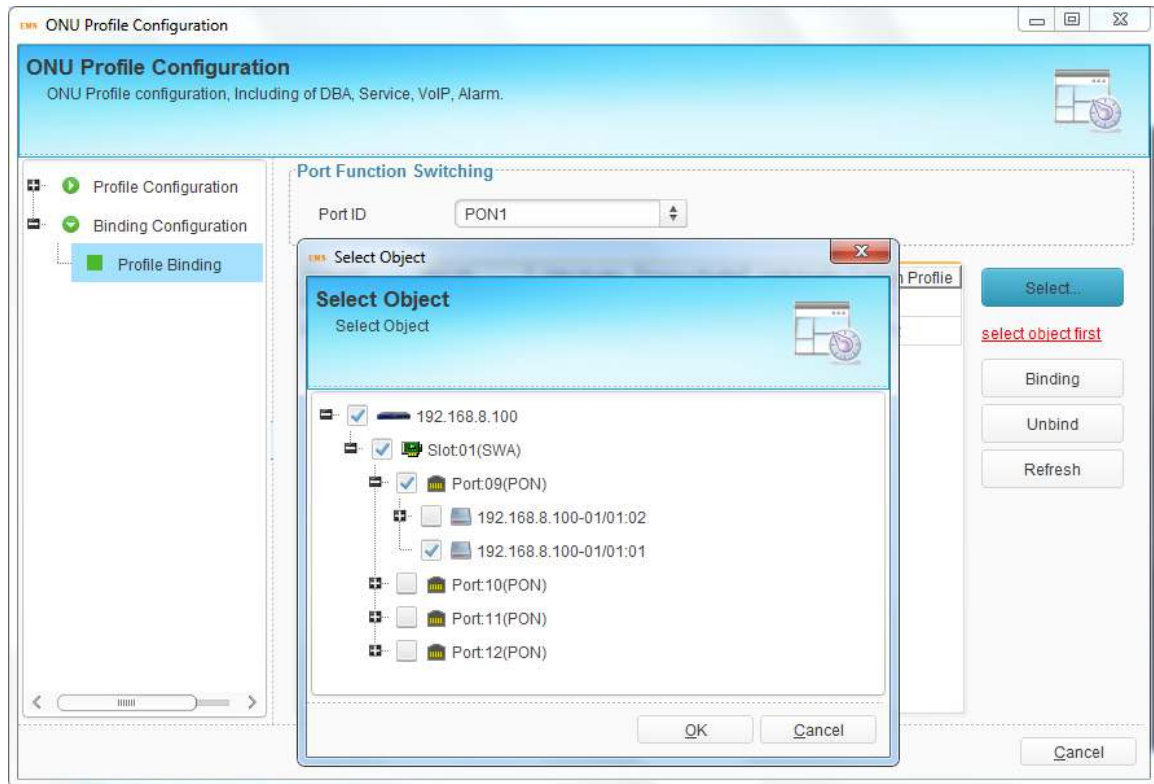


Figure 8-19 Select ONU

Select one or more ONUs in the table, click "Binding" button and select the profile ID, then click "OK" button to apply the configurations. Each ONU can only bind one profile with the same type.

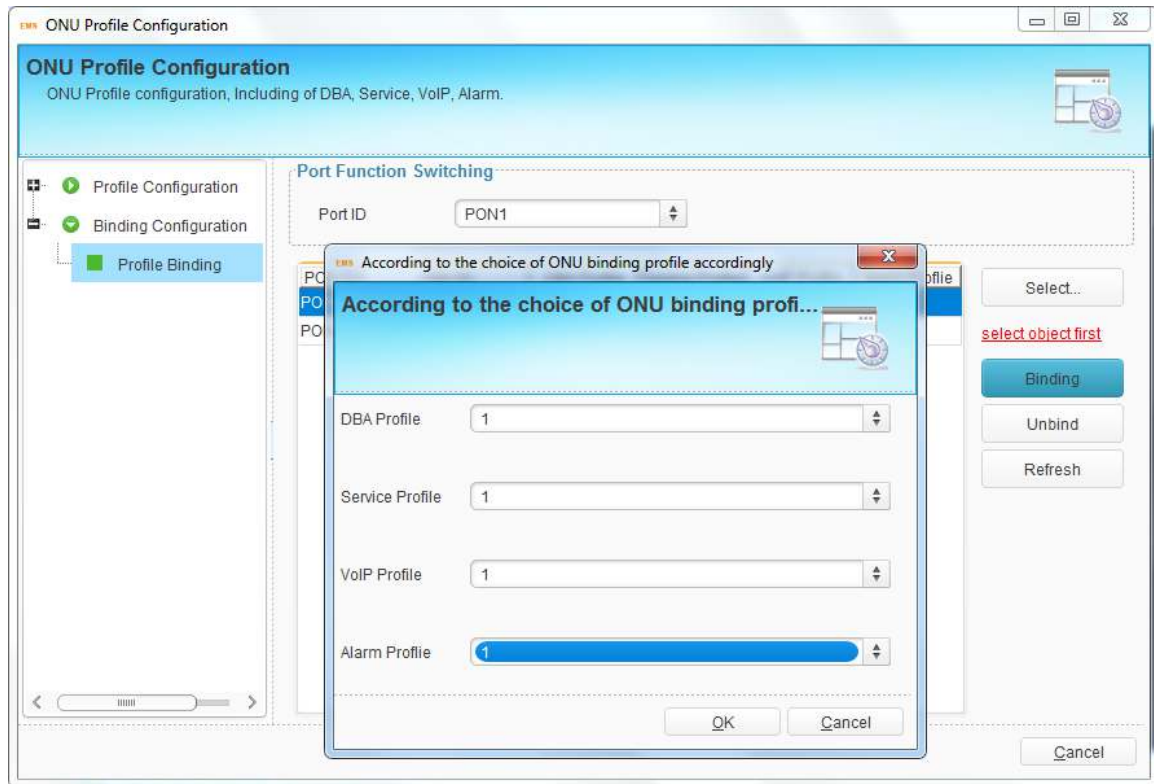


Figure 8-20 Profile Binding

Select one or more ONUs in the table and click “Unbind” button, all profiles will be unbound. If want to unbind part of profiles, you need to unbind them at binding dialog box.

9 ONU Management--EPON

This chapter mainly introduces ONU management function of EMS. ONU management includes ONU system operation and ONU service configuration.

9.1 ONU Basic Information

Choose ONU icon and open right-click menu; click "ONU Detail" to display ONU basic information and ONU user information.

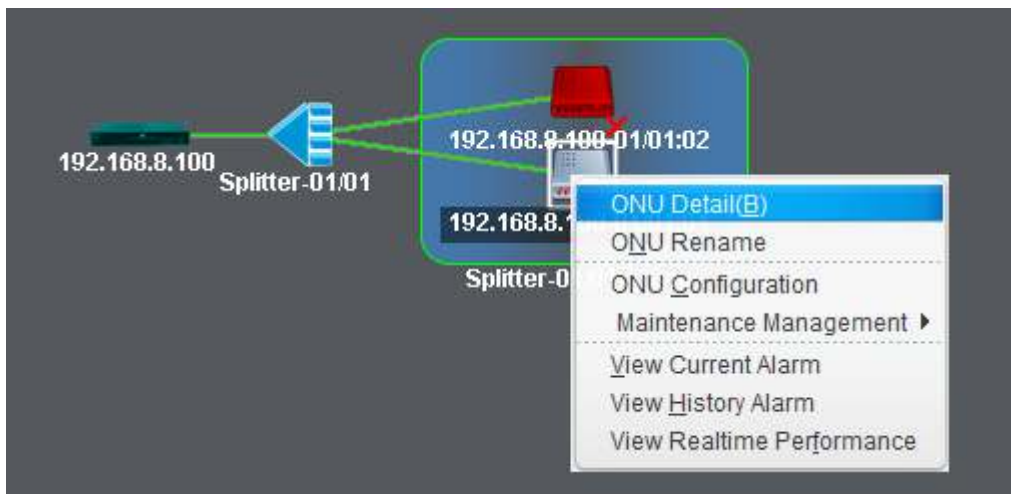
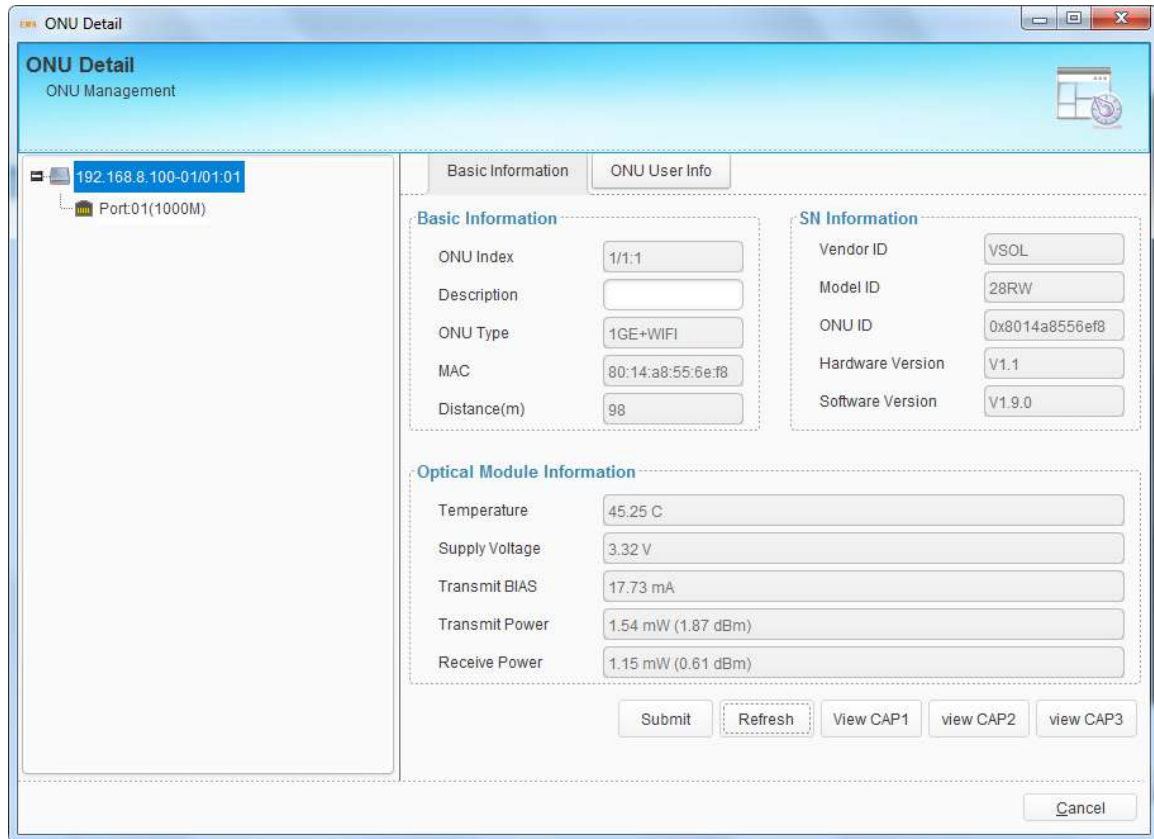


Figure 9-1 Open ONU Device Detail

You can configure ONU description at basic information interface. Click "Submit" button to apply the description and click "View CAP1/2/3" button to display ONU capabilities which are reported by CTC OAM.



ONU Detail
ONU Management

192.168.8.100-01/01-01
Port:01(1000M)

Basic Information **ONU User Info**

Basic Information

ONU Index	1/1:1
Description	
ONU Type	1GE+WIFI
MAC	80:14:a8:55:6e:f8
Distance(m)	98

SN Information

Vendor ID	VSOL
Model ID	28RW
ONU ID	0x8014a8556ef8
Hardware Version	V1.1
Software Version	V1.9.0

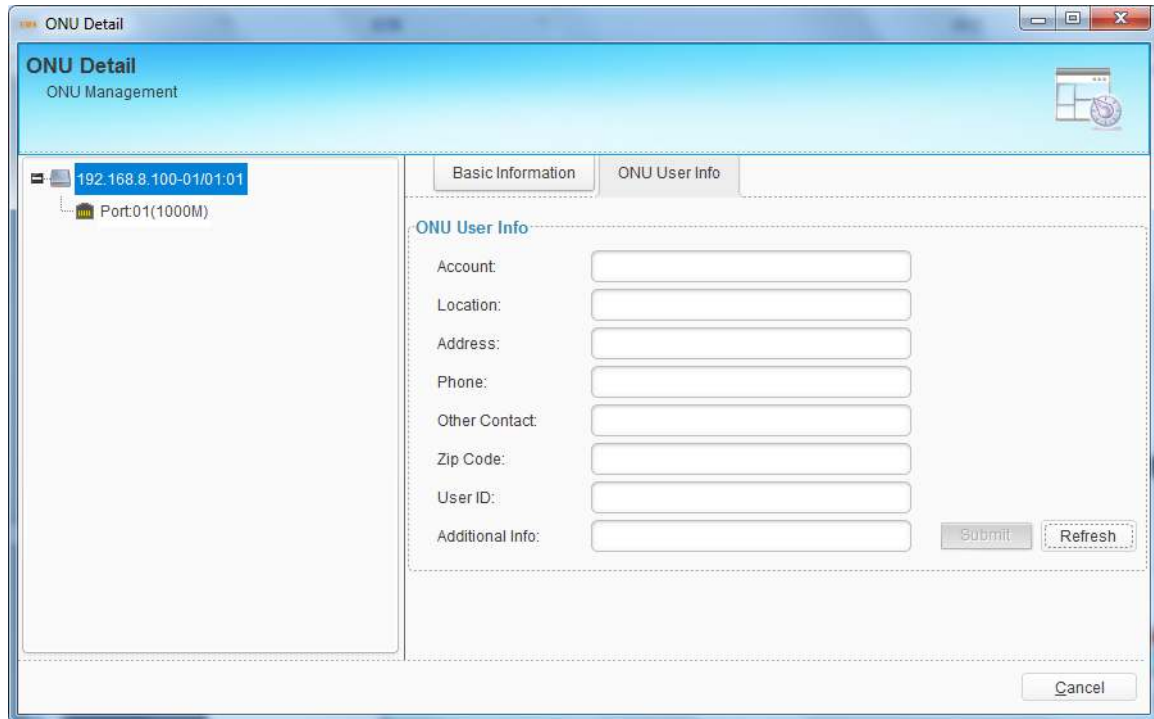
Optical Module Information

Temperature	45.25 C
Supply Voltage	3.32 V
Transmit BIAS	17.73 mA
Transmit Power	1.54 mW (1.87 dBm)
Receive Power	1.15 mW (0.61 dBm)

Submit Refresh View CAP1 view CAP2 view CAP3 Cancel

Figure 9-2 ONU Basic Information

ONU user information is used to record address, phone and other information of the ONU user. It is convenient to know where the ONU is installed and contacts of the user.



The screenshot shows a web application window titled "ONU Detail" with a sub-header "ONU Management". On the left, a tree view displays a network structure with a selected node showing the IP address "192.168.8.100-01/01:01" and a port "Port:01(1000M)". The main area has two tabs: "Basic Information" and "ONU User Info", with the latter being active. The "ONU User Info" tab contains a form with the following fields: "Account:", "Location:", "Address:", "Phone:", "Other Contact:", "Zip Code:", "User ID:", and "Additional Info:". Each field is followed by a text input box. At the bottom right of the form are "Submit" and "Refresh" buttons. A "Cancel" button is located at the bottom right of the entire window.

Figure 9-3 ONU User Information

9.2 ONU Maintenance Management

9.2.1 ONU Rename

This operation is used to set or modify ONU's name. The name will not be saved in device, but be saved in EMS database.

Choose ONU icon and open right-click menu; choose "ONU Rename" to open a pop-up dialog box.

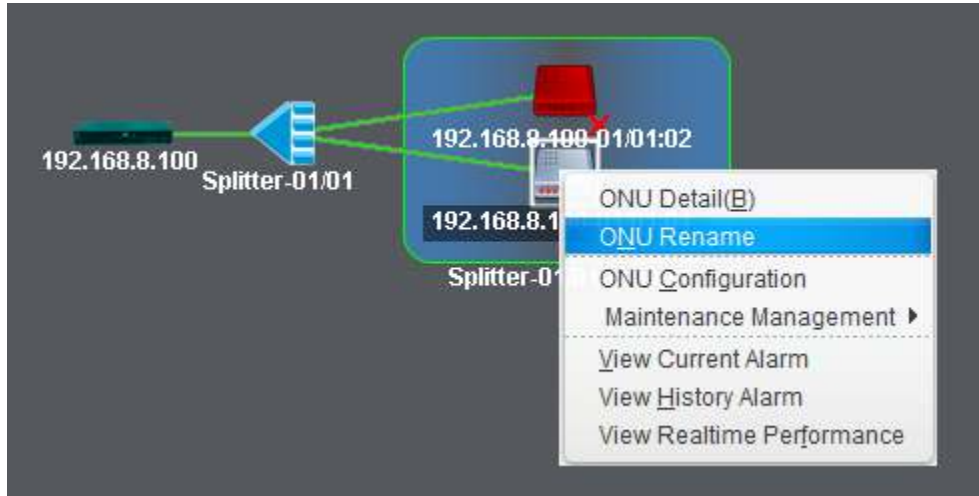


Figure 9-4 ONU Rename

Fill in the ONU new name and click "OK" button to apply.

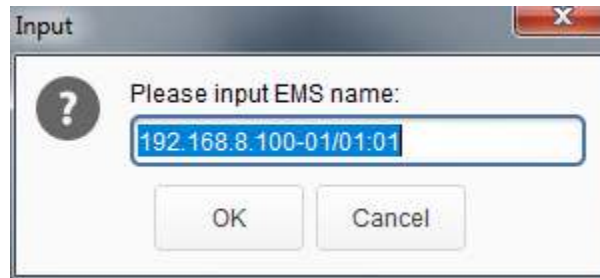


Figure 9-5 Set ONU Rename

9.2.2 Reregister ONU

This operation is used to force ONU to register again. When ONU reregister successful, rolling log bar will display the prompt message.

Right click ONU icon and choose "Maintenance Management" > "Reregister ONU", then click "Yes" button on confirmation dialog box. It will carry out ONU reregister action.

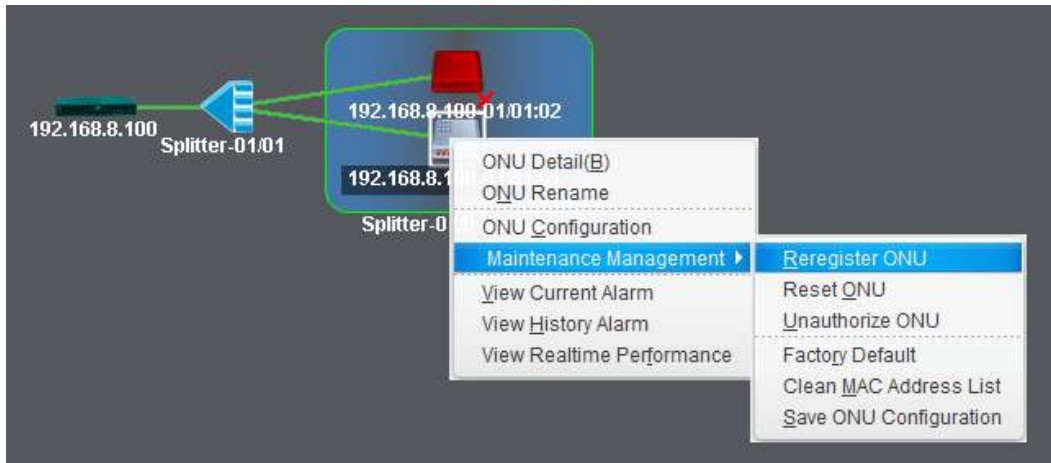


Figure 9-6 Reregister ONU



Caution! The operation will cause user services interruption.

9.2.3 Reset ONU

This operation is used to restart ONU. Rolling log will display the prompt message when the ONU reset successfully.

Right click ONU icon and choose "Maintenance Management" > "Reset ONU", then click "Yes" button on confirmation dialog box to reset it. It will carry out ONU reset action.

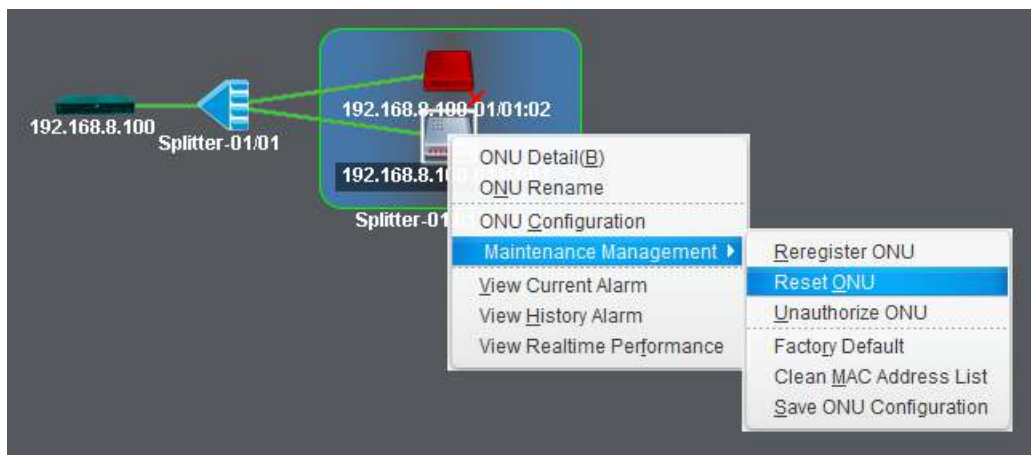


Figure 9-7 Reset ONU



Caution! The operation will cause user services interruption.

9.2.4 Unauthorize ONU

This operation is used to remove ONU from ONU authentication list. All the information related to the ONU will get lost.

Right click ONU icon and choose "Maintenance Management" > "Unauthorize ONU", then click "Yes" button on confirmation dialog box to remove it.

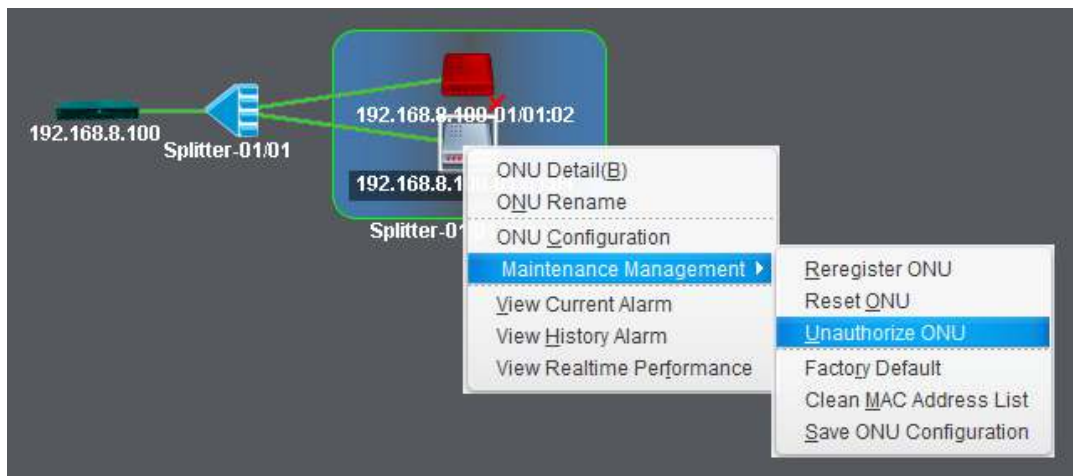


Figure 9-8 Unauthorize ONU



Caution! All information related to the ONU will get lost after executed this operation.

9.2.5 Load Factory Default

This operation is used to load ONU settings to factory default. It is implemented by private OAM.

Right click ONU icon and choose "Maintenance Management" > "Load Factory

Default", then click "Yes" button on confirmation dialog box.

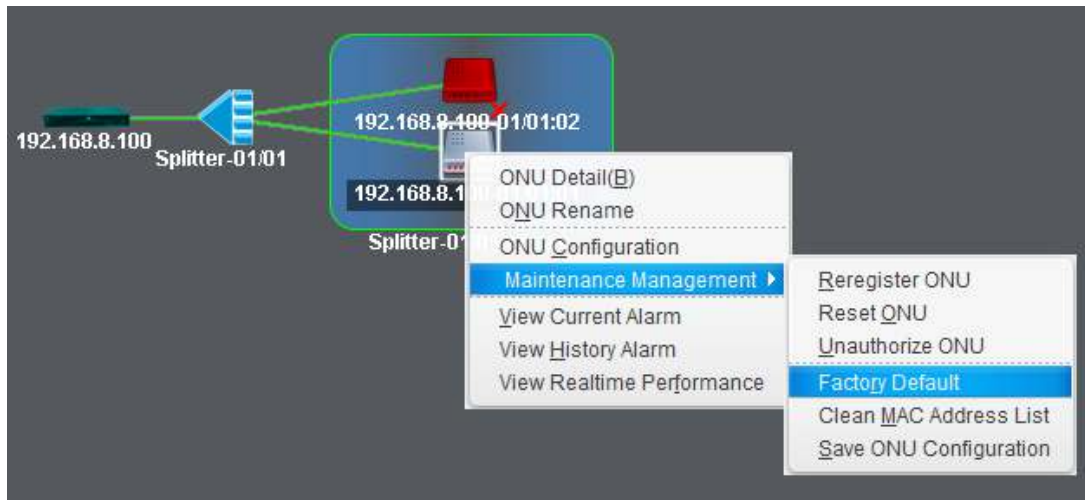


Figure 9-9 Load Factory Default

9.2.6 Clean MAC Address List

This operation is used to clean MAC addresses which the ONU has learnt. It is implemented by private OAM.

Right click ONU icon and choose "Maintenance Management" > "Clean MAC address List", then click "Yes" button on confirmation dialog box.

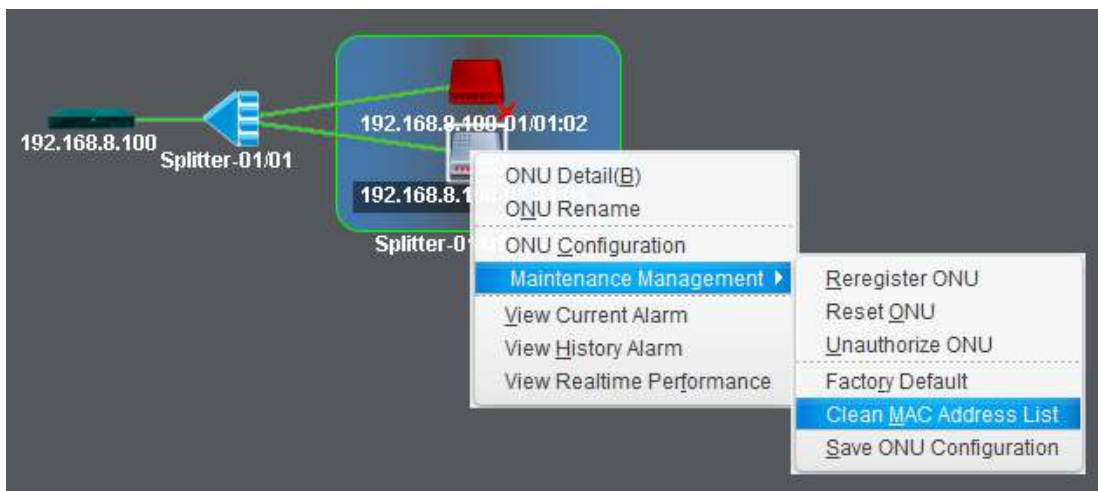


Figure 9-10 Clean MAC Address List

9.2.7 Save ONU Configuration

This operation is used to save ONU configurations to its flash memory. It is implemented by private OAM.

Right click ONU icon and choose "Maintenance Management" > "Save ONU Configurations", then click "Yes" button on confirmation dialog box.

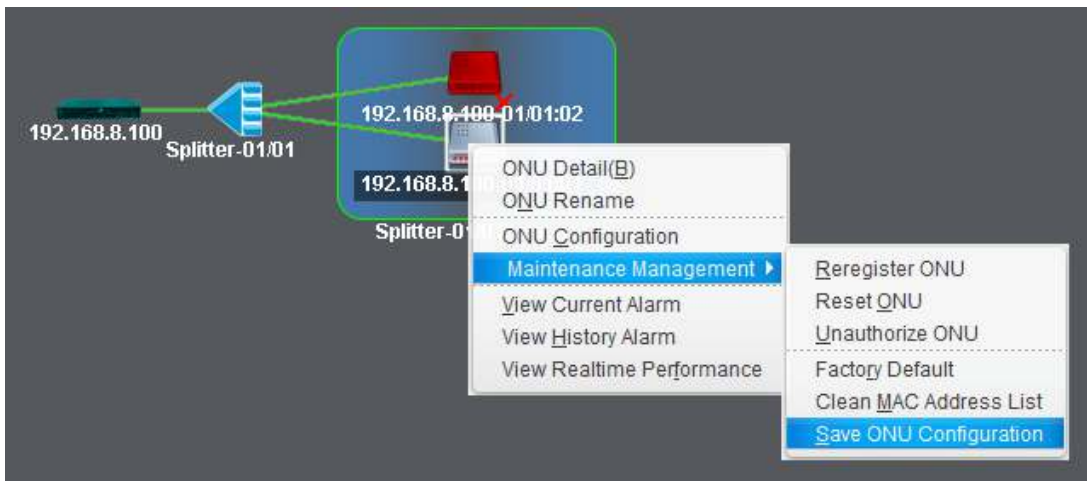


Figure 9-11 Save ONU Configuration

9.3 ONU Configuration

This section mainly introduces ONU service configurations. Different type ONU has different configuration options. OLT can identify what functions the ONU supports and EMS will display the corresponding configuration options in this interface.

Right-click ONU icon, choose "ONU Configuration" to enter ONU configuration interface.

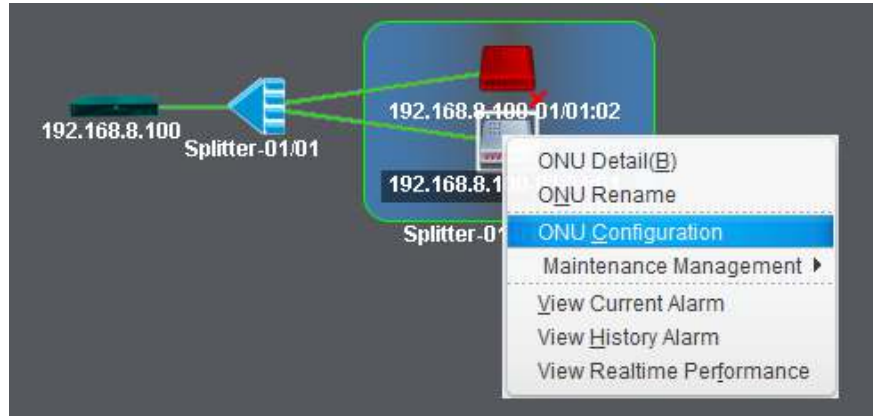


Figure 9-12 Enter ONU Configuration

9.3.1 Information

This interface is the same as ONU detail interface, which displays ONU information. You can also set ONU description and check its capability that reported by CTC OAM.

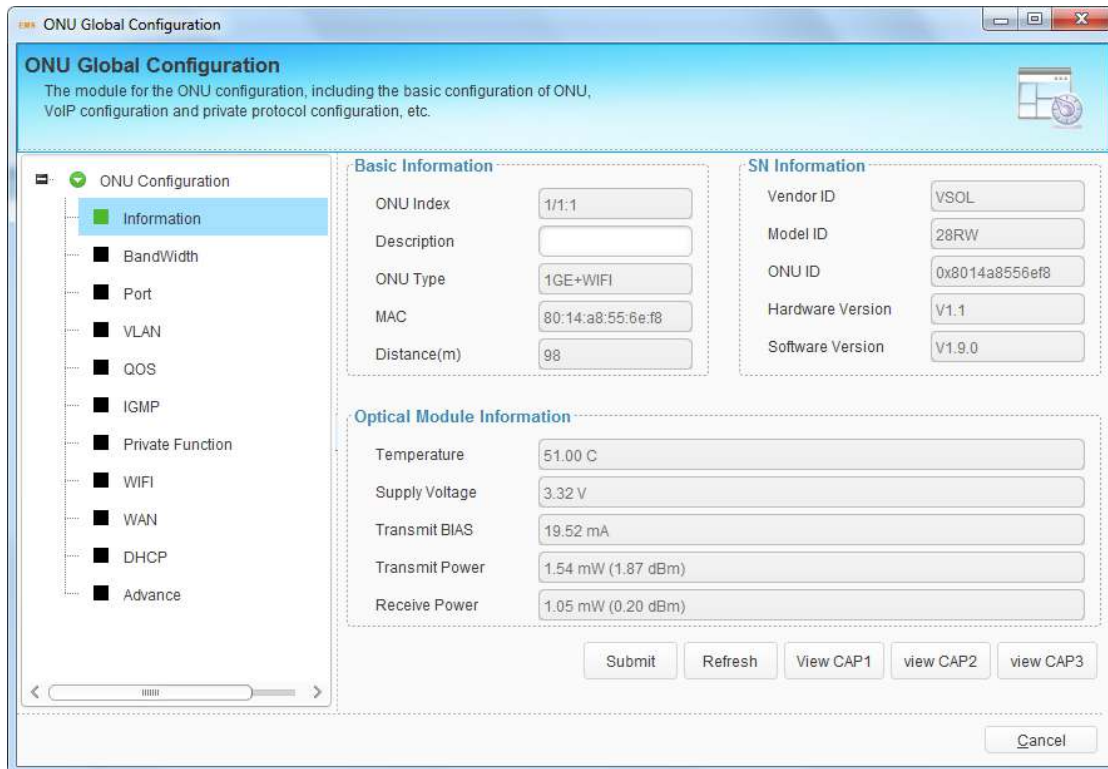
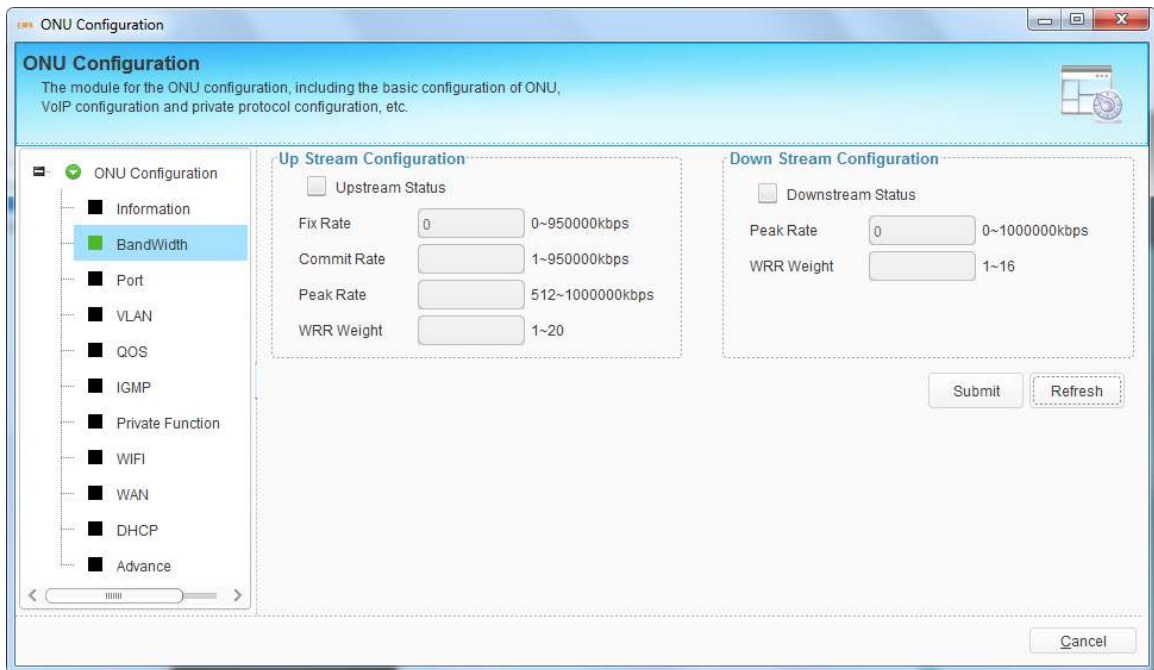


Figure 9-13 ONU Information

9.3.2 Bandwidth

This configuration is used to limit upstream and downstream bandwidth of ONU. It is DBA that changes uplink bandwidth assigned to each ONU in real time according to the instant service status of each ONU.

The upstream WRR weight will be used to compute the remaining bandwidth allocation after fixed rate of each ONU has been guaranteed. The downstream WRR weight will reference to the global 16 PON weights and only work when the ONU egress shaper is disabled.



The screenshot shows the 'ONU Configuration' window. On the left is a tree view with 'BandWidth' selected. The main area is divided into two sections: 'Up Stream Configuration' and 'Down Stream Configuration'. Each section has a status checkbox and several rate/weight input fields with their respective ranges. 'Submit' and 'Refresh' buttons are at the bottom right, and a 'Cancel' button is at the bottom center.

Configuration	Field	Value	Range
Up Stream Configuration	Upstream Status	☐	
	Fix Rate	0	0~950000kbps
	Commit Rate		1~950000kbps
	Peak Rate		512~1000000kbps
	WRR Weight		1~20
Down Stream Configuration	Downstream Status	☐	
	Peak Rate	0	0~1000000kbps
	WRR Weight		1~16

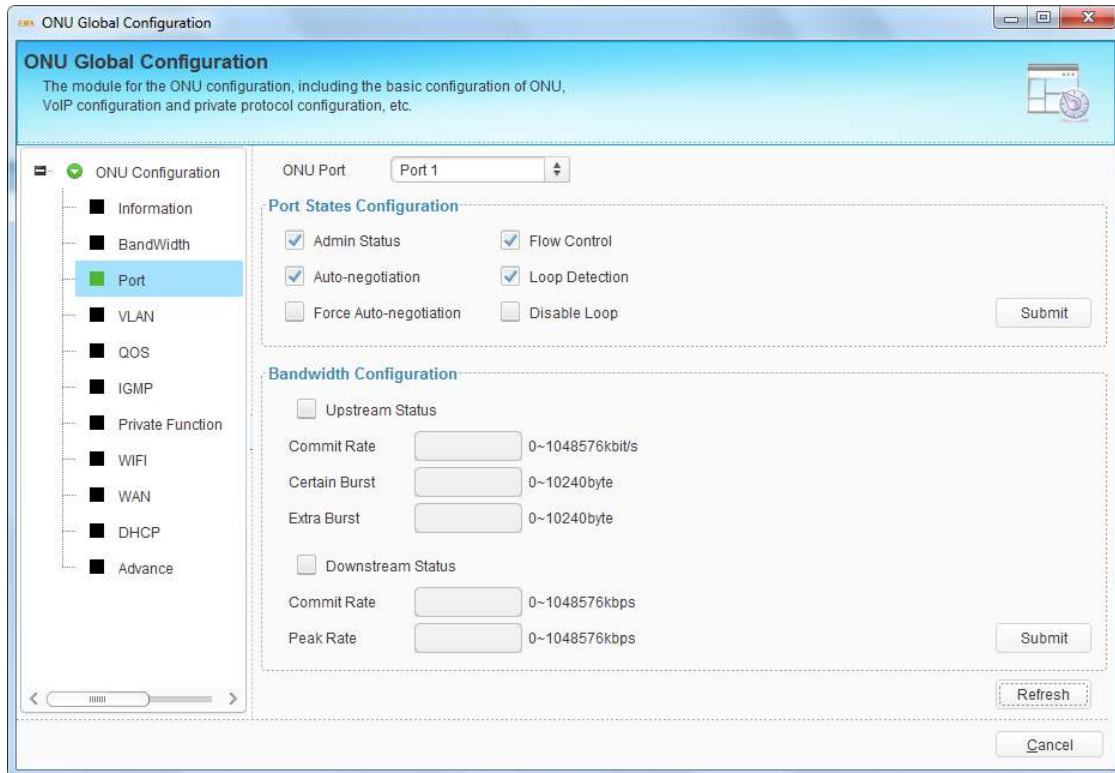
Figure 9-14 ONU Bandwidth Configuration

9.3.3 Port

Port configuration is mainly used to configure functions and characteristic

parameters of Ethernet port. These configurations contain administration status, flow control, loop, auto-negotiation and rate.

Choose one port, select the port attributes or fill in rate value; click "Submit" button to apply the configurations.



The screenshot shows the 'ONU Global Configuration' window. On the left is a tree view with 'Port' selected. The main area is titled 'ONU Port' with a dropdown set to 'Port 1'. It contains two sections: 'Port States Configuration' and 'Bandwidth Configuration'. In 'Port States Configuration', 'Admin Status', 'Auto-negotiation', 'Flow Control', and 'Loop Detection' are checked. In 'Bandwidth Configuration', 'Upstream Status' and 'Downstream Status' are unchecked, and their respective 'Commit Rate' and 'Peak Rate' fields are empty. 'Submit', 'Refresh', and 'Cancel' buttons are at the bottom right.

Figure 9-15 ONU Port Configuration

Illustrations of each parameter:

Parameters	Illustration
Admin Status	Enable or disable administration status of the port.
Auto-negotiation	Enable or disable auto negotiation of the port. After enable, the port will negotiate with the connected port to reach the largest possible transmission rate.
Force Auto-negotiation	Force port to auto-negotiate again.

Flow Control	Enable or disable flow control function of the port in order to control congestion. It is disabled by default.
Loop Detection	Enable or disable port loop detection function.
Disable Loop	Disable the port in the loop.
Upstream/Downstream Status	Enable or disable upstream/downstream bandwidth limitation of the port.
Commit Rate	Committed Information Rate of the port.
Certain Burst	Committed Burst Size.
Extra Burst	Extra Burst Size.
Peak Rate	Peak Information Rate.

9.3.4 VLAN

This configuration is used to configure ONU port VLAN. There are transparent, tag, translation, aggregation and trunk mode. Maximum eight VLAN rules can be configured for each port when choosing translation, aggregation and trunk mode. Select one port, VLAN mode, and fill in VLAN ID. Click "Submit" button to apply configurations.

9.3.4.1 Transparent Mode

In this mode, upstream or downstream Ethernet packet will get through this port directly.

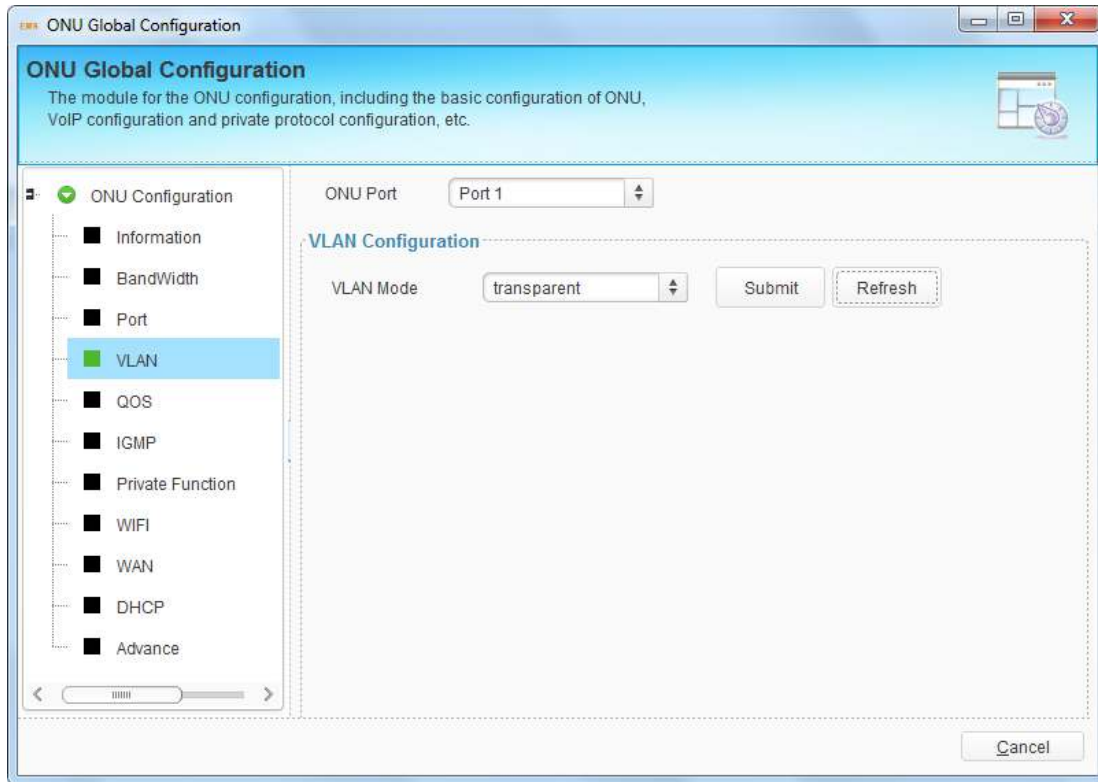


Figure 9-16 ONU port VLAN Transparent Mode

9.3.4.2 Tag Mode

In this mode, PVID is required. PVID is default VLAN of the port. The method of an ONU port with tag mode processing Ethernet packet is shown in the following table.

Direction	VLAN tag	Operation
Upstream	Yes	Discard the packet.
	No	Add default VLAN tag to the packet.
Downstream	Yes	If VID is not equal to default VID, discard the packet; otherwise strip the VLAN tag of the packet.
	No	Discard the packet.

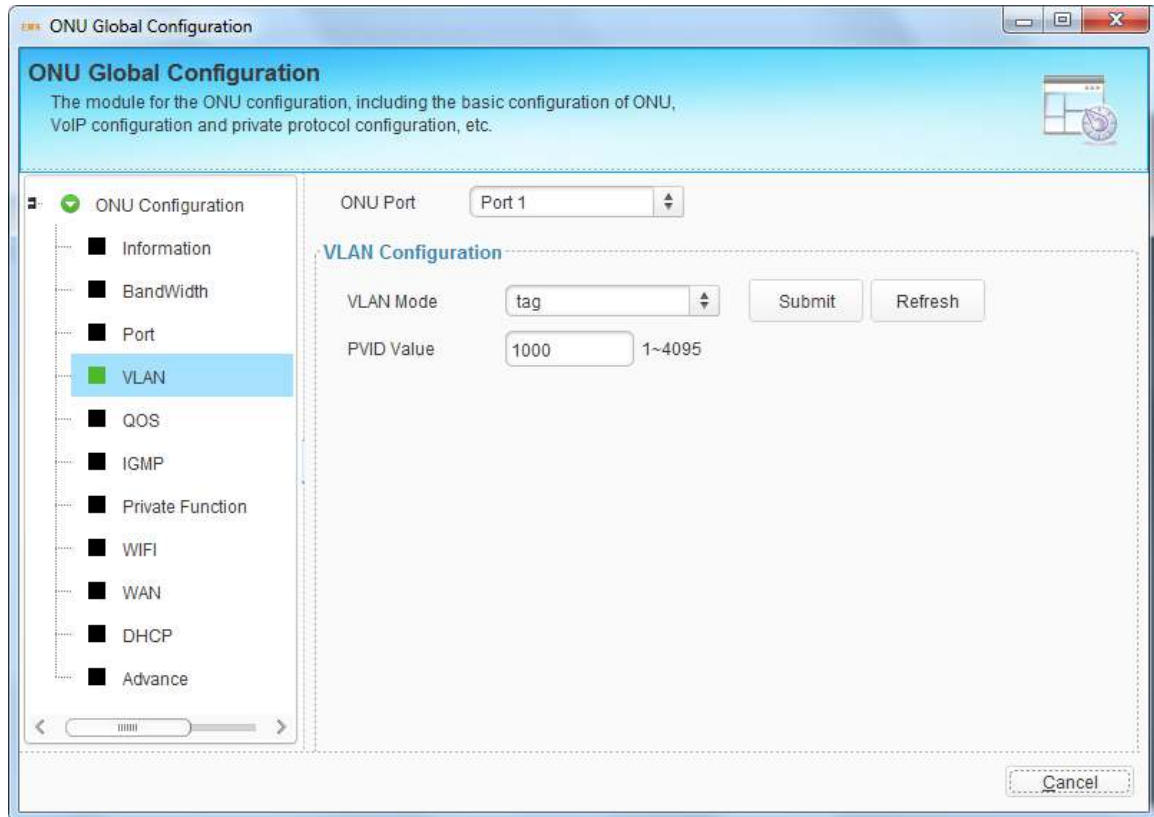


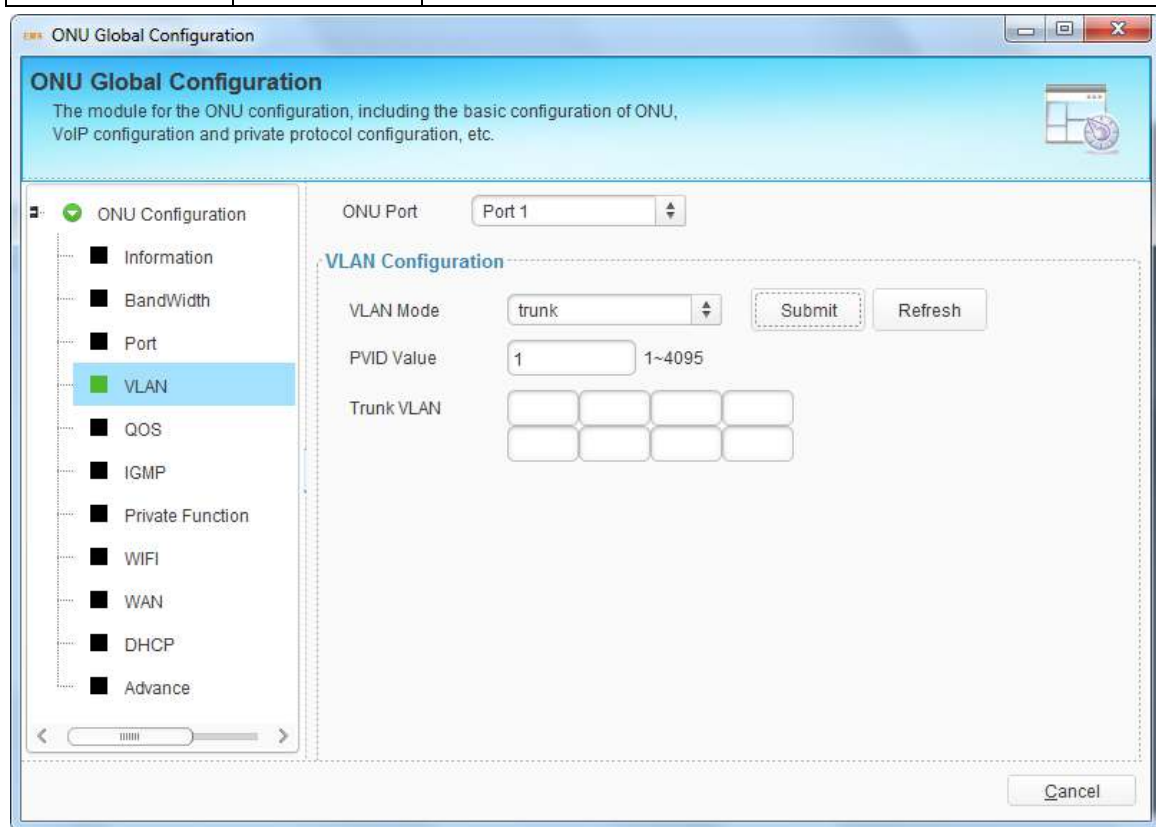
Figure 9-17 ONU Port VLAN Tag Mode

9.3.4.3 Trunk Mode

Trunk mode allows the port forward multiple VLANs at the same time. In this mode, PVID is also required. The method of an ONU port with trunk mode processing Ethernet packet is shown in the following table.

Direction	VLAN tag	Operation
Upstream	Yes	If the packet's VID exists in the VLAN Trunk list or is equal to the port default VID, forward this packet, otherwise discard this packet.
	No	Add default VLAN tag to the packet and forward it.

Downstream	Yes	If the packet's VID is equal to the port default VID, strip the VLAN tag of the packet and forward the packet. If the packet's VID is not equal to the port default VID but exists in the VLAN Trunk list, forward the packet. If the packet's VID is not equal to the port default VID and doesn't exist in the VLAN Trunk list, discard the packet.
	No	Discard this packet.



ONU Global Configuration
The module for the ONU configuration, including the basic configuration of ONU, VoIP configuration and private protocol configuration, etc.

ONU Configuration

- Information
- BandWidth
- Port
- VLAN**
- QOS
- IGMP
- Private Function
- WIFI
- WAN
- DHCP
- Advance

ONU Port: Port 1

VLAN Configuration

VLAN Mode: trunk

PVID Value: 1 (Range: 1~4095)

Trunk VLAN: [Empty grid for Trunk VLAN list]

Buttons: Submit, Refresh, Cancel

Figure 9-18 ONU Port VLAN Trunk Mode

9.3.4.4 Translation Mode

Translation mode allows the port overwrites VLAN tag. In this mode, PVID is also required. The method of an ONU port with translation mode processing Ethernet packet is shown in the following table.

Direction	VLAN tag	Operation
Upstream	Yes	If the VID of the packet is equal to the CVLAN of a certain translation entry, overwrite the packet's VID with this entry's SVLAN and forward the packet. If the VID of the packet is not equal to any translation entry's CVLAN, discard the packet.
	No	Add default VLAN tag to the packet and forward it.
Downstream	Yes	If the VID of the packet is equal to the SVLAN of a certain translation entry, overwrite the packet's VID with this entry's CVLAN and forward the packet. If the VID of the packet is not equal to any translation entry's SVLAN, discard the packet.
	No	Discard the packet.

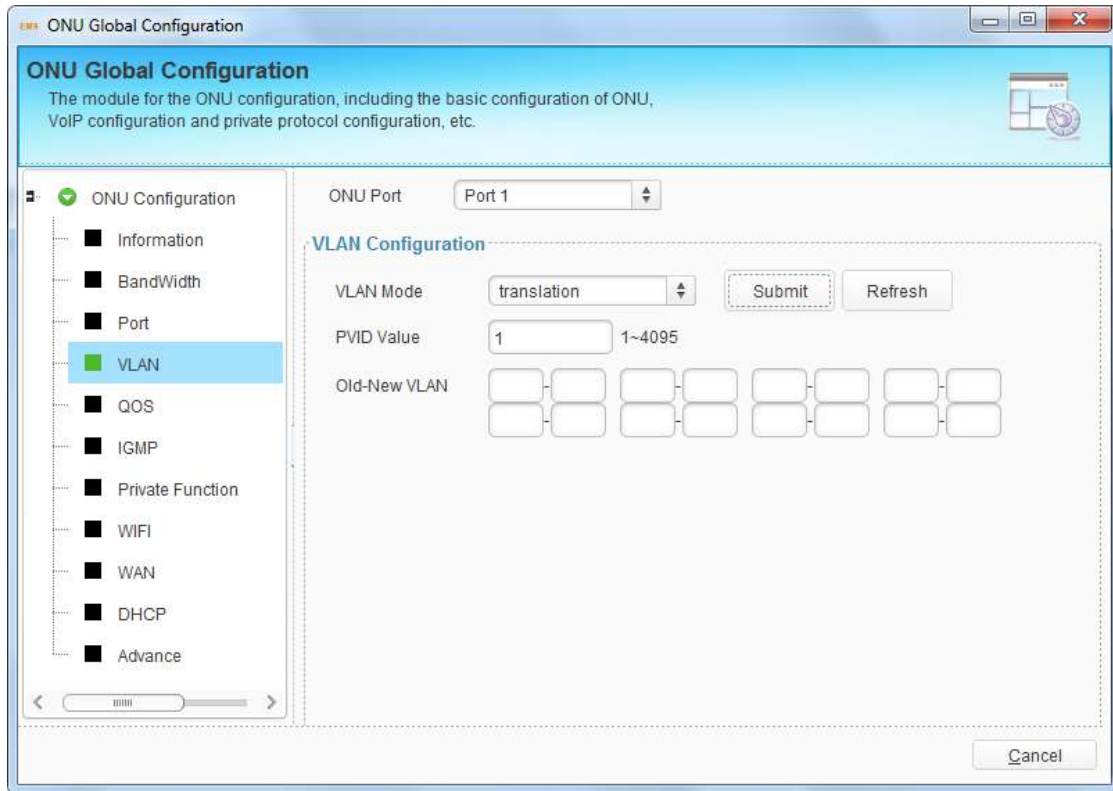


Figure 9-19 ONU Port VLAN Translation Mode

9.3.4.5 Aggregation Mode

Aggregation mode allows multiple VLAN to be overwritten by a same VLAN tag. In this mode, PVID is also required. The method of an ONU port with aggregation mode processing Ethernet packet is shown in the following table.

Direction	VLAN tag	Operation
Upstream	Yes	If the VID of the packet is equal to the CVLAN of a certain VLAN entry, overwrite the packet's VID with this entry's SVLAN and forward the packet.
		If the VID of the packet is not equal to any VLAN entry's CVLAN, discard the packet.

	No	Add default VLAN tag to the packet and forward it.
Downstream	Yes	If the VID of the packet is equal to the SVLAN of a certain translation entry, overwrite the packet's VID with this entry's CVLAN and forward this packet. If the VID of the packet is not equal to any translation entry's SVLAN, discard the packet.
	No	Discard the packet.

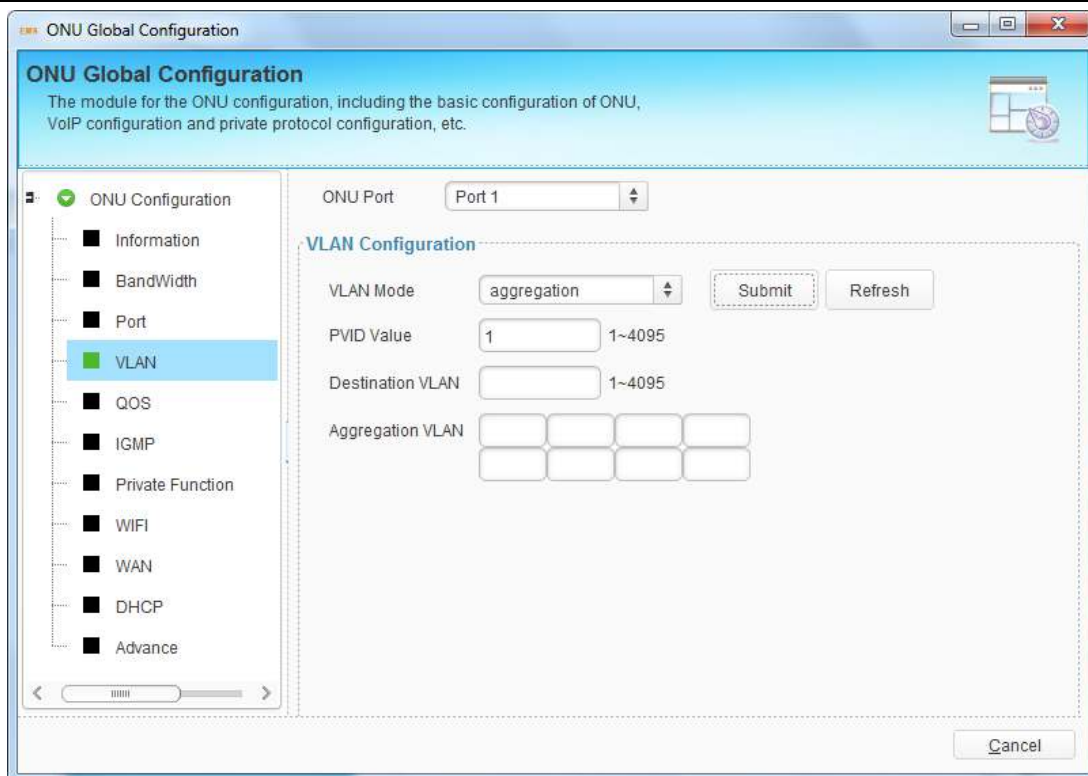


Figure 9-20 ONU Port VLAN Aggregation Mode

9.3.5 QoS

This is QoS configuration for ONU LAN port. QoS function includes data stream classification and mark. Customers can mark different streams by priority

according to different rules. When matches the conditions that have been configured, the data traffic will be set with new priority and mapped to the queue. When bandwidth is not enough or there is congestion, QoS configurations can make sure high priority data traffic passes through the device firstly. The conditions include MAC address, IP address, VLAN, Ethernet type, TCP/UDP port, etc. You can select one or more options to configure.

Select a port, click "Add" button to open a pop-up dialog box, check conditions and fill in the value, click "OK" button to apply the configurations.

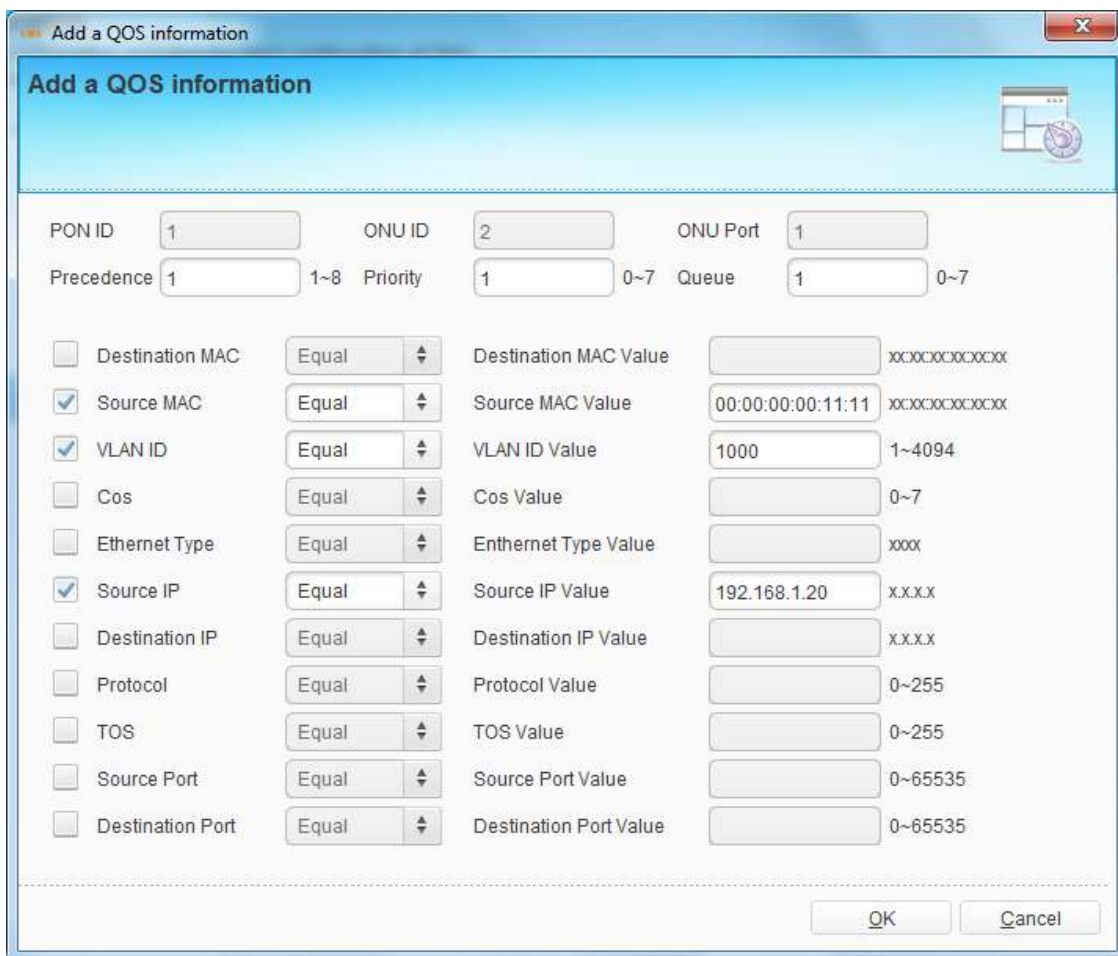


Figure 9-21 Add ONU Port QoS Rule

After added, QoS rules will display in the table. You can click "Details" button to

see the detail configurations. Select the QoS rule in the table and click "Delete" to delete it.

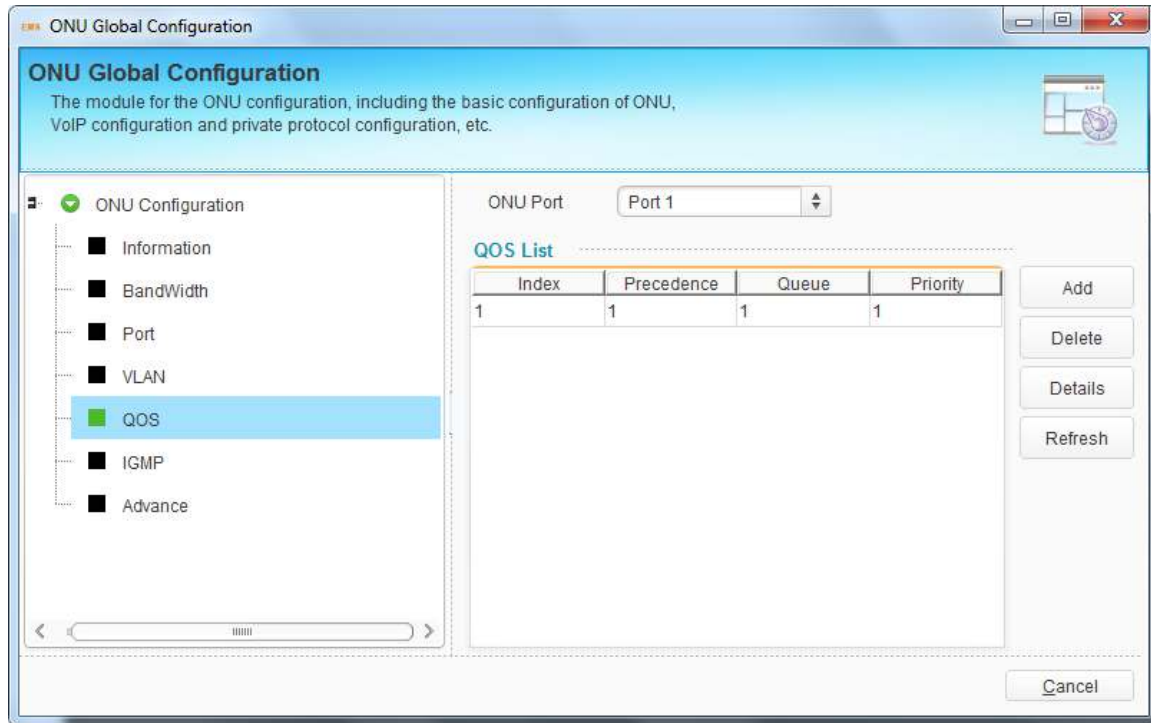


Figure 9-22 ONU Port QoS Rule

9.3.6 IGMP

This is IGMP configuration for ONU LAN port. When the ONU is used for IPTV service, IGMP configurations are required. IGMP port configurations contain multicast VLAN and maximum group.

Multicast max group is used to configure how many multicast groups this port can join in at the same time.

Maximum eight multicast VLAN can be configured for each port. Multicast VLAN translation can be configured only when choosing VLAN Translate.

Select one port, and fill in multicast VLAN, then click “Submit” button to apply the configurations.

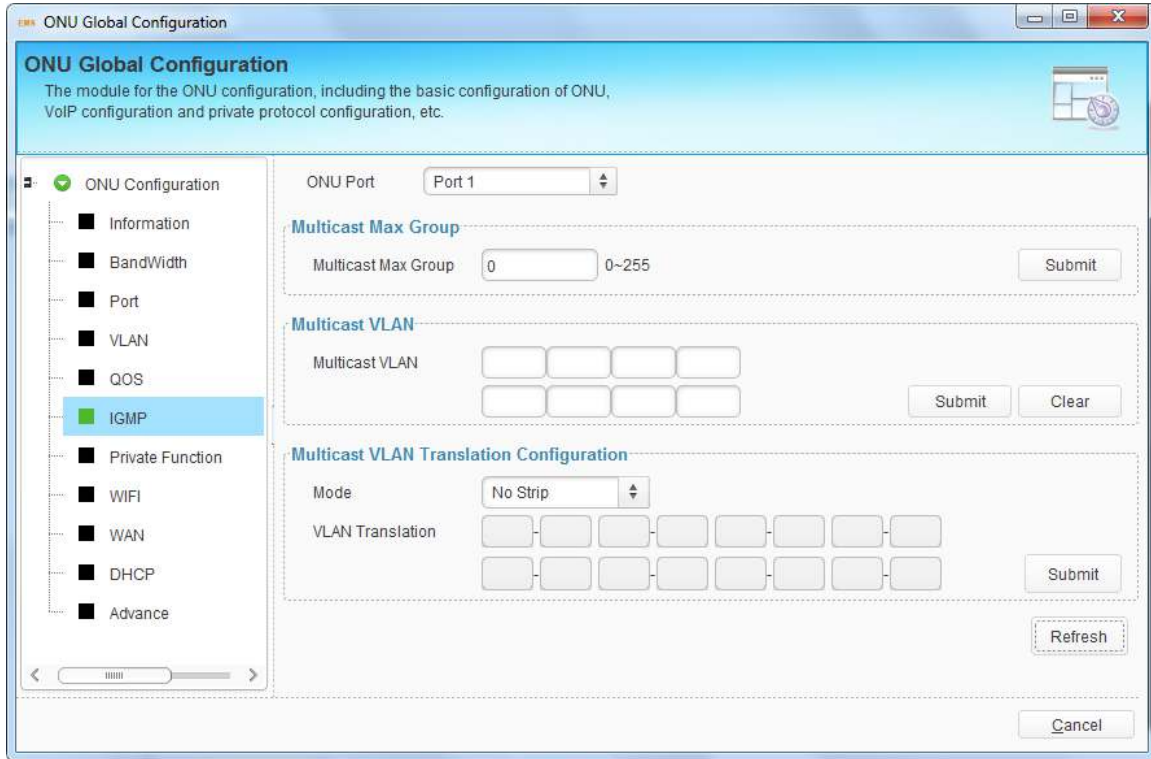


Figure 9-23 ONU Port IGMP Configuration

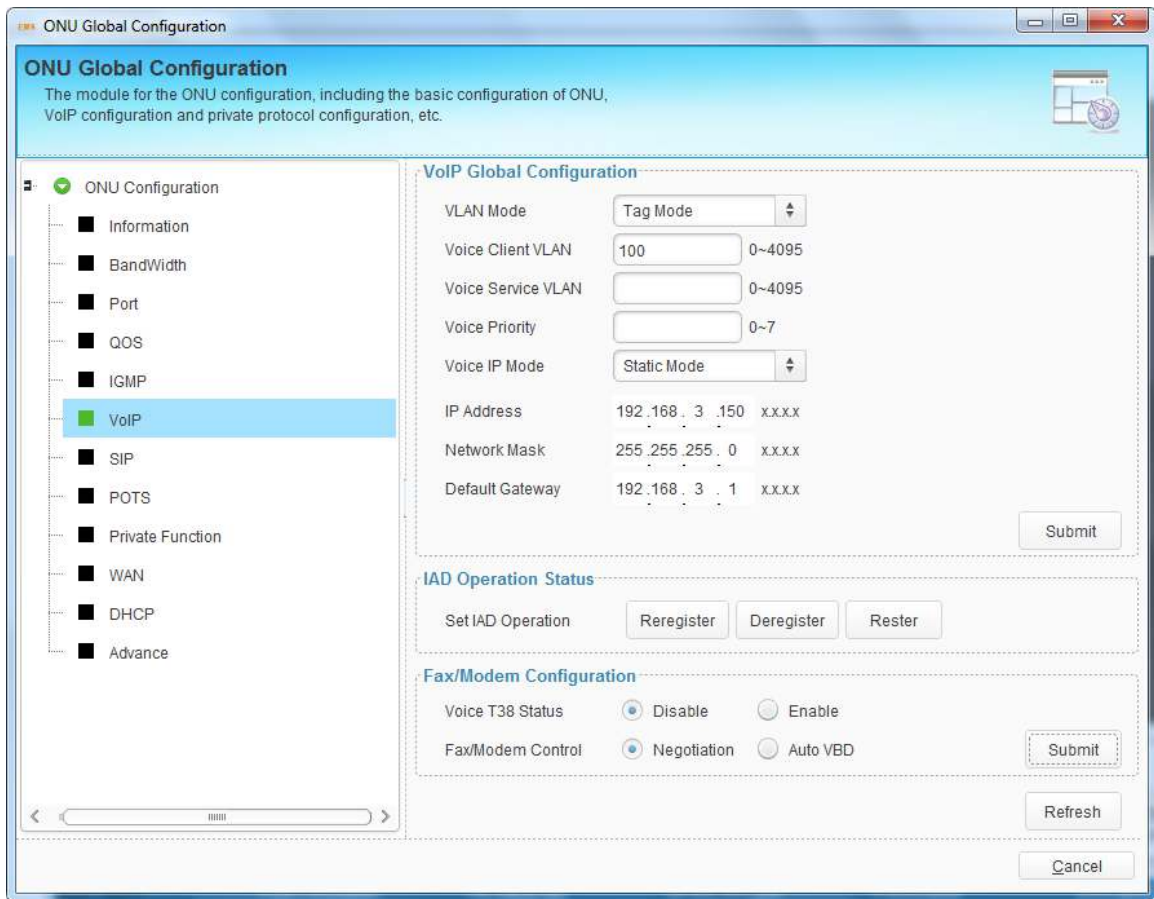
The method of an ONU port with different mode processing multicast packet is shown in the following table.

Mode	Operation
strip	Multicast stream sent out from the port does not contain any multicast VLAN tag.
No strip	Multicast stream sent out from this port keeps multicast VLAN tag.
Translate	Multicast VLAN of multicast stream sent out from this port will be changed to user VLAN.

9.3.7 VoIP

This interface is mainly used to configure VoIP global configurations, which contain IP address and VLAN, and fax mode, execute IAD operations as well.

Select VLAN mode and IP mode, fill in correct parameters, and click "Submit" button to apply VoIP global configurations.



The screenshot displays the 'ONU Global Configuration' window. On the left is a sidebar with a tree view containing: Information, BandWidth, Port, QOS, IGMP, VoIP (highlighted), SIP, POTS, Private Function, WAN, DHCP, and Advance. The main area is titled 'VoIP Global Configuration' and includes a description: 'The module for the ONU configuration, including the basic configuration of ONU, VoIP configuration and private protocol configuration, etc.' The configuration fields are as follows:

Parameter	Value	Range/Format
VLAN Mode	Tag Mode	
Voice Client VLAN	100	0~4095
Voice Service VLAN		0~4095
Voice Priority		0~7
Voice IP Mode	Static Mode	
IP Address	192.168.3.150	x.x.x.x
Network Mask	255.255.255.0	x.x.x.x
Default Gateway	192.168.3.1	x.x.x.x

Below these fields is a 'Submit' button. The 'IAD Operation Status' section contains buttons for 'Set IAD Operation', 'Reregister', 'Deregister', and 'Rester'. The 'Fax/Modem Configuration' section has two rows of radio buttons: 'Voice T38 Status' (Disable selected, Enable unselected) and 'Fax/Modem Control' (Negotiation selected, Auto VBD unselected). This section includes 'Submit', 'Refresh', and 'Cancel' buttons.

Figure 9-24 Voice Configuration

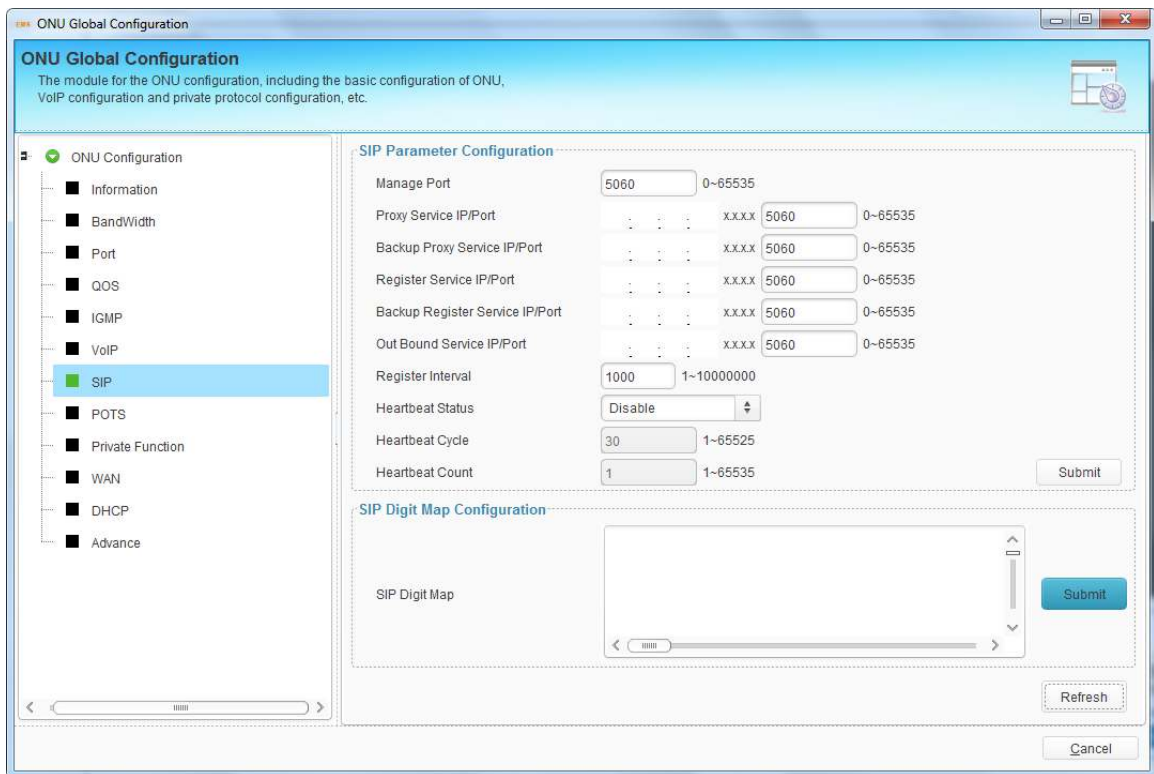
IAD operation includes reregister, deregister and restart. Reregister is used to force VoIP accounts to register again. Deregister is used to deregister VoIP accounts. Restart it used to restart IAD module.

Fax/Modem Configuration is used to set fax mode. When Voice T38 Status is

disabled, the fax mode is T30 mode.

9.3.8 SIP

SIP parameters mainly contain proxy server, register server, backup server, server port, register interval, heartbeat and digit map. Digit map defines the rules of dialing phone number.



The screenshot shows the 'ONU Global Configuration' window. On the left is a tree view with 'SIP' selected. The main area is divided into two sections:

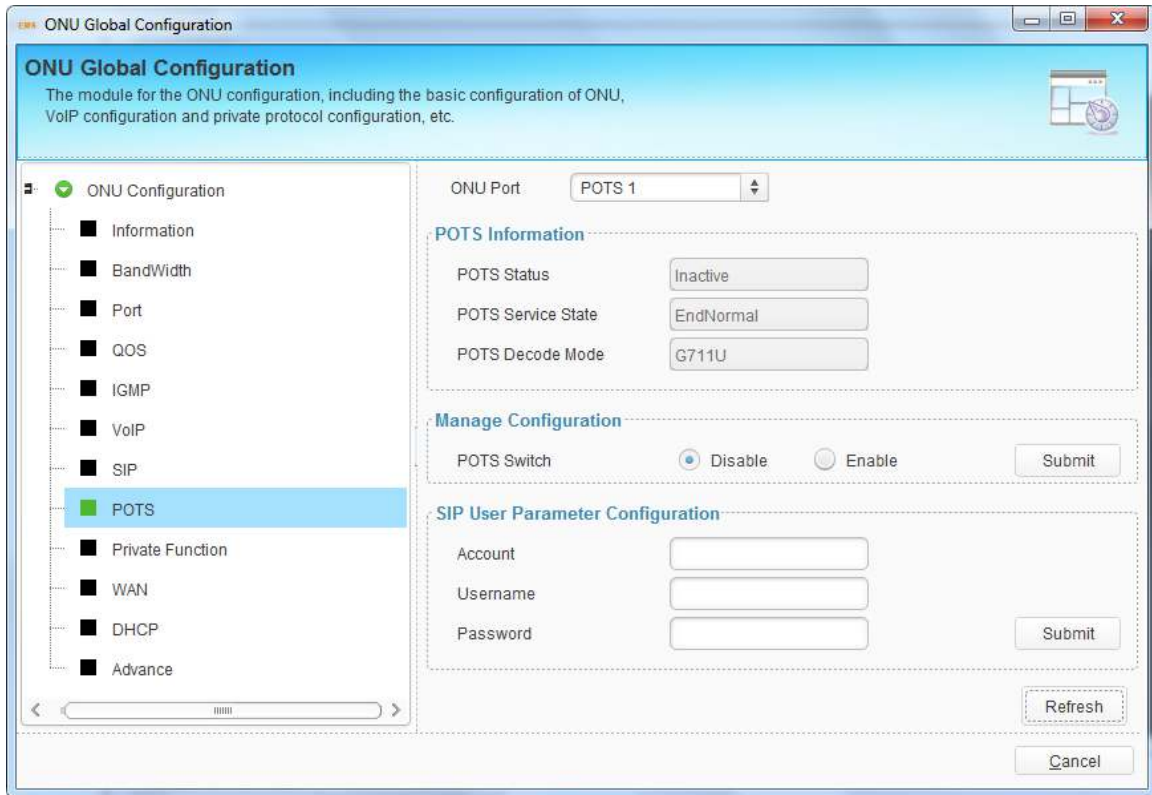
- SIP Parameter Configuration:** Contains fields for:
 - Manage Port: 5060 (range 0~65535)
 - Proxy Service IP/Port: . . . XXXX 5060 (range 0~65535)
 - Backup Proxy Service IP/Port: . . . XXXX 5060 (range 0~65535)
 - Register Service IP/Port: . . . XXXX 5060 (range 0~65535)
 - Backup Register Service IP/Port: . . . XXXX 5060 (range 0~65535)
 - Out Bound Service IP/Port: . . . XXXX 5060 (range 0~65535)
 - Register Interval: 1000 (range 1~10000000)
 - Heartbeat Status: Disable (dropdown)
 - Heartbeat Cycle: 30 (range 1~65525)
 - Heartbeat Count: 1 (range 1~65535)
- SIP Digit Map Configuration:** Contains a 'SIP Digit Map' text area with a scrollbar and a 'Submit' button.

At the bottom right are 'Submit', 'Refresh', and 'Cancel' buttons.

Figure 9-25 SIP Parameter Configuration

9.3.9 POTS

This interface is mainly used to configure POTS active status, SIP accounts and display POTS status and so on.



ONU Global Configuration
The module for the ONU configuration, including the basic configuration of ONU, VoIP configuration and private protocol configuration, etc.

ONU Configuration

- Information
- BandWidth
- Port
- QOS
- IGMP
- VoIP
- SIP
- POTS**
- Private Function
- WAN
- DHCP
- Advance

ONU Port: POTS 1

POTS Information

POTS Status: Inactive

POTS Service State: EndNormal

POTS Decode Mode: G711U

Manage Configuration

POTS Switch: ☒ Disable ☐ Enable

SIP User Parameter Configuration

Account:

Username:

Password:

Figure 9-26 POTS Configuration

9.3.10 Private Function

Private function is used to enable or disable some functions of ONU by private OAM. It includes IGMP status, CTC OAM status and port isolate status.

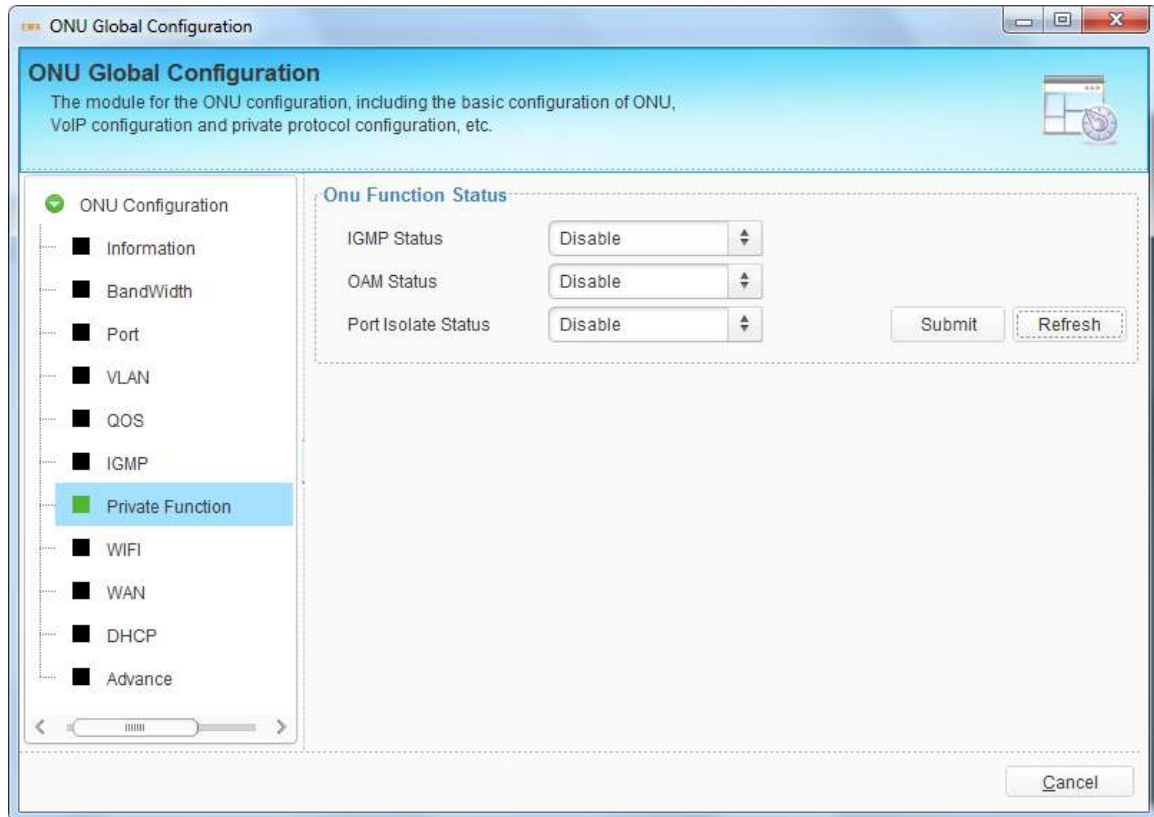
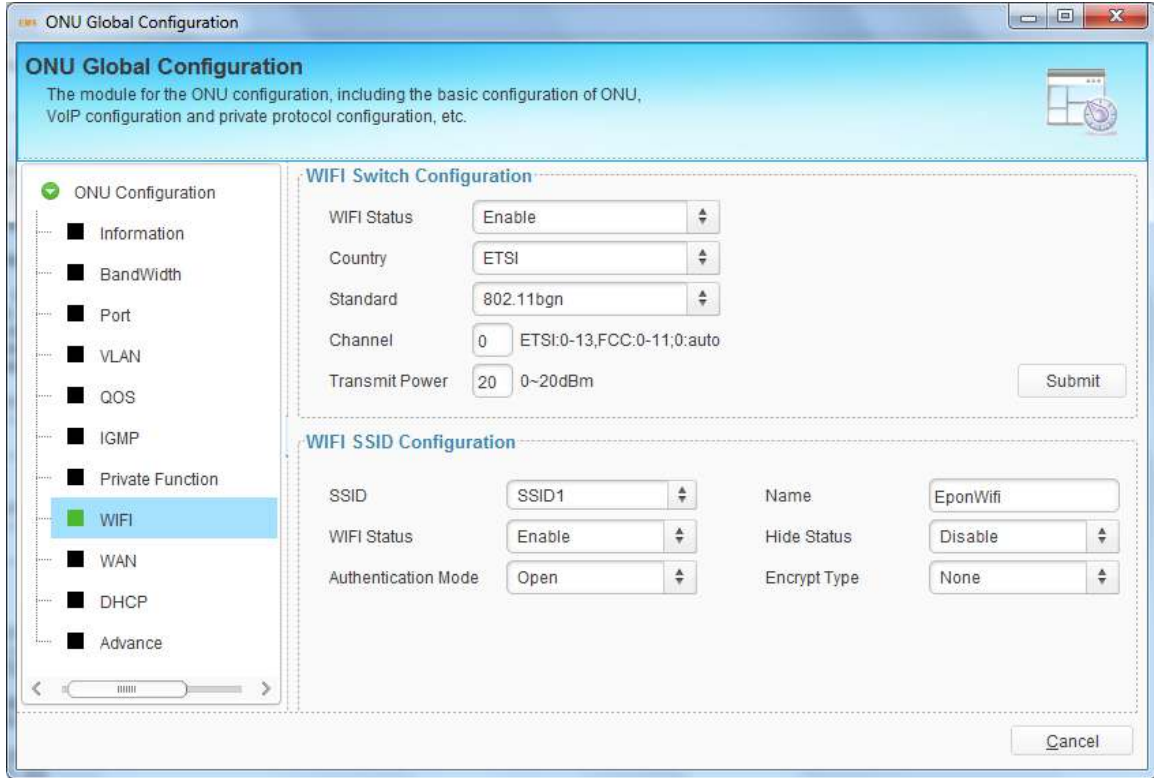


Figure 9-27 ONU Private Function

9.3.11 WIFI

This interface is used to configure ONU WIFI parameters. WIFI switch configuration mainly contains WIFI status, country, standard, channel and transmit power. WIFI SSID configuration mainly contains SSID name and encryption for each SSID. These configurations are implemented by private OAM.



ONU Global Configuration
The module for the ONU configuration, including the basic configuration of ONU, VoIP configuration and private protocol configuration, etc.

ONU Configuration

- Information
- BandWidth
- Port
- VLAN
- QOS
- IGMP
- Private Function
- WIFI**
- WAN
- DHCP
- Advance

WIFI Switch Configuration

WIFI Status: Enable
Country: ETSI
Standard: 802.11bgn
Channel: 0 ETSI:0-13,FCC:0-11;0:auto
Transmit Power: 20 0~20dBm

WIFI SSID Configuration

SSID: SSID1 Name: EponWifi
WIFI Status: Enable Hide Status: Disable
Authentication Mode: Open Encrypt Type: None

Submit Cancel

Figure 9-28 ONU WIFI Configuration

9.3.12 WAN

This interface is used to configure HGU WAN connection. These configurations are implemented by private OAM.

Click "Add" button to open a pop-up dialog box, select WAN mode and other parameters, then click "OK" button to apply the configurations. WAN connections will display in the table.

Select one WAN connection, click "Modify" button to modify its parameters, or click "Delete" button to delete it.

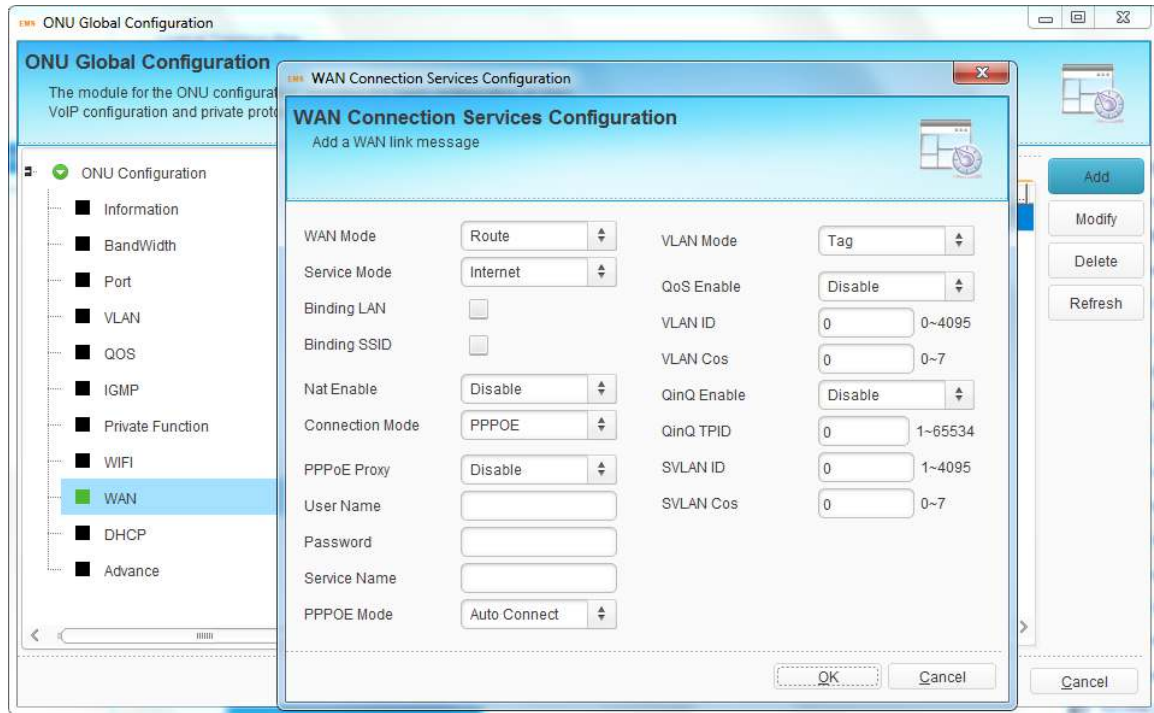
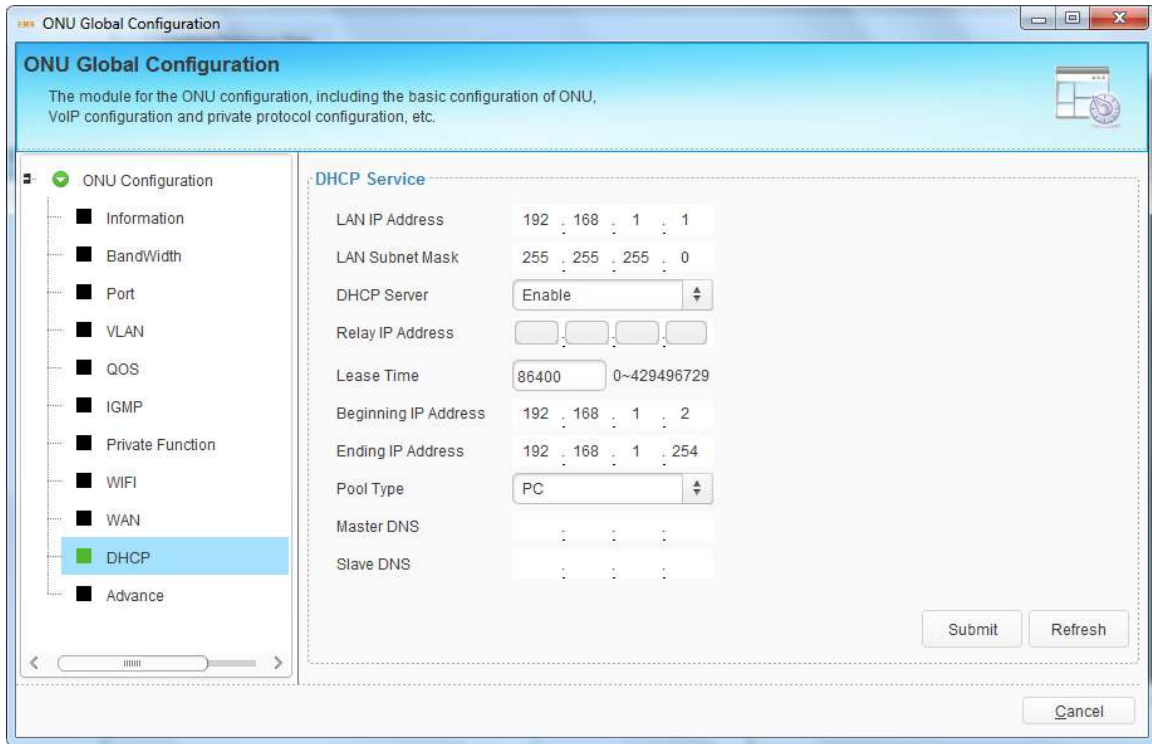


Figure 9-29 Add ONU WAN Connection

9.3.13 DHCP

This interface is used to configure ONU DHCP function. These configurations are implemented by private OAM.



ONU Global Configuration

The module for the ONU configuration, including the basic configuration of ONU, VoIP configuration and private protocol configuration, etc.

ONU Configuration

- Information
- BandWidth
- Port
- VLAN
- QOS
- IGMP
- Private Function
- WIFI
- WAN
- DHCP**
- Advance

DHCP Service

LAN IP Address: 192 . 168 . 1 . 1

LAN Subnet Mask: 255 . 255 . 255 . 0

DHCP Server: Enable

Relay IP Address:

Lease Time: 86400 0~429496729

Beginning IP Address: 192 . 168 . 1 . 2

Ending IP Address: 192 . 168 . 1 . 254

Pool Type: PC

Master DNS: . . .

Slave DNS: . . .

Submit Refresh

Cancel

Figure 9-30 ONU DHCP Configuration

9.3.14 Advance

This interface is used to configure ONU management IP and MAC aging time.

ONU Global Configuration

The module for the ONU configuration, including the basic configuration of ONU, VoIP configuration and private protocol configuration, etc.

ONU Configuration

- Information
- BandWidth
- Port
- VLAN
- QOS
- IGMP
- Private Function
- WIFI
- WAN
- DHCP
- Advance**

Management IP Configuration

IP Address: 0 . 0 . 0 . 0

Subnet Mask: 0 . 0 . 0 . 0

Gateway: 0 . 0 . 0 . 0

Client VLAN: 0 0~4095

Service VLAN: 0 0~4095

Priority: 0 0~7

MAC Aging Configuration

Aging Time: 0 0~65535(s)

Submit Delete Refresh Cancel

Figure 9-31 ONU Advance Configuration

10. ONU Authentication--GPON

This chapter mainly introduces ONU authentication.

Right click OLT icon, choose "ONU Authentication" to open the authentication configuration interface.

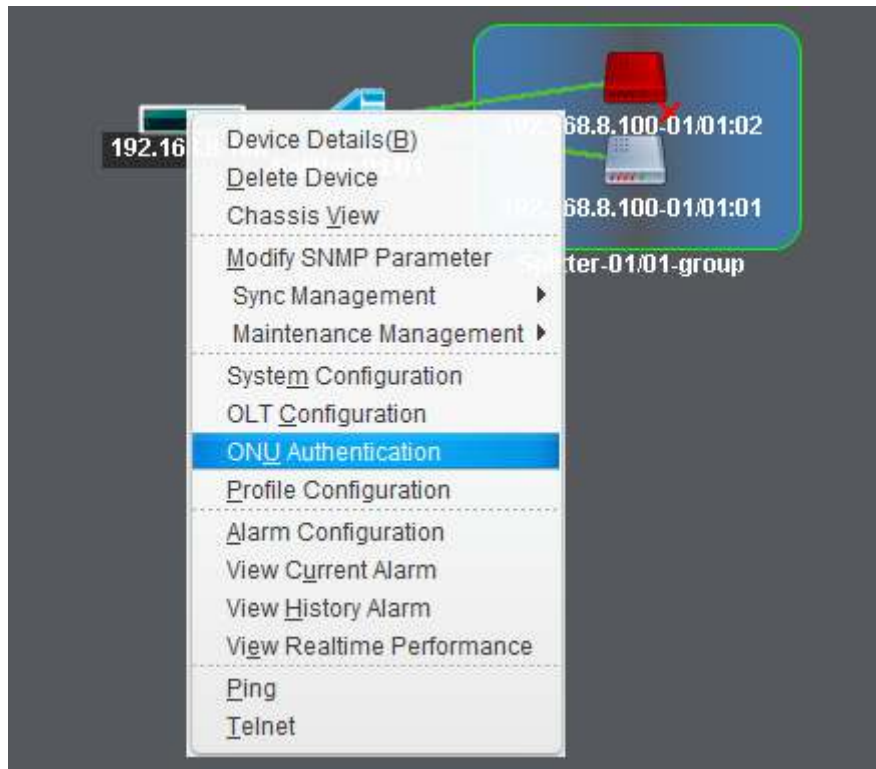


Figure 10-1 ONU Authentication

10.1 ONU AuthList

10.1.1 ONU List

All ONUs which are authenticated successful will be displayed in this interface.

You can do reset, delete to all ONUs that connect to the PON port.

Reset is to make all ONUs under the port restart.

Delete is to remove all ONUs under the port.

You can check PON/ONU/Admin State/OMCC State/Phase State/ONU profile/Auth mode/Auth Info in onu authentication Info window.

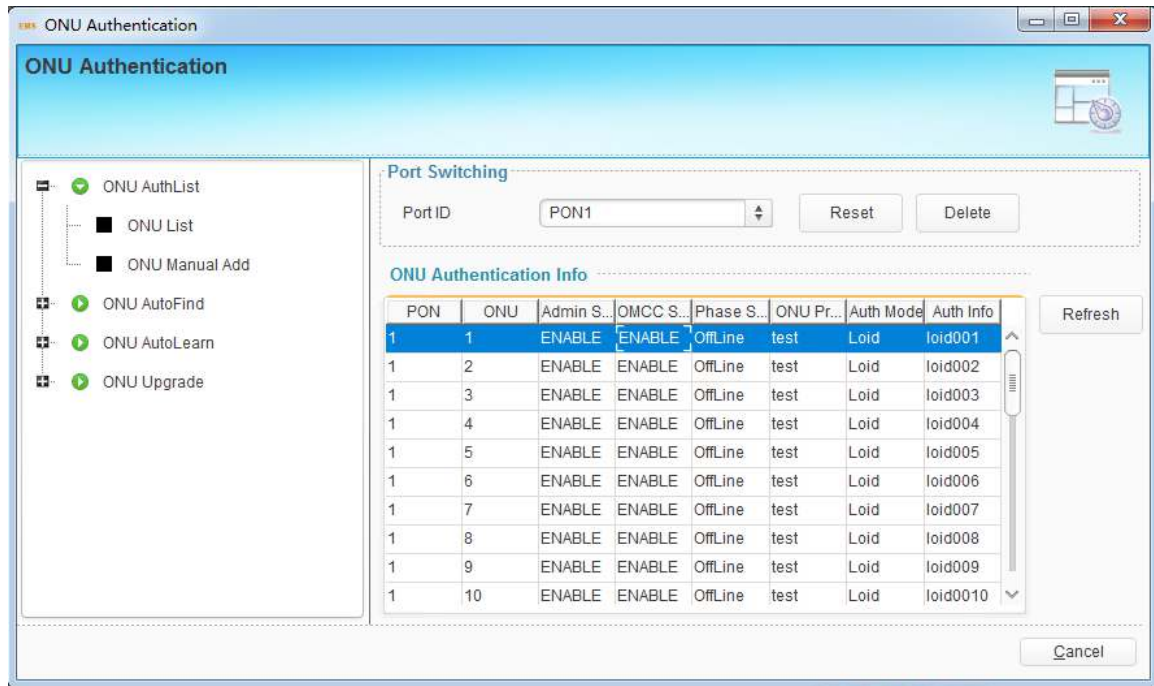


Figure 10-2 ONU List

10.1.2 ONU manual add

ONU can be added manually by this operation.

Step1. Select PON number. For V1600G1, it's PON1 to PON8.

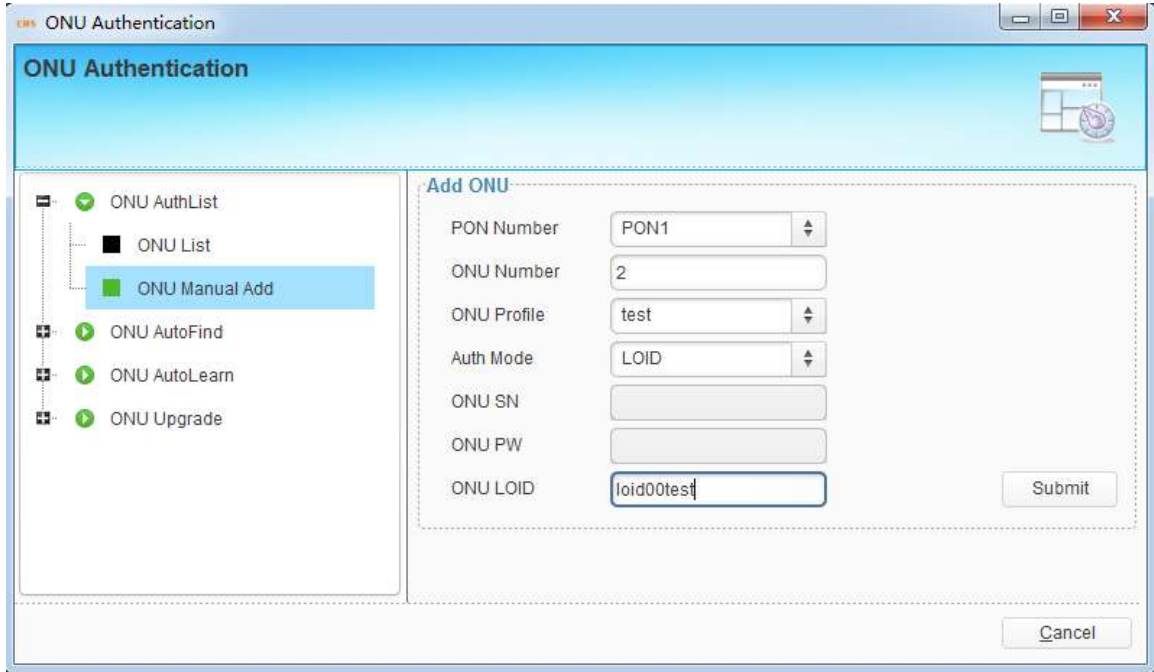
Step2. Enter the ONU number, it should not be conflict with the others under the same PON port.

Step3. Select the onu profile.

Step4. Select the authentication mode.

Step5. The authentication information, it depends on the step4 selection.

Step6. Click the submit button.



The screenshot shows a web application window titled "ONU Authentication". On the left is a navigation menu with the following items: "ONU AuthList" (checked), "ONU List" (unchecked), "ONU Manual Add" (checked and highlighted in blue), "ONU AutoFind" (unchecked), "ONU AutoLearn" (unchecked), and "ONU Upgrade" (unchecked). The main area is titled "Add ONU" and contains the following fields: "PON Number" (dropdown menu with "PON1" selected), "ONU Number" (text input with "2"), "ONU Profile" (dropdown menu with "test" selected), "Auth Mode" (dropdown menu with "LOID" selected), "ONU SN" (empty text input), "ONU PW" (empty text input), and "ONU LOID" (text input with "loid00test"). There are "Submit" and "Cancel" buttons at the bottom right of the form.

Figure 10-3 ONU manual add

10.2 ONU AutoFind

10.2.1 Discover ONU

After selecting PON port number, all ONUs which are authenticated failed or not authenticated will be displayed in this interface. You can check the serial number of ONUs.

More information will be show under the ONU Detail menu.

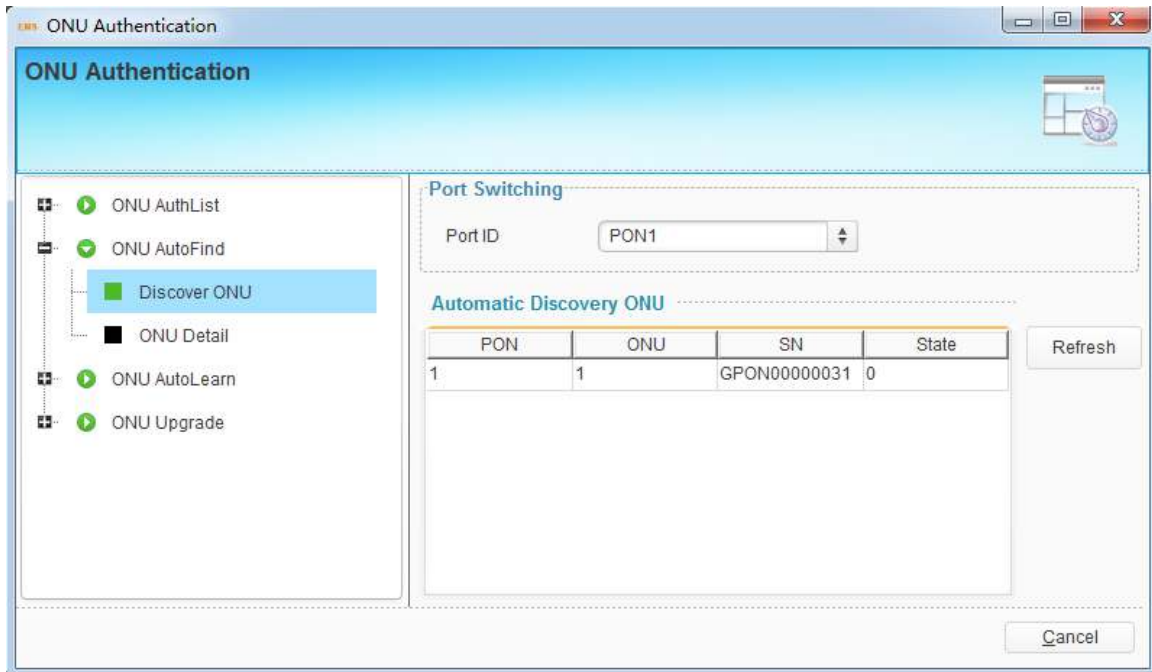


Figure 10-4 Discover ONU

10.2.2 ONU Detail

The detail information will be show in Discovery ONU Detail window, include the serial number, hardware password, LOID, LOID password, Model string, Version string.

The selected ONU can be added manually by clicking the 'Add' button on the right side. And the ONU profile should be selected first before adding, or the 'default' profile will be used.

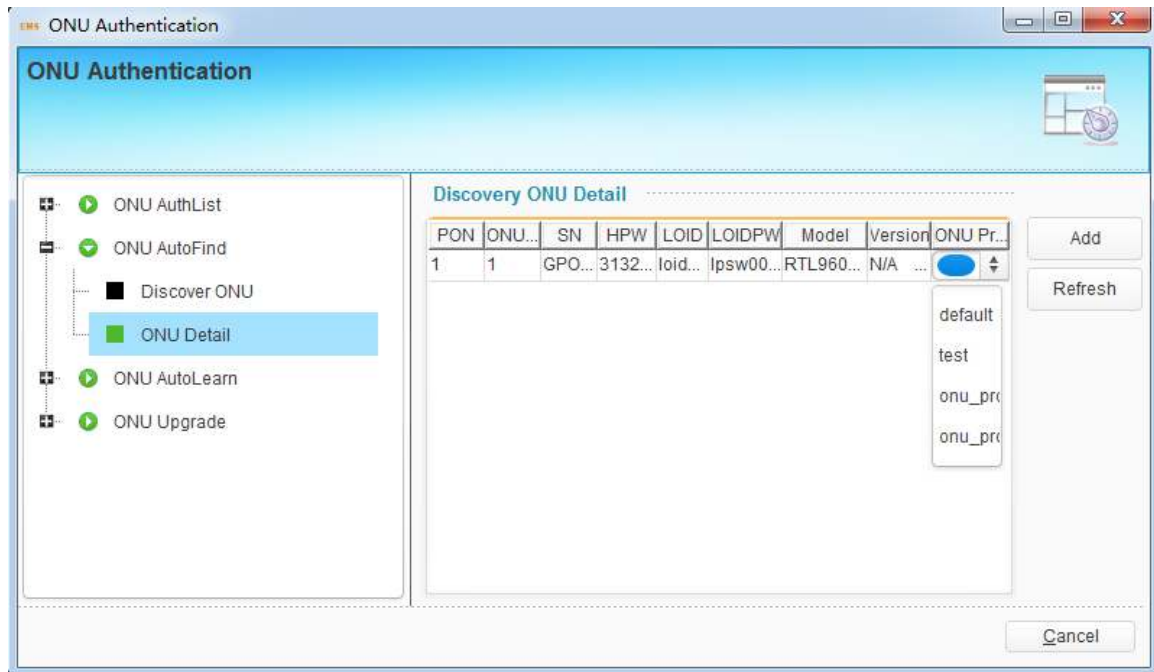


Figure 10-5 ONU Detail

10.3 ONU AutoLearn

10.3.1 Automatic Learn

ONU can be auto authenticated after enabling PON port automatic learning.

Step1. Select 'status' checkbox

Step2. Select onu profile or 'default' profile will be used.

Step3. Click the submit button.

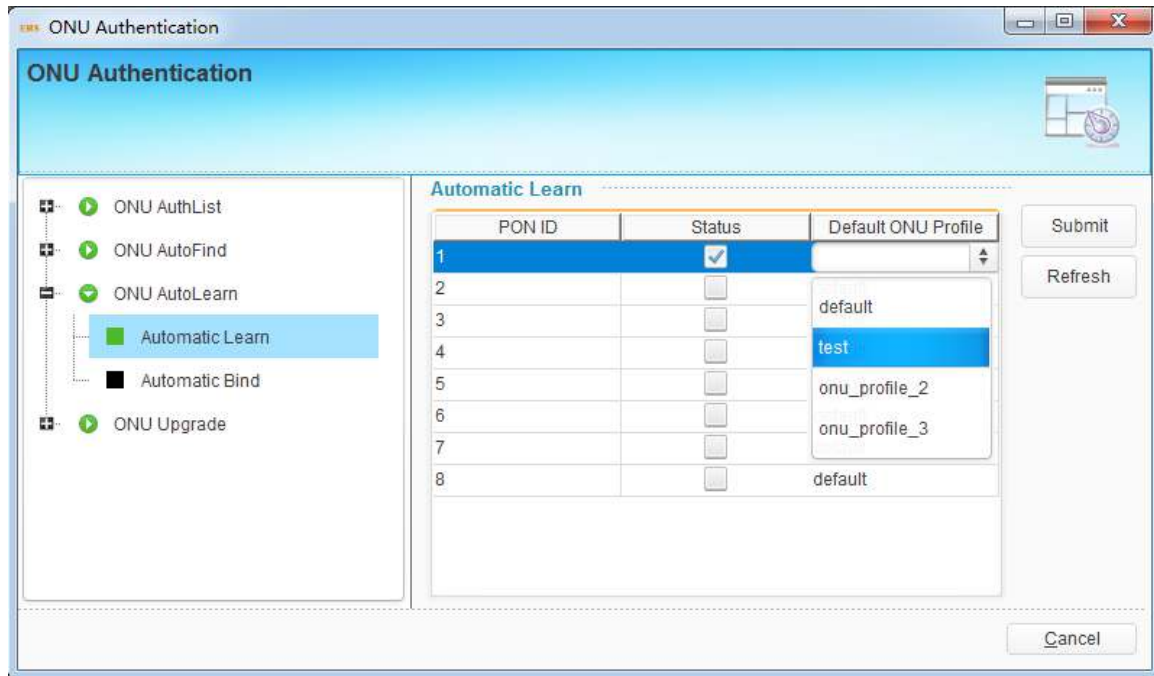


Figure 10-6 Automatic Learn

10.3.2 Automatic Bind

The onu's equipment ID is the key information for onu auto binding. It can be found by showing the onu's detail information, see xxx. We can exactly set the onu profile by checking the onu's equipment ID when onu auto authenticating.

Also, the line profile, srv profile and alarm profile can be auto set.

Step1. Enter the equipment ID

Step2. Select onu profile.

Step3. Select line profile, it's not required.

Step4. Select srv profile, it's not required.

Step5. Select alarm profile, it's not required.

Step6. Click the 'Add' button. Check the result in 'Automatic Bind' table.

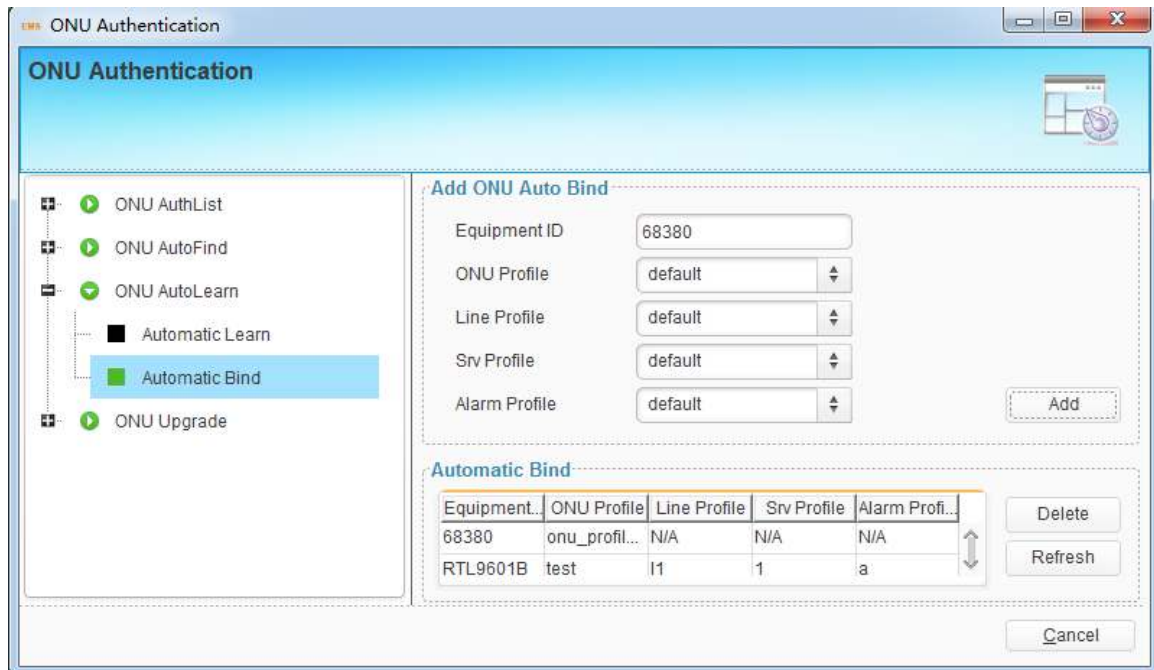


Figure 10-7 Automatic Bind

10.4 ONU Upgrade

10.4.1 Upload Image

First of all, the onu's firmware should be downloaded from TFTP server to OLT's RAM.

Step1. Enter the firmware name.

Step2. Enter the TFTP server's IP

Step3. Click 'submit' button.

We will use the firmware in the 'Upgrade Configuration' window.

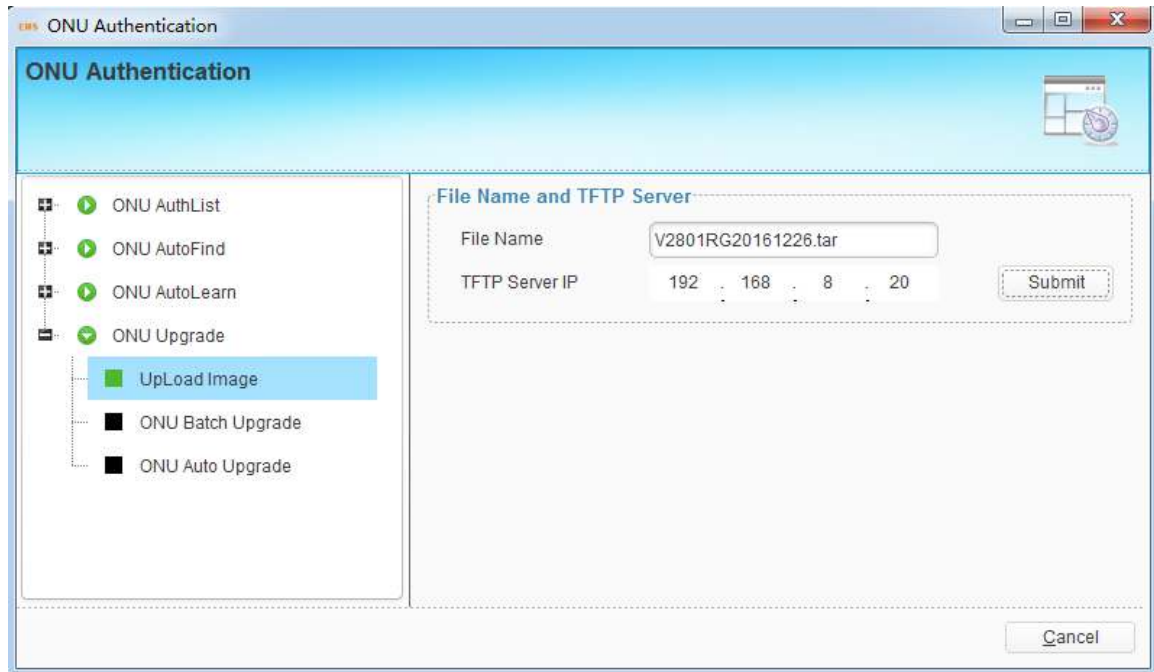


Figure 10-8 UpLoad Image

10.4.2 ONU Batch Upgrade

You can upgrade one or many ONUs at the same time at this interface. But the ONUs need to be updated should be the same device type. You should only select the online ONUs.

Step1. Click the 'select' button to pop up the onu select window.

Step2. Select ONU Firmware.

Step3. Select upgrade mode.

Step4. Click start button.

You can click 'refresh' to check the upgrade progress.

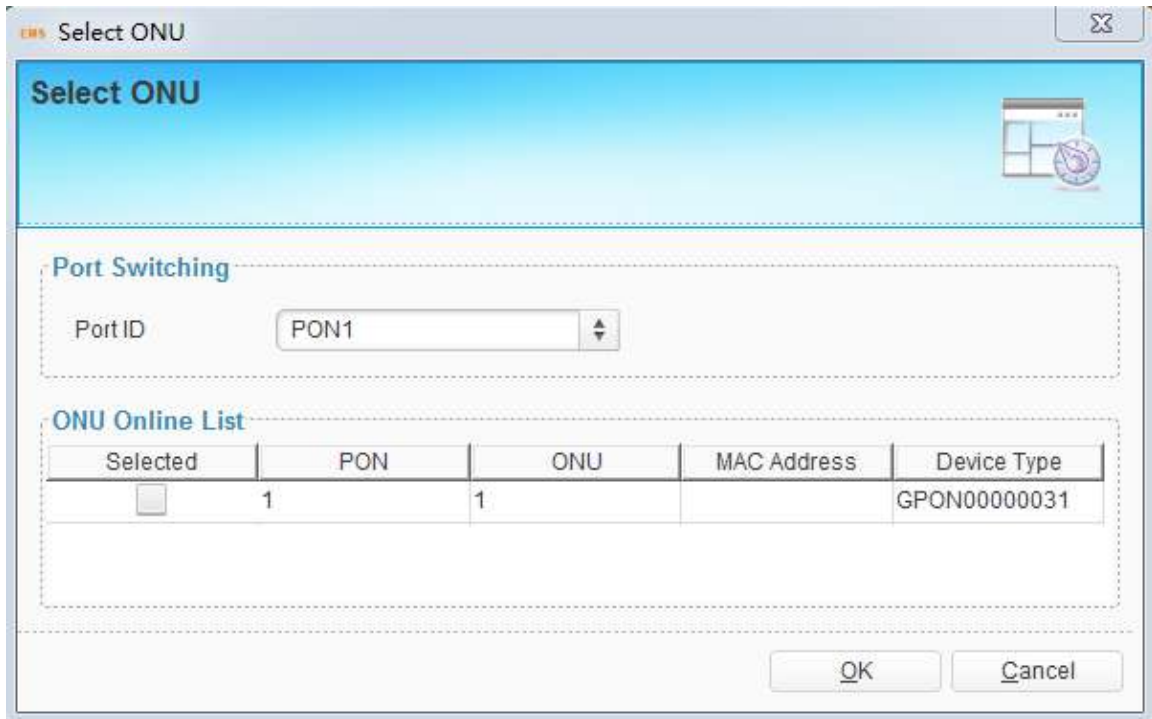


Figure 10-9 select onu

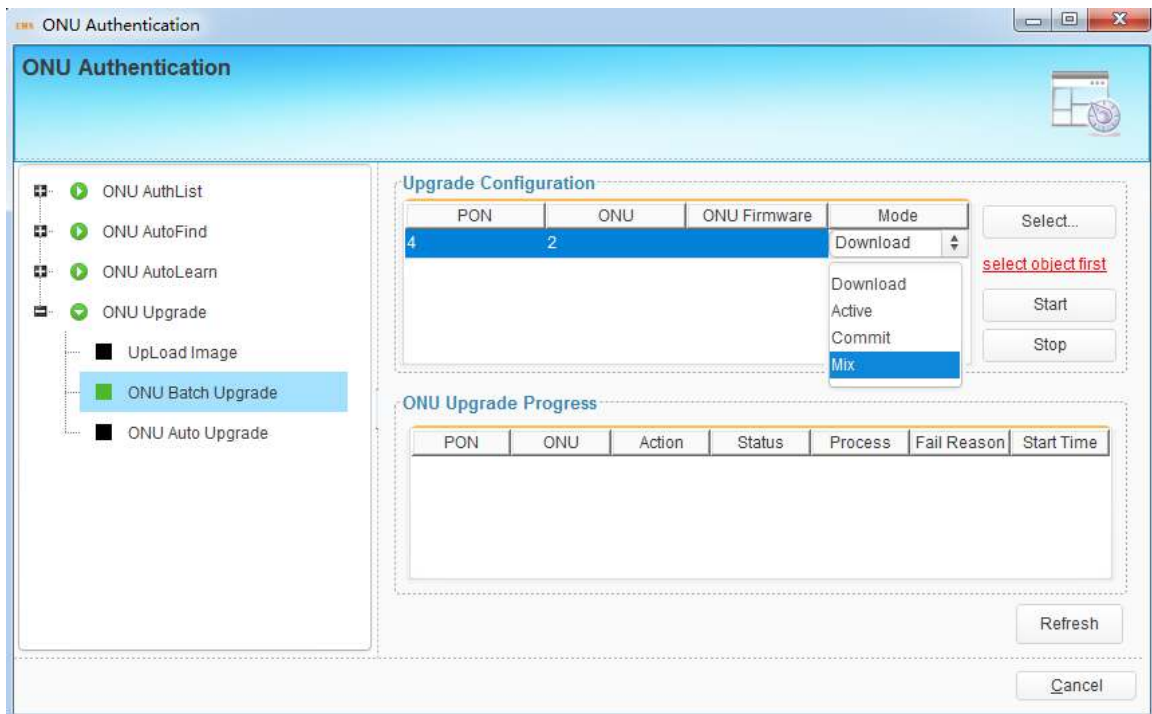


Figure 10-10 ONU Batch Upgrade

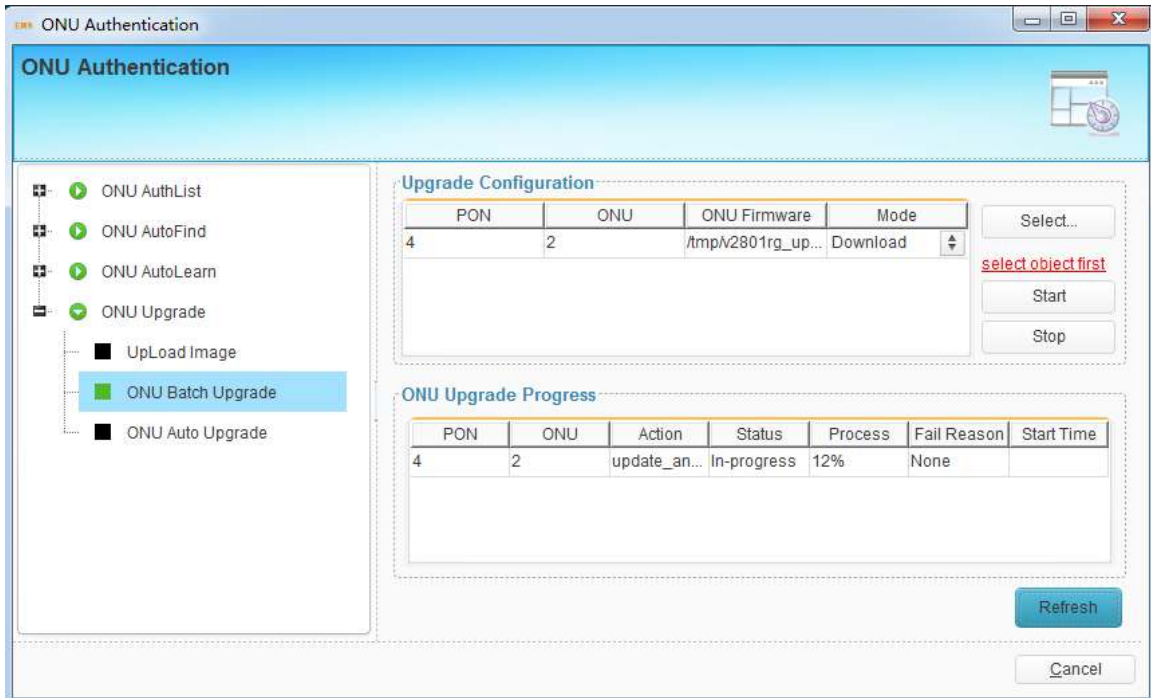


Figure 10-11 Upgrade progress

10.4.3 ONU Auto Upgrade

The specify type of ONU should be upgraded automatically.

Step1. Enter the equipment ID.

Step2. Enter software version.

Step3. Select onu firmware.

Step4. Click 'submit' button.

ONU Authentication

File Name is required!

ONU AuthList

ONU AutoFind

ONU AutoLearn

ONU Upgrade

UpLoad Image

ONU Batch Upgrade

ONU Auto Upgrade

ONU Automatic Upgrade

Equipment ID

RTL9601B

Software Version

R20170420

ONU Firmware

v2801rg20161226.tar

Submit

Upgrade Information

Equipment ID	Software Version	ONU Firmware

Delete

Refresh

Cancel

Figure 10-12 ONU auto upgrade

11 Profile Configuration--GPON

This chapter introduces profile configuration of ONU. According to the characteristics of multiple services (data, voice, alarm) integrated in an ONU, and there would be huge quantity terminals but their configurations are similar, it is necessary to configure these similar configurations in a profile and bind it to ONU.

OLT supports the following profile:

- ONU profile
- DBA profile
- Traffic profile
- Line profile
- Service profile
- Alarm profile

Right click OLT icon, choose "Profile Configuration" to open the configuration interface.

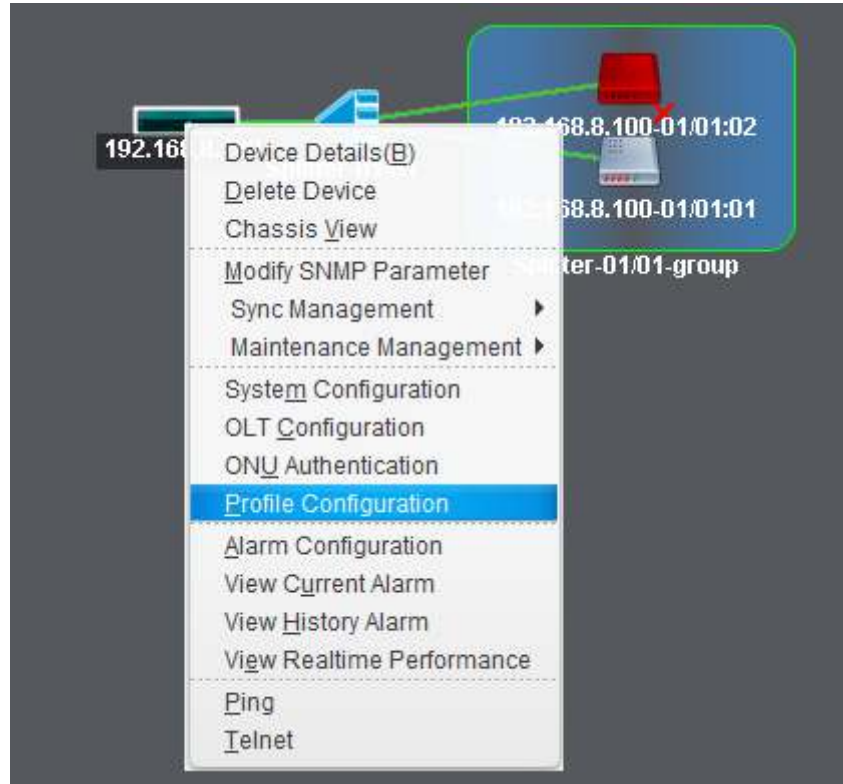


Figure 11-1 Profile Configuration

11.1 Profile Configuration

11.1.1 ONU Profile

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

Check onu profile in profile list window, click 'add' button to add a new onu profile, click 'delete' button to remove a profile.

Step1. Modify profile name or let it as auto generated.

Step2. Modify description string.

Step3. Modify max t-cont number, default value is 8.

Step4. Modify max gem-port number, default value is 32.

Step5. Modify max Ethernet number, default value is 1. For some hgu, it should be set to 0.

Step6. Modify max POTS number, default value is 0.

Step7. Modify max Iphost number, default value is 2.

Step8. Modify max VEIP number, default value is 0. For hgu, it shouldn't be 0.

Step9. The others configuration are modified by professional user, or just set it default value.

Step9. Click 'OK' button.

Step10. Click 'commit' button.

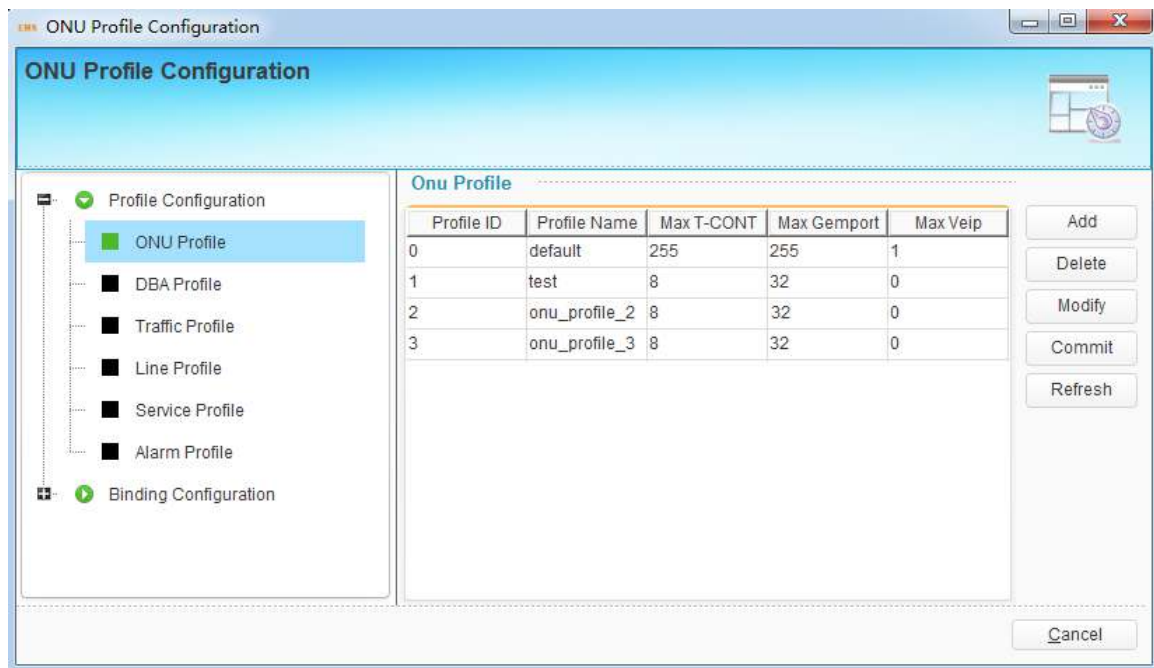
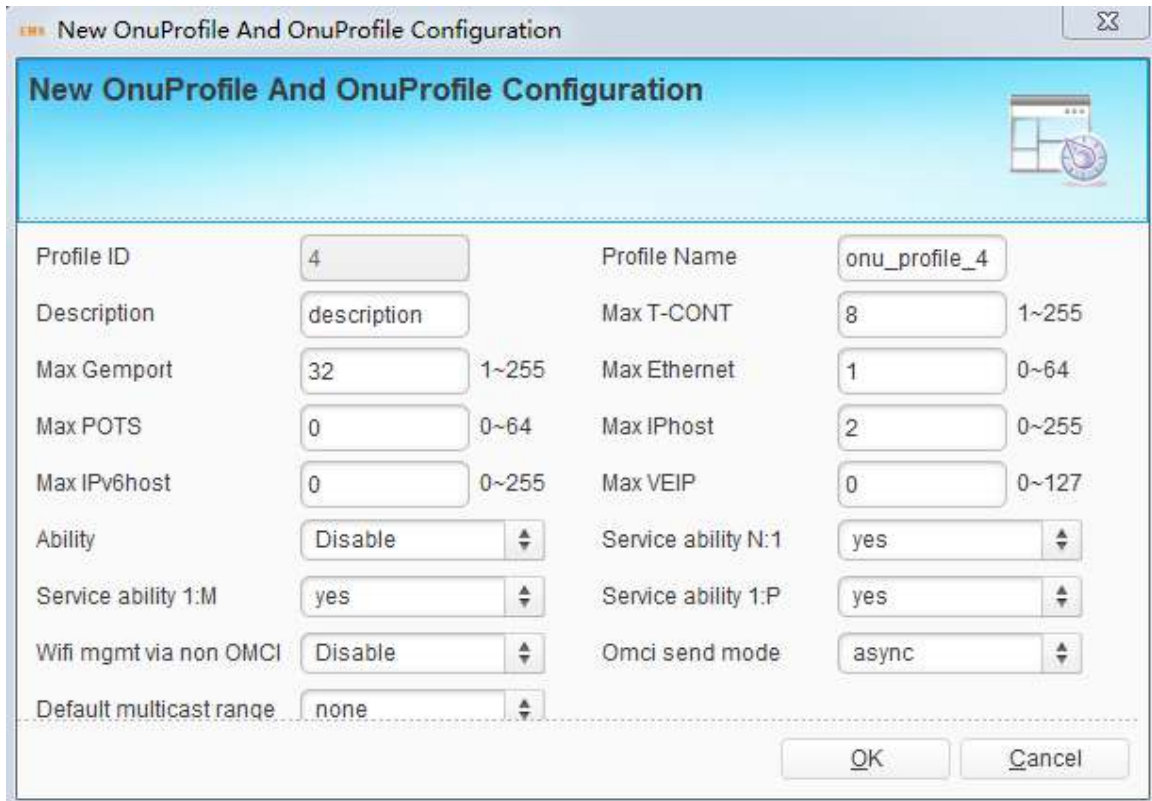


Figure 11-2 onu profile list



New OnuProfile And OnuProfile Configuration

Profile ID	4	Profile Name	onu_profile_4
Description	description	Max T-CONT	8 1~255
Max Gempport	32 1~255	Max Ethernet	1 0~64
Max POTS	0 0~64	Max IPhost	2 0~255
Max IPv6host	0 0~255	Max VEIP	0 0~127
Ability	Disable	Service ability N:1	yes
Service ability 1:M	yes	Service ability 1:P	yes
Wifi mgmt via non OMCI	Disable	Omci send mode	async
Default multicast range	none		

OK Cancel

Figure 11-3 add onu profile

11.1.2 DBA Profile

DBA is a bandwidth allocation strategy that changes uplink bandwidth assigned to each T-CONT in real time according to the instant service status of each ONU.

There are five BW types supported and make sure that $fix \leq assure \leq max$.

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

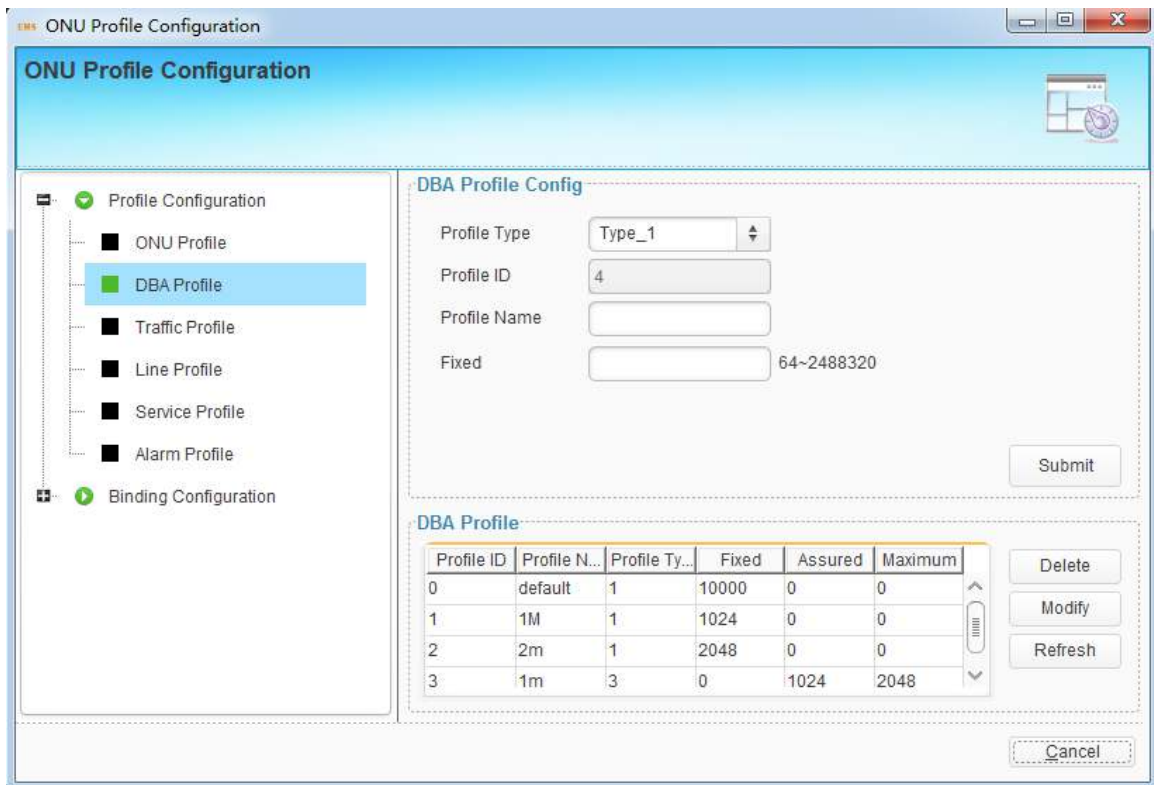
Step1. Select BW type.

Step2. Enter profile name.

Step3. Enter the BW value, it depends on the step1.

Step4. Click 'submit' to add a new dba profile.

When need to delete DBA profile, select it and click "Delete" button and it can be modify by click 'modify' button.



The screenshot shows the 'ONU Profile Configuration' window. On the left is a tree view with 'Profile Configuration' expanded, showing 'ONU Profile', 'DBA Profile' (selected), 'Traffic Profile', 'Line Profile', 'Service Profile', and 'Alarm Profile'. Below this is 'Binding Configuration'. The main area is titled 'DBA Profile Config' and contains the following fields:

- Profile Type: Type_1
- Profile ID: 4
- Profile Name: (empty)
- Fixed: (empty) 64~2488320

There is a 'Submit' button at the bottom right of this section. Below the configuration fields is a table titled 'DBA Profile' with the following data:

Profile ID	Profile N...	Profile Ty...	Fixed	Assured	Maximum
0	default	1	10000	0	0
1	1M	1	1024	0	0
2	2m	1	2048	0	0
3	1m	3	0	1024	2048

To the right of the table are buttons for 'Delete', 'Modify', and 'Refresh'. At the bottom right of the window is a 'Cancel' button.

Figure 11-4 DBA Profile

11.1.3 Traffic Profile

Traffic profile is used by Gemport to specify the upstream/downstream bandwidth.

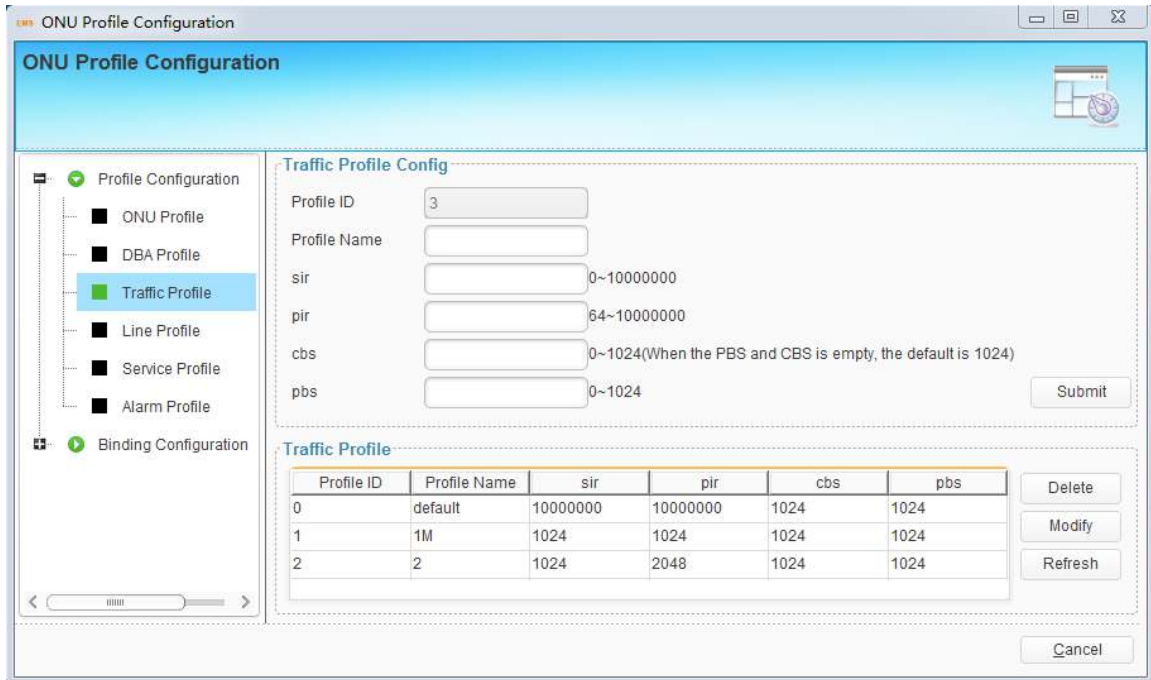
Step1. Enter the profile name.

Step2. Enter the sir value.

Step3. Enter the pir value, the pir >= sir.

Step4. cbs and pbs are not required.

Step5. Click 'submit' button to add new traffic profile.



The screenshot shows the 'ONU Profile Configuration' window. On the left, a tree view under 'Profile Configuration' has 'Traffic Profile' selected. The main area is titled 'Traffic Profile Config' and contains input fields for 'Profile ID' (value: 3), 'Profile Name', 'sir' (range: 0~10000000), 'pir' (range: 64~10000000), 'cbs' (range: 0~1024, note: When the PBS and CBS is empty, the default is 1024), and 'pbs' (range: 0~1024). A 'Submit' button is at the bottom right of this section. Below is a 'Traffic Profile' table with columns: Profile ID, Profile Name, sir, pir, cbs, and pbs. The table contains three rows: 0 (default, 10000000, 10000000, 1024, 1024), 1 (1M, 1024, 1024, 1024, 1024), and 2 (2, 1024, 2048, 1024, 1024). To the right of the table are 'Delete', 'Modify', and 'Refresh' buttons. A 'Cancel' button is at the bottom right of the window.

Profile ID	Profile Name	sir	pir	cbs	pbs
0	default	10000000	10000000	1024	1024
1	1M	1024	1024	1024	1024
2	2	1024	2048	1024	1024

Figure 11-5 Traffic Profile

11.1.4 Line Profile

Line profile is used to configure the ANI side services of onu, such as t-cont, gem-port, service-port and so on.

Click 'add' button to add a new line profile. Enter profile name in the add window.

Click 'delete' button to remove a line profile.

Click 'modify' button to modify a line profile.

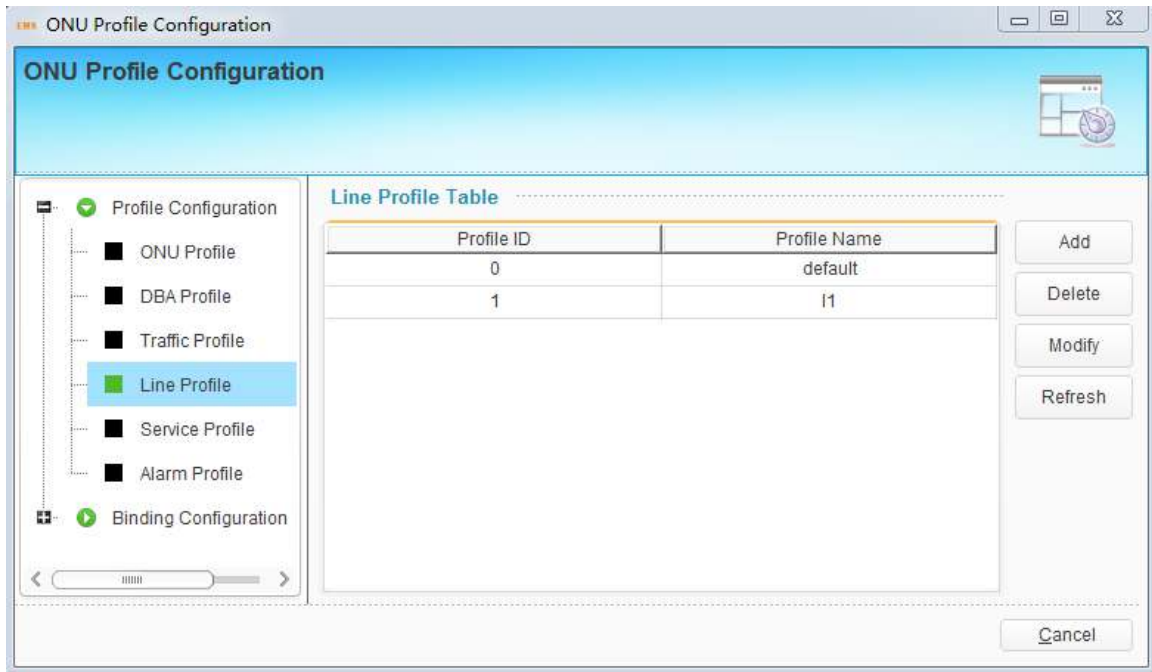


Figure 11-6 line Profile

Enter T-cont ID, T-cont name, select DBA profile and click 'add' button to add a new T-cont. select t-cont and click 'delete' button to removed it.

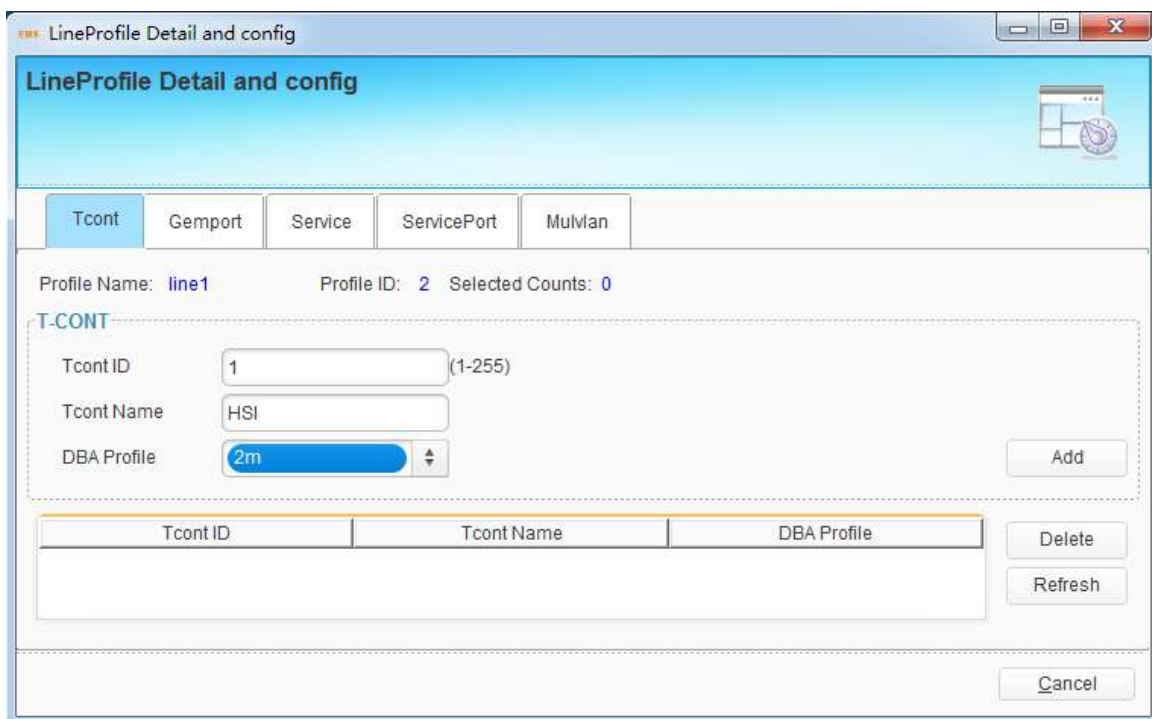
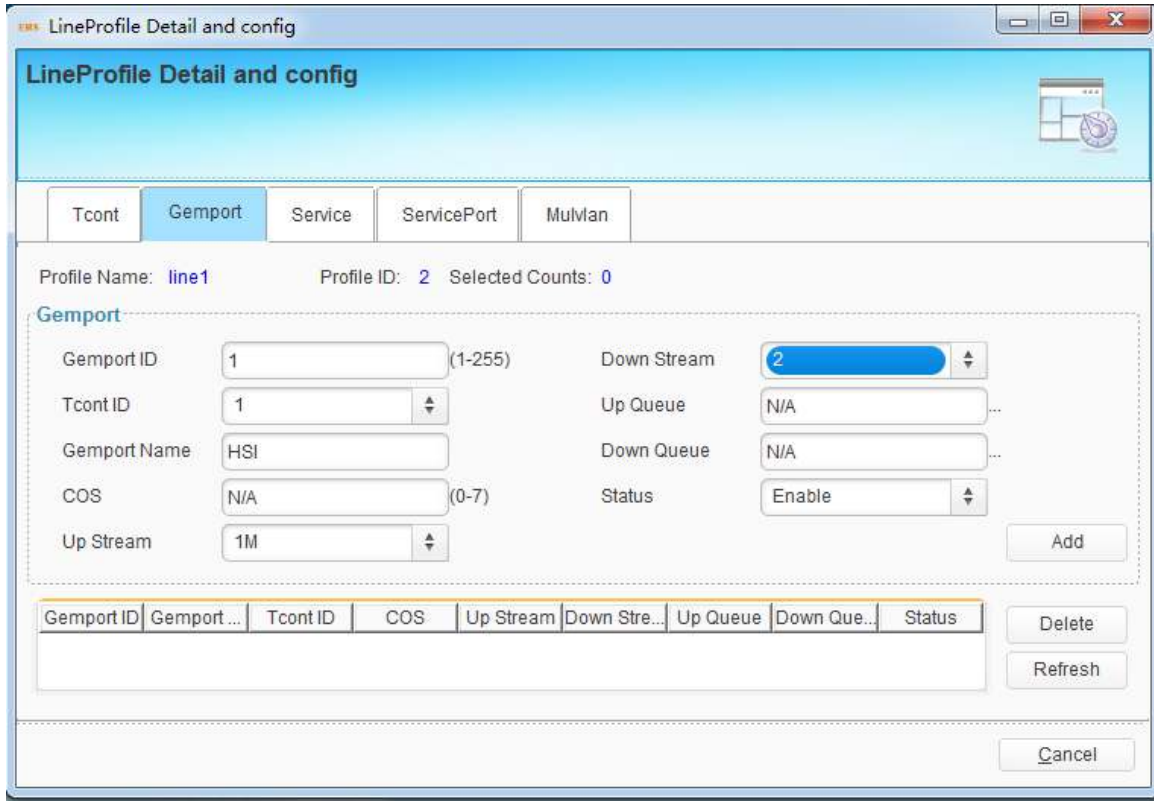


Figure 11-7 T-cont

Enter gemport ID, select Tcont ID, enter gemport name, select Up/down Stream traffic profile and click 'add' button to add a new gemport. The others configuration are not required. select gemport and click 'delete' button to removed it.



The screenshot shows the 'LineProfile Detail and config' window with the 'Gemport' tab selected. The window displays the following configuration fields:

- Profile Name: line1
- Profile ID: 2
- Selected Counts: 0

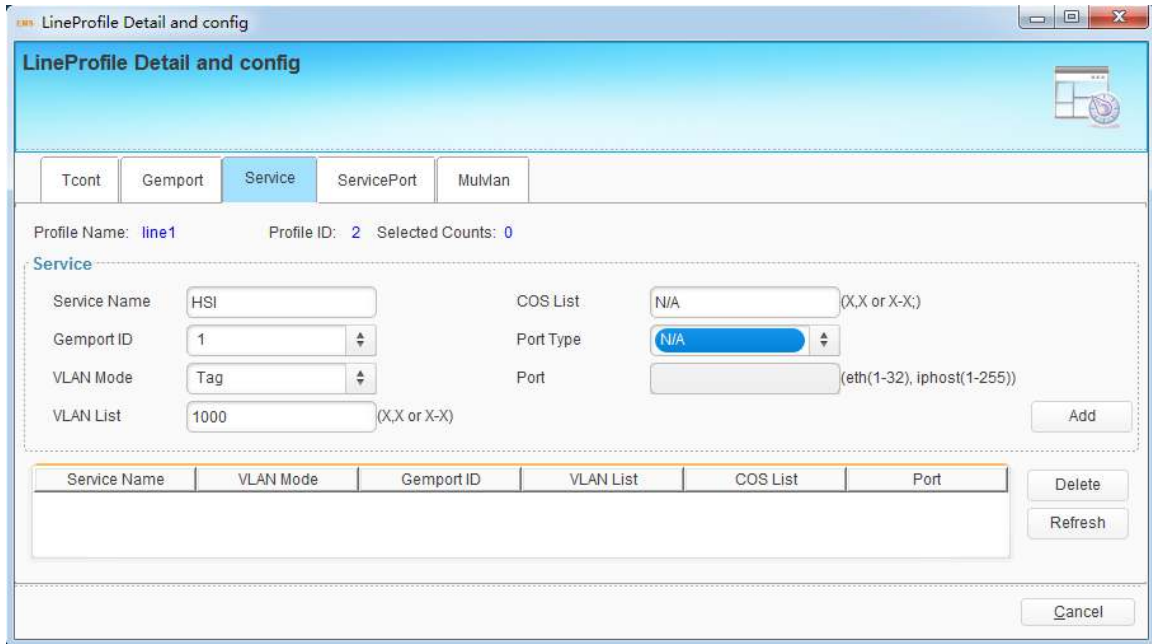
The 'Gemport' section contains the following fields:

- Gemport ID: 1 (range 1-255)
- Tcont ID: 1
- Gemport Name: HSI
- COS: N/A (range 0-7)
- Up Stream: 1M
- Down Stream: 2
- Up Queue: N/A
- Down Queue: N/A
- Status: Enable

At the bottom, there is a table with the following columns: Gemport ID, Gemport Name, Tcont ID, COS, Up Stream, Down Stream, Up Queue, Down Queue, and Status. The table is currently empty. To the right of the table are buttons for 'Delete', 'Refresh', and 'Cancel'.

Figure 11-7 gemport

Enter service name, select gemport ID, enter vlan list and click 'add' button to add a new service. The others configuration are not required. select service and click 'delete' button to removed it.



LineProfile Detail and config

Tcont | **Gemport** | Service | ServicePort | Mulvlan

Profile Name: line1 Profile ID: 2 Selected Counts: 0

Service

Service Name: HSI COS List: N/A (X,X or X-X)

Gemport ID: 1 Port Type: N/A

VLAN Mode: Tag Port: (eth(1-32), iphost(1-255))

VLAN List: 1000 (X,X or X-X)

Add

Service Name	VLAN Mode	Gemport ID	VLAN List	COS List	Port

Delete

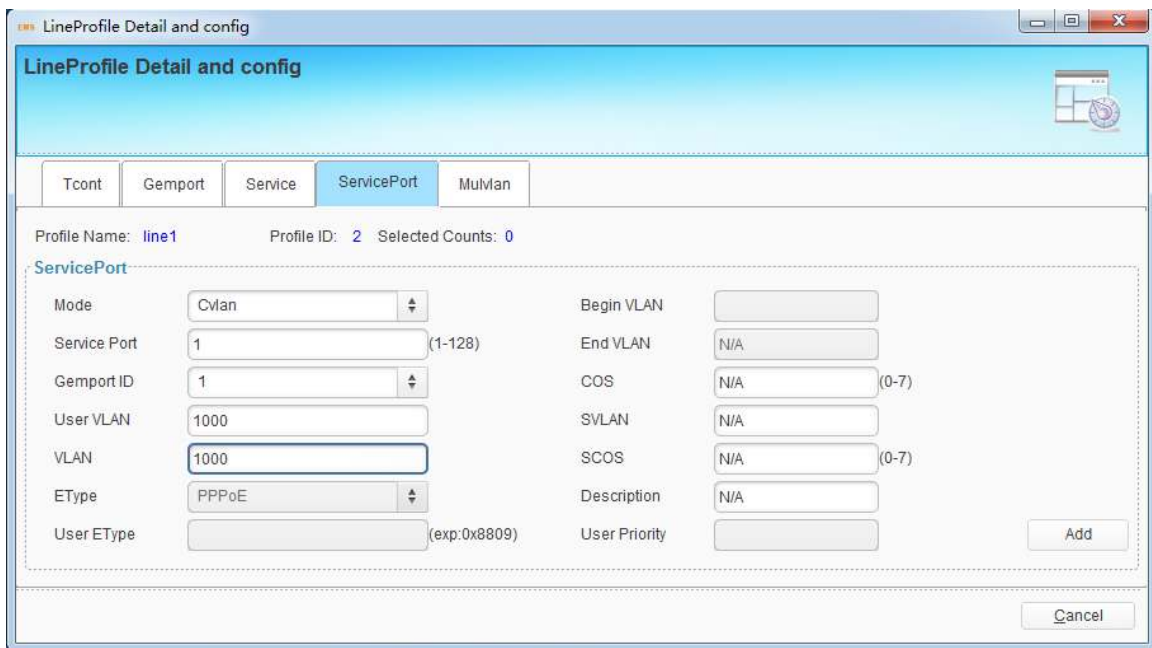
Refresh

Cancel

Figure 11-8 service

Enter service port ID, select gemport ID, enter user vlan, enter vlan and click 'Add' button to add a new service-port. The others configuration are not required.

select service port and click 'delete' button to removed it.



LineProfile Detail and config

Tcont | Gemport | Service | **ServicePort** | Mulvlan

Profile Name: line1 Profile ID: 2 Selected Counts: 0

ServicePort

Mode: Cvlan Begin VLAN:

Service Port: 1 (1-128) End VLAN: N/A

Gemport ID: 1 COS: N/A (0-7)

User VLAN: 1000 SVLAN: N/A

VLAN: 1000 SCOS: N/A (0-7)

EType: PPPoE Description: N/A

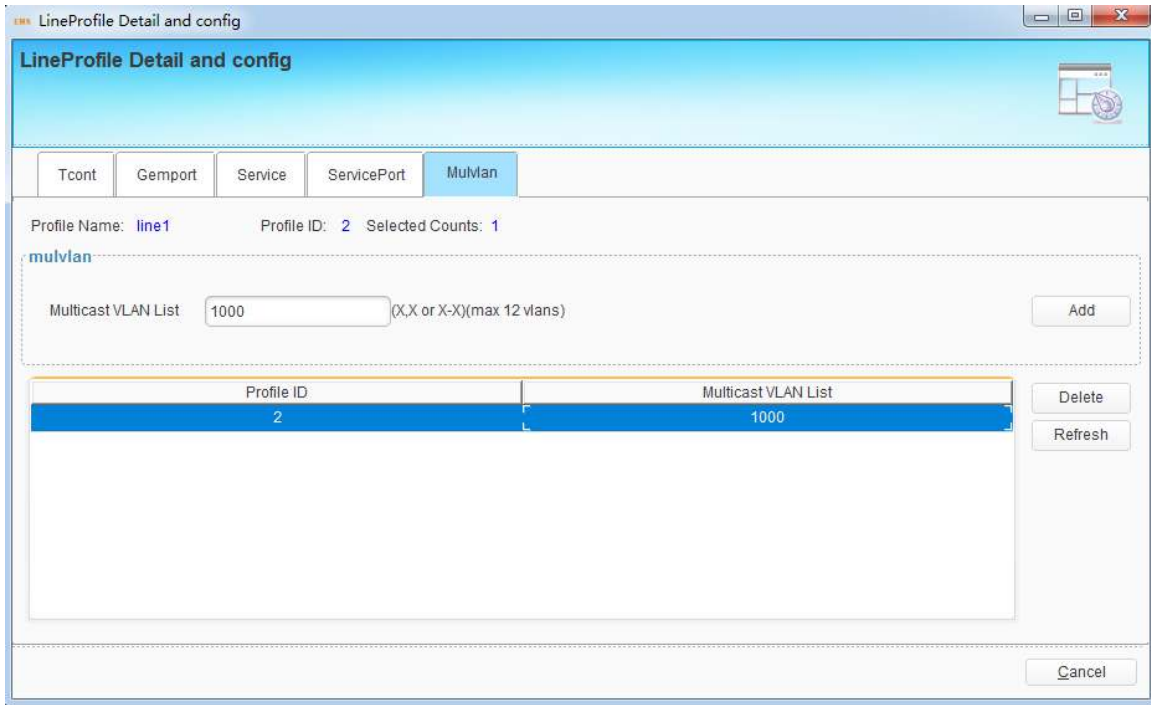
User EType: (exp:0x8809) User Priority:

Add

Cancel

Figure 11-9 service port

Enter multicast vlan list and click 'Add' button to add it. Max 12 multicast vlan id supported.



LineProfile Detail and config

Profile Name: line1 Profile ID: 2 Selected Counts: 1

Multicast VLAN List: 1000 (X,X or X-X)(max 12 vlans) Add

Profile ID	Multicast VLAN List
2	1000

Delete Refresh

Cancel

Figure 11-10 multicast vlan

11.1.5 Service Profile

service profile is used to configure the UNI side services of onu, such as Ethernet port, wifi, veip and so on.

Click 'add' button to add a new service profile. Enter profile name in the add window.

Click 'delete' button to remove a service profile.

Click 'modify' button to modify a service profile.

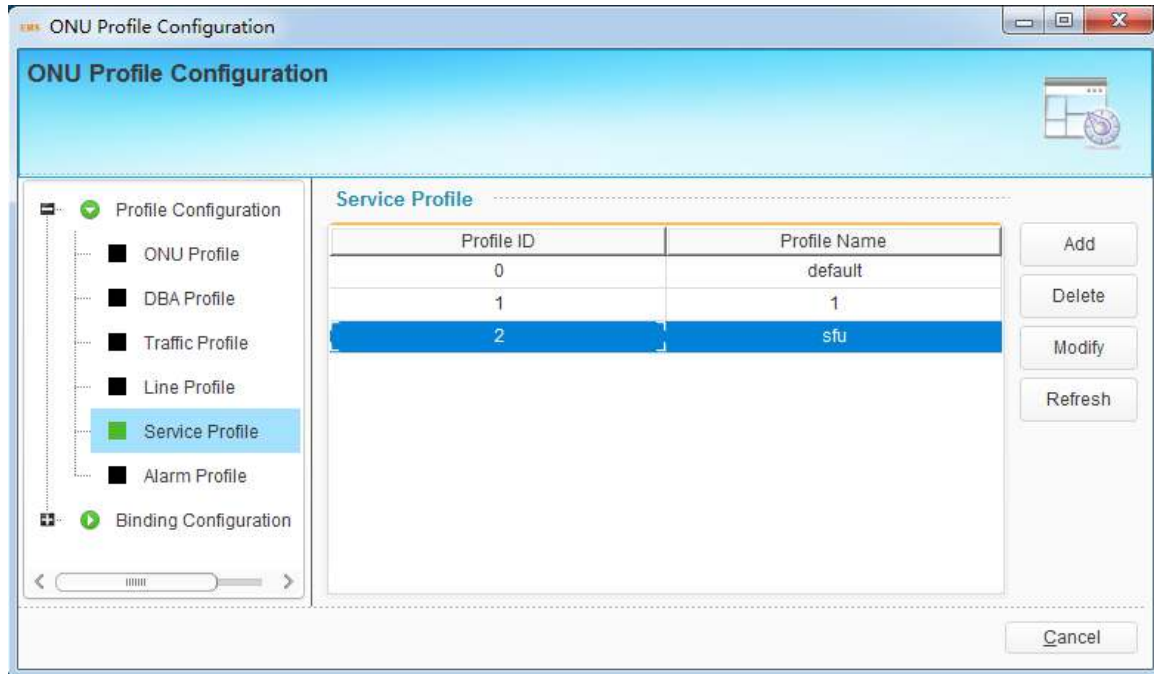


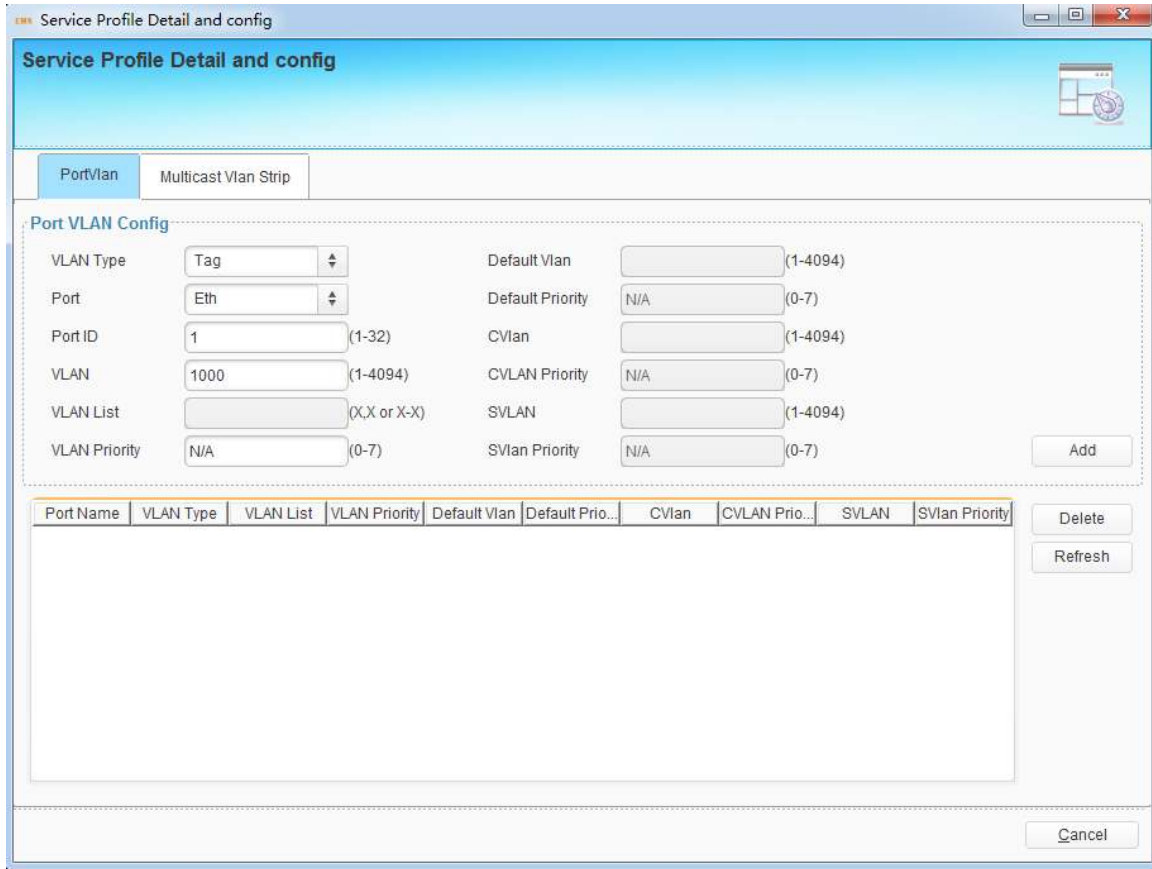
Figure 11-11 service profile

Select vlan type, select port type, enter port id, vlan list and click 'Add' button to add a new portVlan service.

Vlan type include: Transparent, Trunk, Tag, Hybrid, Translate

Port type include: Eth, Wifi, Veip

Select port vlan service and click 'delete' button to remove it.



Service Profile Detail and config

Service Profile Detail and config

PortVlan Multicast Vlan Strip

Port VLAN Config

VLAN Type Tag (1-4094)

Port Eth (0-7)

Port ID 1 (1-32)

VLAN 1000 (1-4094)

VLAN List (X,X or X-X)

VLAN Priority N/A (0-7)

Default Vlan (1-4094)

Default Priority N/A (0-7)

CVlan (1-4094)

CVLAN Priority N/A (0-7)

SVLAN (1-4094)

SVlan Priority N/A (0-7)

Add

Port Name	VLAN Type	VLAN List	VLAN Priority	Default Vlan	Default Prio...	CVlan	CVLAN Prio...	SVLAN	SVlan Priority

Delete

Refresh

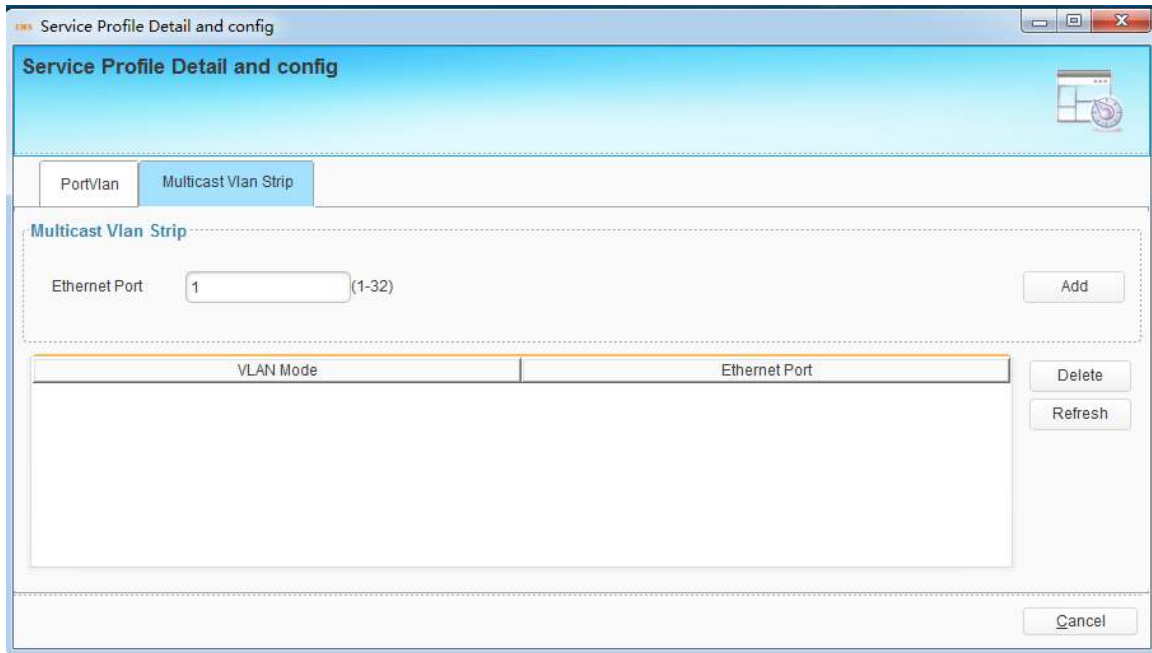
Cancel

Figure 11-12 port vlan

Sometimes, multicast vlan tag strip function should be set to the Ethernet Port. It depends on the onu's process.

Enter Ethernet Port number and click 'Add' button to enable multicast vlan tag strip function.

Select the multicast vlan strip service and click 'delete' to remove it.



The screenshot shows a web-based configuration window titled "Service Profile Detail and config". It has two tabs: "PortVlan" and "Multicast Vlan Strip", with the latter being selected. Below the tabs, there is a section labeled "Multicast Vlan Strip" containing an "Ethernet Port" input field with the value "1" and a range indicator "(1-32)". To the right of this input is an "Add" button. Below this section is a table with two columns: "VLAN Mode" and "Ethernet Port". The table is currently empty. To the right of the table are "Delete" and "Refresh" buttons. At the bottom right of the window is a "Cancel" button.

Figure 11-13 multicast vlan strip

11.1.6 Alarm Profile

alarm profile is used to configure the pon parameters of onu.

Click 'add' button to add a new alarm profile.

Click 'delete' button to remove a service profile.

Click 'modify' button to modify a service profile.



Figure 11-14 alarm profile

Step1. Enter alarm profile name.

Step2. Select state, enable/disable.

Step3. Enter Rx low power threshold.

Step4. Enter Rx high power threshold.

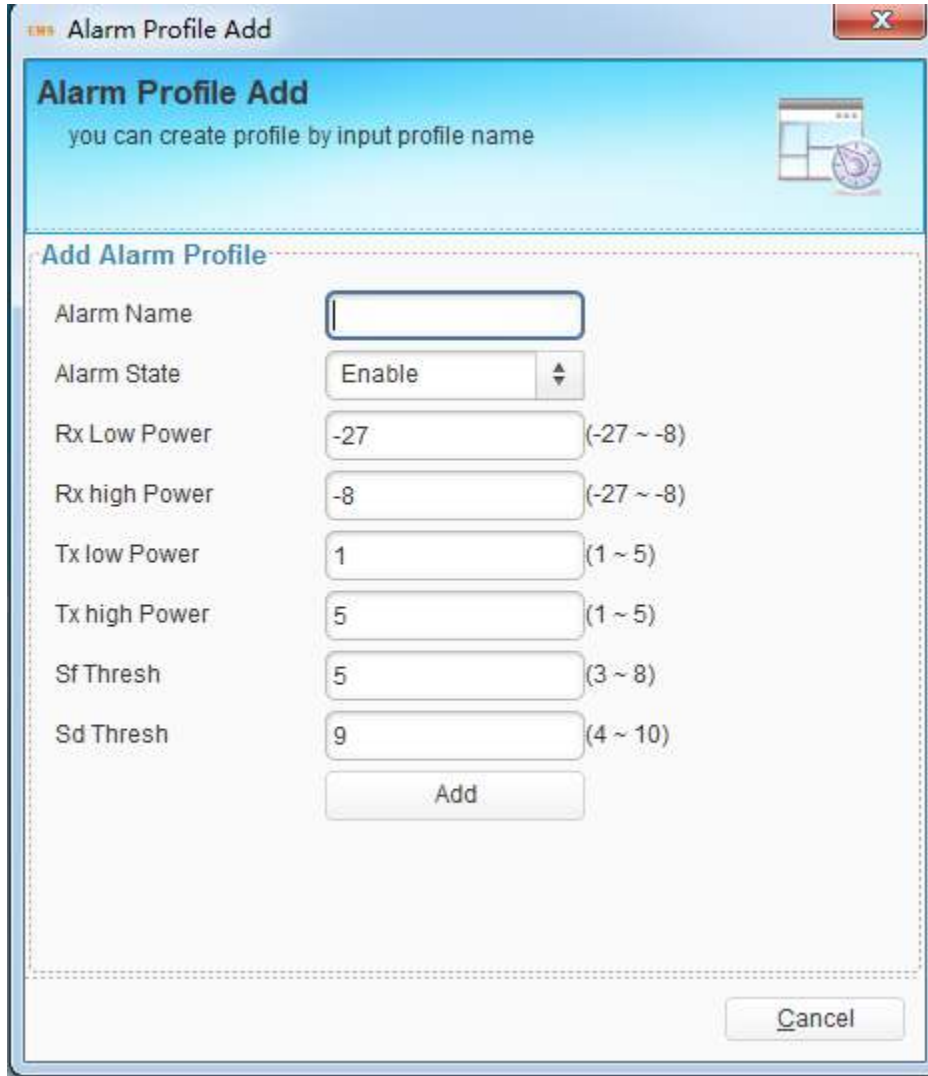
Step5. Enter Tx low power threshold.

Step6. Enter Tx high power threshold.

Step7. Enter SF threshold.

Step8. Enter SD threshold.

Step9. Click 'Add' button.



The dialog box is titled "Alarm Profile Add" and contains the instruction "you can create profile by input profile name". It features a section titled "Add Alarm Profile" with the following fields:

Field	Value	Range
Alarm Name		
Alarm State	Enable	
Rx Low Power	-27	(-27 ~ -8)
Rx high Power	-8	(-27 ~ -8)
Tx low Power	1	(1 ~ 5)
Tx high Power	5	(1 ~ 5)
Sf Thresh	5	(3 ~ 8)
Sd Thresh	9	(4 ~ 10)

Buttons: "Add" and "Cancel".

Figure 11-15 alarm profile

11.2 Binding Configuration

After profile is configured, it is necessary to bind it to ONU.

Select PON port ID, then select onu and click "binding" button to open a pop-up dialog box.



Figure 11-16

Select line profile, service profile, alarm profile on the binding window. And click 'OK' button to commit.

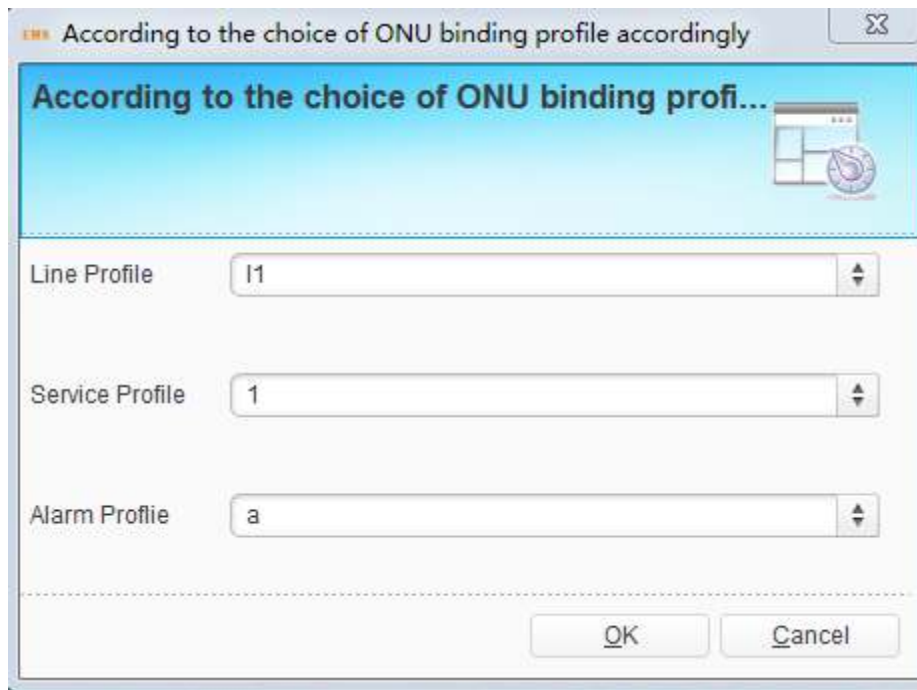


Figure 11-17 Profile Binding

12 ONU Management--GPON

This chapter mainly introduces ONU management function of EMS. ONU management includes ONU configuration, rename, reset, delete, view alarm.

Choose ONU icon and open right-click menu.

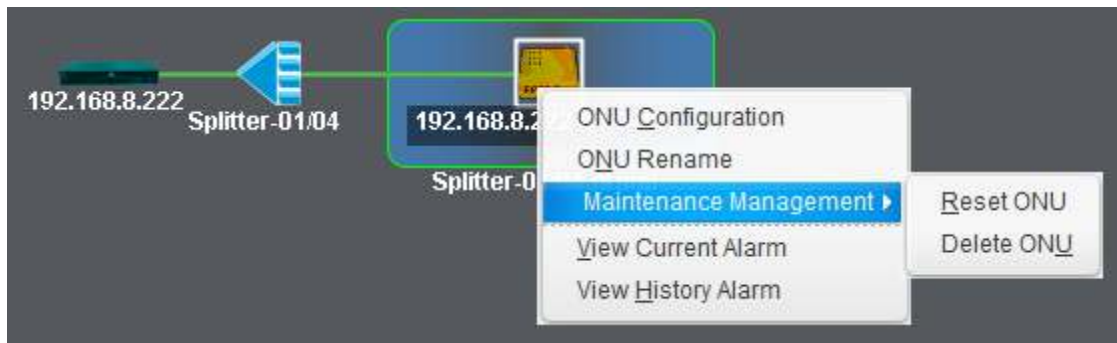


Figure 12-1 onu management

12.1 ONU Configuration

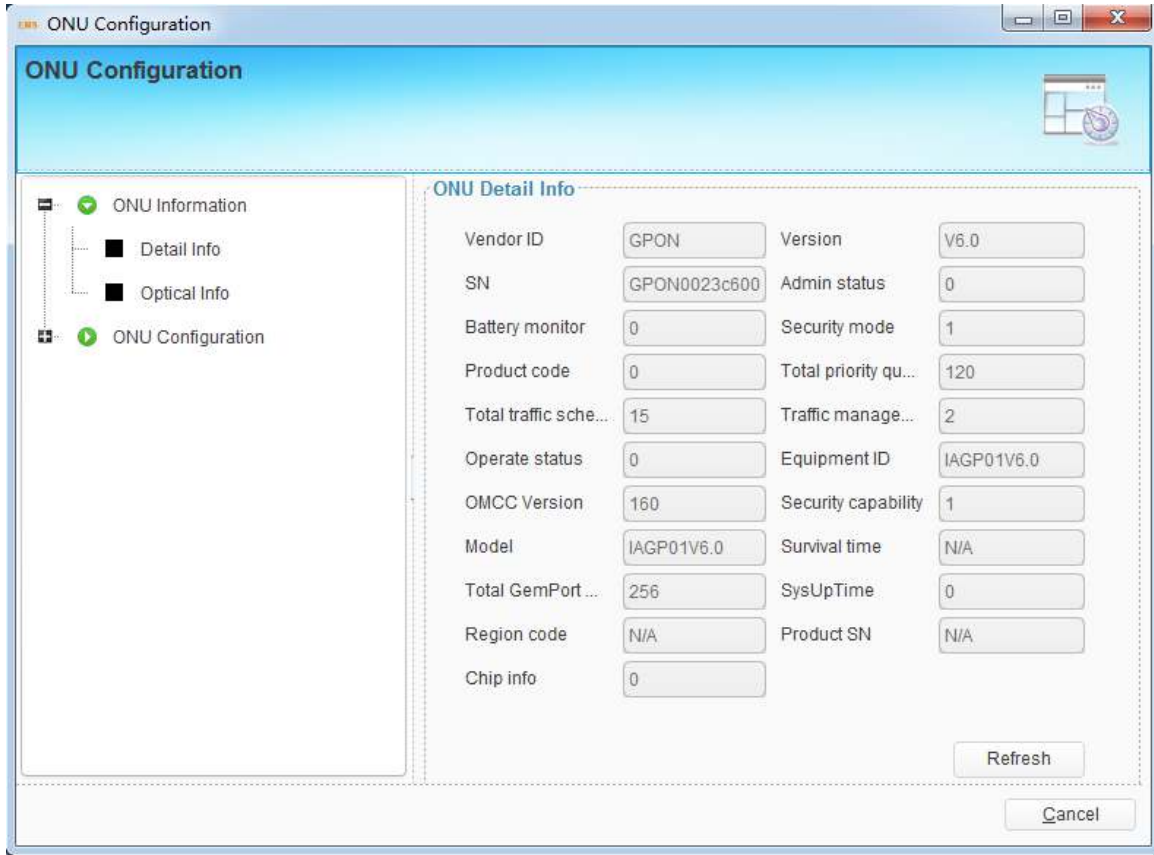
This section mainly introduces ONU service configurations. Different type ONU has different configuration options. OLT can identify what functions the ONU supports and EMS will display the corresponding configuration options in this interface.

Right-click ONU icon, choose "ONU Configuration" to enter ONU configuration interface.

12.1 .1 ONU Information

12.1 .1 .1 Detail Info

We can check the onu detail information in detail info window.



The screenshot shows the 'ONU Configuration' window. On the left is a tree view with 'ONU Information' (selected), 'Detail Info', 'Optical Info', and 'ONU Configuration'. The main area is titled 'ONU Detail Info' and contains a table of parameters with input fields. At the bottom right are 'Refresh' and 'Cancel' buttons.

Parameter	Value	Parameter	Value
Vendor ID	GPON	Version	V6.0
SN	GPON0023c600	Admin status	0
Battery monitor	0	Security mode	1
Product code	0	Total priority qu...	120
Total traffic sche...	15	Traffic manage...	2
Operate status	0	Equipment ID	IAGP01V6.0
OMCC Version	160	Security capability	1
Model	IAGP01V6.0	Survival time	N/A
Total GemPort ...	256	SysUpTime	0
Region code	N/A	Product SN	N/A
Chip info	0		

Figure 12-2 onu detail information

12.1 .1 .2 Optical Info

We can check the onu's pon port parameters.

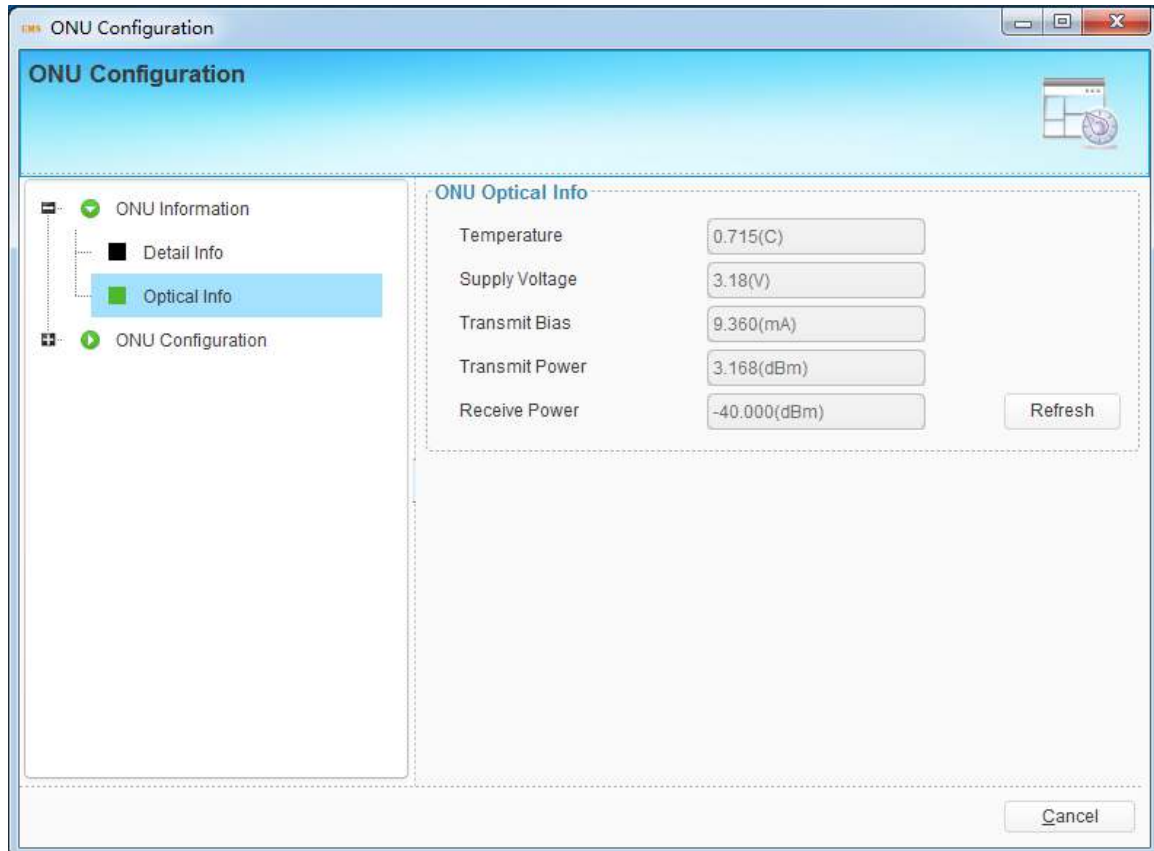


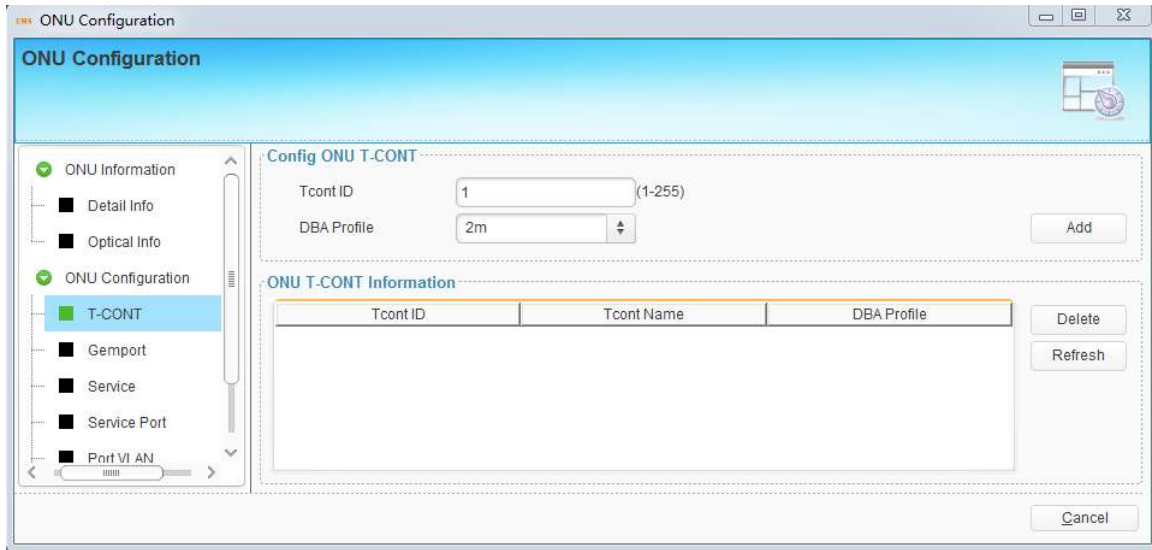
Figure 12-3 onu optical information

12.1.2 ONU Configuration

Onu configuration includes t-cont, gempport, service, service port, port vlan, multicast vlan, multicast vlan strip.

12.1.2.1 T-CONT

Enter Tcont ID, select DBA profile and click 'Add' button to add a new tcont to ONU. Select Tcont and click 'Delete' to remove it.



ONU Configuration

Config ONU T-CONT

Tcont ID: 1 (1-255)

DBA Profile: 2m

Add

ONU T-CONT Information

Tcont ID	Tcont Name	DBA Profile
----------	------------	-------------

Delete

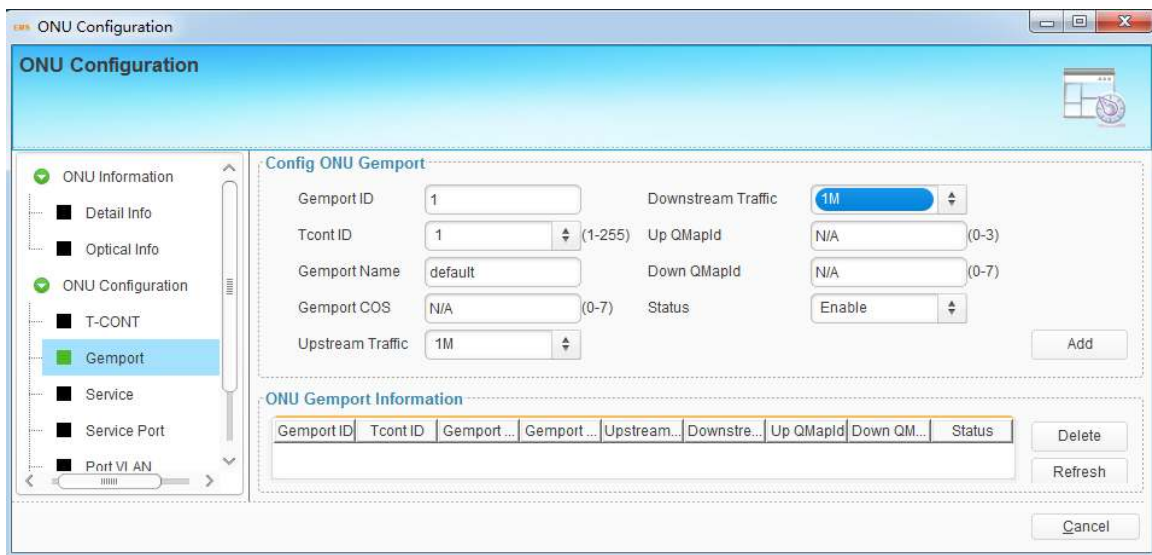
Refresh

Cancel

Figure 12-4 T-CONT configuration

12.1 .2 .2 Gemport

Enter Gemport ID, select Tcont ID, select Upstream/Downstream Traffic and click 'Add' button to add a new gemport to ONU. Select gemport and click 'Delete' to remove it.



ONU Configuration

Config ONU Gemport

Gemport ID: 1

Tcont ID: 1 (1-255)

Gemport Name: default

Gemport COS: N/A (0-7)

Upstream Traffic: 1M

Downstream Traffic: 1M

Up QMapId: N/A (0-3)

Down QMapId: N/A (0-7)

Status: Enable

Add

ONU Gemport Information

Gemport ID	Tcont ID	Gemport ...	Gemport ...	Upstream...	Downstre...	Up QMapId	Down QM...	Status
------------	----------	-------------	-------------	-------------	-------------	-----------	------------	--------

Delete

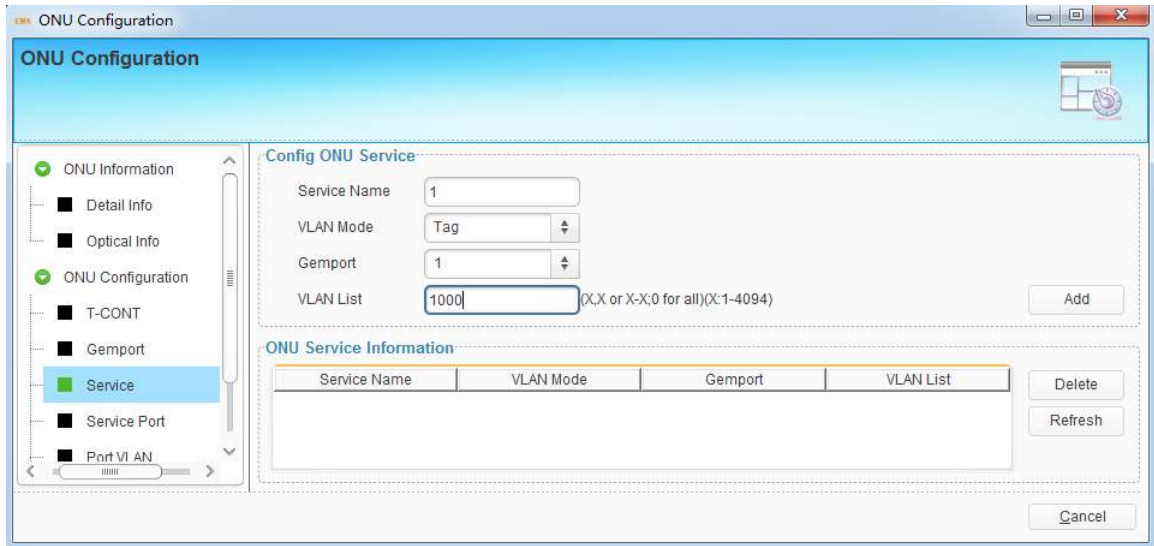
Refresh

Cancel

Figure 12-5 Gemport configuration

12.1 .2 .3 Service

Enter Service name, select Gemport ID, enter vlan list and click 'Add' button to add a new service to ONU. Select service and click 'Delete' to remove it.



The screenshot shows the 'ONU Configuration' window. On the left is a tree view with the following items: ONU Information (checked), Detail Info, Optical Info, ONU Configuration (checked), T-CONT, Gemport, **Service** (highlighted), Service Port, and Port VLAN. The main area is titled 'Config ONU Service' and contains the following fields:

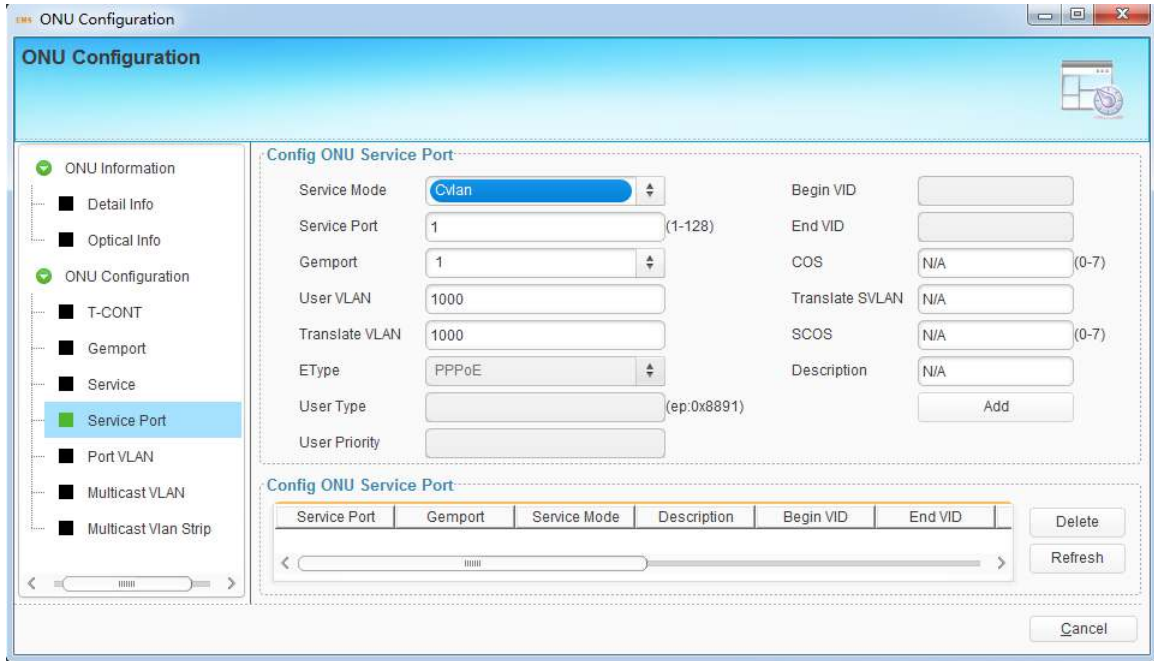
- Service Name: 1
- VLAN Mode: Tag
- Gemport: 1
- VLAN List: 1000 (with a note: (X,X or X-X;0 for all)(X:1-4094))

There is an 'Add' button to the right of the VLAN List field. Below this is a section titled 'ONU Service Information' which contains a table with the following columns: Service Name, VLAN Mode, Gemport, and VLAN List. The table is currently empty. To the right of the table are 'Delete' and 'Refresh' buttons. At the bottom right of the window is a 'Cancel' button.

Figure 12-6 Service configuration

12.1 .2 .4 Service Port

Enter Service port ID, select Gemport ID, enter user vlan, enter translate vlan and click 'Add' button to add a new service port for ONU. Select service port and click 'Delete' to remove it.



ONU Configuration

ONU Information

- Detail Info
- Optical Info
- ONU Configuration
 - T-CONT
 - Gemport
 - Service
 - Service Port**
 - Port VLAN
 - Multicast VLAN
 - Multicast Vlan Strip

Config ONU Service Port

Service Mode: Begin VID:

Service Port: (1-128) End VID:

Gemport: COS: (0-7)

User VLAN: Translate SVLAN:

Translate VLAN: SCOS: (0-7)

EType: Description:

User Type: (ep:0x8891)

User Priority:

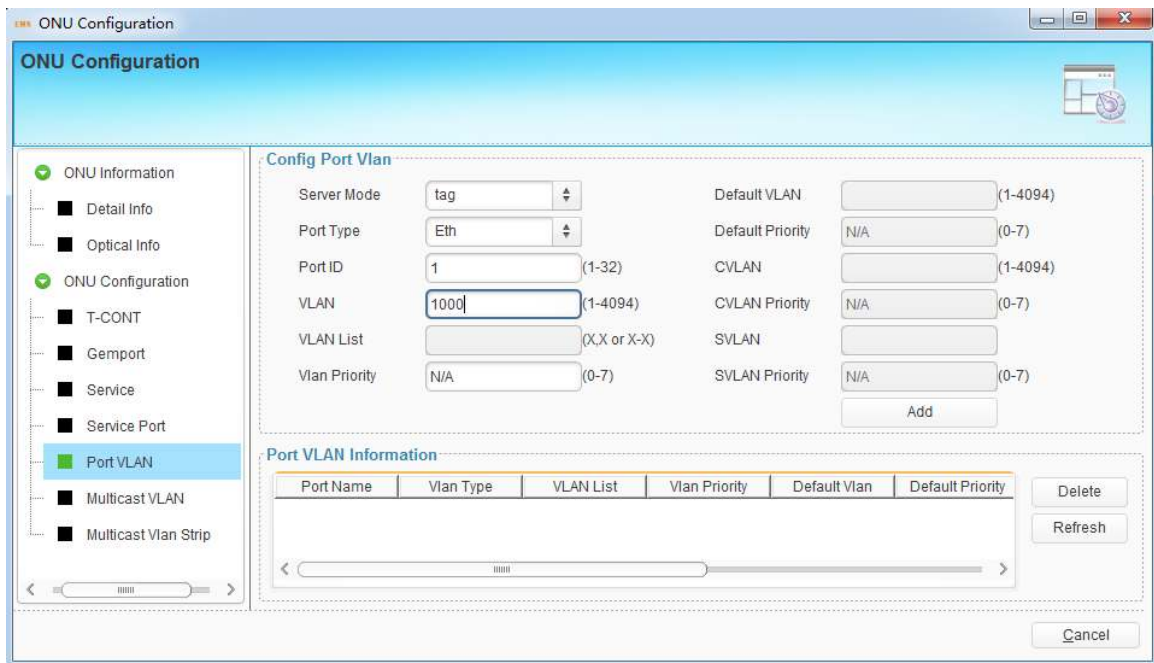
Config ONU Service Port

Service Port	Gemport	Service Mode	Description	Begin VID	End VID
Delete Refresh					

Figure 12-7 Service port configuration

12.1 .2 .5 Port vlan

select server mode, enter port ID, enter vlan and click 'Add' button to add a new port vlan for ONU. Select port vlan and click 'Delete' to remove it.



ONU Configuration

ONU Information

- Detail Info
- Optical Info
- ONU Configuration
 - T-CONT
 - Gemport
 - Service
 - Service Port
 - Port VLAN**
 - Multicast VLAN
 - Multicast Vlan Strip

Config Port Vlan

Server Mode: Default VLAN: (1-4094)

Port Type: Default Priority: (0-7)

Port ID: (1-32) CVLAN: (1-4094)

VLAN: (1-4094) CVLAN Priority: (0-7)

VLAN List: (X,X or X-X) SVLAN:

Vlan Priority: (0-7) SVLAN Priority: (0-7)

Port VLAN Information

Port Name	Vlan Type	VLAN List	Vlan Priority	Default Vlan	Default Priority
Delete Refresh					

Figure 12-7 port vlan configuration

12.1 .2 .6 Multicast vlan

Enter vlan list and click 'Add' button to add multicast vlan.

Select vlan list and click 'Delete' button to remove it.

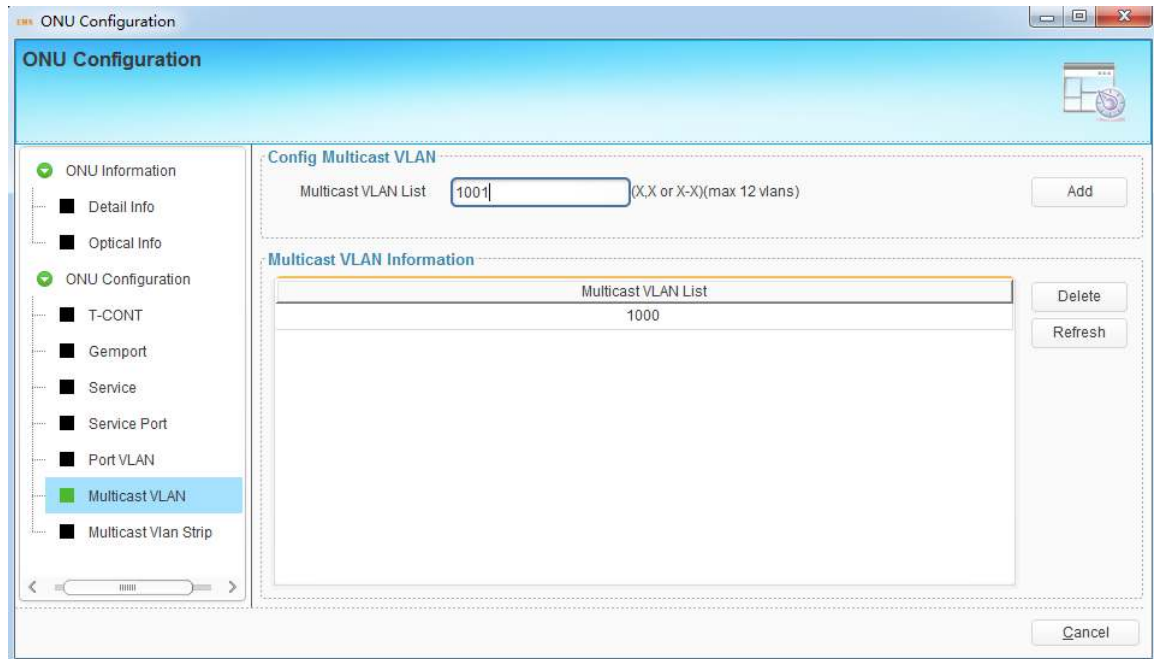


Figure 12-8 multicast vlan configuration

12.1 .2 .7 Multicast vlan strip

Enter port number and click 'Add' button to add multicast vlan strip, this operation just for Ethernet port.

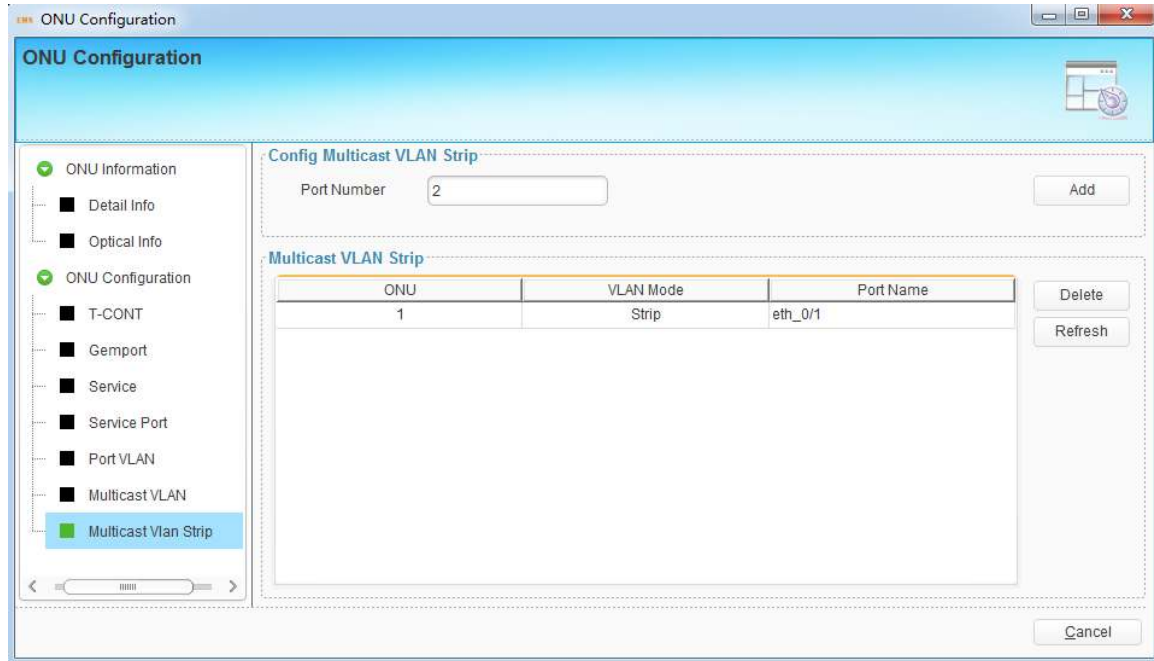


Figure 12-9 multicast vlan configuration

12.2 ONU Rename

This operation is used to set or modify ONU's name. The name will not be saved in device, but be saved in EMS database.

Choose ONU icon and open right-click menu; choose "ONU Rename" to open a pop-up dialog box.

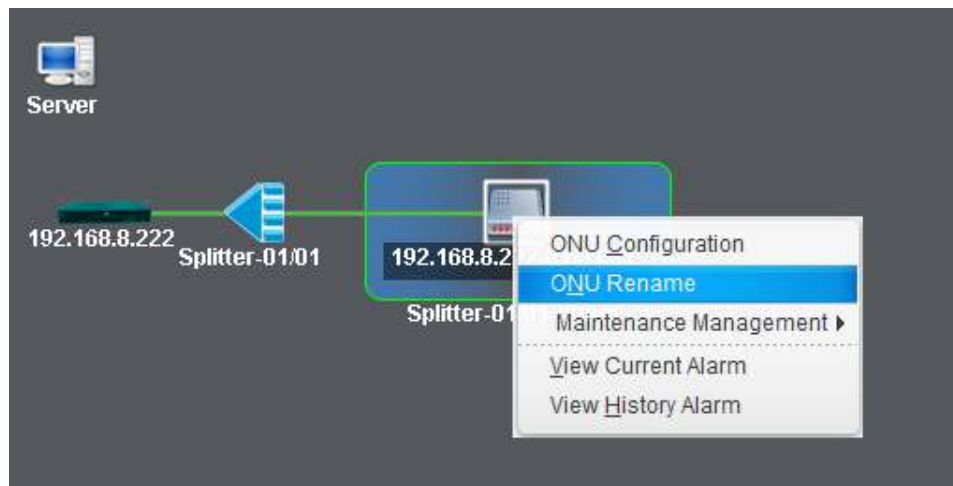


Figure 12-4 ONU Rename

Fill in the ONU new name and click "OK" button to apply.

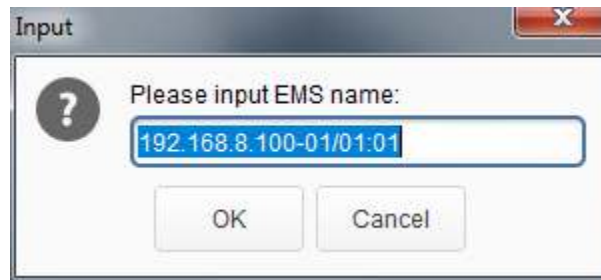


Figure 12-5 Set ONU Rename

12.3. Maintenance Management

12.3.1 Reset ONU

This operation is used to restart ONU. Rolling log will display the prompt message when the ONU reset successfully.

Right click ONU icon and choose "Maintenance Management" > "Reset ONU", then click "Yes" button on confirmation dialog box to reset it. It will carry out ONU reset action.

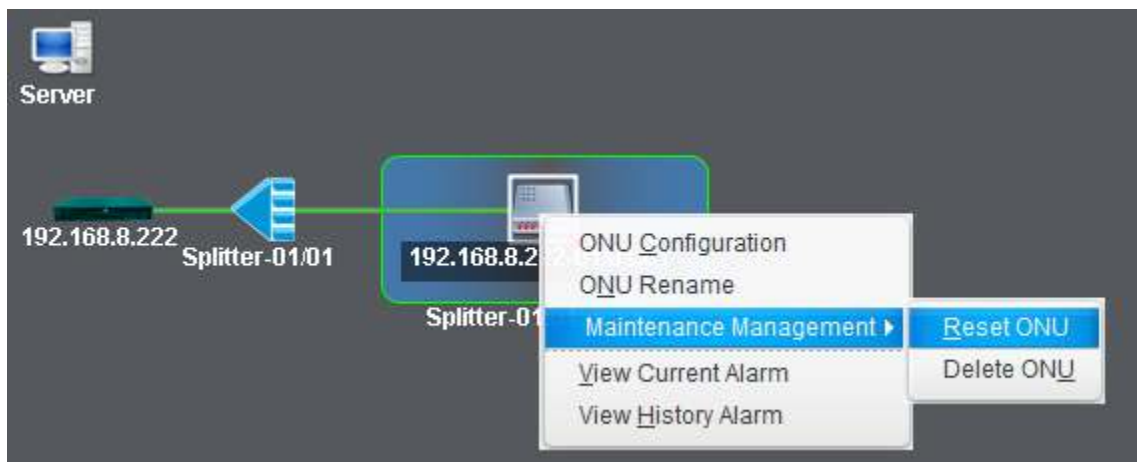


Figure 12-7 Reset ONU



Caution! The operation will cause user services interruption.

12.3.2 Delete ONU

This operation is used to remove ONU from ONU authentication list. All the information related to the ONU will get lost.

Right click ONU icon and choose "Maintenance Management" > "Unauthorize ONU", then click "Yes" button on confirmation dialog box to remove it.

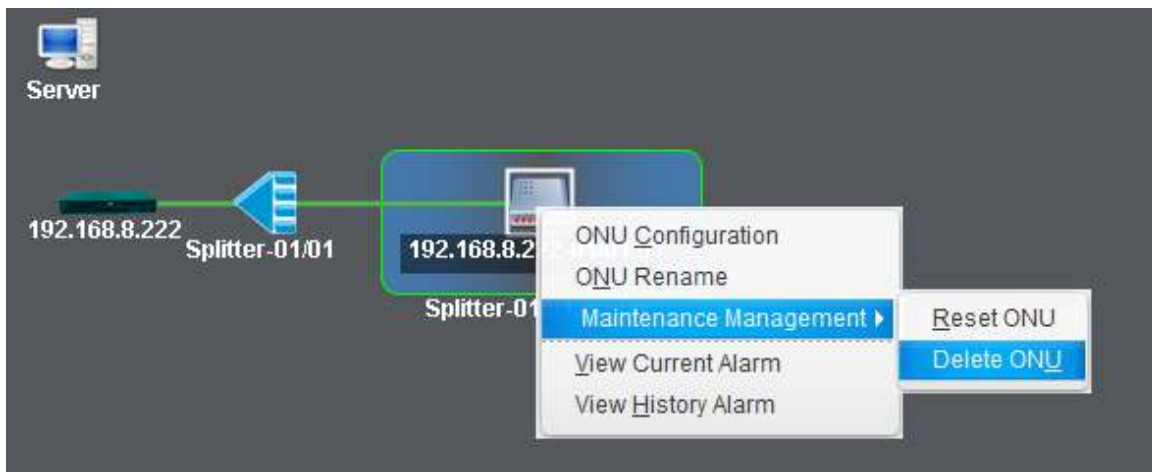


Figure 12-8 Delete ONU



Caution! All information related to the ONU will get lost after executed this operation.

13 Alarm Management

This chapter introduces alarms and events query and configurations. In order to receive alarms normally by EMS, you must add trap server to OLT. The trap server is the IP address of the computer where the EMS server installed.

Right-click OLT icon, choose “Device Details” and open a pop-up dialog box. Click “Add Trap Server” button to add current EMS server to OLT. There will be a prompt which says successfully.

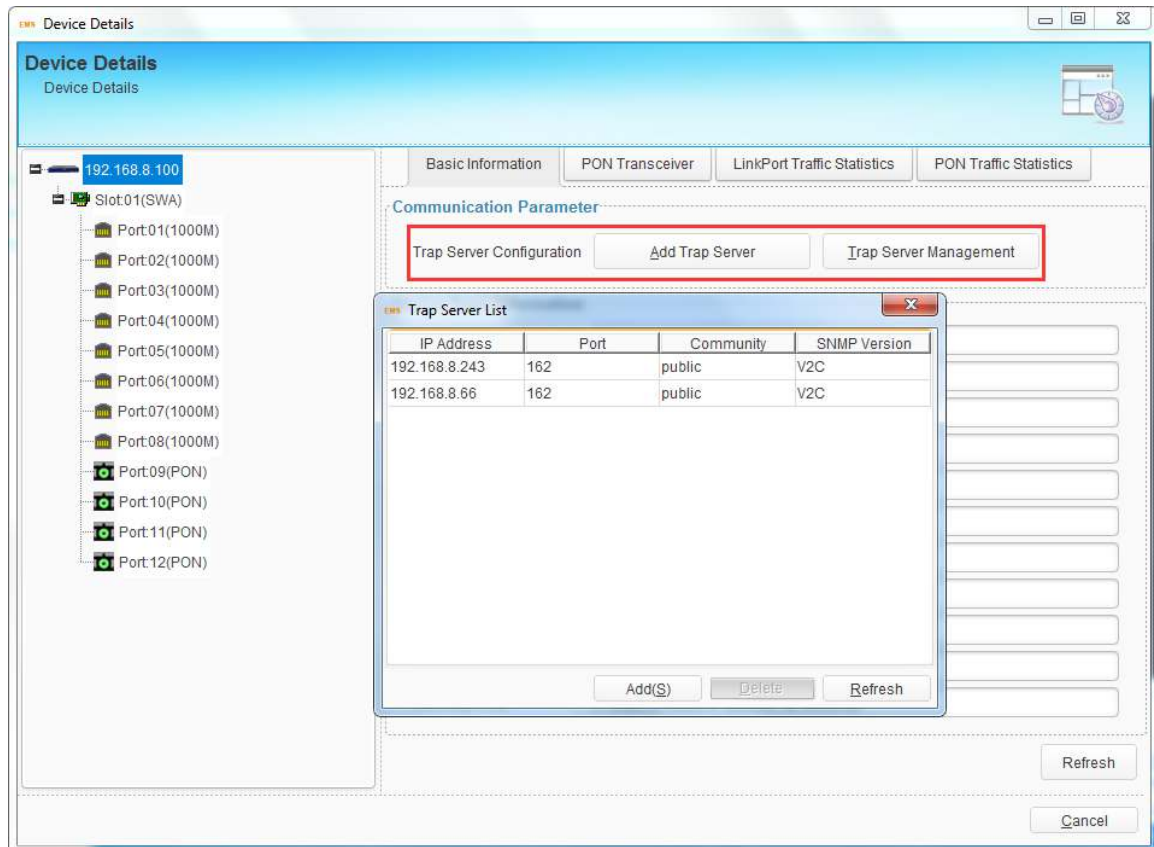


Figure 13-1 Trap Server Configuration

Click “Trap Server Management” button to view the trap servers. Trap server can

also be added or deleted in this dialog box. When add a trap server, fill in the IP address, UDP port, community and select SNMP version. Usually, UDP port is 162, SNMP version is V2C, community is default read community public.

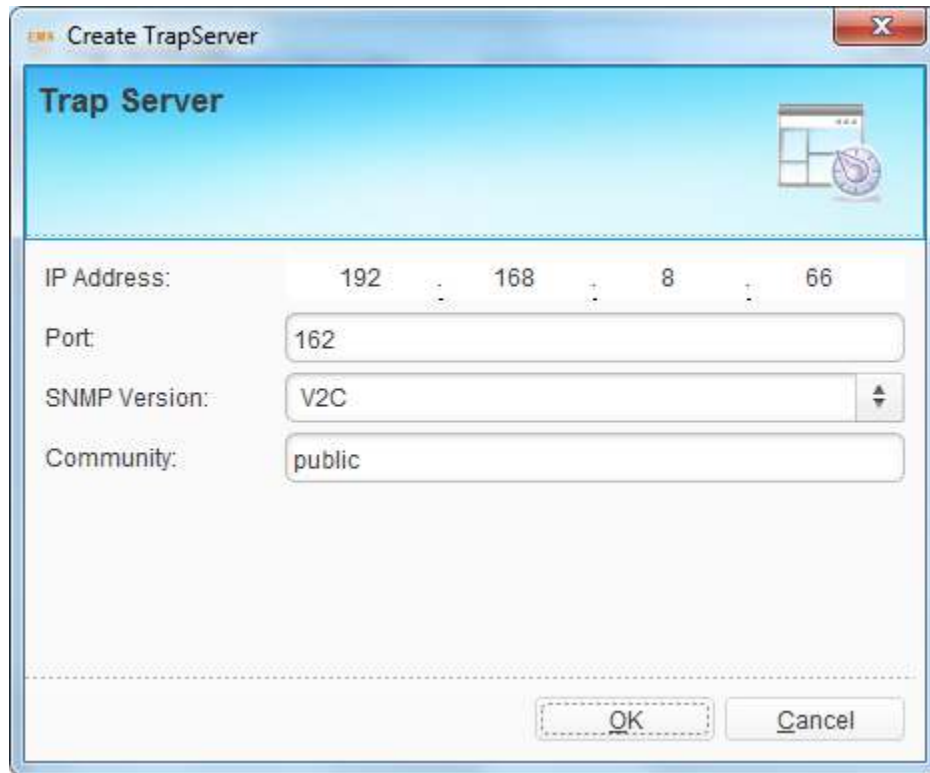


Figure 13-2 Add Trap Server



Trap server must be added to OLT so that EMS can receive alarms.

13.1 Alarm Configuration

This section introduces alarm process rules configuration and alarm sound configuration.

13.1.1 Alarm Process Rule

There may be are many kinds of alarms occur when the PON system is working,

but not every alarm we need to care about or the important ones we must know.

In this case, alarm shield rule and Email send rule are useful.

Click menu "Alarm Management" > "Alarm Process Rule", open a dialog box, and choose Alarm Process Rule, create a rule, add alarms which need to be shielded. If the rule is active, the alarms in the rule will not occur any more.

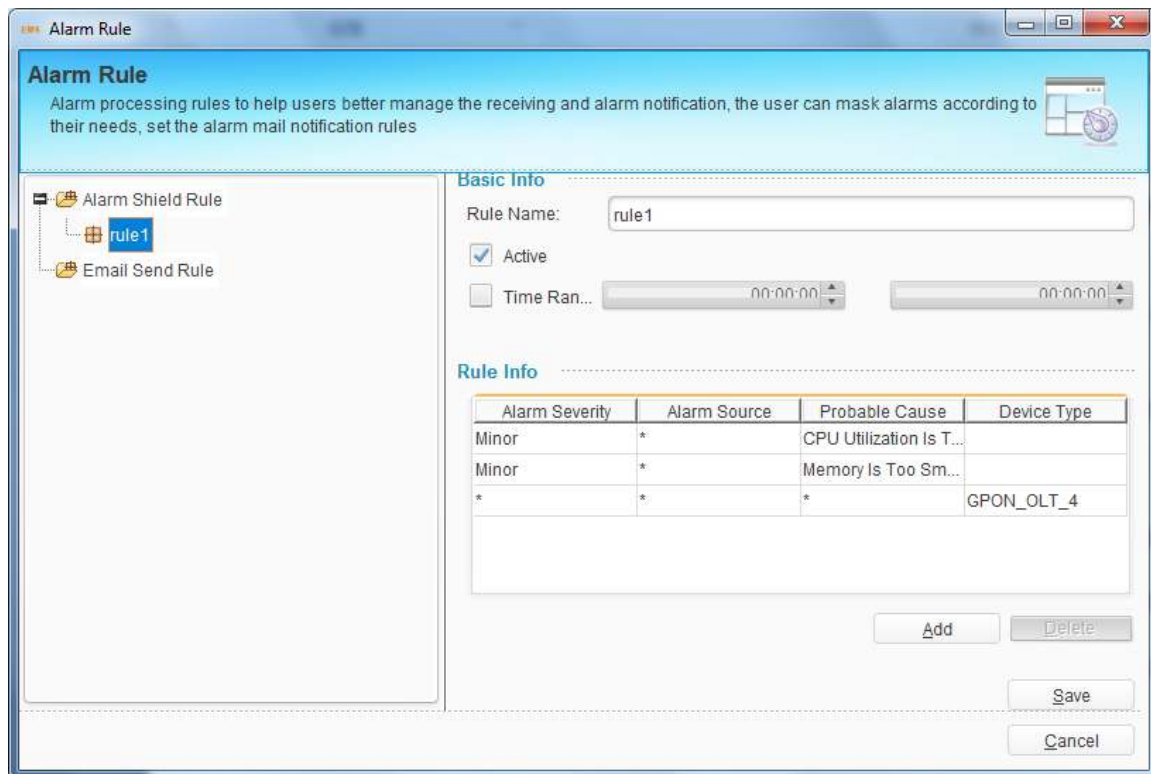
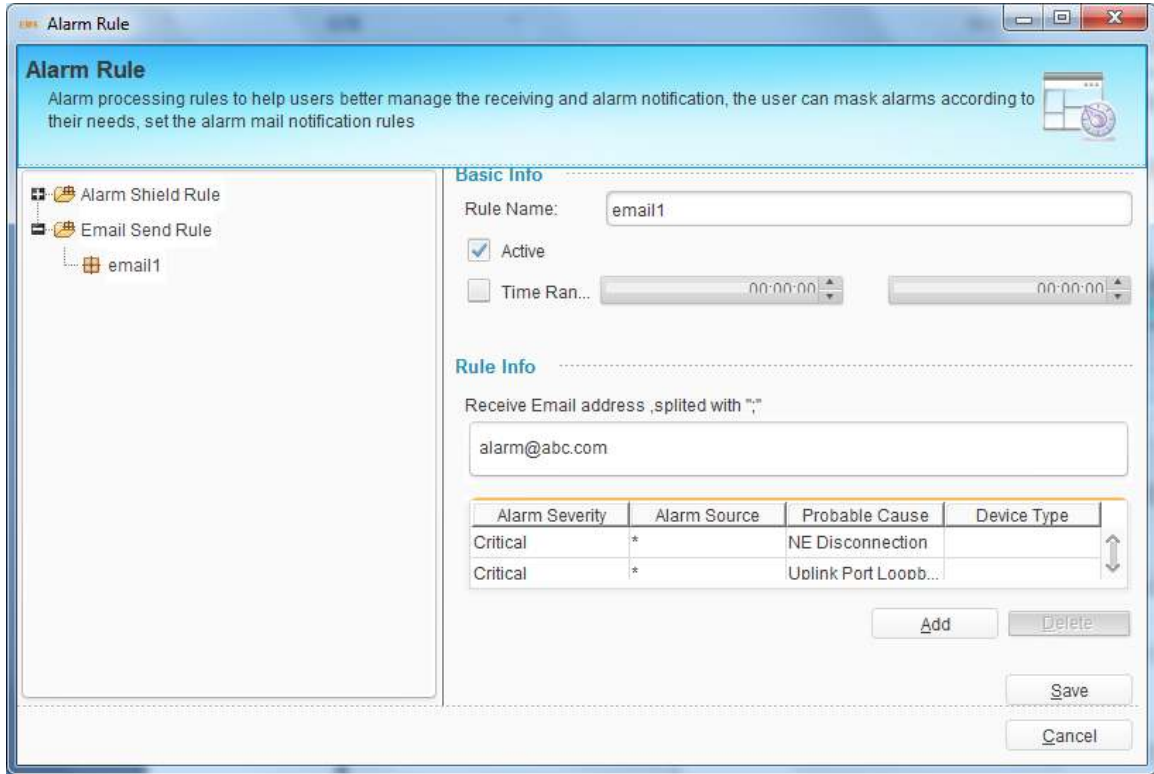


Figure 13-3 Alarm Shield Rule

Click Email Send Rule, create a rule, fill in alarm receive Email and add alarms which need to be sent by Email. If the rule is active, the alarms in the rule will be sent by Email.



Alarm Rule
Alarm processing rules to help users better manage the receiving and alarm notification, the user can mask alarms according to their needs, set the alarm mail notification rules

Basic Info

Rule Name:

☒ Active

☐ Time Ran...

Rule Info

Receive Email address ,splited with ","

Alarm Severity	Alarm Source	Probable Cause	Device Type
Critical	*	NE Disconnection	
Critical	*	Uplink Port Loob...	

Figure 13-4 Alarm Email Send Rule



Alarm shield rule and Email send rule are still under development.

13.1.2 Alarm Sound

Alarm sound is used to remind network administrator that there is alarm occurred.

Different sound can be chosen for different severity level alarm.

Click menu "Alarm Management" > "Alarm Sound", select alarm sound for each severity level alarm.



Figure 13-5 Alarm Sound

13.2 Alarm and Event Query

There may be many alarms and events occur when the system is working. Some of them are happening and some have already cleared or been cleared. If want to know what alarms or events occurred, you can use the alarm and event query function.

Click menu "Alarm Management" > "Alarm and Event Query", open query dialog box. You can query event, current alarm or history alarm, which can be chosen on the upper-left of the dialog box. Select alarm source device on the left of the box and query conditions, add alarm types to the right of the box, click "Query" button

to query alarms. You can also save the query conditions as a template.

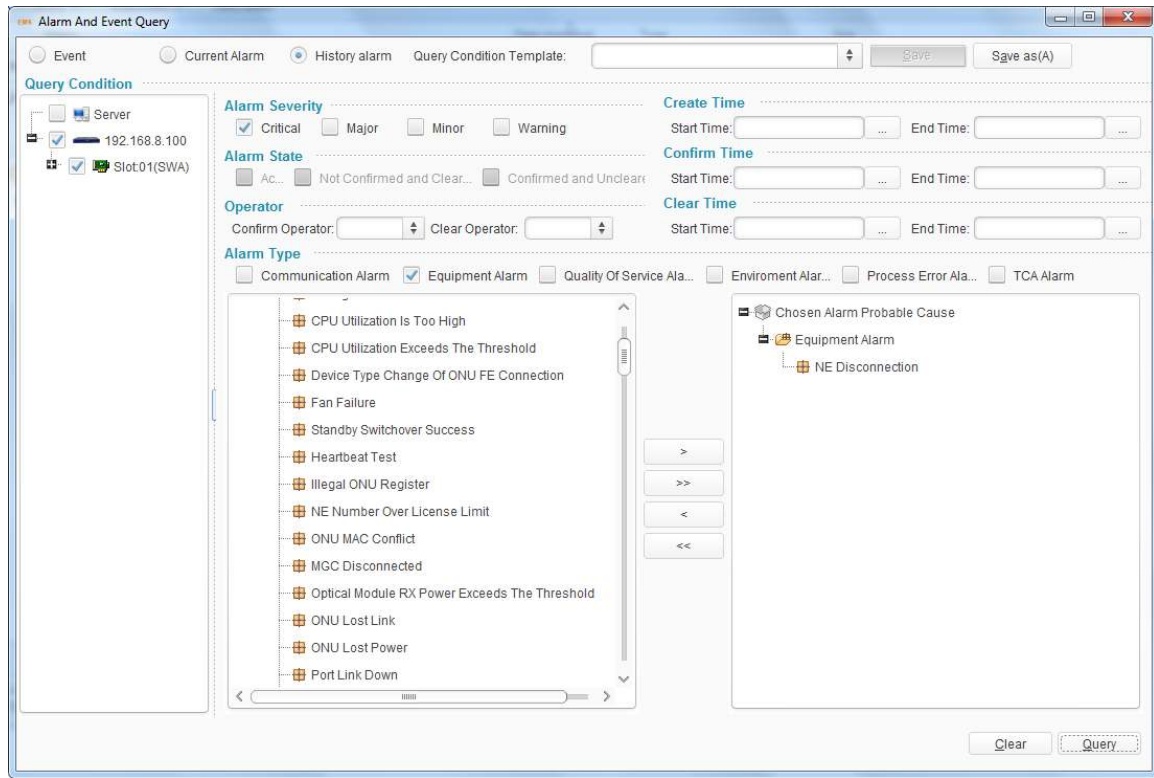
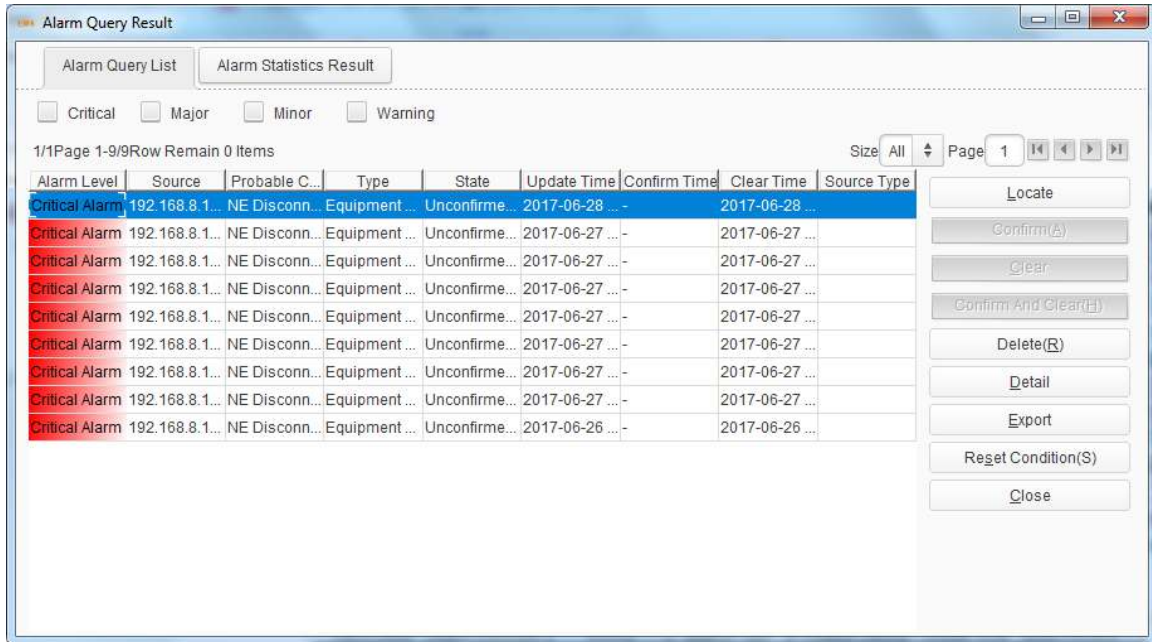


Figure 13-6 Alarm Query Configuration

Choose one alarm in the query result table; you can do some operations to the alarm, such as locate the source device in the topology, confirm or clear alarm, delete alarm, export and view the alarm details. Confirm and clear operation are available for current alarms and delete operation is available for history alarms.



Alarm Level	Source	Probable C...	Type	State	Update Time	Confirm Time	Clear Time	Source Type
Critical Alarm	192.168.8.1...	NE Disconn...	Equipment ...	Unconfirme...	2017-06-28 ...	-	2017-06-28 ...	
Critical Alarm	192.168.8.1...	NE Disconn...	Equipment ...	Unconfirme...	2017-06-27 ...	-	2017-06-27 ...	
Critical Alarm	192.168.8.1...	NE Disconn...	Equipment ...	Unconfirme...	2017-06-27 ...	-	2017-06-27 ...	
Critical Alarm	192.168.8.1...	NE Disconn...	Equipment ...	Unconfirme...	2017-06-27 ...	-	2017-06-27 ...	
Critical Alarm	192.168.8.1...	NE Disconn...	Equipment ...	Unconfirme...	2017-06-27 ...	-	2017-06-27 ...	
Critical Alarm	192.168.8.1...	NE Disconn...	Equipment ...	Unconfirme...	2017-06-27 ...	-	2017-06-27 ...	
Critical Alarm	192.168.8.1...	NE Disconn...	Equipment ...	Unconfirme...	2017-06-27 ...	-	2017-06-27 ...	
Critical Alarm	192.168.8.1...	NE Disconn...	Equipment ...	Unconfirme...	2017-06-27 ...	-	2017-06-27 ...	
Critical Alarm	192.168.8.1...	NE Disconn...	Equipment ...	Unconfirme...	2017-06-26 ...	-	2017-06-26 ...	

Figure 13-7 Alarm Query Result

13.3 Real Time Alarm

At the bottom of EMS main interface, real time alarm/event window will display all current alarms/events of OLT and ONU devices.

Real time alarm list contains alarm level, description, alarm source, device type, probable cause, alarms create time and EMS receive time. Different severity level is marked by different color. The color also displays on the alarm source. You can confirm, clear, shield the alarms or view alarm details by right-clicking.

Real time event list contains event name, event source, source type, events create time and event type. You can delete events or view event details by right-clicking.

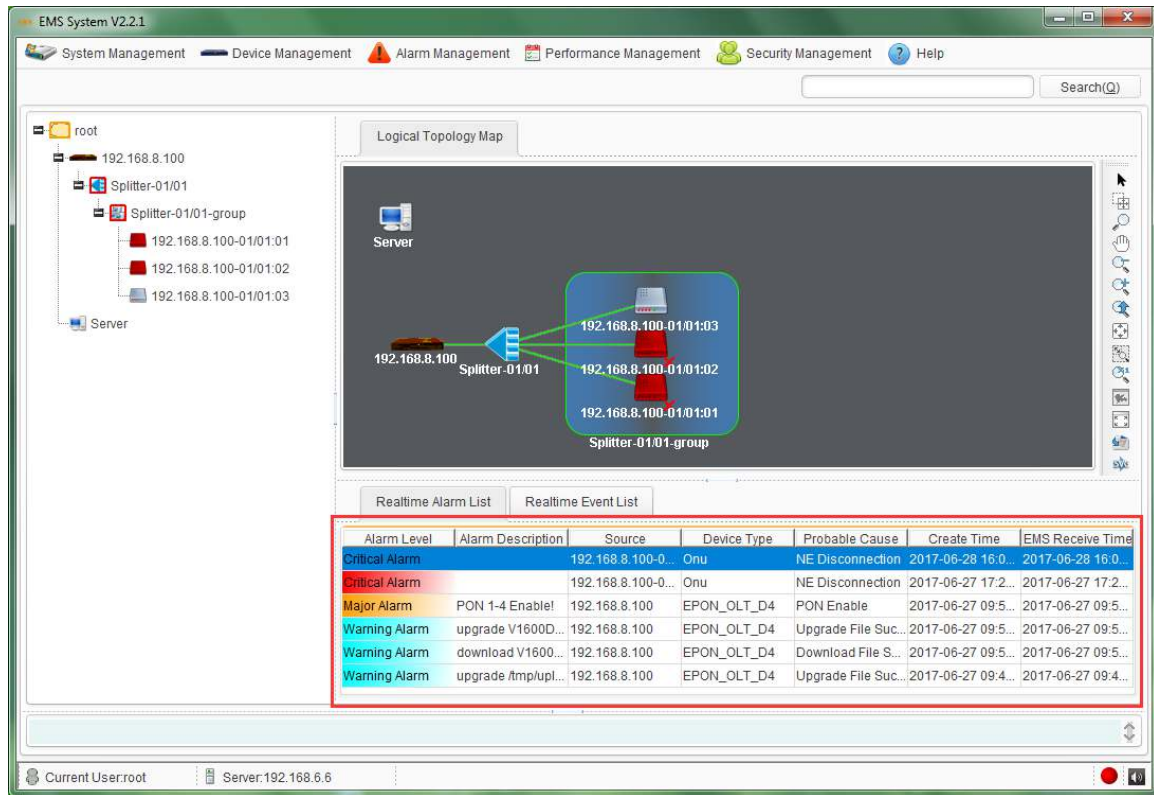


Figure 13-8 Real Time Alarm

When OLT is disconnected with EMS, EMS will display a red "X" at the OLT icon in the topology map. When ONU is disconnected with OLT and OLT is still connecting with EMS, EMS will display a red "X" at the ONU icon in the topology map. The cross mark "X" will disappear after the connection is established.

13.4 OLT Alarm Management

This section introduces OLT alarm configuration and view.

13.4.1 OLT Alarm Configuration

OLT alarm configuration contains PON alarm, alarm control and threshold alarm.

Right click OLT icon, choose "Alarm Configuration" to enter OLT alarm configuration interface.

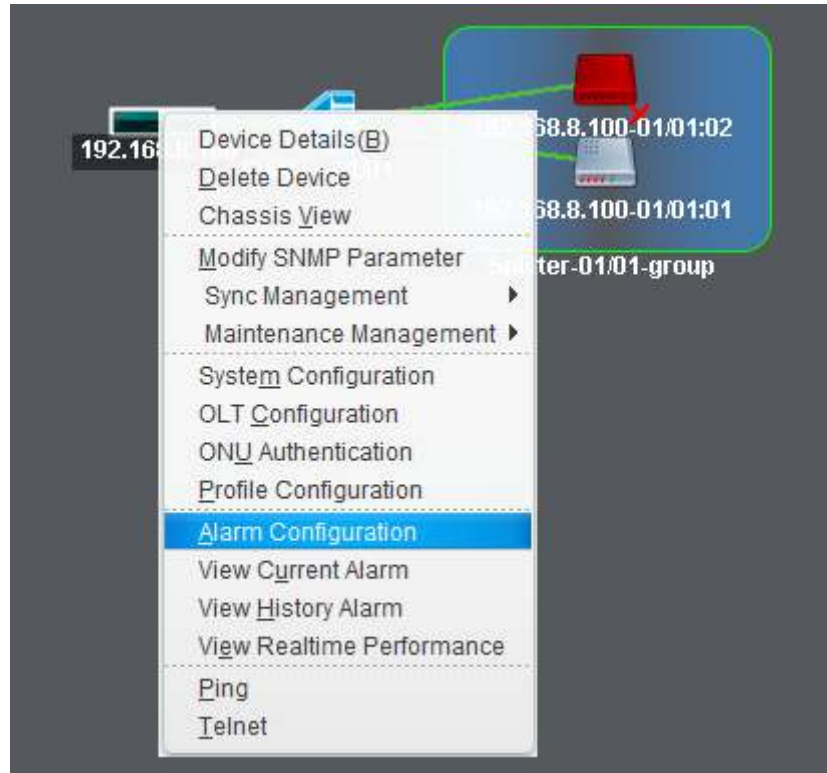


Figure 13-9 Enter OLT Alarm Configuration

13.4.1.1 OLT PON alarm

OLT PON alarm contains transmit power, Vcc, bias current and temperature alarm of PON module.

Select PON port, active status and fill in threshold. For high alarm, alarm threshold must be bigger than clear threshold; oppositely, for low alarm, alarm threshold must be smaller than clear threshold.

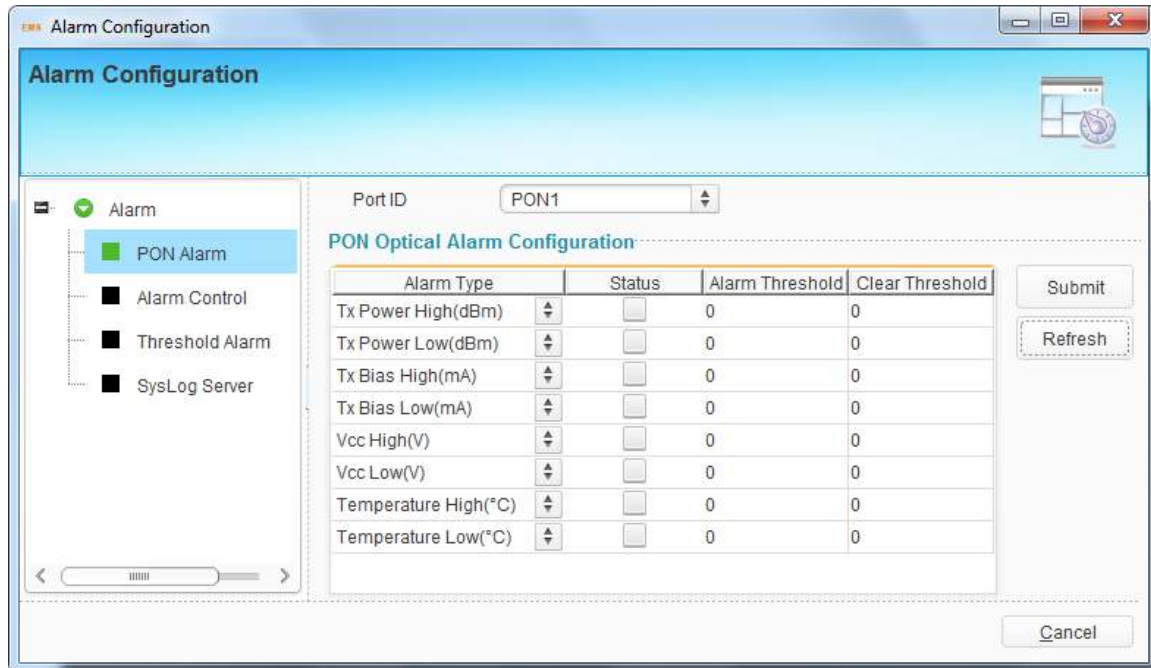


Figure 13-10 OLT PON Alarm Configuration

13.4.1.2 Alarm Control

These configurations are used to control whether the alarms display on EMS, system log or other devices. There are four options for each alarm, which are print, record, trap and remote. The meaning of each option is shown bellow.

- Print: print alarm information on console port.
- Record: record alarm information in system log.
- Trap: display alarm information on EMS.
- Remote: send alarm information to remoter server.

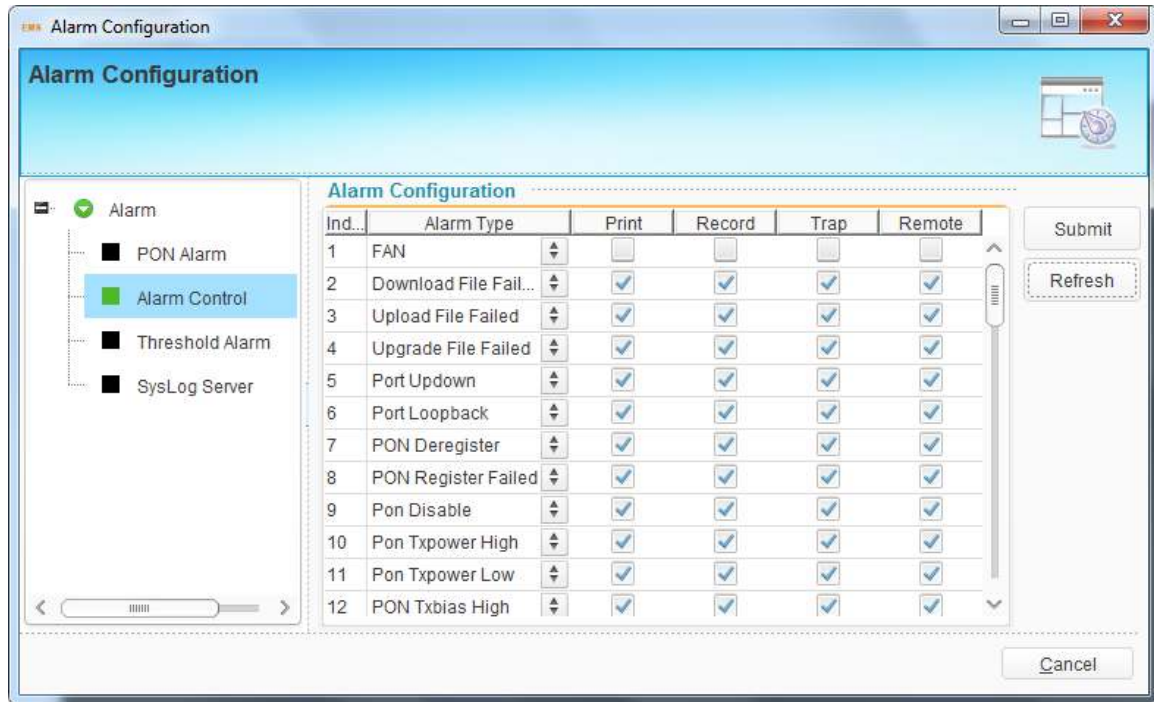


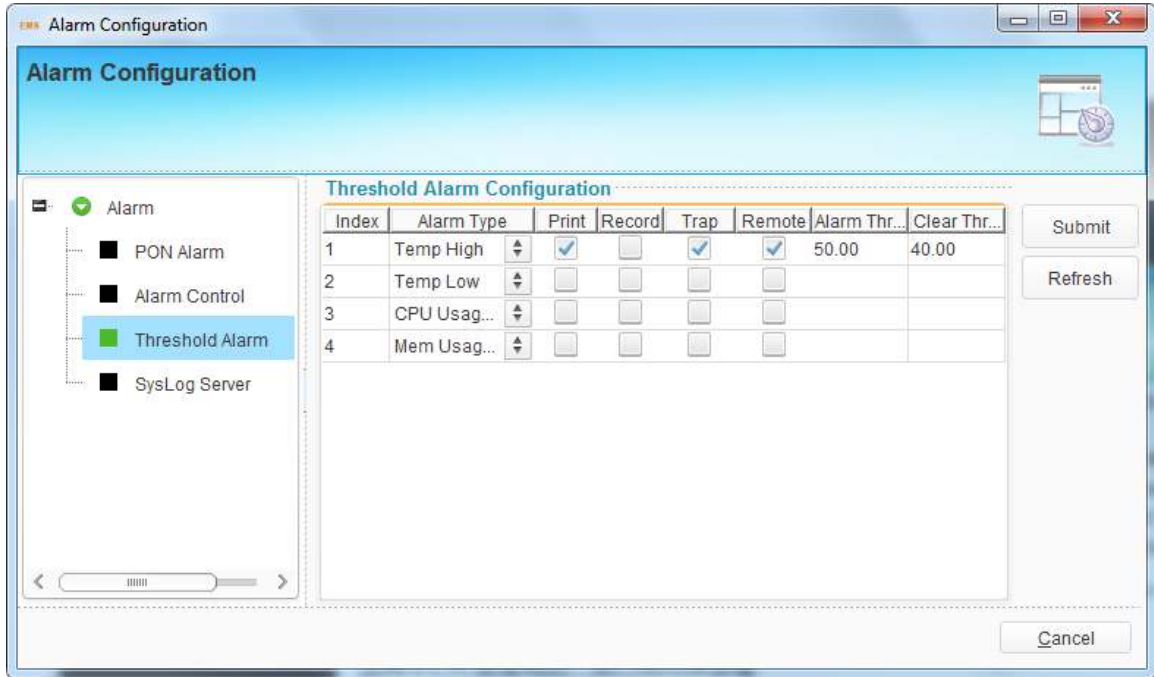
Figure 13-11 Alarm control configuration



The alarm control configuration contains all alarms of the PON system. It is only used to control whether the alarms display or not, but not to control whether the alarms report or not.

13.4.1.3 Threshold Alarm

These configurations are used to configure OLT system alarm, such as temperature alarm, CPU usage alarm and memory usage alarm. You need to select alarm display mode and set threshold.



The screenshot shows the 'Alarm Configuration' window with the 'Threshold Alarm Configuration' tab selected. On the left, a tree view shows 'Alarm' expanded, with 'Threshold Alarm' highlighted. The main area contains a table with the following data:

Index	Alarm Type	Print	Record	Trap	Remote	Alarm Thr...	Clear Thr...
1	Temp High	☒	☐	☒	☒	50.00	40.00
2	Temp Low	☐	☐	☐	☐		
3	CPU Usag...	☐	☐	☐	☐		
4	Mem Usag...	☐	☐	☐	☐		

Buttons for 'Submit', 'Refresh', and 'Cancel' are located on the right side of the window.

Figure 13-12 Threshold Alarm Configuration

13.4.1.4 System Log Server

This configuration is used to configure server address and monitor UDP port for receiving system log. When enabled Remote in the alarm settings, the alarms will send to the server.

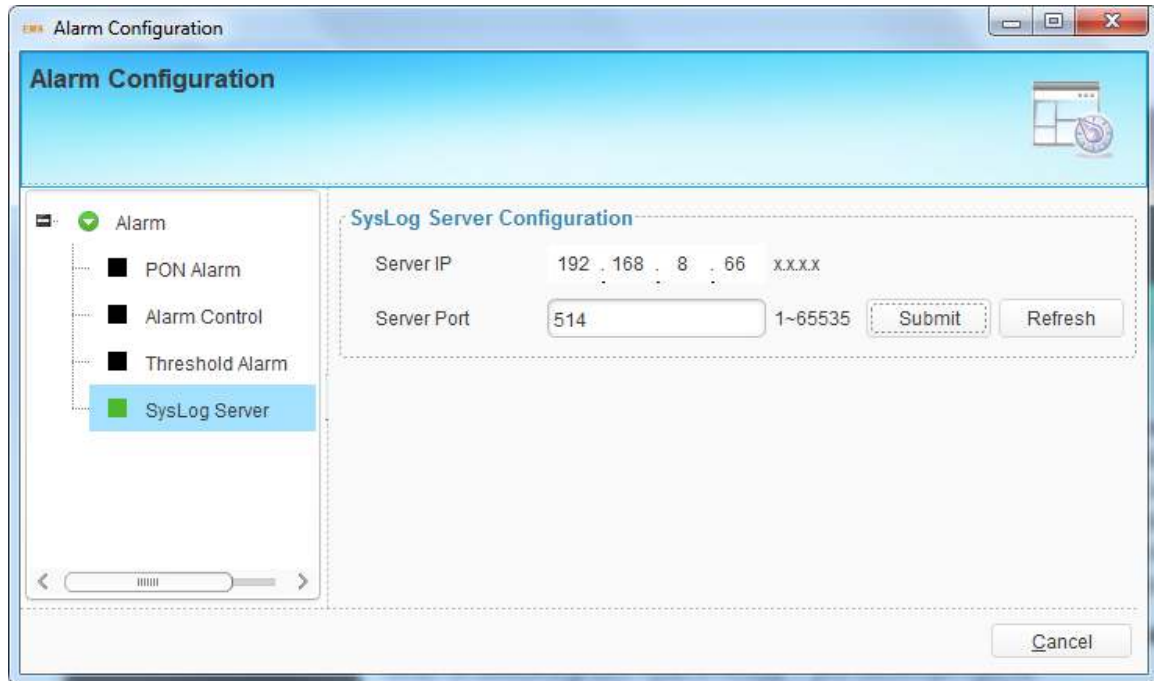


Figure 13-13 Syslog Server Configuration

13.4.2 View OLT Alarm

Except querying alarms and viewing real time alarms described above, there is another frequently-used ways to view OLT alarms.

13.4.2.1 View Current Alarm

Right-click OLT icon, choose "View Current Alarm", and open current alarms dialog box. You can choose alarm list or alarm statistics to view.

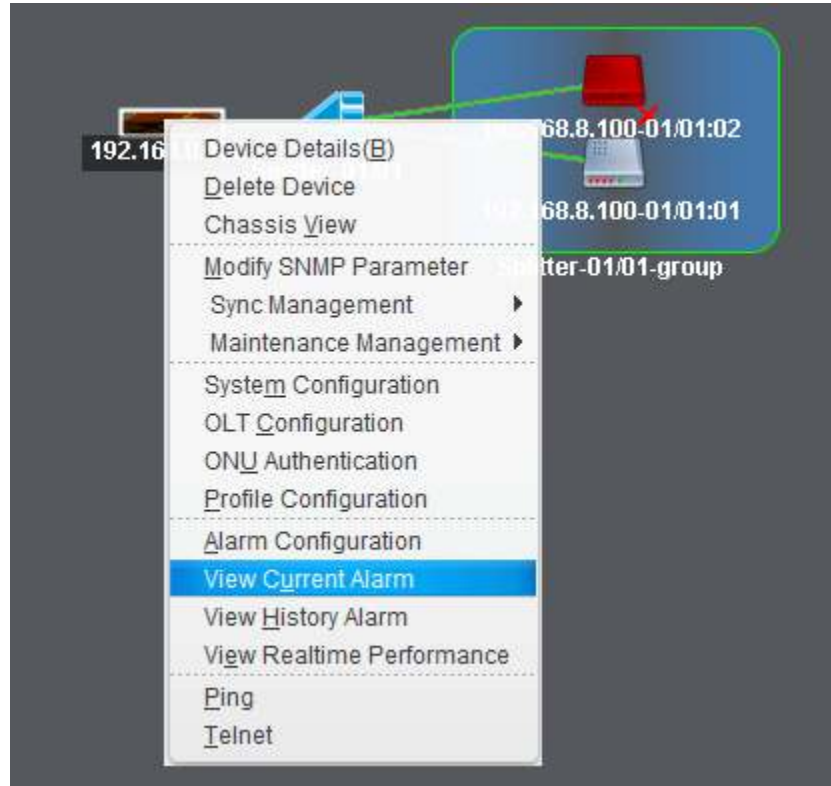
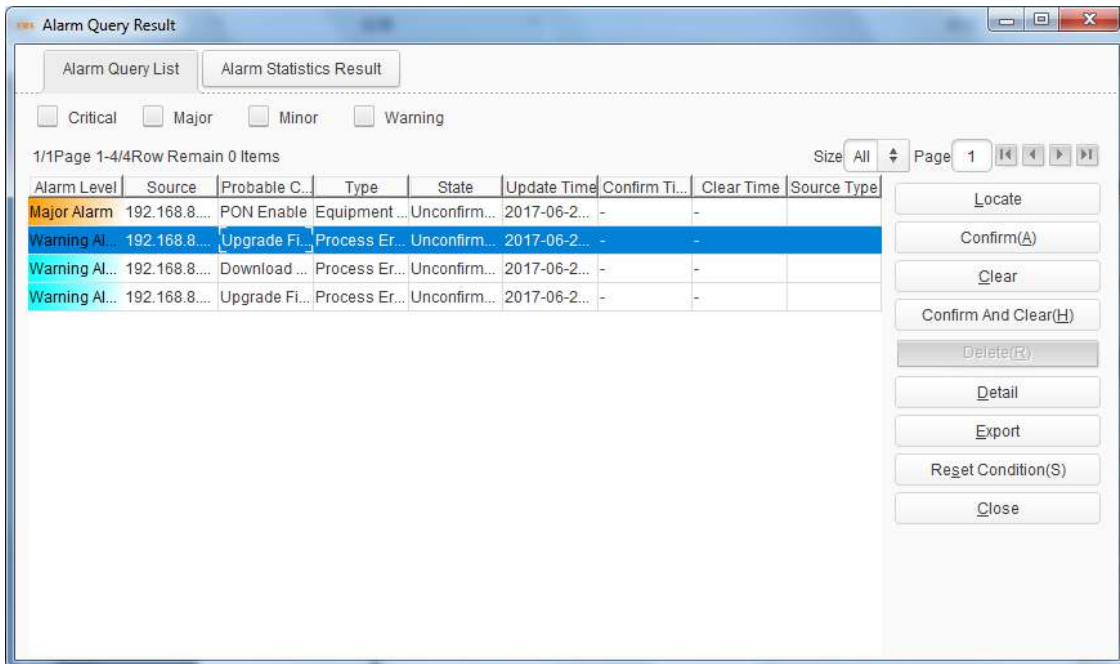


Figure 13-14 View OLT Current Alarm

In alarm list interface, you can choose which severity level alarms can be displayed and confirm or clear the alarms, view alarm details and export the alarms.

In alarm statistics interface, you can choose which kind of methods to display the alarms. The methods contain pie graph, bar graph and statistics table.



Alarm Query Result

Alarm Query List Alarm Statistics Result

☐ Critical ☐ Major ☐ Minor ☐ Warning

1/1Page 1-4/4Row Remain 0 Items

Size: All Page: 1

Alarm Level	Source	Probable Cause	Type	State	Update Time	Confirm Time	Clear Time	Source Type
Major Alarm	192.168.8...	PON Enable	Equipment ...	Unconfirm...	2017-06-2...	-	-	
Warning Al...	192.168.8...	Upgrade Fi...	Process Er...	Unconfirm...	2017-06-2...	-	-	
Warning Al...	192.168.8...	Download ...	Process Er...	Unconfirm...	2017-06-2...	-	-	
Warning Al...	192.168.8...	Upgrade Fi...	Process Er...	Unconfirm...	2017-06-2...	-	-	

Locate
Confirm(A)
Clear
Confirm And Clear(H)
Delete(R)
Detail
Export
Reset Condition(S)
Close

Figure 13-15 OLT Current Alarm List

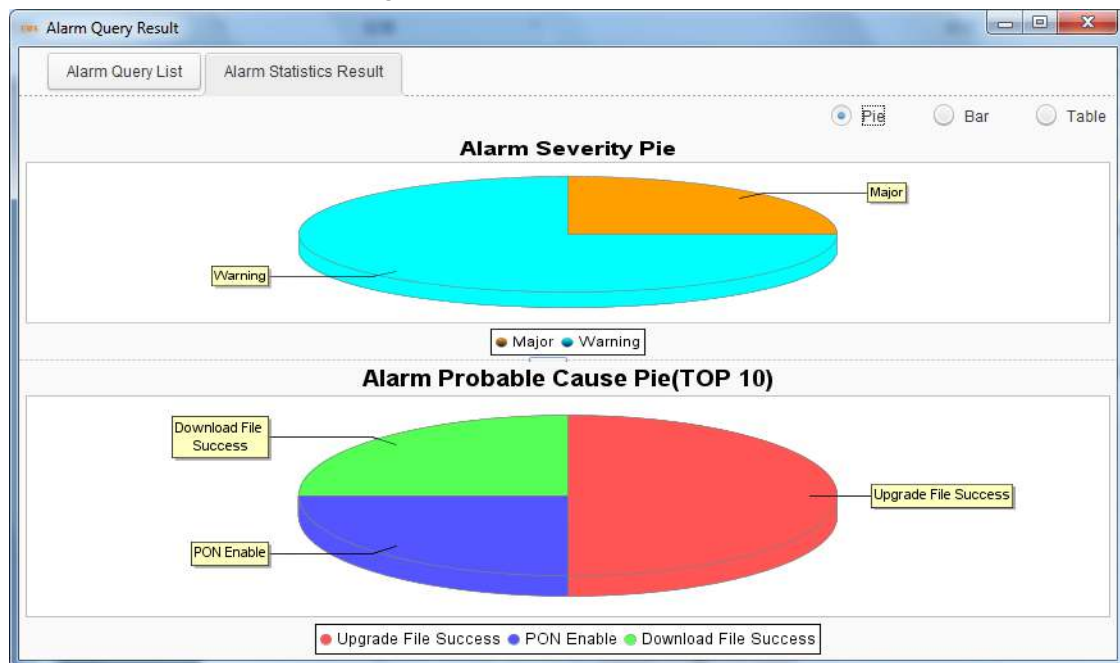


Figure 13-16 OLT Current Alarm Statistics

13.4.2.2 View History Alarm

Right-click OLT icon, choose "View History Alarm", and open history alarms dialog box. You can choose alarm list or alarm statistics to view.

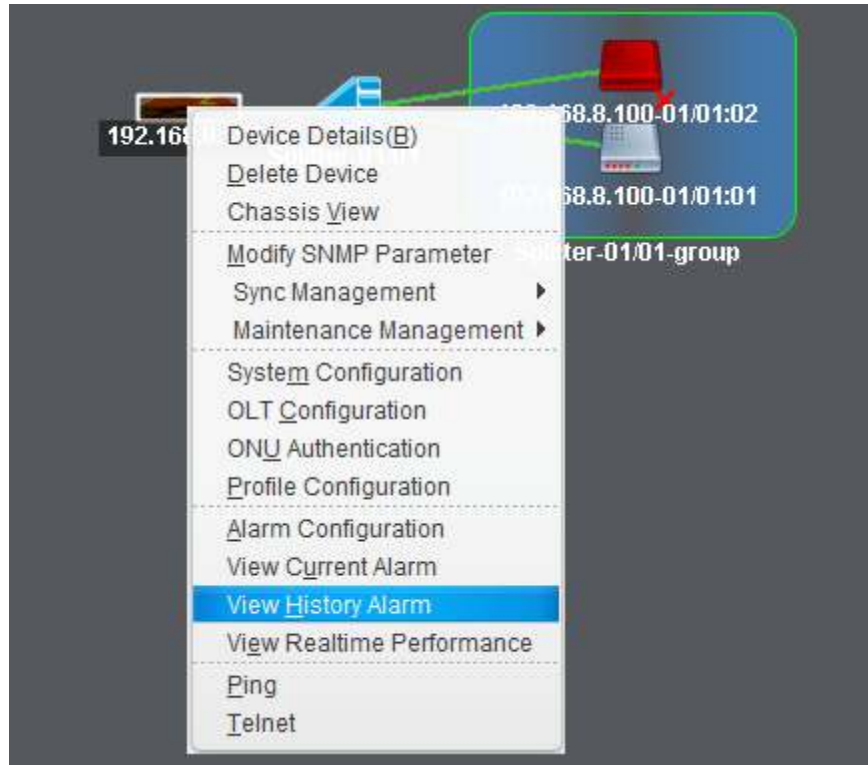


Figure 13-17 View OLT History Alarm

In alarm list interface, you can choose which severity level alarms can be displayed and delete the alarms, view alarm details and export the alarms.

In alarm statistics interface, you can choose which kind of methods to display the alarms. The methods contain pie graph, bar graph and statistics table.

Alarm Query Result

Alarm Query List Alarm Statistics Result

☐ Critical
 ☐ Major
 ☐ Minor
 ☐ Warning

1/1Page 1-33/33Row Remain 0 Items

Size All Page 1

Alarm Level	Source	Probable C...	Type	State	Update Time	Confirm Ti...	Clear Time	Source Type
Major Alarm	192.168.8.1...	ONU Regis...	Communic...	History Alarm	2017-06-29...	2017-06-29...	2017-06-29...	
Warning Ala...	192.168.8.1...	Port Link D...	Communic...	Unconfirm...	2017-06-29...	-	2017-06-29...	
Warning Ala...	192.168.8.1...	Port Link D...	Communic...	Unconfirm...	2017-06-29...	-	2017-06-29...	
Major Alarm	192.168.8.1...	ONU Regis...	Communic...	History Alarm	2017-06-29...	2017-06-29...	2017-06-29...	
Critical Alarm	192.168.8.1...	NE Discon...	Equipment ...	Unconfirme...	2017-06-29...	-	2017-06-29...	
Warning Ala...	192.168.8.1...	Port Link D...	Communic...	Unconfirme...	2017-06-29...	-	2017-06-29...	
Major Alarm	192.168.8.1...	ONU Regis...	Communic...	History Alarm	2017-06-28...	2017-06-28...	2017-06-28...	
Warning Ala...	192.168.8.1...	Port Link D...	Communic...	Unconfirme...	2017-06-28...	-	2017-06-28...	
Major Alarm	192.168.8.1...	ONU Regis...	Communic...	History Alarm	2017-06-28...	2017-06-28...	2017-06-28...	
Warning Ala...	192.168.8.1...	Port Link D...	Communic...	Unconfirme...	2017-06-28...	-	2017-06-28...	
Major Alarm	192.168.8.1...	ONU Regis...	Communic...	History Alarm	2017-06-27...	2017-06-27...	2017-06-27...	
Warning Ala...	192.168.8.1...	Port Link D...	Communic...	Unconfirme...	2017-06-27...	-	2017-06-27...	
Major Alarm	192.168.8.1...	ONU Regis...	Communic...	History Alarm	2017-06-27...	2017-06-27...	2017-06-27...	
Warning Ala...	192.168.8.1...	Port Link D...	Communic...	Unconfirme...	2017-06-27...	-	2017-06-27...	
Major Alarm	192.168.8.1...	ONU Regis...	Communic...	History Alarm	2017-06-27...	2017-06-27...	2017-06-27...	
Warning Ala...	192.168.8.1...	Port Link D...	Communic...	Unconfirme...	2017-06-27...	-	2017-06-27...	
Critical Alarm	192.168.8.1...	NE Discon...	Equipment ...	Unconfirme...	2017-06-27...	-	2017-06-27...	
Critical Alarm	192.168.8.1...	NE Discon...	Equipment ...	Unconfirme...	2017-06-27...	-	2017-06-27...	
Major Alarm	192.168.8.1...	ONU Regis...	Communic...	History Alarm	2017-06-27...	2017-06-27...	2017-06-27...	
Critical Alarm	192.168.8.1...	NE Discon...	Equipment ...	Unconfirme...	2017-06-27...	-	2017-06-27...	
Critical Alarm	192.168.8.1...	NE Discon...	Equipment ...	Unconfirme...	2017-06-27...	-	2017-06-27...	

Locate
 Confirm(A)
 Clear
 Confirm And Clear(H)
 Delete(R)
 Detail
 Export
 Reset Condition(S)
 Close

Figure 13-18 OLT History Alarm List

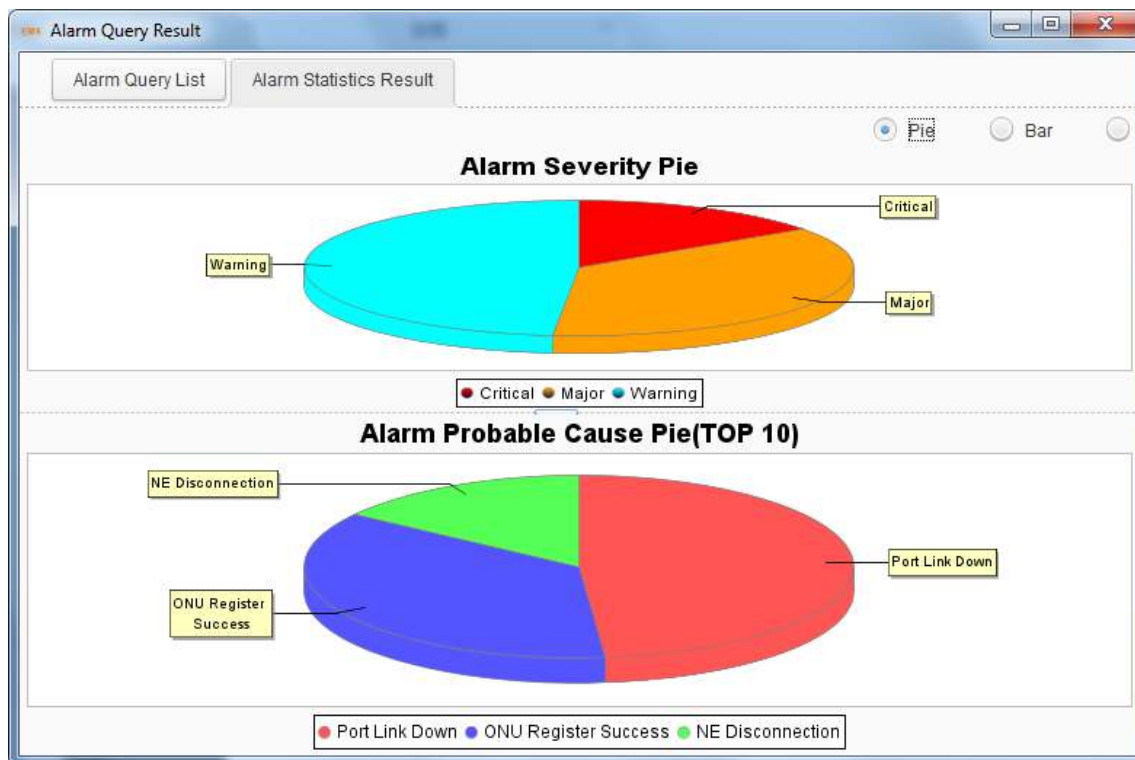


Figure 13-19 OLT History Alarm Statistics

13.5 ONU Alarm Management

This section mainly introduces ONU alarm configuration and view.

13.5.1 ONU Alarm Configuration

ONU alarm configuration has been introduced in alarm profile configuration and it is the only way to configure ONU alarm. If want to configure ONU alarm, please refer to alarm profile configuration.

13.5.2 View ONU Alarm

Except querying alarms and viewing real time alarms described above, there is another frequently-used ways to view ONU alarms.

13.5.2.1 View Current Alarm

Right-click ONU icon, choose "View Current Alarm", and open current alarms dialog box. You can choose alarm list or alarm statistics to view.

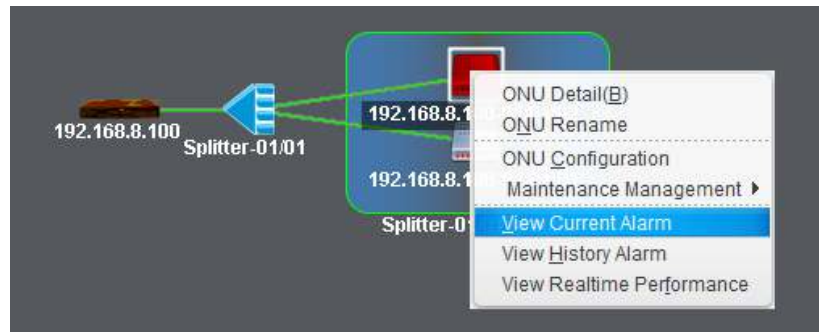


Figure 13-20 View ONU Current Alarm

In alarm list interface, you can choose which severity level alarms can be displayed

and confirm or clear the alarms, view alarm details and export the alarms.

In alarm statistics interface, you can choose which kind of methods to display the alarms. The methods contain pie graph, bar graph and statistics table.

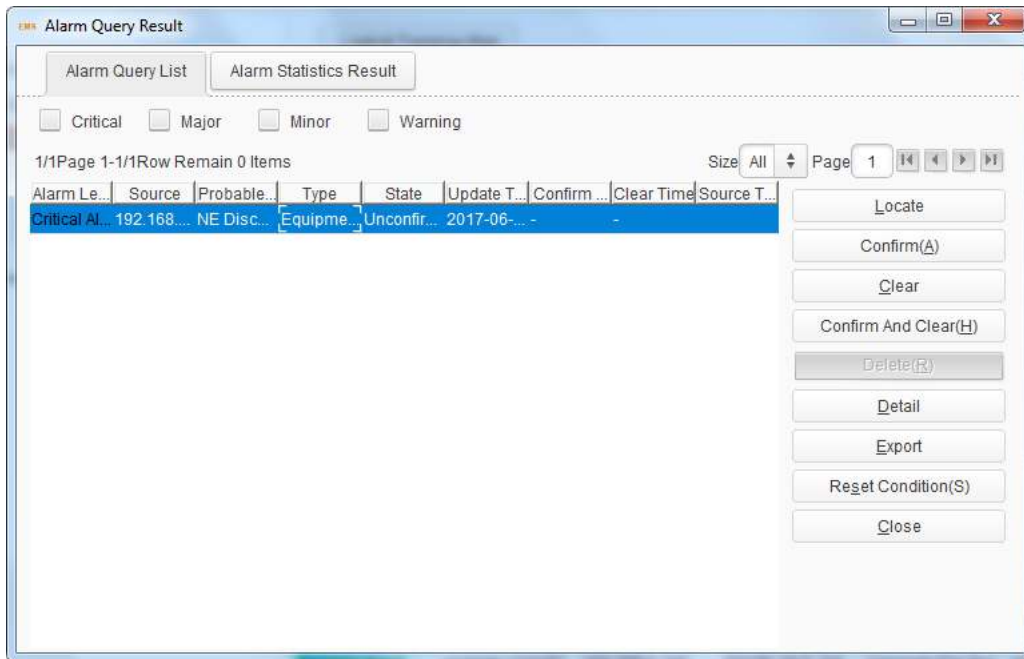


Figure 13-21 ONU Current Alarm List

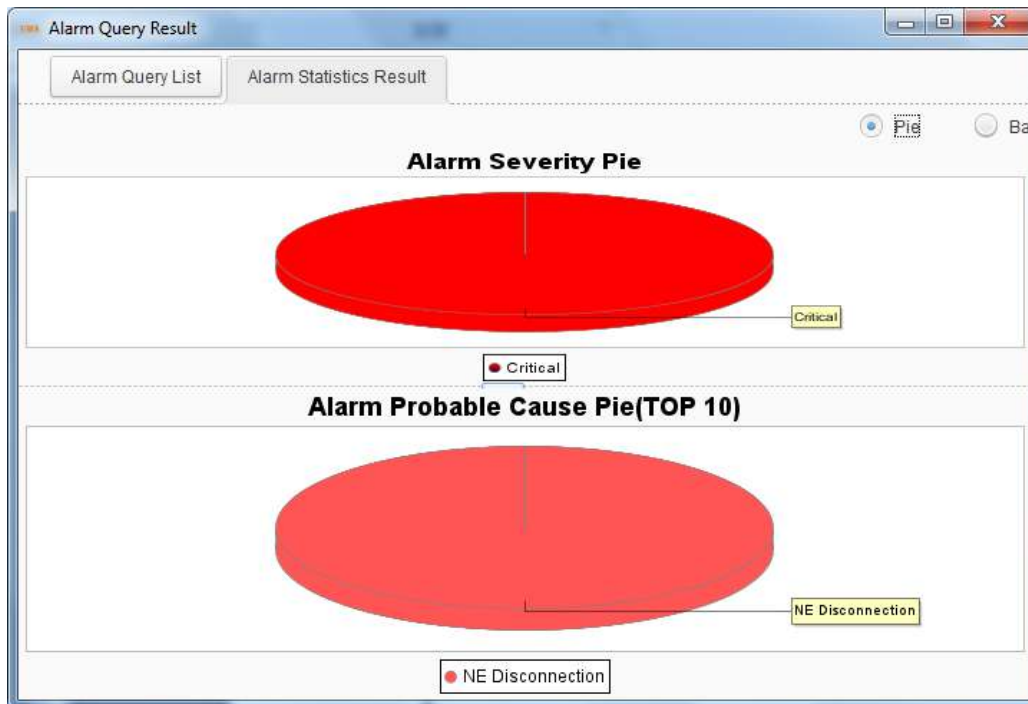


Figure 13-22 ONU Current Alarm Statistics

13.5.2.2 View History Alarm

Right-click ONU icon, choose "View History Alarm", and open history alarms dialog box. You can choose alarm list or alarm statistics to view.

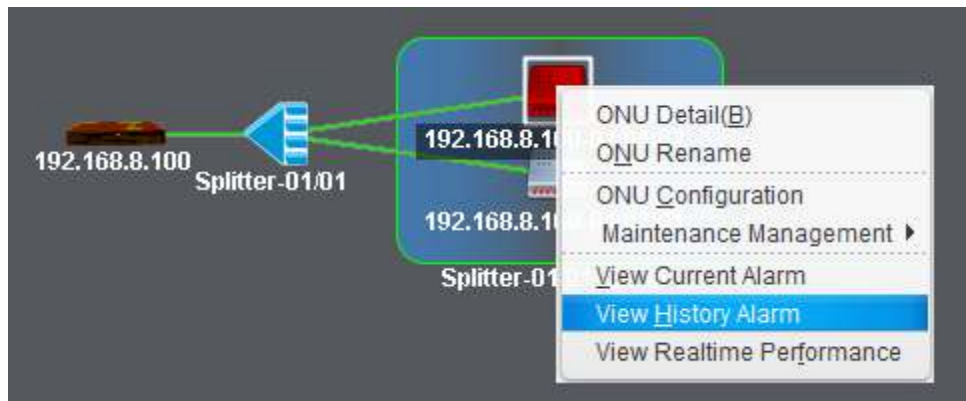


Figure 13-23 View ONU History Alarm

In alarm list interface, you can choose which severity level alarms can be displayed and delete the alarms, view alarm details and export the alarms.

In alarm statistics interface, you can choose which kind of methods to display the alarms. The methods contain pie graph, bar graph and statistics table.

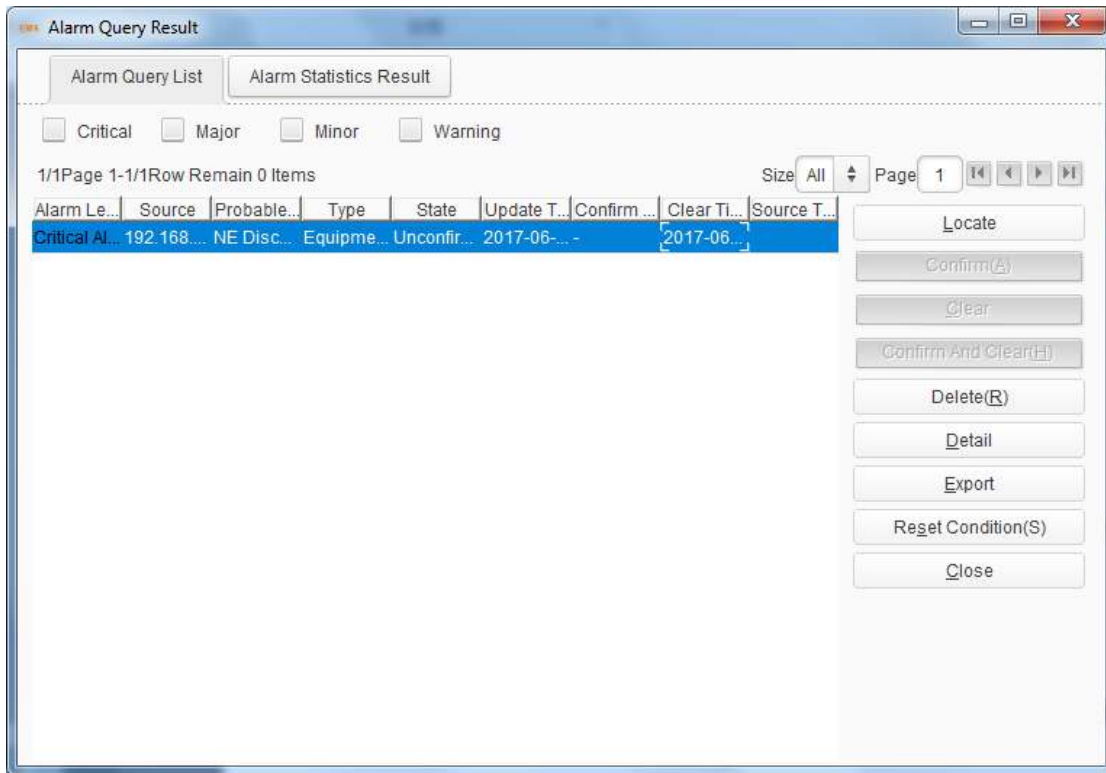


Figure 13-24 ONU History Alarm List

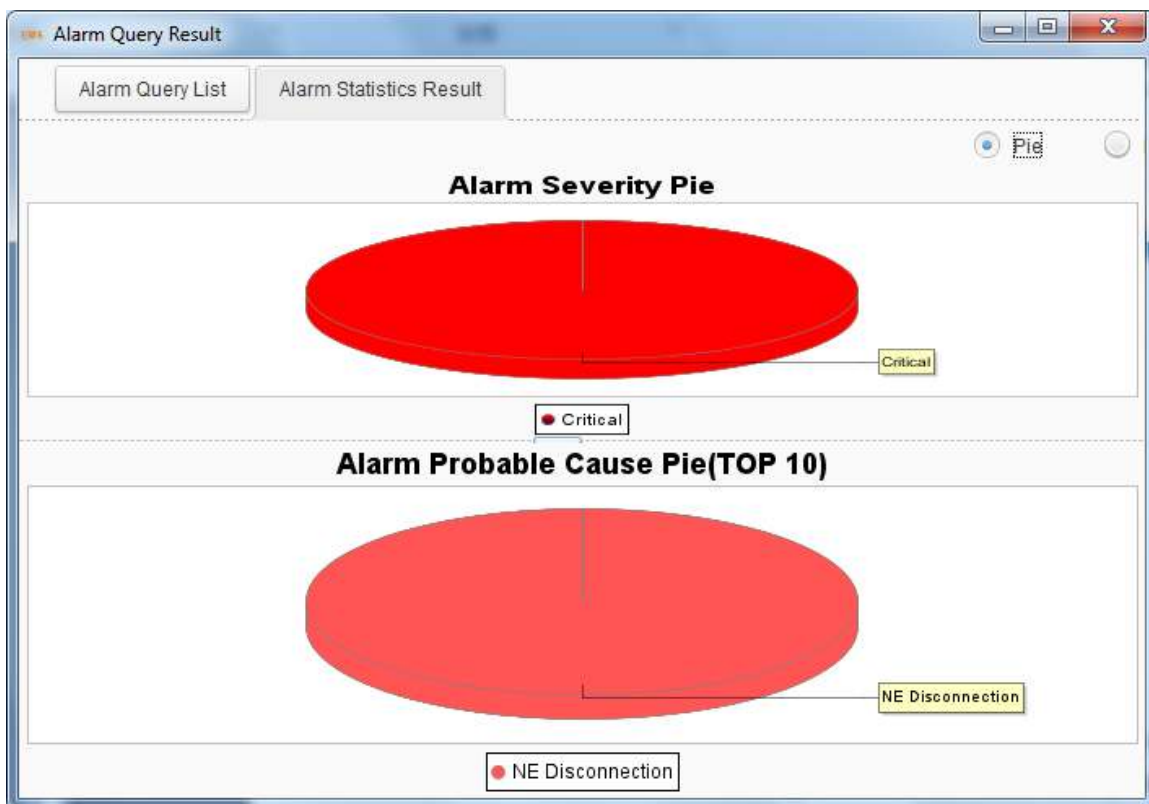


Figure 13-25 ONU History Alarm Statistics

14 Performance Management

14.1 OLT Performance

OLT performance is used to collect OLT real time traffic statistics of a certain time and draw a graph. Traffic statistics can be shown by line graph, area graph, bar graph and table.

Right-click OLT icon, choose "View Realtime Performance", open performance statistics dialog box.

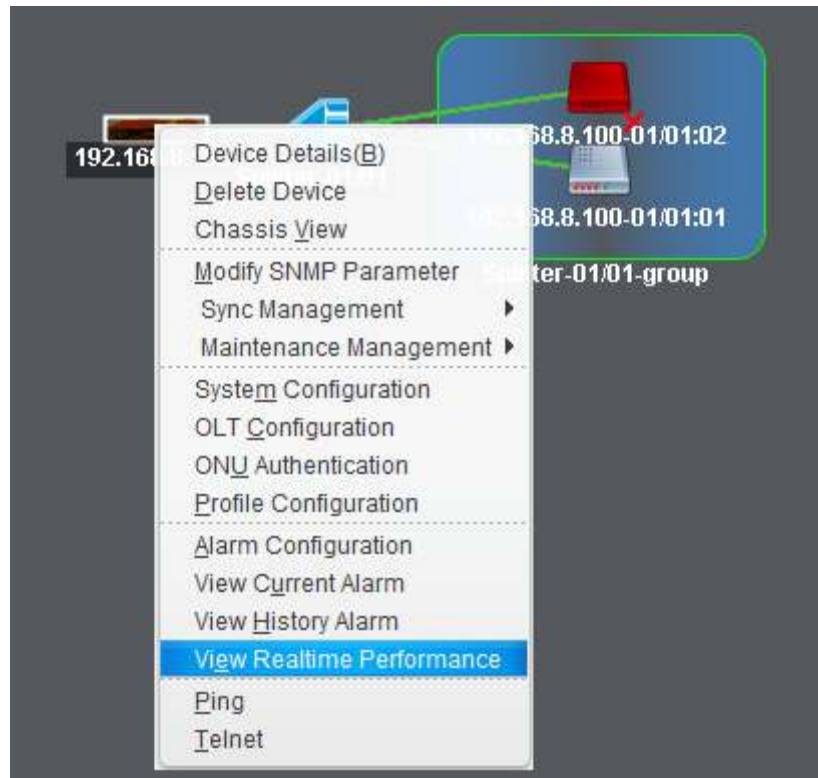


Figure 14-1 Enter OLT Performance Statistics

Select ports and types of traffic and click "Add" button, the traffic of the selected ports will be shown on the interface. You can pause and start collecting traffic at

any time. Once stopped, you need to add the traffic types again.

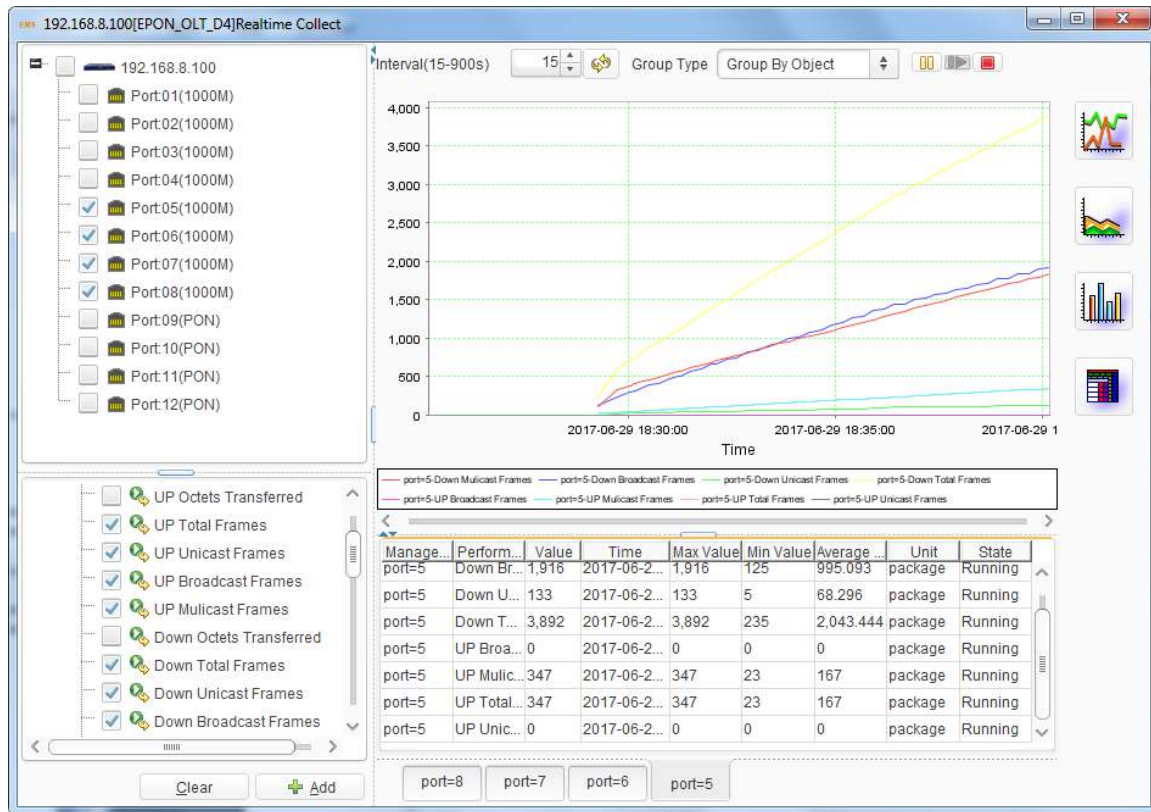


Figure 14-2 OLT Performance Statistics

14.2 ONU performance—EPON

ONU performance is used to collect ONU real time traffic statistics of a certain time and draw a graph. Traffic statistics can be shown by line graph, area graph, bar graph and table.

Right-click ONU icon, choose "View Realtime Performance", open performance statistics dialog box.

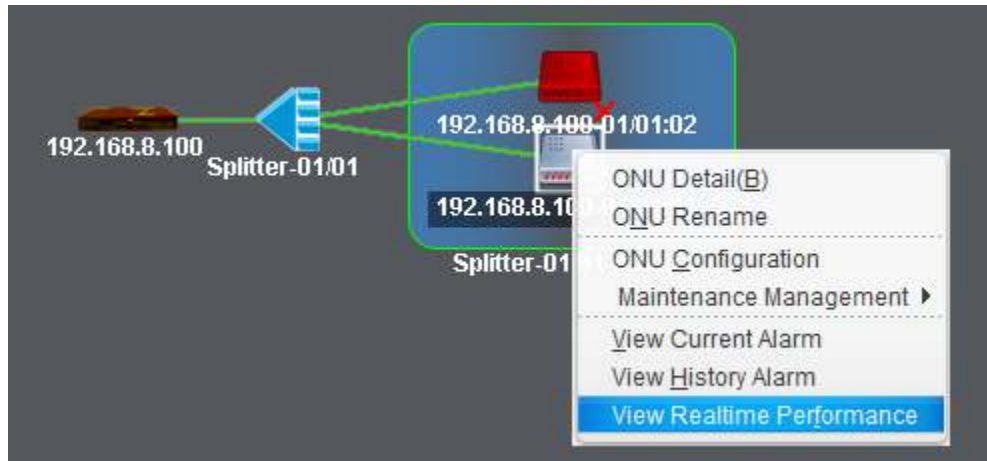


Figure 14-3 Enter ONU Performance Statistics

Select ports and types of traffic and click "Add" button, the traffic of the selected ports will be shown on the interface. You can pause and start collecting traffic at any time. Once stopped, you need to add the traffic types again.

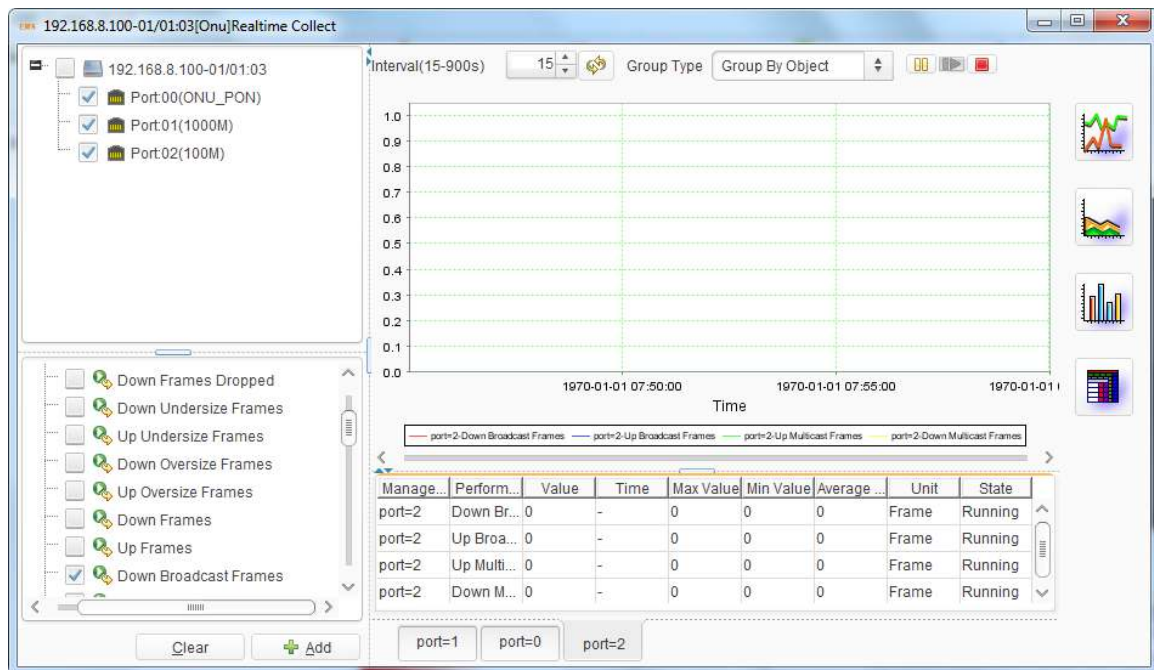


Figure 14-4 ONU Performance Statistics