## 2011

# NMS 3.0.1 Administrator's Handbook

## Preface

NMS is a multiplatform and multiprotocol-compatible (such as SNMP, HTTP and CLI) network management system. NMS has various network monitor tools, friendly customized window and simple but versatile network configuration. Hence, the application of NMS can greatly improve the efficiency of network operating. This network management system can realize the real-time monitor of the whole network, making real centralized management of the whole LAN available for the administrator.

This handbook is edited for the management system and the network administrator can know all management functions and operation methods of this system after reading it.

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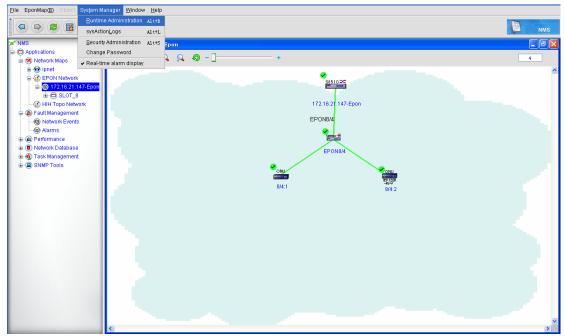
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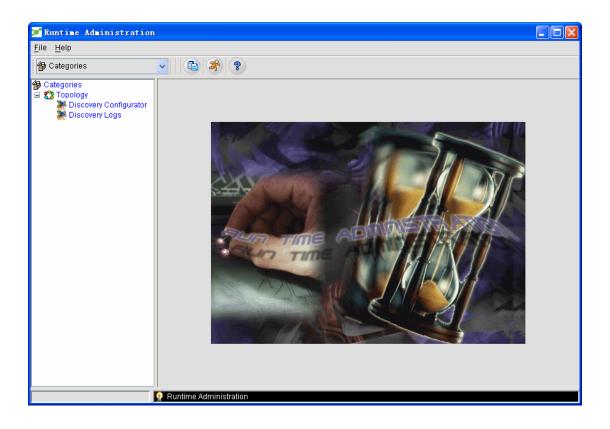
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## **Discovery Management**

Discovery Management provides a platform for device management. All managed devices are logged in from this platform. After login the system will differentiate the devices according to device types and their states and then provide different proper management methods to different devices. The system obtains the basic information of the devices and then stores the information in the database and at last display the information on the corresponding windows according to device types.

The administrator can click **System Management -> Runtime Administration** or use the shortcut key "**ALT+R**" to open the real-time management window, as shown in the following figure:





In Runtime Administration tools, the system settings provided by the system makes users configure the network topology flexibly and conveniently. For example, you can configure the protocol and parameters, whether to discover the local network, whether to conduct automatic discovery or whether to discover all nodes in a network for **Discovery Configurator**.

The systematic administrator can perform the following operations to open the **Discovery Configurator** panel.

Click System Management -> Runtime Administration to open the Discovery Configurator page, and then on this page click Topology -> Discovery Configurator. The Discovery Confurator panel is shown in the following figure.

Runtime Administration	
<u>F</u> ile <u>H</u> elp	
🔭 Discovery Configurator 🔹 🔹 🕉 💡	
Categories Topology Discovery Configurator Discovery Logs	scovery       Node Discovery <ul> <li>This tool configures the parameters which control the WebNMS discovery process.</li> <li>You can configure SNMP,ICMP and NativePing based discoveries by specifying their related parameters.</li> <li>You can enable or disable the discovery of a network, a set of nodes in a network or even a single node in a network.</li> </ul> <ul> <li>AutoDiscovery</li> <li>Rediscover Already Discovered</li> <li>Discover LocalNet</li> <li>Enable Log</li> </ul> Discovery Interval          1
	Click on the button to configure the Initial Parameters.
	Click on the button to configure the Rediscovery process.
	Apply
👔 Done	

The discovery settings function provided by the system makes the administrator conduct the corresponding settings based on the following three aspects:

- ♦ General
- Network discovery
- Node discovery

#### **1.1 General**

In General you will be presented how to set some common attributes of topology settings. See the following figure.

📕 Runtime Administration		
<u>F</u> ile <u>H</u> elp		
🐺 Discovery Configurator 🛛 🗸	• 🗈 🌴 🤋	
	General Network Disc	covery       Node Discovery <ul> <li>This tool configures the parameters which control the WebNMS discovery process.</li> <li>You can configure SNMP,ICMP and NativePing based discoveries by specifying their related parameters.</li> <li>You can enable or disable the discovery of a network, a set of nodes in a network or even a single node in a network.</li> </ul> ✓ AutoDiscovery         Rediscover Already Discovered           Discover LocalNet         Enable Log           Discovery Interval         1           Click on the button to configure the Initial Parameters.         Initial Parameters           Initial Parameters
		Click on the button to configure the Rediscovery process.
		Apply
	Done	

• Enable automatic discovery or not

Automatic discovery is enabled by default. If automatic discovery is deselected, the alarm information will be presented, as shown in the following figure:



Note: If the automatic discovery option is canceled, the system will not discover all devices in the networ, and network discovery and node discovery are will be forbidden. See the following figure.

🚰 Runtime Administration			
<u>F</u> ile <u>H</u> elp			
🐺 Discovery Configurator	- 6 3 ?		
Categories Topology Discovery Configurator Discovery Logs	General Network Disc	overy       Node Discovery <ul> <li>This tool configures the parameters which control if process.</li> <li>You can configure SNMP,ICMP and NativePing bas specifying their related parameters.</li> <li>You can enable or disable the discovery of a network network or even a single node in a network.</li> </ul> AutoDiscovery     Rediscover Already Discovered           Discover LocalNet         Enable Log           Discovery/Interval         1           Discovery Interval         1	sed discoveries by
		Click on the button to configure the Initial Parameters.	Initial <u>P</u> arameters
		Click on the button to configure the Rediscovery process.	Rediscovery
			Viddo
	🔮 Done		

• Rediscover the already discovered nodes

The **rediscover the already discovered nodes** option is used to decide whether to rediscover an already discovered network. If this option is selected, rediscovery will be carried on according to the rediscovery interval which is set by users. In defaut settings, this option is deselected.

• Discover the local network or not

The **Discover the local network** option is used to permit or forbid to discover the local network where the NMS server is located.

Record the discovery log or not

This option is used to record and discover related information in a single log file. The **Record the log** option is enabled by default. The related logs are saved in a **discoveryLogs.txt** folder.

• Set the discovery interval

The discovery interval, taking second as its unit, defines the interval between two devices in the discovery network. The default value is 1 second. To find a device, the system will send an SNMP request and an ICMP request to it; if the system receives response, a lot more SNMP requests will be sent to obtain more detailed information about this device. Considering the CPU usage and the network's flux, users have to set a proper discovery interval, whose unit is second.

Note: If the discovery interval is set to 0, no problem will arise. If you set the discovery interval to **0** in the initial parameter dialog box, the NMS server will read the value of the initial parameter at the first startup; but in the following startups, the NMS server will read the discovery interval value in the regular setup and the values of the corresponding discovery parameters in the local Ping options

• Set the initial parameters

The systemati administrator can configure parameters in the **initialized parameter** window to improve the effeciency of the discovery. Click **Discovery Settings -> Regular Settings -> Initialized Parameters**, the **Initialized Parameters** window appears, as shown in the following figure:

🌺 Initial Para	eters 🔀				
The discovery engine considers the parameters specified here during the first start of the WebNMS server(either a cold or a warm start).					
Discovery Interval	þ				
Rediscovery Interval	1				
ICMP Ping Retries	þ				
SNMP Timeout	1				
SNMP Retries	þ				
NativePing Timeout	1				
NativePing Retries	1				
	<u>O</u> K <u>C</u> ancel				

The parameters in the Initialized Parameters window are described in the following table:

Parameter	Remarks		
Discovery interval	Defines the interval between two devices in the discovery network. The default value is 1 second. If this parameter is set to be less than 0 or be some characters, the default discovery interval of the system is 10 seconds.		
Rediscovery interval	Defines the interval to carry on complete network discovery (rediscovery of the network), whose unit is hour. The default value is 24 hours. If a minus value (except minus 1) is entered, the system still carry on network rediscovery every 24 hours.		
ICMP Ping Retry Times	Sets the retry times of sending the Ping packets. The default value is 0, that is, the Ping packets are only sent once.		
SNMP timeout	Sets the timeout time for a device to reply the SNMP packet after this packet is received by the device. (as for not so good network conditions, you can set this parameter to be a bigger value)		
SNMP retry times	This parameter is mainly used for topology discovery, status round query and data collection. When the device has no response, the system will resend the SNMP packet. The default value is 0.		
Local Ping timeout	Sets the timeout time for a device to reply the local Ping packet after this packet is received by the device. The default value is 1 second.		
Local Ping Retry Times	Stands for the times that the system resends the local Ping packet when there is no response from the device, whose default value is 1.		

• Set the rediscovery interval

Users can click **Rediscovery** to set the rediscovery process.

After the **rediscovery** option is selected, the rediscovery interval can then be set; if users select the **rediscovery date** option, the specific date to carry on network rediscovery can be designated.

## **1.2 Setting Network Discovery**

The network discovery settings provided by the system enable an administrator to specify a discovery area or to find a group of nodes in a network. The system supports the DHCP protocol.

Click **Discovery Configurator -> Network Discovery**. The Network Discovery page appears, as shown in the following figure:

💓 Runtime Administration						
<u>F</u> ile <u>H</u> elp						
🐺 Discovery Configurator	<ul> <li>1</li> <li>2</li> <li>3</li> <li>4</li> <li>4</li> <li>5</li> <li>5</li> <li>6</li> <li>7</li> <li>7&lt;</li></ul>					
<ul> <li>Categories</li> <li>Topology</li> <li>Discovery Configurator</li> <li>Discovery Logs</li> </ul>	General         Network Discovery         Node Discovery           Configure Network Discovery parameters.IPAddress,Netmask,StartIP,EndIP and DHCP are the key parameters for Network Discovery.					
	Discover IPAddress NetMask	StartIP EndIP DHCP				
	✓ Discover	ofNodes				
	IPAddress NetMask					
	Start IP End IP					
	SNMP SNMP Properties					
	Add	Delete				
		A	Apply			
	👷 Done					

#### 1.2.1 Setting Remote Network Discovery

If an administrator wishes to add a remote network and discover this remote network, he can select the "Discovery" option in the **Network Discovery** page to finish this settings.

- Select the "Discovery" option on the **Network Discovery** page;
- Enter the IP address and the network mask in the corresponding text box;
- Click Add.

After the above-mentioned steps are performed, the IP address and the network mask are added to the discovery list, that is, the system will discover this remote network.

Note: Multiple networks can be discovered if you add multiple IP addresses and network masks.

#### Example for multiple network settings

As shown in the following figure, two networks are set:

Runtime Administration						
<u>File H</u> elp						
🐺 Discovery Configurator		2				
🚰 Categories 🖃 😭 Topology	General Netwo	ork Discovery No	de Discovery			
Discovery Configurator	Configure Networl	k Discovery parameter	s.IPAddress,Netmask,S	StartIP,EndIP and DH	ICP are the key paran	neters for Network Discovery.
San Diccorci, Logo	Discover	IPAddress	NetMask	StartIP	EndIP	DHCP
		172.16.21.0	255.255.0.0			
		192.168.1.0	255.255.0.0			
	Discover (	Entire Network	🔘 Set of Nodi	es		
	IPAddress		NetMask			
	Start IP		End IP			
	DHCP					
	SNMP	SNMP Properties				
			Add	Delete	Modify	
						Apply
	🔮 Done					

In this example, the system will discover the network whose mask is 225.225.0.0 and whose IP address is 172.16.21.0 and the other network whose mask is same but whose IP address is 198.168.1.0.

#### **1.2.2 Setting Network Discovery in a Designated IP Range**

By using the start IP and the end IP, the administrator can designate an IP address range to be discovered. The detailed procedure is shown as follows:

- Select the **Specifying the node** option and activate the start IP or the end IP.
- Enter the IP address, network mask, start IP and end IP.
- Click **Add** to finish the settings.

The administrator can set several IP address ranges in a network.

#### Example for multiple designated IP address ranges in a network

You can set multiple IP address ranges in a network, as shown in the following figure.

Runtime Administration						
<u>File H</u> elp						
E Discovery Configurator		8				
Categories						
🖃 🚼 Topology	General Ne	twork Discovery No	de Discovery			
Discovery Configurator	Configure Netv	vork Discovery parameter	s.IPAddress,Netmask,	StartIP,EndIP and DH	ICP are the key parameter	s for Network Discovery.
Sisterity 2000	Discover	IPAddress	NetMask	StartIP	EndIP	DHCP
		10.0.0.0	255.255.255.0	10.0.0.40	255.255.255.0	
						]
	V Discover	O Entire Network	<ul> <li>Set of Nod</li> </ul>	es		
	IPAddress	10.0.0.0	NetMask 255.2	55.255.0		
	Start IP	10.0.0.40	End IP 255.2	55.255.0		
	DHCP					
	SNMP	SNMP Properties				
				Dalata D		
			Add	Delete	Modify	
						Apply
	🕑 Done					

In the above-mentioned example, the system discovers the IP address range from 10.0.0.1 to 10.0.0.40 in network 10.0.0.0 whose mask is 255.255.0.0.

#### **1.2.3 Forbidding Network Discovery**

The "discovery" option is selected by default on the **Network Discovery** page. After the "discovery" option is canceled, you can add the IP address and the network mask, or forbid the discovery of the designated network, which further forbids the network to be added to the topology database.

You can click Edit to reselect the "discovery" option or modify the IP address.

Multiple networks can be forbidden if you add multiple IP addresses and network masks.

#### **1.3 Setting Node Discovery**

The discovery mechanism of NMS can be used to discover the designated devices mandatorily or discover the devices through specific ports or agents when users find any other devices in the discovery network. In this way users can first find and add specific devices and nodes before finding any other nodes in the discovery network.

Click **Discovery Configurator** -> **Network Discovery**. The **Network Discovery** page appears, as shown in the following figure:

💓 Runtime Administration									
<u>F</u> ile <u>H</u> elp									
R Discovery Configurator	A     A	8							
Categories Categories Discovery Configurator Discovery Logs	Image: style="text-align: center;">             false         172.16.21         255.255.0.0         bdc           Image: style="text-align: center;">             Discover         Image: style="text-align: center;">             false         172.16.21         255.255.0.0         bdc		Communi bdcom bdcom bdcom bdcom	ommunity Port Version UserName Co loom 161 v2 c loom 161 v2 c loom 161 v2 c loom 161 v2 c loom 161 v2 c			∋y		
	SNMP Version Community UserName Properties	v2 public	Add	SNI	x over Parent MPAgentPort ntextName	Net   161 Modify		Ap	ply

#### 1.3.1 Discovering a Node with Designated IP

If the administrator wants to find the designated node before any other nodes are found in the discovery network, he can use the "discovery" option to conduct this operation. The detailed procedure is shown as follows:

- Select the "discovery" option on the **node discovery** page and then enter the IP address and the network mask in the corresponding text box. Note: The IP address and the network mask is necessary.
- Click Add. After the IP addresses and the network masks are added to the discovery list, the system will perform the discovery of these nodes.

You can use the "Add" option to add or set more IP addresses.

#### 1.3.2 Forbidding Node Discovery in the Local Network

For how to discover the nodes in a forbidden local network, see **Forbidding the discovery of the local network** in the regular parameter settings.

See the following figure to forbid the discovery of the local network and set the node discovery in this network.

🔀 Runtime Administration	
<u>F</u> ile <u>H</u> elp	
🞘 Discovery Configurator	
🚰 Categories 🖃 🞇 Topology	General Network Discovery Node Discovery
Discovery Configurator	<ul> <li>This tool configures the parameters which control the WebNMS discovery process.</li> <li>You can configure SNMP,ICMP and NativePing based discoveries by specifying their related parameters.</li> <li>You can enable or disable the discovery of a network, a set of nodes in a network or even a single node in a network.</li> </ul>
	AutoDiscovery     Rediscover Already Discovered      Discover LocalNet     Enable Log
	Discovery Interval 1
	Click on the button to configure the Initial Parameters.
	Click on the button to configure the Rediscovery process.
	Apply
	😭 Done
<b>-</b>	
Runtime Administration           File         Help	
·	
🖗 Categories	General Network Discovery Node Discovery
Copology Configurator Configurator Configurator Copology	Configure Node Discovery parameters.IPAddress,Netmask,Community,Port,SNMP Version,UserName and ContextName are the key parameters for Node Discovery.
	Discover         Parent Net         IPAddress         NetMask         Community         Port         Version         UserName         ContextNa           Image: Talse         192.168.0         255.255.2         public         161         v2         Version         UserName         Version         Version
	✓ Discover           IPAddress(es)           192. 168. 0. 18           ✓           NetMask           255.255.255.0
	IPAddress(es)         192. 168. 0. 18         VetMask         255.255.255.0           SNMP Version         v2         Discover Parent Net
	Community public SNMPAgentPort 161
	UserName ContextName
	Properties
	Add Delete Modify
	Apply
	P Done

Conduct the above-mentioned settings and you can find and add the node whose IP address is 192.168.0.18 (If you want to finde the whole network where this node is located, select the "Discover the father network" option).

#### 1.3.3 Setting Parent Network Discovery for a Node

The "Discover the father network" option is enabled by default. This option can be used to enable the discovery of the father network of the selected node, that is, it is to enable the discovery of the other nodes of this father network. Users can cancel this option to forbid the discovery of the father network of this selected node. By default, only when this "Discovery" option is selected can this network be found.

#### 1.3.4 Setting SNMP Device Discovery Based on the Community and the Agent

#### Port

By default, when NMS finds the SNMP device, NMS finds that the community's character string used by the engine is **public** and the agent port is **161**. However, some devices in the network may use different ports and communities. In order to find these devices, the administrator can set the SNMP device discovery based on the community and the agent port through the following options.

- SNMP version: select the corresponding SNMP version from the dropdown box of the SNMP version (v1/v2/v3).
- Community: designate the community of nodes. The default community is **public**.
- SNMP agent port: designate the SNMP agent port of the node. The default agent port is port 161.

#### 1.3.5 Setting SNMPv3 Device Discovery

To find the SNMPv3 device, you can follow the steps below:

- Select v3 in the SNMP version dropdown box. The username text box and the context name text box will be activated.
- Enter the username.
- Enter the context name.

Please refer to the SNMP settings to obtain more information about SNMPv3 device discovery.

#### 1.3.6 Forbidding the Discovery of a Node with a Designated IP

On the "node discovery" page, the "discovery" option is selected by default. To forbid the discovery of the designated node, you can cancel the "discovery" option and add the corresponding IP address and network mask. In this way these nodes will be forbidden to be found and added to the topology database.

### 1.4 Discovery Log

#### 1.4.1 Network Discovery Status

After configuring **Node Discovery**, please click **Apply** to automatically transfer to the **Discovery log** page. The detected network and equipment will appear in the log. If there is network discovery, the log page makes the being-detected status available, as shown in the following figure.

🗾 Runtime Administration						
<u>F</u> ile <u>H</u> elp						
🐺 Discovery Logs		2 3				
<ul> <li> <b>P</b> Categories             <b>S</b> Topology             <b>Discovery Configurator</b></li></ul>	queryConditionLabel         deviceIP       0       0       0       deviceType       gueryConditionLabel         deviceIP       0       0       0       deviceType       gueryConditionLabel       endTime         deviceIP       0       0       0       deviceType       gueryConditionLabel       endTime         deviceIP       0       0       0       deviceType       gueryConditionLabel       endTime         deviceDiscoveryLog       0       0       deviceDiscoveryLog       gueryConditionLabel       gueryConditionLabel					query
	index	deviceName	deviceType	operateType	operateTime	
		192.168.33.0	Network	added	2012-05-17 15:36:15	~
	-	172.16.1.0	Network	added	2012-05-17 15:36:13	
		192.168.100.0	Network	added	2012-05-17 15:36:14	
	4	192.168.47.0	Network	added	2012-05-17 15:36:14	
	3	111.1.1.0	Network	added	2012-05-17 15:36:13	
	2	192.168.0.0	Network	added	2012-05-17 15:36:01	
	1	10.0.0.0	Network	added	2012-05-17 15:35:56	
						M
	👔 Discov	ery Logs				

When all network discoveries are done, the log window makes available the **Discovery Done** status. See the following figure.

ile <u>H</u> elp							
Niscovery Logs		to 🛪 🔋					
Categories	queryC	onditionLabel					
K Topology E Discovery Configurator	devicel	P 0 . 0 . 0 . 0 device	Type please select	💌 startTime	endTime		
Discovery Logs		Finished query					
	device	DiscoveryLog					
	index	deviceName	deviceType	operateType	operateTime		
	18	192.168.10.0	Network	added	2012-05-17 15:36:18		
	17	192.168.11.0	Network	added	2012-05-17 15:36:18		
	16	192.168.12.0	Network	added	2012-05-17 15:36:18		
	15	192.168.21.0	Network	added	2012-05-17 15:36:17		
	14	192.168.22.0	Network	added	2012-05-17 15:36:17		
	13	192.168.23.0	Network	added	2012-05-17 15:36:17		
	12	192.168.24.0	Network	added	2012-05-17 15:36:16		
	11	192.168.25.0	Network	added	2012-05-17 15:36:16		
	10	192.168.26.0	Network	added	2012-05-17 15:36:16		
	9	192.168.31.0	Network	added	2012-05-17 15:36:15		
	8	192.168.32.0	Network	added	2012-05-17 15:36:15		
	7	192.168.33.0	Network	added	2012-05-17 15:36:15		
	6	172.16.1.0	Network	added	2012-05-17 15:36:14		
	5	192.168.100.0	Network	added	2012-05-17 15:36:14		
	4	192.168.47.0	Network	added	2012-05-17 15:36:14		
	3	111.1.1.0	Network	added	2012-05-17 15:36:13		
	2	192.168.0.0	Network	added	2012-05-17 15:36:01		

## 1.4.2 Discovery Log Query

If you want to query the device discovery and delete the logs, you can query them through this function. You can query the required logs according to your condition. If you has not set your condition, all logs will be queried.

🗾 Runtime Administration						X	
<u>F</u> ile <u>H</u> elp							
🐺 Discovery Logs		2 3					
<ul> <li>Categories</li> <li>Copology</li> <li>Discovery Configurator</li> <li>Discovery Logs</li> </ul>	queryConditionLabel deviceIP 0 . 0 . 0 . 0 deviceTypeSwitchObject v startTime 2-05-16 15:37:56 endTime 12-05-18 15:40:49						
	GeviceDiscoveryLog						
	index	deviceName	deviceType	operateType	operateTime		
	5	10.0.0.100	SwitchObject	added	2012-05-17 15:36:22	<u>^</u>	
	4	172.16.21.51	SwitchObject	added	2012-05-17 14:38:33		
	3	172.16.21.55	SwitchObject	added	2012-05-17 14:36:18		
	2	172.16.21.52	SwitchObject	added	2012-05-17 14:36:18		
	1	172.16.21.172	SwitchObject	added	2012-05-17 14:30:19		
	🔮 Done						

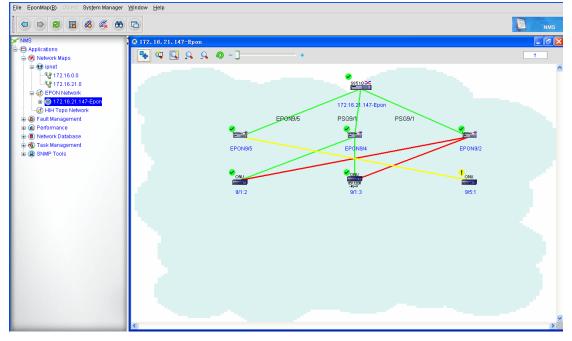
## 1.5 Precautions

Sometimes, a device is already in the IP network or the EPON network but cannot be rediscovered or discovered during the discovery operation.

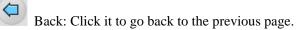
In this case, the deletion of a device in the IP network would not lead to the deletion of the device's node in the EPON network. On the contrary, the deletion of a device in the EPON network would lead to the deletion of the device's node in the IP network.

## 2. Map Management

Map management is also called as topology management, including IP topology management, EPON topology management, and hand-in-hand topology management. See the following figure:



The shortcut menus are listed below:



Next: Click it to go to the next page.



 $\Rightarrow$ 

Refresh: Click it to reread and display the topology in the database.



Add: This symbol will be explained later.

🔏 🔏

Add a link: This symbol will be explained later.



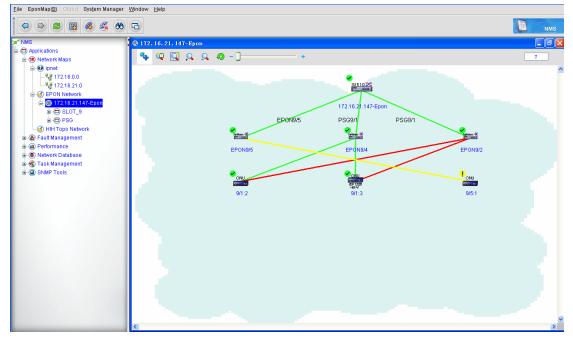
Delete a link: This symbol will be explained later.

Device detection: For example, you can click it to look for the icon of "172.16.21.147", as shown in the following figure:

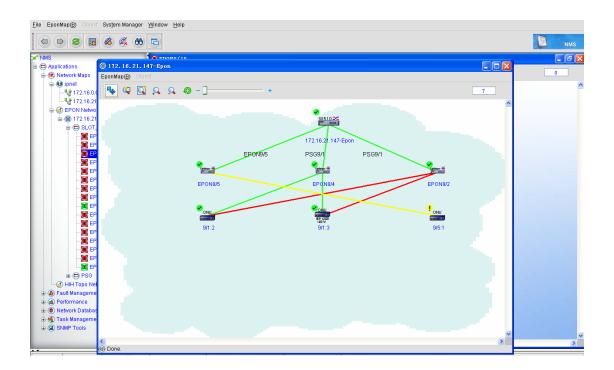
@ 172.16.21.147-E	pon	- 7 🛛
🗣 🔍 🔍 斗	<u> </u>	7
	EPON9/5 PSG9/1 PSG9/1 Search	
	Search MapSymbol Name 172.16.21.147 O Up O Down Ignore Case Match Whole Word Find Next New Search Close Symbol Found (172.16.21.147-Epon)	
		×

Segment the current window: The result of clicking it is shown below:

Before the window is segmented:



After the window is segmented:



## 2.1 IP Topology Management

00000000000	5				6
- C Applications - S Fastwork Maps	● 172. 16. 21. 1 ● 역 🖾 유 유	0-]	*		<u>ا</u> ( ۳ )
	1772-166-21-24	172-16-21.99	172.16.21 147	172:16:21:172	172 16 21 6
HHH Tapp Interest      Will Fault Management      Will Fault Management      Will Management      Will Management      Will Chair Tools	172.16.21.61	172.16.21.60	172.16.21.29	172.16.21.63	172 16 21 25
	172.16.21.50	172 16 21 101	172 16 21 3	172 16 21 135	• 172 16 21 52
	172.96.21.179	172.16.21,191	172.10.21.124	172 16 21 159	172 16 21 106
	Dom	•			

Unfold the IP Network node to open the IP topology management page. See the following figure:

The IP network topology consists of the following parts:

♦ Title bar

The title bar shows the current network, such as 172.16.21.0.

♦ Tool bar

22

The tool bar shows in the following figure:

🎭 🗘 🖸 🔍 🔍 🤌 – 🕽 ——

Select mode: There are two modes available for choice: the anchor mode and the non-anchor mode.

The anchor mode: the detected device icons are forbidden to move in this mode.

The anchor mode: the detected device icons are allowed to move in this mode.

If you click the "Select mode" shortcut button in non-anchor mode, the non-anchor mode changes to the anchor mode. So it is with the anchor mode.

Zoom: Click it, and the zoom preview is shown in the following figure:

📁 Zoom Overview						

Put the cursor on the foursquare of the **Zoom** button and you can change the size of the zoom window. See the following figure:

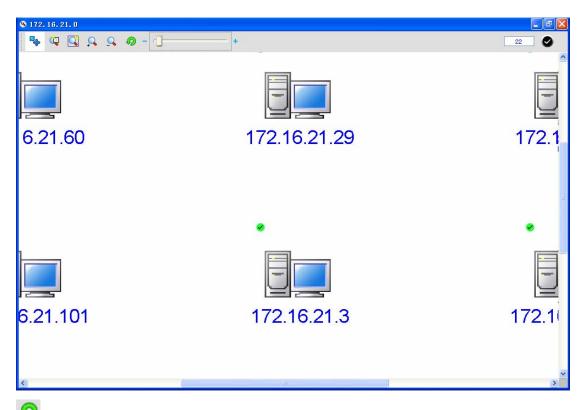
🕏 172. 16. 21. 0 R 🗣 🔍 🞑 斗 🖓 - 🕽	+	22 O
Zoom Overview	× 172.16.21.3	• 172.16.21.135
• 172.16.21.191	172.16.21.124	• 172.16.21.159
	ш	×

Zoom mode: Click it and then you cannot choose a device icon and the device icon can only

be zoomed out. You can click to select the zoom mode. Soom out: Click it to enlarge a device icon.

**Q** Zoom in: Click it to reduce a device icon.

Icon zoom rate: When you move the slide, you can enlarge or reduce the size of a chosen device icon. See the following figure:



Resume: A device icon can be removed to another place, but it can go back to its original place if you click the **Resume** button.

#### • Search state:

The search state tells users the number of currently searched devices and the state of the radar detector. The following figure shows that 14 devices are currently being found and the search is still going on.



The following figure shows that the search is already done and 17 devices are found.



• Search display zone:

The search display zone presents the currently detected IP topology. See the following figure:

Q Q Q Q Q	o - ]	÷		22
172.16.21.24	EMN 25 172.16.21.99	172.16.21.147	172.16.21.172	172.16.21.6
172.16.21.51	• 172 16 21.60	172.16 21.29	• 172 16 21 53	172.16.21.25
172.16.21.50	172.16.21.101	172.16.21.3	172 16 21 136	172.16.21.62
172.16.21.179	172.16.21.191	172.16.21.124	172.16.21.159	172.16.21.105
•	•			

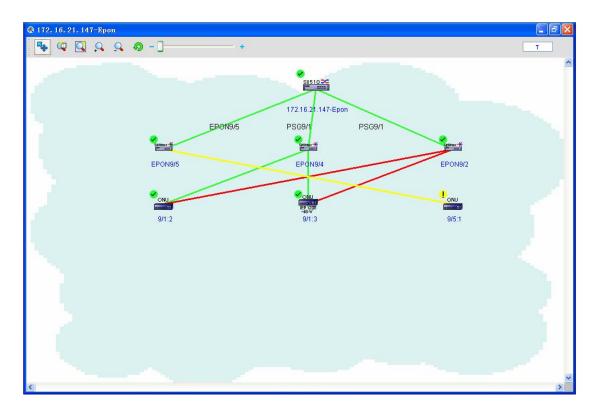
Means the device is currently working normally.

8 Means the device is not under work.

After you choose a detected device icon, you can manage this device.

## 2.2 EPON Topology Management

Unfold the **EPON Network** node to open the EPON topology management page. See the following figure:



When the EPON topology is opened, you may find it is similar to the IP topology. Here gives a detailed description of the EPON topology and its operations.

In the EPON topology, you can find two links between OLT and optical splitter, one being green and the other red. They relate with PSG and CSG (for details, please refer to related documents).

PSG is adopted between OLT and optical splitter. When the main link (represented by the green line) cannot work normally due to troubles, the standby link (represented by the red line) will turn to work immediately.

CSG is adopted between optical splitter and ONU. It also adopts link redundancy, that is to say, the standby optical splitter will turn to work in time if one optical splitter has trouble.

If you right click the EPON network icon, the operation menu will pop up, as shown in the following figure:

HIH Topo Descovery	
Add Symbol	Ctrl+M
Anchor Map UnAnchor Map	Ctrl+A Ctrl+V
Relayout Change BackGround	۰ Ctrl+C
Save Map	Ctrl+S

The specific operations will be described below:

• Hand-in-hand discovery

For details, see section "Hand-in-Hand Topology."

• Add an icon:

To add an icon to the topology, do as follows:

If you click **Add an icon** or the shortcut button

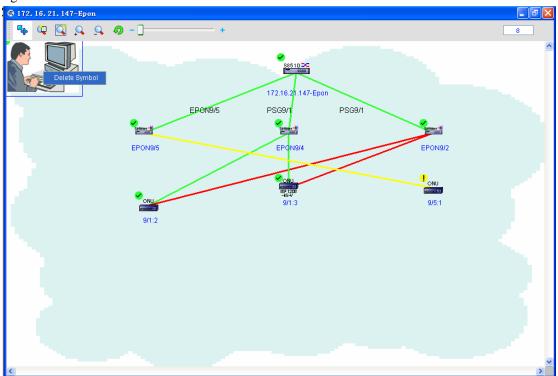
the following page appears:

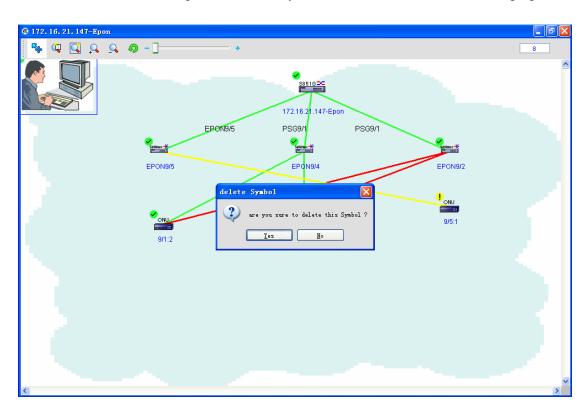
8 172. 16. 21. 147-Epon		- 7 🗙
👒 🗘 🖸 o - 🕽	+	7
add Symbol	S8510 ₩₩ 172.16.21.147-Epon	*
	Symbol name Eymbol Symbol Label X 0 Y 0 Symbol Hight 50 Symbol Width 50 Symbol Width 50 Symbol Map 172.16.21.147-Epon.netmsp Choose Icon include figure network other termina include figure network	
<		>

Then you can choose a proper icon and click the **Add** button. The chosen icon is added to the topology. See the following figure:

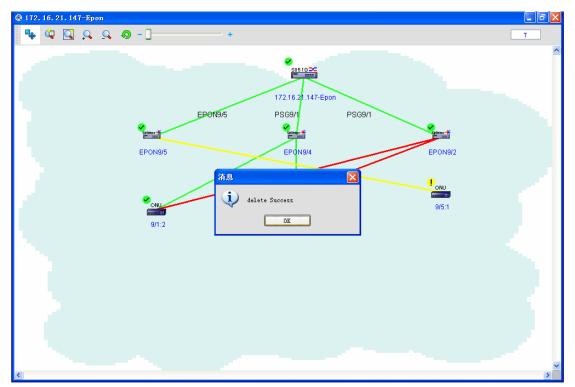
@ 172.16.21.147-Epon		- 6 🛛
🍕 🥨 🖾 🔍 🧔 🧿 - 🕽 –	+	8
add Sysbol	30510 × ■ mail 172.16.21.147-Epon	×
	Symbol name Symbol Symbol Label X 0 0 U 0 U 0 U 0 U 0 U 0 U 0 U 0 U 0 U	

When you want to delete an icon, first choose an icon and right click it, as shown in the following figure:





And then select **Yes** in the dropdown box. Finally the icon is deleted. See the following figure:



• Icon maintenance

The maintenance of the EPON network icon mainly refers to the changes of the widths, heights, positions, pictures and names of the related EPON devices in the EPON network topology. The maintenance of OLT, optical splitter or ONU is similar to that of EPON network icon. The following is an example based on OLT. Right click the OLT icon. The right-key menu appears.

<ul> <li> <sup>1</sup> 2 18 21 14 7-5por             <sup>1</sup> ⊕ SLOT_9             <sup>1</sup> ⊕ P80             <sup>1</sup> ⊕ Pr80             <sup>1</sup> ⊕ Pranace             <sup>1</sup> ⊕ Pranace             <sup>1</sup> ⊕ Pranace             <sup>1</sup> ⊕ Network Database             <sup>1</sup> ⊕ Network Database             <sup>2</sup> ⊕ SNMP Tools      </li> </ul>		EPON9/5	EPONDIS	172.16: PSG9/1 EPQ1	Alarm View DBA Conf OLT 5tp Conf Mirror Managed Register ONU Port Rate Limit Storm Control Port Flow Control OLT ACL Port Agregation OLT Vian QOS Manage OLT Encryp OLT Millicast Serial Server Config	EPON9/2 9/5:1
					CPU Info Memory Utilization OpticalPort Info OLT Bandwidth	
	<	-			Device settings Modify Map Symbol ReFound	
Severity Category Confirm Confir	Confirm Time	Source	Alert Time		Delete Device	Alert Content
					HIH Topo Descovery	

Select Modify Map Symbol, as shown in the following figure:

The Maintain icon page appears, as shown in the following figure:

@ 172.16.21.147-Epc	on	- 🗗 🔀
🕵 🗘 🕵	<u>Q</u> <b>9</b> - ] +	7
	172.16.21.147-Epon PSG9/1	
	Symbol Taint enance-172, 16, 21, 147-Epon         Device Name         Device Name         Display Name         Device Type         EponOLTDevice         Map Name         172.16.21.147-Epon.netmap	
	View Synchronou V Update Close	5
K		×

In the Common option, the administrator can know the name and type of a device, the display

name and the current topology, among which the display name system shall support the **Edit** operation. In the **Show** option, the width, height, coordinate and name of an icon are included. All of them support the **Edit** operation.

@ 172	. 16. 21	. 147-	Epon			- 7 🛛
R.	4	Q (	<u> </u>	<b>9</b> - ]-	+	7
•					Tricito 21.147-Epon Provide	
٢				_		×

After you set related data, click **Refresh** to refresh an icon.

#### Anchor topology

The anchor topology and cancelling the anchor are used as a pair. The anchor topology means that any icon in the current topology cannot be moved. In the menu, you can click **anchor topology** or

on the toolbar and then the topology is anchored.

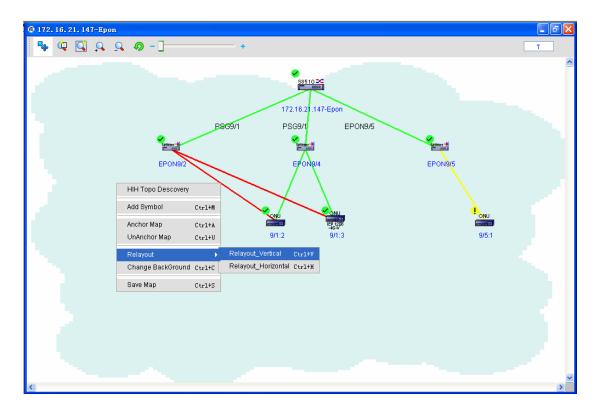
#### Cancel anchor

When you know to anchor a topology, it is very easy for you to cancel the anchor. In case a

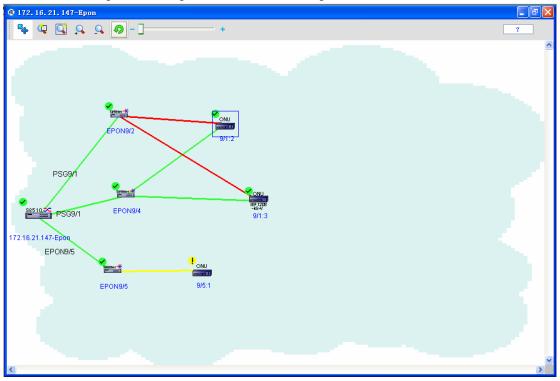
topology is anchored, you can click **cancel anchor** or the shortcut button to cancel the anchor.

#### Re-plan

Re-plan includes the vertical plan and the horizontal plan. See the following figure:

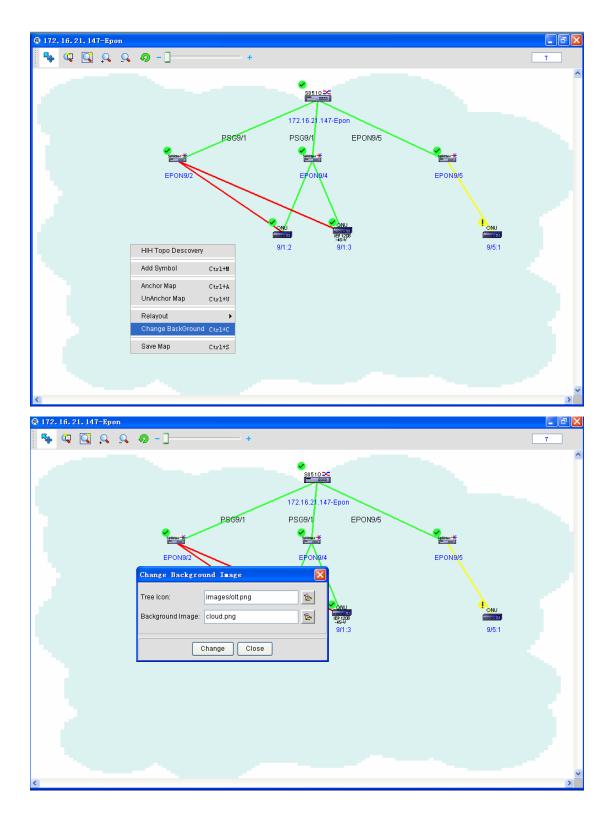


Here take the vertical plan as an example. The horizontal plan is similar to the vertical plan. It is noted that the completion of re-plan means the reordering of PON interfaces.

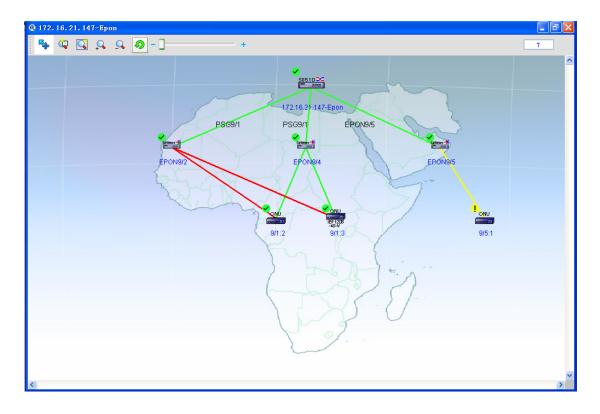


Change background

The **Change background** operation is to change the tree icon and the background picture. Before the background is changed, it appears as the following figure:



After the background is changed, it appears as the following figure:



Note:

If you want to add more customized pictures, you can store related pictures at the following directories:

Installation directory/images/TreeIcons/ (for the tree node icons)

Installation directory\images\MapImages\ (for the background pictures)

• Save image

**Save image** means to store to the database the state of the EPON topology when it is closed, so that it resumes to the previous state when it is opened again.

## **3** Security Management

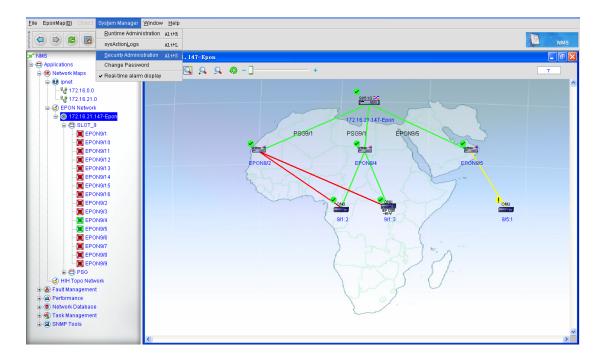
Security Management helps the system administrator to carry on the granular permission management based on user and user group.

The provided security management tasks can be divided into user definition and group definition, as shown in the following table:

38

User Definition	Group Definition
Add users	Add groups
Add users to a group	Allocate users to a group
Set user description	Allocate operations for a group
Modify user's password	
Assign authorization to users	
User audits	
Delete user	
All user lists	

Click **System Management -> Security Management**, and the administrator can open the **security management** page, as shown in the following figure:





If you click the group node and the user node, all groups and users will be displayed.



# 3.1 Defining a User

#### 3.1.1 Adding a User

The system administrator can follow the following steps to add a new user. On the **security management** page, the administrator can use one of the following methods to open the Add the user guide window:

- 1 Click File -> New -> Add user.
- 2 Click the **Add a user** icon in the toolbar.
- 3 Right click the User node in the left tree and then choose the Add a user option.

The Add the user guide window is shown in the following figure:



🗾 User Administration		×
	User Description         Enter the user name (*)         Enter the full name         Enter the password         Enter the password         Confirm password         By default any new user added will         have only login permission.Selective         permissions can be assigned to the         user in the following two ways :         * Direct assignment of permissions.         * Making him a member of a group         which has preconfigured permissions.         If no password is entered the username         will be taken as the password.	
	Back Next Cancel	

ſ	Remark:
	When the administrator adds a new user in the security management window
	but does not set a password for it, the system will use the username as the
	password.

Enter the username and password to the corresponding textbox in the **Add the user guide** window and click **Next**, and then another window appears, as shown in the following figure:

🗾 User Administration		×
Start.	Vser account expiry	
	This user account expires in 0	Day(s).
124	Password expiry	
( entres	Password never expires	
	The password expires in	Days(s).
	Please enter the number of days in which the user and/or the password expires A value of zero indicates no expiry.	
	<u>B</u> ack <u>N</u> ext	<u>C</u> ancel

This window shows the expiration date of the user account and its password. In default mode, both of them are 0, which means the user account and the password never expire. If the administrator needs to set a period for the user account and the password, he shall deselect the **Account ID never expires** checkbox and the **password never expires** checkbox, and then enter the days in the corresponding textbox.

After setting the expiration date for the account and the password, click **Next** and enter the last window of **Add the user guide**, as shown in the following figure:

📁 User Administration	
	Group based permissions.
of to Patri	Direct assignment.
24242427	Assign groups for the user
	Group name(s)
RLAIRL TO	Admin 😐
The second	Users 💿
	Enter the new group name
	Add Group
	Direct assignment of Permissions
	Click here to assign permissions directly. Permissions
	<u>B</u> ack Fi <u>n</u> ish <u>C</u> ancel

The system administrator can distribute users the group permission or assign users the operation permission.

The administrator can enter the new group name in the **Add a group** textbox and then click the **Add a group** button to designate a new group for users.

The administrator can distribute users the corresponding group by clicking **group-based permission** and the corresponding group name. The administrator can browse the group's

authorization operation by clicking  $\textcircled{\bullet}$  .

Choose **Direct distribution**, and then the administrator can designate the authorization operation to users directly without adding users to any group. Click the **Permission** button in the **Direct distribution of the access permission** faceplate to pop up the **Designate the permission** window. The system administrator can designate the authorization operation to users.

After distributing users to the group or designating the authorization operation to users, the administrator click **Over** to confirm the above-mentioned settings. The newly-added users will be displayed under the **User** tree node.

Note: If the administrator wants some alteration, he or she can click **Back** to return to the previous window for necessary alteration before **Over** is clicked.

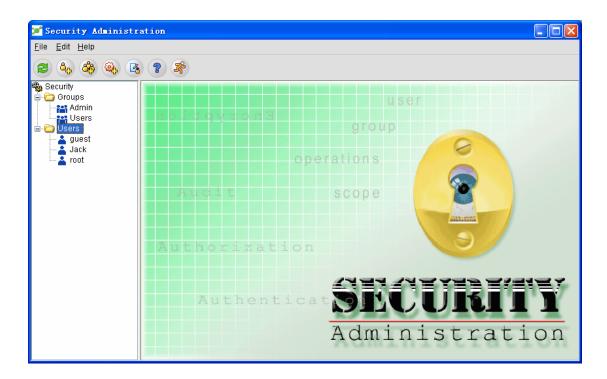
The system administrator can provide new users the following items: username, group, password and password confirmation, and their durations. If the administrator clicks the **Everlasting Password** checkbox and the **Everlasting Account** checkbox, the password and the account will never expire. If the administrator deselects the two checkboxes, he or she should set the efficient period for the password and the account. After the period, the password and the account will take no effect again.

If the username is already existing, the system will give an alarm information, notifying users cannot be created.

## 3.1.2 User Settings

#### 3.1.2.1 Browsing all user lists

If you select the **User** tree node in the security management window, all users will be displayed in the sub-node, as shown in the following figure:



#### 3.1.2.2 Distributing a group for users

The authorization service provided by the NMS module can limit users' access permission to the objects and instances. For example, users are limited in the authorization and can access only some specific devices.

The system provides the group-based authorization, and the administrator designates the corresponding groups to users according to actual needs. Thus users can be managed through the group authorization. The detailed procedure is shown below:

Select specific users in the **User** tree node, open the **User's group** attribute page, click **Set a group** and open the **Select a group** window, as shown in the following figure:

🗾 Security Administr	ration	
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
۲ او او او او	8 ? *	
Security Groups Hamin Users Current Sers Sers Sers Sers Sers Sers Sers Sers	Member Of User Profile Permitted Operations for User Groups for : Jack Group Name Users	Description
		Setting Groups

🛩 select group		×		
Select the groups from the list for which the user needs to be assigned.				
All Groups		Selected Groups		
Admin Vsers		Vsers		
	¥			
		<u>O</u> k <u>C</u> ancel		

All groups are shown on the left of the window, while the groups that users are added to are shown on the right of the window. The administrator can select the specific group on the left, click ">" and add a user to the group. To remove a user from its group, select the corresponding user and click "<" to remove this user from its group.

#### 3.1.2.3 Setting user description

NMS enables the system administrator to modify user's status, password, account and password's validation period.

Select a specific user on the **User** tree node and open the **User Configuration File** page, on which the current user's status, the account's validation period and the password's validation period are displayed, as shown in the following figure:

🗾 Security Administr	ation 📃	
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
2 4 4 4 3	8 8	
Security ⊕ Groups ⊖ Users ↓	Member Of User Profile Permitted Operations for User Full Name of the User : Jack	]
Jack root	Full name of the user Jack	
	Status for the User : Jack       Current status of the user	
	Account expiry for :Jack This user account expires in Day(s).	
	Password expiry for :Jack The password expires in Days(s).	
	Please enter the number of days in which the user and/or the password expires	
	A value of zero indicates no expiry.	ofile

The security management tool uses different icons to show the current status of a user. The icons that show different user statuses are listed in the following table:

Icon	Remarks	
2	The account is valid.	
2	The account is invalid and cannot be logged in.	
2	The account expires.	
≫	The password already expires and need be reset.	
2	The user has been forced to log out of the server, just as the account cannot be activated.	
8	User's login fails.	

On the user settings page, click **Set the configuration file** to open the **User configuration file** window, as shown in the following figure:

🎾 User Profile			
Full Name of the user:Jack			
Enter the Full Name	Jack		
Status for the user :Jack			
☑ No change in status			
Select the status to be set for this user			enable 💌
Account expiry for :Jack			i i i i i i i i i i i i i i i i i i i
Account never expires			
This user account expires in	0	Day(s).	
Password expiry for :Jack			
Password never expires			
The password expires in	0	Days(s).	
Please enter the number of days in which			
the user and/or the password expires			
A value of zero indicates no expiry.			6.70
		Qk	<u>C</u> ancel

On this window, the administrator can set the corresponding user status, the account's period and the password's period for a user.

After some necessary alteration, click **Ok** to update the user settings.

#### **3.1.2.4 Modifying the user's password**

As to a selected user, the administrator can right click this user and select **Change password** or click **Edit -> Change password** in the security management window to modify the password, as shown in the following figure:

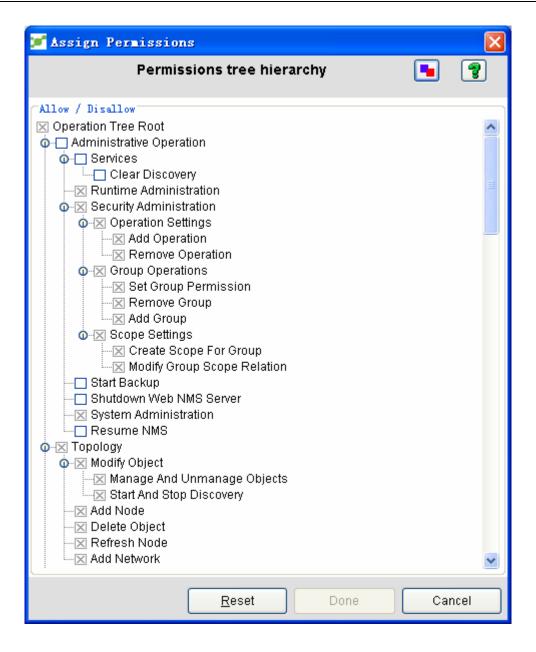
🔎 Security Administr	ation		
<u>F</u> ile <u>E</u> dit <u>H</u> elp			
ي کې کې کې 😢	3 ? 🍣		
🏶 Security 🗐 🛅 Groups	Member Of User Profile Permitted Opera	ations for User	
🖻 🧰 Users	Full Name of the User :Jack		
guest 🕰 Jack	Full name of the user	Jack	
<mark> c</mark> hange Pa	ssword		
Delete	s for the User (Jack		
	Current status of the user	enabled	
	Account expiry for :Jack		
	This user account expires in	Day(s).	
	Password expiry for :Jack		
	The password expires in	0 Days(s).	
	Please enter the number of days in which		
	the user and/or the password expires	_	
	A value of zero indicates no expiry.	2	Betting Profile
Security Administr <u>F</u> ile <u>E</u> dit <u>H</u> elp	ation		_ 🗆 🗙
🔁 🖧 🎝 🥸 🗷 🎭 Security			
🚊 🗁 Groups	Member Of User Profile Permitted Opera	ations for User	
Admin			
	Full Name of the User :Jack		
🖻 🗁 Users	Full Name of the User :Jack Full name of the user	Jack	
i⊒-/⊖ Users ≙ guest ≙ Jack	Full name of the user	Jack	
ie <mark>ie</mark> Users <mark>ie</mark> guest	Full name of the user	Jack	
i⊒-/⊖ Users ≙ guest ≙ Jack	Full name of the user	Jack	
i⊒-/⊖ Users ≙ guest ≙ Jack	Full name of the user           Full name of the user           Status for           Change Password           Current sta	Jack	
i⊒-/⊖ Users ≙ guest ≙ Jack	Full name of the user           Status for         Change Password           Current state         Enter New Password           Confirm New Password         Confirm New Password	Jack	
i⊒-/⊖ Users ≙ guest ≙ Jack	Full name of the user           Status for         Change Password           Current state         Enter New Password           Account ex         Confirm New Password		
i⊒-/⊖ Users ≙ guest ≙ Jack	Full name of the user  Status for Current sta Account ex This user a  Password expiry for :Jack		
i⊒-/⊖ Users ≙ guest ≙ Jack	Full name of the user          Status for         Current status         Enter New Password         Account         This user		
i⊒-/⊖ Users ≙ guest ≙ Jack	Full name of the user  Status for Current sta Account ex This user  Password expiry for :Jack The password expires in	Qk Cancel Day(s).	
i⊒-/⊖ Users ≙ guest ≙ Jack	Full name of the user  Status for Current sta  Account ex  This user  Password expiry for :Jack The password expires in  Please enter the number of days in which	Qk Cancel Day(s).	
i⊒-i∰ Users guest Jack	Full name of the user  Status for Current sta Account ex This user  Password expiry for :Jack The password expires in	Qk Cancel Day(s).	Setting Profile

On the Change password textbox, enter a new password, confirm it and then click Ok.

#### 3.1.2.5 Assigning authorization to users

The system administrator can follow the procedure below to assign authorization to users. In the **User** tree node, select a specific user, open the **User access permission** page and click **Set permission**. The **Designate permission** window appears, as shown in the following figure:

<u>F</u> ile <u>E</u> dit <u>H</u> elp			
2 & & @	<b>B ? X</b>		
🖏 Security 📮 🦳 Groups	Member Of User Profile Perm	nitted Operations for User	
Admin Users	Permissions For User :Jack		
😑 🧰 Users	Operation Name	Туре	Description
guest 🗠 🔔 guest	Topology	excluded	
root	System Administration	excluded	
	Security Administration	excluded	
	Alert User Operations	included	
	Event User Operations	included	
	Runtime Administration	excluded	
	Map Editing Operations	excluded	
			Set Permissions



The permission tree displayed in the **Designate permission** window includes all authorization operations. The administrator can assign related authorization permissions to users by clicking the corresponding options. After the settings is done, click **Over**.

#### 3.1.3 Deleting Users

The system administrator can perform the following operations to delete a user.

You can select a specific user in the **User** tree node, right click this user and then click **Delete** to delete this user, or you can do this by choosing a user and then clicking **Edit -> Delete**. See the following figure:

Becurity	🛚 🔏 💡 🍣 Member Of User Profile Permitt	ted Operations for User	
Groups Admin Users	Permissions For User : Jack		
🔁 Users	Operation Name	Туре	Description
guest 🕰 Jack	Topology	excluded	
	System Administration	excluded	
<u>C</u> hange I	Password curity Administration	excluded	
Delete	rt User Operations	included	
Delete	_,ent User Operations	included	
	Runtime Administration	excluded	
	Map Editing Operations	excluded	

# 3.2 Defining a Group

## 3.2.1 Adding a Group

The system administrator can add a new group through the following steps:

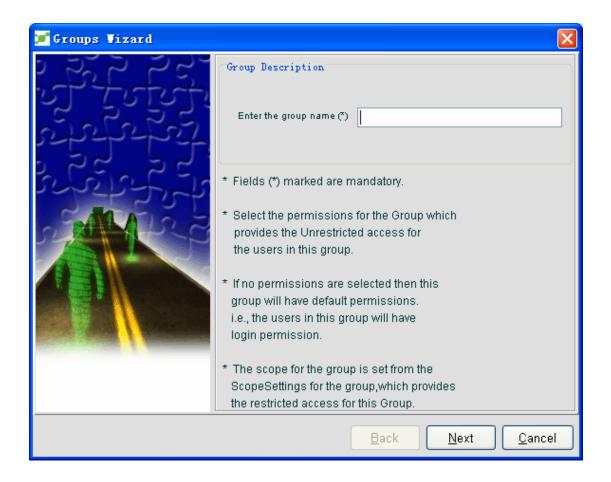
Security Administra	tion	
Eile Edit Help	(9) (20)	
Courting Courti	user group operations Audit scope Authorization Authenticat	-
	Administratio	nc

On the **security management** page, the administrator can use one of the following methods to open the **Add the group guide** window:

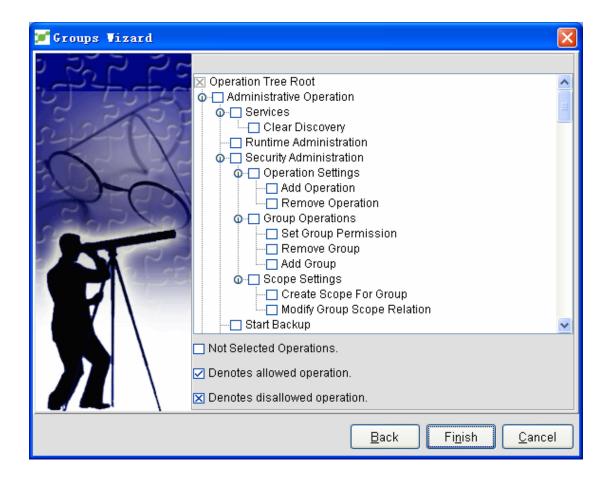
- 1 On the security management window, click **File -> New -> Add a group**.
- 2 Click the **Add a group** icon in the toolbar.
- 3 Right click the **Group** tree node and select the **Add a group** option.



The Add the group guide window is shown in the following figure:



If the administrator enters the new group name in the **Enter the group name** textbox in the **Add the group guide** window, the second **Add the group guide** window appears, as shown in the following figure:



In this window, the administrator can authorize the group operations through the following methods:

- 1.1 Tick the **allowable operation** checkbox.
- 1.1 Cross the **disallowable operation** checkbox.
- 1.1 The unselected **operation** checkbox is null. Operating a null checkbox will not be regarded as the authorization operation.

After the configuration is over, click Finish. The server will save the modification.

#### 3.2.2 Group Configuration

#### 3.2.2.1 Distributing users for a group

The system administrator can distribute users for a group by conducting the following steps: Select a specific group under the **Group** tree node, open the **Member** attribute page, and click **Settings**. The **Select users** window appears, as shown in the following figure:

🗾 Security Admini	stration	
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
ی کې کې 😂	(3) (2) (3)	
Security Groups Admin Sers Users Jack Jack root	Members       Permitted Operations for Group         Custom View Scope for Group         Members       for : Users         User Name         guest         root         Jack	
		Setting Users
Security Admini <u>File E</u> dit <u>H</u> elp	stration	_ 🗆 🗙
0000	Select users  Select users from the list for which the group needs to be assigned.  All Users  guest Jack root Jack	
		<u>S</u> etting Users

All users are displayed on the left of this window, while the selected users are displayed on the right of this window. The administrator can select a specific group on the left, click ">" and add the user to the group. To remove a user from its group, select the corresponding user and click "<" to remove this user from its group.

Į

## **3.2.2.2** Designating the authorization operation for a group

The system administrator can follow the procedure below to assign authorization to users.

Select a specific group under the **Group** tree node, open the **Group permission** attribute page, and click **Set the permission**. The **Designate the permission** window appears.

On the **Designate the permission** window, the administrator can set operations for a group by selecting or deselecting the operations. After the settings is over, click **Finish**.

Note: If you click the **Reset** button, the group permission will be set through the default mode.

#### **3.3 Operation Tree**

The operations in NMS are listed out in a tree structure, including the parent operations and child operations. On the security management window, the administrator can add new operations through the following two methods:

- 1 Click **File -> New -> Add an operation**.
- 2 Click the **Add an operation** icon in the toolbar.

If the administrator wishes to explore the operations in NMS, he or she can add new operations at the corresponding locations of the operation tree. The operation tree faceplate is shown in the following figure:

🥦 Operations	×
Operation Tree Configuration The following tree displays the whole hierarchy of operations that can be authorized for us	sers.
Select a tree node to add an operation under it, click on apply to save changes to server	-
Operations Tree	
Operation Tree Root	~
🗄 🗖 Administrative Operation	
o 🖸 Services	-
Clear Discovery	<u></u>
Runtime Administration	
o - 🛄 Security Administration	
operation Settings	
Add Operation	
Remove Operation	
🗿 🗖 Group Operations	
Set Group Permission	
Remove Group	
Add Group	
O Scope Settings	
Create Scope For Group	
Modify Group Scope Relation	
Start Backup	~
Shutdown Web NMS Server	
Add <u>R</u> emove	
Ok Cancel App	IV

#### 3.3.1 Adding an Operation

Choose the parent operations and then enter the to-be-added operation in the textbox. Click **Add**.

The new operation is then added to the place under the parent operations.

#### **3.3.2** Deleting an Operation

Select the to-be-deleted operation from the operation tree and then click **Remove**. The operation is then deleted.

#### **3.3.3 Default Operation Tree**

The operation tree includes the default operation list provided by NMS. The administrator can designate different operations for different users, which are given detailed explanation below:

Operation	Remarks	
Service		
Delete discovery	When a discovery is terminated by some reason, you can use this operation to delete this discovery.	
Start backup	It is used to enable the functionality of system backup.	
Resume the server	If NMS stops running due to a certain reason during the backup process, you can perform this operation to resume all processes of the server.	
Disable the NMS server	This operation is used to disable the NMS server.	
Set the log level	This operation is used to provide logs for multiple modules, and of course set the logs.	
Real-time management	It is used to conduct the settings for the running of NMS server.	
Security Management	Security management includes ID authentication during login and access permission designation for each user.	
System Management	It is used to process all operations of the administrator.	

The operations with relation to the administrator are shown in the following table:

The operations towards the modules in NMS are listed below:

- 1. Administrator's Operations
- 2. Event
- 3. Topology
- 4. User Management
- 5. Alarm
- 6. Figure
- 7. EPON Settings

**Administrator's Operations** 

Operation	Remarks
Delete discovery	Deletes the already discovered devices.
Disable server	Disables the network management server.
Security Management	Sets the permission of the user and user group.
System Management	Discovers and manages the devices in real time during running.

#### Event

Network event means a description of all statuses of network equipment. The event can bear not only the regular information but also the current status of a network device. The following table gives a description of all kinds of operations related with network events.

Operation	Remarks
Save the event to the file	It is used to save the selected events or those events on the event faceplate.
Print the event view	It is used to print the selected events or those events on the event faceplate.

#### Topology

The operation of related topologies is shown in the following table:

Operation	Remarks
Start and stop discovery	It is used to set the discovery status of a specific object during the running of the system.
Manage an object or cancel management	It is used to set the management status of a specific object during the running of the system.
Delete an object	It is used to delete a specific object from the topology database.
Refresh a node	It is used to refresh the polling status.

#### Alarm

If the system detects a trouble of a device in the network, it will generate an alarm. This alarm will be shown in the alarm view and users can browse alarms with a lot of levels, such as severe alarms, main alarms, secondary alarms and deleted alarms and so on. The operations related with alarm are shown in the following table:

Operation	Remarks
Set alarm's remarks	It is used to add an alarm remark.
Gain alarm details	It is used to browse the details of a specific alarm.
Save the alarm to the file	It is used to save the chosen alarms or those in the current alarm faceplate to a folder.
Print the alarm view	It is used to print the chosen alarms or those in the current alarm faceplate.
Delete alarm	It is used to delete alarms.
Obtain the alarm remark	It is used to browse the remarks of the existent specific alarm.
Obtain the	It is used to browse the history alarm, that is, the status change from the
history alarm	first to the last of an alarm.
Obtain the alarm	It is used to obtain alarms.
Delete the alarm	It is used to delete an uncared or resolved alarm.

#### **EPON Settings**

OLT settings	Includes the settings of dba, stp, multicast, acl, qos, vlan and so on.
ONU settings	Includes the management of ONU faceplates, qos and onu icons.
Other Settings	Browses the device faceplates and manages the slot information, the chip information, the SNMP attribute settings, rediscovery and CPU performance collection.

# 3.4 Customizing the View's Function Domain

You can customize the view's function domain to designate the read permission of a group.

# **3.4.1 Adding the Authorization Function Domain**

Click the **Group** tree node, as shown in the following figure:

🗾 Security Administr	ation	
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
2 4 4 2	s 😢 🔏	
Security Groups Co	Members       Permitted Operations for Group         CustomViewScope for the group : Users         Custom View Scope Name         Events         AuthorizedScopes for CV : Events         Authorized Scope         AuthorizedScope         Add AuthorizedScope         Assign AuthorizedScope         Set Scope Pro	

On the configuration attribute page, click the Customize the view's function domain page.

On the **Customize the name of the view's function domain** option, you have the following names to choose from: Events, Alerts and Maps.

🗾 Security Administra	ation	
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
2 & & & &	8 8	
Security Groups Admin Users Users Jack Jack root	Members       Permitted Operations for Group         CustomViewScope for the group : Users         Custom ViewScope Name         Events         Alerts         Maps	
	Add AuthorizedScope Assign AuthorizedScope Set Scope Proper	rties

**Maps:** You can filter those unrequested maps according to actual needs, making user management more convenient and easier.

Alerts: You can filter those unrequested alarms and just keep those requested alarms.

Events: You can filter those unrequested events and just keep those requested events.

🍠 Security Administratio	n			
<u>F</u> ile <u>E</u> dit <u>H</u> elp				
2 4 8 2 3	🔀 Scope Settings		Σ	3
Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca	st	view by setting pro * For example, s Only corrpondir Other icons wi	o filters display information on corresponding operty values. Let the property name IP Address to 10.0.0.1, ng device icon displayed on the map, II be filtered. t can also be set by conditions to user group	~
	AL SPECT	Name		
	22012 VOC	Property Name	Property Value	
		hlama		<b>a</b>
		Name Property Value	Event Level [severity]	
			Add Edit Delete	
	Add Authori:	zedScope	Assign AuthorizedScope Set Scope Pr	operties

Click Add the authorization function domain. The following page then appears:

Name: It stands for the name of the group's function domain and you can enter a name according to your requirements.

Attribute name: You can click this button to choose a name, but its default name is **IP address** [name].

Attribute value: It stands for the filtration premises. For example, if you want to filter the network graphic whose IP is 172.16.21.1, just set the attribute name to be **IP address** and the attribute name to be **172.16.21.1**. Then you can find that only the icon of this device is displayed on the map and other icons about this device will be filtered. On options such as **Events** and **Alerts**, you can set the read permission of the user group. Click **OK** to save the added function domain.

# 3.4.2 Designating the Authorization Function Domain

On the existing authorization function domain, click **Designate the authorization function domain**, as shown the following figure:

💓 Security Administr	ation	
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
2 🕹 🏘 🚳 🖪	8 8 3	
Security Groups Users Users Jack	Members       Permitted Operations for Group       Custom View Scope for Group         Custom ViewScope for the group : Admin       Events         Custom View Scope Name       Events         AuthorizedScopes for CV : Events       Authorized Scope         addnode       deletenode         pi       AuthorizedScope       Set Scope Pro	perties

The following page appears, as shown in the following figure:

📁 Security Administra			
Eile Edit Help	select authorized scopes		×
Security Groups Admin Users Users Jack Jack	Select the AuthorizedScopes from the All AuthorizedScopes pi deletenode addnode	list for which the CustomView needs to be assigned.	
	Add Authorized	Qk Qancel IScope Assign AuthorizedScope Set St	cope Properties

You can select a specific authorization function domain according to actual needs and add it to a user group. Click **OK** and the settings is successfully done.

# **3.4.3** Setting the Attributes of the Authorization Function Domain

You can set the existing authorization function domain, as shown in the following figure:

🗾 Security Administr	ation	
<u>F</u> ile <u>E</u> dit <u>H</u> elp		
	§ ? *	
Security Groups Users Users Users Jack	Members       Permitted Operations for Group       Custom View Scope for Group         Custom View Scope       Admin         Custom View Scope       Events         AuthorizedScope       Addhoide         deletenode       pi         Add AuthorizedScope       Assign AuthorizedScope         Add AuthorizedScope       Set Scope Property	perties

Select the to-be-set authorization function domain and click **Set the attribute of the function domain**. The following page then appears:

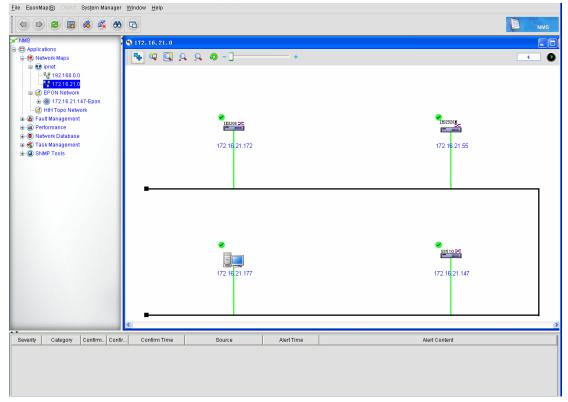
🍠 Security Administration			
<u>F</u> ile <u>E</u> dit <u>H</u> elp			
2 4 4 4 3 7 4	6		
Secu Scope Settings			
	view by setting proper * For example, set th Only corrponding d Other icons will be	he property name IP Address to 10.0.0.1, levice icon displayed on the map, e filtered. n also be set by conditions to user group	its 💌
	Name		
STAR SAF	Property Name	Property Value	
	Name Property Value	Add Edit Delete	pe Set Sco <u>p</u> e Properties

You can reset the authorization function domain.

## 4. Managing Devices in the IP Network

The Network Management Software (NMS) supports the discovery and management of multiple kinds of devices, including general switches and EPON devices. The management of the EPON device will be further described in the next section. NMS provides a lot of flexible management methods and enables you to browse all kinds of parameters of this device.

In the left tree menu, open the IP network and click the **Network** icon or directly open the **Network** option in the tree menu. Enter the **Network** view. Here, all managed devices in this network will be displayed. See the following figure:

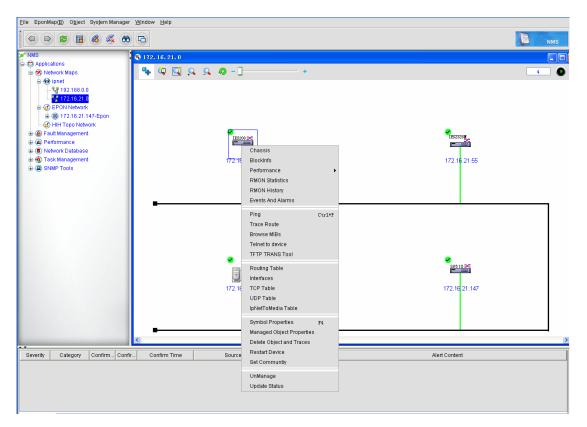


All managed devices are shown. These devices include the EPON devices, general switches and PCs.

If you then click **General device**, a menu option, Device Management, will appear on the top of the system window. Click **Device Management**. The menu options then appear, which are functions, as shown in the following figure:

Eile EponMap(B)	O <u>bject</u> System Manager <u>W</u> in	idow <u>H</u> elp				
	Chassis					
	Blockinfo					NMS
MMS	Performance	• . 21. 0				
🛓 🖨 Applications	RMON Statistics					
😑 🛞 Network N	RMON History	🔍 🔍	<u> </u>	+		4
😑 😢 ipnet	Events And Alarms					
	Ping	Ctrl+P				
B-G EPON	Trace Route	001101				
±-@ 17	Browse MIBs					
- 🧭 НІН ТС	Telnet to device					
🗉 💩 Fault Man	TFTP TRANS Tool					288
🕀 🏨 Performai			IES208 C		-	
🕀 📵 Network E	Routing Table					
🕀 🏀 Task Man 🕀 🚇 SNMP Tor	Interfaces		172.16.21.172		172.1	6.21.55
H-(B) SINME TO	TCP Table					
	UDP Table					
	lpNetToMedia Table					
	Symbol Properties	F4				
	Managed Object Properties					
	Delete Object and Traces					
	Restart Device					
	Set Community					
	UnManage					
	Update Status		<ul> <li></li> </ul>		S051	<u>. &gt;c</u>
			172.16.21.177		172.16	21.147
			172.10.21.177		172.10	21.197
		_				
		-				>
Severity Cate	gory Confirm Confir	Confirm Time	Source	Alert Time	Alert Conter	it

Or click the **Device** icon and right click **Pop-up**, the menu options then appear.



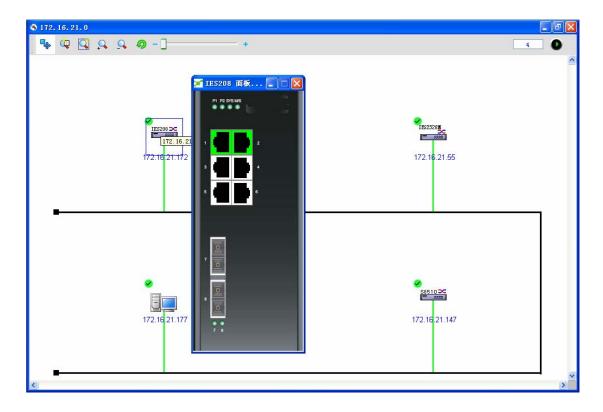
These menu options are described below:

## 4.1 Device Faceplate

The device faceplate graphic is displayed, including the port's status. Port's color: The color of a port is decided by the configuration and connection statuses of this port. If this physical port's configuration status is **Disable**, the color of this port is red. In the case that the physical port's configuration status is **Enable**, if the protocol is down the color of this port is white, and if the protocol is up the color of this port is green.

# 4.1.1 Views of General Switches and Routers

On general device faceplates, you can only find the statuses of devices. You, however, cannot operate their ports, as shown in the following figure:



## 4.1.2 EPON Faceplate Graphic

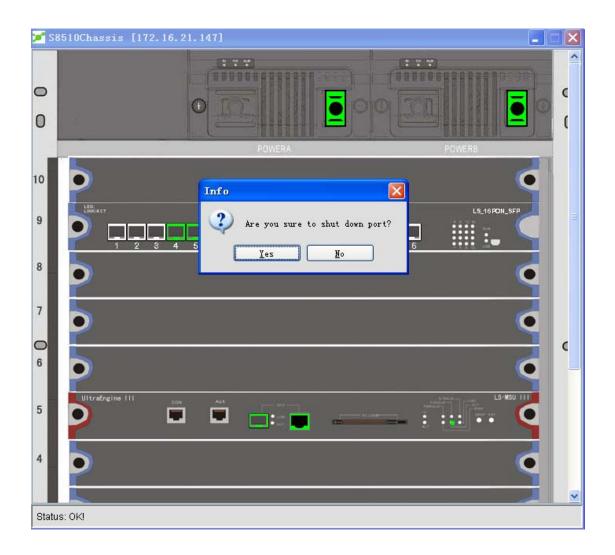
The EPON faceplate graphic enables you to operate the ports and the board cards. See the following figure:

<u>File</u> EponMap( <u>B</u> ) Object System Manager	<u>Window</u> Help	
		NMS
	S 172, 16, 21, 0	- 7 X
- Applications	🎭 🕸 🖸 A. A. Ø - ] +	
🖶 🛞 Network Maps		
ipnet 	🗾 \$8510Chassis [172.16.21.147]	<u>^</u>
172.16.21.0		
GON Network		
HIH Topo Network     General Management		
er • • • • • • • • • • • • • • • • • • •		
	POWERA. POWERB	
🖩 🚳 Task Management	10 10 16.21	.55
ė́-@ SNMP Tools		
	LS_16 PON_SFP	
	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	
	7	
		- I I
	6	i
	5 S S S S S S S S S S S S S S S S S S S	147
	° 👂 🔍 🖬 🖬 💼 💼 🚛 🚛 🗄 👬 🥵 💽	
		×
• •		1
Severity Category Confirm Confir.	Status: OKI ontent	

1. Main control functions: Right click the main controller board and the **master-backup-shift** option. When there are two main controller boards, the switchover of the main controller boards can be conducted.

2. Other equipment faceplates: Right click other device faceplates and then two options, **Reset the** card and Forbid the slot, appears.

- Click **Reset the card** to enable this card again. Click **Forbid the slot** to forbid this slot. Only when the system is enabled can the card on this slot be identified.
- 3. Operating the port on the faceplate:
  - a. The PON port on the PON card provides two options for port operation, that is, **shutdown** and **no shutdown**. Click the menu to conduct operations, as shown in the following figure:



b. The operations of the non-PON port include the VLAN settings, the port status operation, the port mode and the port rate. See the following figure:

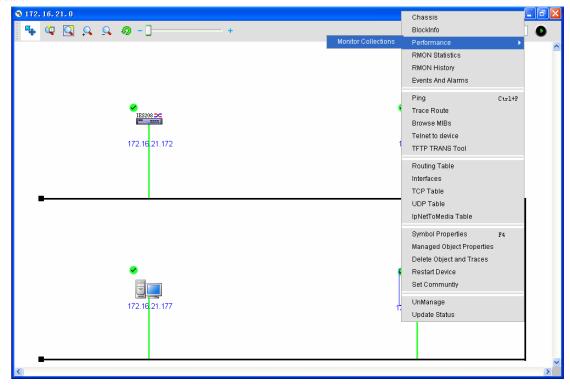
# **4.2 Common Functions**

- BlockInfo: it is used to browse the block information.
- NAT monitor: it is used to browse and monitor L3 switching or routing equipment and the NAT list.
- Events and Alerts: It is the statistics of the events and alerts.
- Ping: It is to ping other devices.
- Trace Router: It is to browse the information about trace router.
- Browse MIB: It is to browse the MIB value of the device.
- Telnet: It is to control devices in a remote way.
- TFTP: It is to upload the TFTP files.

- Routing table: It is to browse the routing table of a device, which only supports L3 routing or switching devices.
- Interface: It is to browse and query the interfaces of a device, including the information about the interface type and the interface speed.
- TCP table: It is to browse and query the TCP links of a device.
- UDP table: It is to browse and query the UDP links of a device.
- IpNetToMedia table: It is the IP-MAC mapping table.
- Cancel management: It means not to manage those managed devices.
- Start management: It is to re-manage a device.
- Update the status: It means that the system re-confirms the status of a device.

## 4.3 Performance Management

The data about a device's performance can be obtained in time and presented by the statistics graphs so that the administrator can know the operation performance of the device in an objective way. If you click **Menu -> Performance management -> Collect monitors**, the following page appears:



8 172. 16. 21. 0		
🗣 🔍 🖸 🔉 🔍 🥱 - 🗋	+	4
Performance Tor Polled statistics for agent Polled Statistics Device_INTERFACE_ov Smin - 1.3.6.1.2.1 Smin - 1.3.6.1.4.1 etherStatsPkts258tol inin - 1.3.6.1.4.1 etherStatsPkts258tol ifHClaNeastPkts - .ifHCDatUeastPkts - INTERFACE_ont_octet ifHCDatUeastPkts1. hrStorageUsed_RAM - <		✓ INS2308 IT2.16.21.55
Register	Collected Statistics Current Statistics	S8510 2000
View Reports	Close Help	172.16.21.147
<		1/2.10/21.14/

The related parameters are described blow:

Polling statistics data: standing for the data collection option obtained from a device After the data collection option of polling is chosen, click **Register** and then you will find the system starts collection data. Click **Current statistics** and then you will find that the performance collection statistics graphic appears.

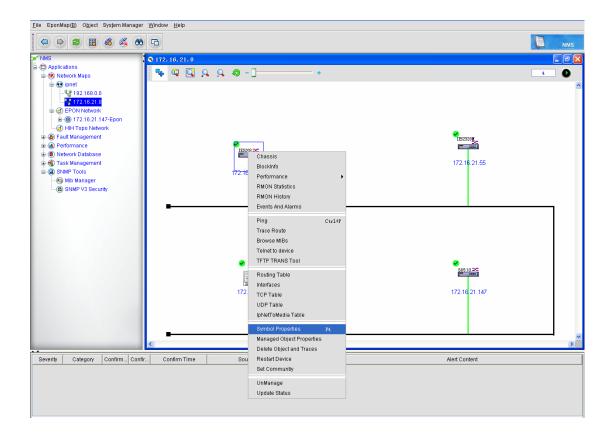
	🛃 Performance Mon	itoring		IES2328E	
	Polled statistics for agent Polled Statistics	3		172.16.21.55	
	Device_INTERFACE_ou 5min = .1.3.6.1.2.1 5min = .1.3.6.1.4.1		tatsPkts128to2550ctets = .1.3	172.16.21.33	
-	etherStatsPkts65tol: etherStatsPkts128to 1min = .1.3.6.1.4.1	Time			
-	etherStatsPkts256to <sup>r</sup> ifHCInUcastPkts ifHCOutUcastPkts -	Poll period 300			
	INTERFACE_out_octet ifHCOutOctets1. hrStorageUsed_RAM - 🗸	Value			
				Ø	
	Deregister	Collected Statistics	Current Statistics	S8510 X	
	View Reports	Close	Help	1 <mark>72:16:21:14</mark> 7	

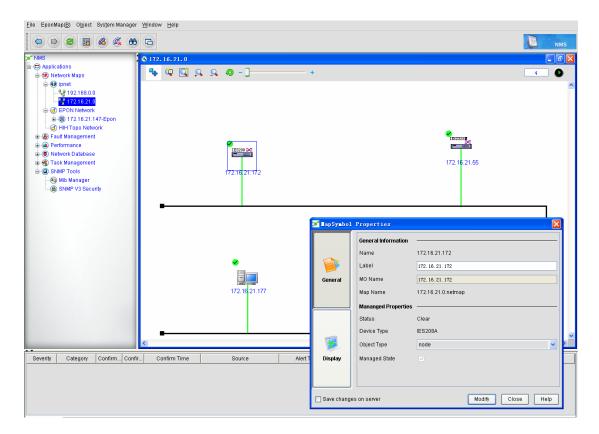
🔎 CurrentGraj	oh¥iewer			
	Polling interval 5 🛔 Sec	onds		3
		<b>172.16.21.</b> 1min	147	
	8- 7-			
	4.1.3320.9.109.10.1.4.1.3320.9.109.10.1.4.4. 2. 4. 3. 5. 4. 5. 5. 4. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5.			
2	1,3320.9			
	1.3.6.1.4 5.1.4			
	05.18.2012 14:41:30	05.18.2012 14:42:00	05.18.2012 14:42:30	
	05.18.2012 14:41:30	US.18.2012 14:42:00 Time of Coll 		

Collection statistics table: You can self-define the data statistics time to browse the statistics data.

# 4.4 Symbol Attribute

The symbol attributes simply describe several attributes of a device, such as **Regular** and **Show**. The regular attributes are shown in the following figure:





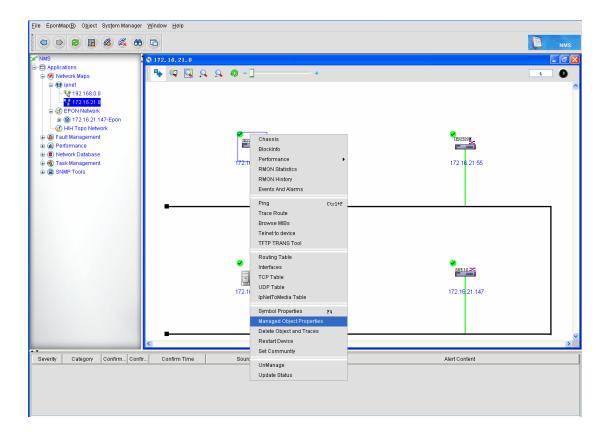
The Show attribute is used to set the display area, the map, the location and so on.

<u>File</u> EponMap(B) Object System Manager	<u>W</u> indow <u>H</u> elp						
	<b>FD</b>						NMS
MS	172.16.21.0						
🖮 🗇 Applications		0 - 1				-	4
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172.16.21.0							
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- 🧐 Mib Manager							
SNMP V3 Security							
				_			
			🗾 HapSymbol	Properties			
				Display Details			
				Icon Name	BDCOM_IES208.png		
		<b>e</b>		Menu Name	BDCOM		
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Severity Category Confirm Confir	Confirm Time	Source Alert T	Display				
			🗌 Save change	es on server		Modify Close	Help

Click **Edit** to change the current attribute.

# 4.5 Attributes of the Managed Object

The attributes of the managed object show all kinds of data of the managed device, including SNMP. The section is similar to section 4.5. Some attributes are the same, such as the **Regular** attribute.



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IES208 🗢		182328	5
🗾 Ianaged0b	ject Properties	<u> </u>	55
	General Information		33
	Name	172.16.21.172	
	Display Name		
General	Device Type	IES208A	
	Class Name	SwitchObject	
	Status	Clear	
	Managed		
	Identification Details		
	IP Address	172.16.21.172	
Monitoring	Netmask	255.255.255.0	147
<b></b>		Modify Close Help	
<			5
Monitor attribut	te:		

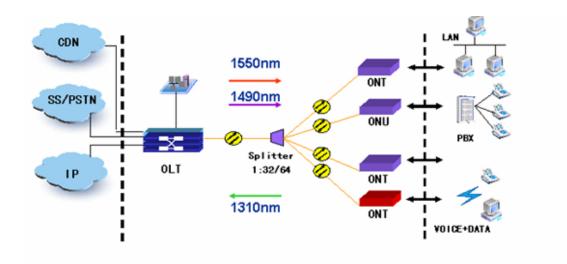
3 172, 16, 21, 0			
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IES200 DC Tanaged01	ject Properties	TECTOOL TECTOOL	•
General	Status Monitoring Details Enable Status Polling Last Status Update Time Next Status Poll Time Last Status Change Time Status Polling Interval (secs)	✓ Jul 23,2012 09:04:59 AM Jul 23,2012 05:23:00 PM Jul 23,2012 06:40:59 AM 180	55
Monitoring	SNMP Details SNMP Port Read Community Write Community SNMP Version	161 bdcom public	147
		Modify Close Help	×

Here the polling and polling time of a device are displayed.

## **5 EPON Management**

EPON is a new type of optical network access technology. It adopts the point-to-multipoint structure and the passive optical-fiber transmission. On the physical layer, EPON adopts the PON technology, while on the link layer, EPON uses the Ethernet protocol. The Ethernet access is realized through the topology of PON. Hence, it integrates the advantages of the PON technology and the Ethernet technology. These advantages include low cost, high bandwidth, expansibility, flexible and fast service regrouping, high compatibility and convenient management.

The regularly used EPON network structure is shown below:



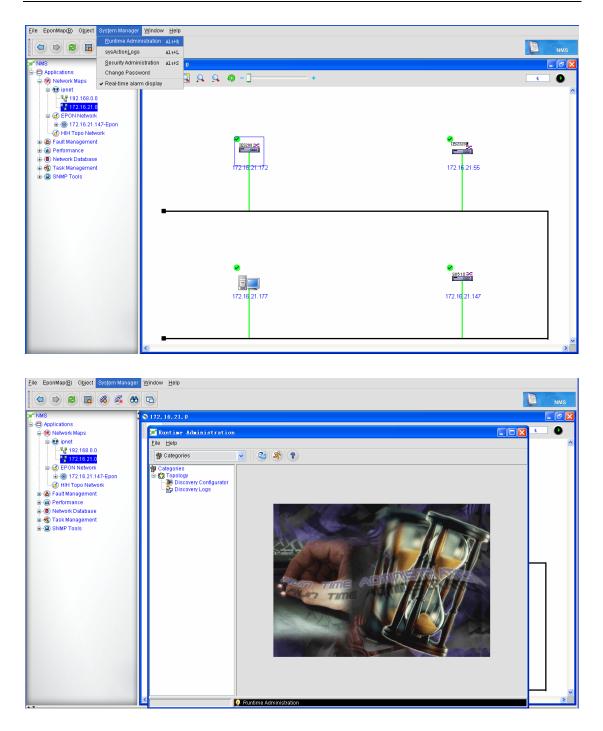
- OLT-- optical line terminal
- ONU--Optical Network Unit
- **ONT--** Optical Network Terminal
- ODN -- Optical Distribution Network

### **5.1 Device Discovery**

Device discovery means to find devices in a network according to a designated parameter and then manage and maintain the devices in real time. In this section, the operation of discovering EPON devices through NMS will be mainly described.

The operation procedure is shown below:

- Open the NMS client and pop up the homepage of NMS.
- Click System Management -> Real-time Management. See the following figure:

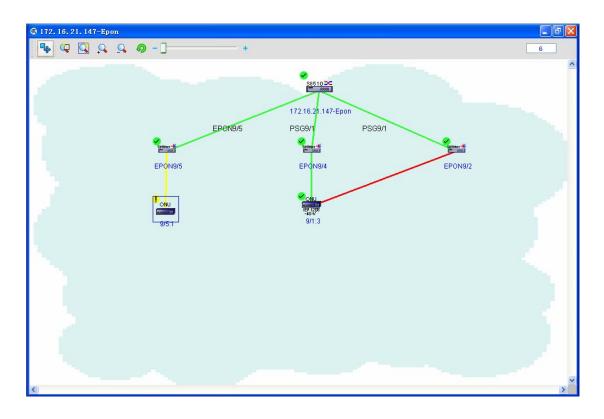


 Click Topology -> Discovery Settings on the real-time management window. Select Node Discovery and then enter the IP address and network mask of the to-be-discovered device. Click Add.

🔀 Runtime Administration									
<u>F</u> ile <u>H</u> elp									
Niscovery Configurator	<ul> <li>Image: Image: Ima</li></ul>	8							
Categories Categories Configurator Configure Node Discovery Node Discovery Configure Node Discovery parameters JPAddress,Netmask,Community,Port,SN parameters for Node Discovery.						ort,SNMP Versio	on,UserName a	and ContextNam	ie are the key
	Discover	Parent Net	IPAddress	NetMask	Commu	Port	Version	UserNa	Context
		false	172.16.21	255.255.2	bdcom	161	v2	1	
				255.255.2		161	v2		
				255.255.2		161	v2		
		false	172.16.21	255.255.2	bdcom	161	v2		
	Discover IPAddress(es SNMP Version	n <u>v</u> 2				wer Parent N			
	Community	public			SNM	PAgentPort	161		
	UserName				Cont	extName			
	Properties		Ad	d	Delete		Iodify		Apply
	😥 Done								
	e one								

Parameter description

- > The IP address must be the management address of OLT.
- The mask is entered according to the real mask of the local network, such as 255.255.255.0.
- SNMP (Simple Network Management Protocol) has three versions: v1, v2 and v3. You can select the version according to your equipment settings. At present, NMS support these three versions, but the default version is v2.
- If you choose the Whether to discover the parent network option, all manageable devices in the parent network where OLT belongs to will be displayed in the topology. You can make choice according to requirements.
- The community, a character string, is the text password between the management process and the agent process. It is used by SNMP to authenticate the SNMP control station from the SNMP agent; if a network is set to require authentication, SNMP will authenticate the community name and the IP address of the control station; if the authentication fails, SNMP will sent a trap message, showing a failed authentication, from the SNMP agent to the SNMP control station.
- > The SNMP agent port is port 161 by default.
- Click Apply. The system then conducts device discovery according to the IP and network mask configured by the administrator.
- Close the real-time management window and then get the topology of the to-be-discovered device in the EPON topology. See the following figure:



# 5.2 Deleting a Device

You can delete some devices that are not required management on NMS, which helps manage and maintain the network topology.

#### 5.2.1 Deleting OLT

The operation procedure is shown below:

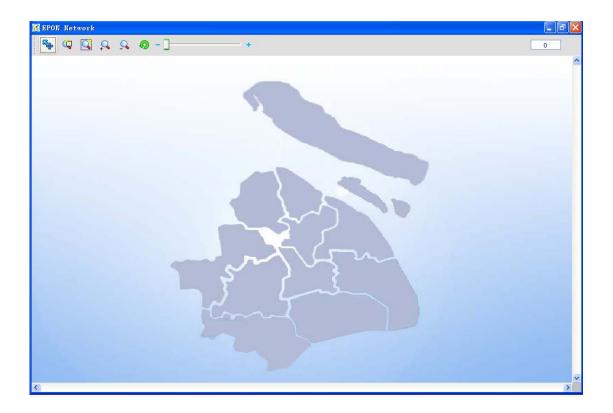
• Open the EPON topology and right click the OLT icon. The following menu appears:

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NMS Applications NMS Notices Maps Notices Maps Notices Name Notices Name			еренял	Register ONU     Post Rate Limit     Sterm Cardesi     Post Rote Cardesi     Post Rose Cardesi     OLT ACL     Post Aggregation     OLT Van     OOS Manage     OLT Enrep     OLT Multicast	
				Serial Server Config CPU Indi Memory Utilization OpticalPot Into OUT Seriesbith	
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-	<u>с</u>			Refound Deate Deate	,
Baventy Category Confirm. Con	ofir. Cantive Time	Source	AlertTime	Heri Topo Descovery	
stand candid learning on					

• On the menu, choose **Delete a device**. The system will obtain related information according to OLT.

If you delete OLT, all other devices on OLT will also be deleted. See the following figure:

Confirmation Lossage   Image: Confirmation Lossage     I		
EPON9/5 PSG9/1 PSG9/1 EPON9/5 PSG9/1 PSG9/1 EPON9/5 EPON9/4 EPON9/2 Confir antion Ecssage This operation will delete all sub-elements of the selected object(s). Bo you want to proceed ? This operation will delete all sub-elements of the selected object(s). Bo you want to proceed ? This operation will delete all sub-elements of the selected object(s). Bo you want to proceed ?	@ 172, 16, 21, 147-Epon	- 7 🛛
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	2	2

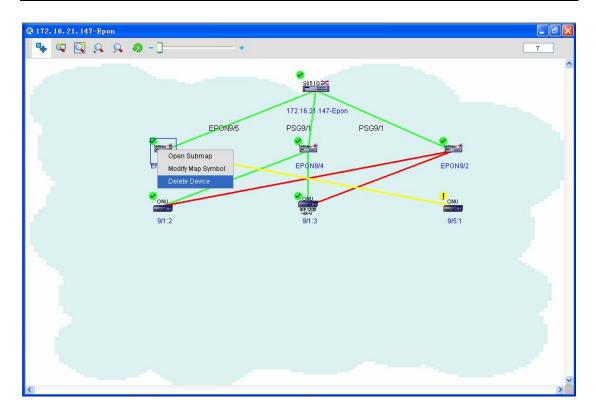


The administrator also needs to note that the deletion of OLT means to delete OLT itself and its connected devices, so the administrator shall confirm it before this operation.

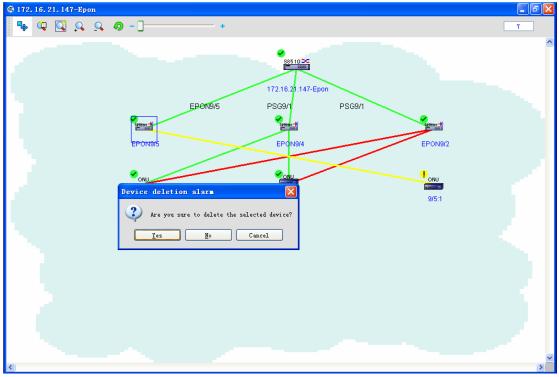
# **5.2.2 Deleting the Optical Splitter**

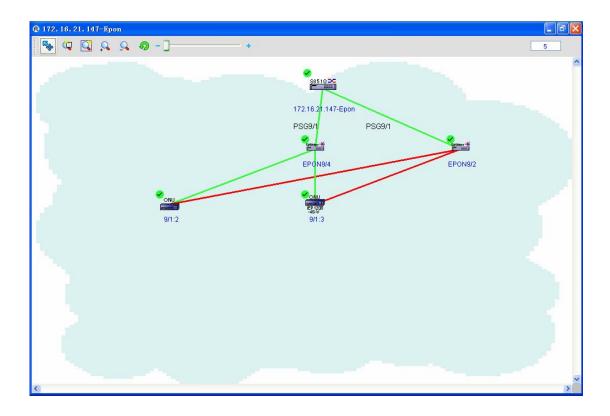
The operation procedure is shown below:

• Open the EPON topology and right click the Splitter icon. The following menu appears:



Click Delete a device. The system obtains related data from a optical splitter that the administrator selects, and then delete the optical splitter. See the following figure:



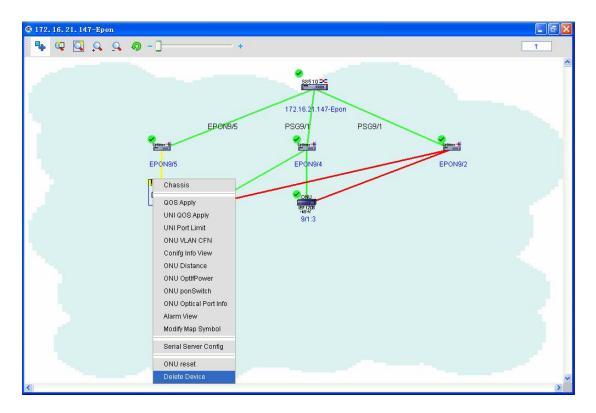


If you delete an optical splitter, all downstream ONUs, which connect the optical splitter, will also be deleted. The administrator must confirm your operation before performing it.

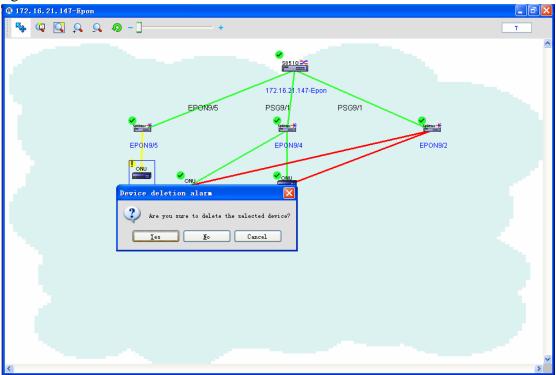
### 5.2.3 Deleting ONU

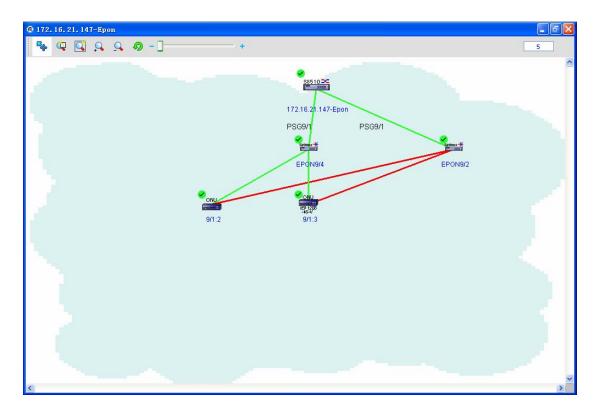
The operation procedure is shown below:

• Open the EPON topology and right click the ONU icon. The following menu appears:



After you confirm to delete it, you will find the results, as shown in the following figure:





Click Delete a device. The system deletes an ONU according to the related information about ONU that the administrator selects. What's more, during ONU deletion, the system will automatically judge the number of other ONUs that the same upstream optical splitter connects. If the number of ONUs is zero, the system will delete this upstream optical splitter at the same time; If the number is not zero, the upstream optical splitter will not be deleted.

## **5.3 OLT Settings**

OLT settings management includes: browsing basic OLT information, setting VLAN, DBA and multicast, registering and deleting ONU, and setting STP attributes.

#### 5.3.1 Basic OLT information

On the basic OLT information page, you can only browse OLT's slots, OLT's chips and ONU's distances. You have no right to access the basic OLT information at present. On the basic OLT information page, right click the OLT icon and then click **Basic information**. A page then appears, as shown in the following figure:

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Government		172.16.	OLT Deivce Info		
Performance		EPON9/5 PSG9/1	Alarm View		
		-	DBA Conf		
	Sprine - 12	Sink	OLT Stp Conf	Spinor +	
Ergy of the foots	EPON9/5	EPO	Mirror Managed	EPON9/2	
			Register ONU		
	⊘NU	€ on	Port Rate Limit Storm Control		
	Conc.	Con EF 127	Port Flow Control	[mmm 11]	
	9/1:2	9/1	OLT ACL	9/5:1	
			Port Aggregation		
			OLT Vlan 🕨		
			QOS Manage 🛛 🕨		
			OLT Encryp		
			OLT Multicast		
			Serial Server Config		
			CPU Info		
			Memory Utilization		
			OpticalPort Info		
			OLT Bandwidth		
			Device settings		~
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	Chip In	Slot ID	Module	Device ID	MAC Address	Chip Status	EPON9/2	
	0	9		0x1f070000	00-E0-0F-C2-34-10	operational	1	
	1	9		0x1b030000	00-E0-0F-C2-34-13	operational		
	2	9		0x1d050000 0x1e070000	00-E0-0F-C2-34-12 00-E0-0F-C2-34-11	operational operational		
							9/5:1	5
	Finished.							
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The figure above shows OLT's slots.

Click Chip and then you can browse the related information about chips. See the following figure:

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		💓 OLT D	eivce Ir	ufo-172. 1	6.21.147-Epon		
		OLT Deivo		ation 🙈 O	NU Distance  🜆 OLT	Card Info	
		Chip In	Slot ID	Module	Device ID	MAC Address	Chip Status
	I	0	9	0	0x1f070000	00-E0-0F-C2-34-10	operational
		1	9	3	0x1b030000	00-E0-0F-C2-34-13	operational
		2	9	2	0x1d050000	00-E0-0F-C2-34-12	operational
		3	9	1	0x1e070000	00-E0-0F-C2-34-11	operational
	ĺ	Finished.					
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Click **ONU's distance** and then you can browse the distance between ONU and OLT. See the following figure:

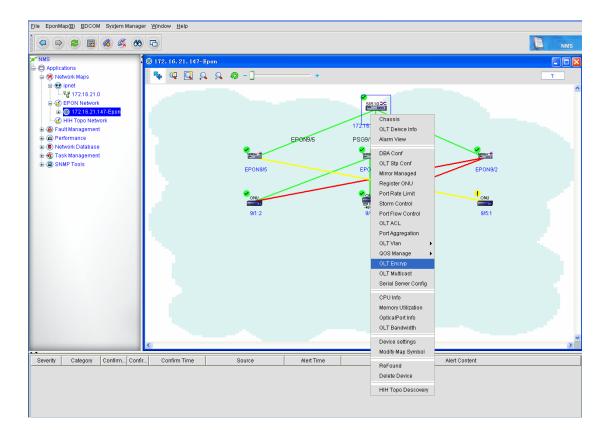
172.16.21.147-Epo	n			
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		88510× #### 172 <del>.16.21.147-E</del> pon		
CLT Deiv	ce Info-172.16.21.147-Epo	n - 🗆 🔀		
	Infomation 🚳 ONU Distance 📘	OLT Card Info	Spinter +	
	ONU Name	Distance(Meter)	EPON9/2	
9/1:2		163 (ONU status:auto_config)	F	
9/1:3		280 (ONU status:auto_config)		
9/5:1		137 (ONU status:auto_config)		
Succeed.		Refresh	9/5:1	5
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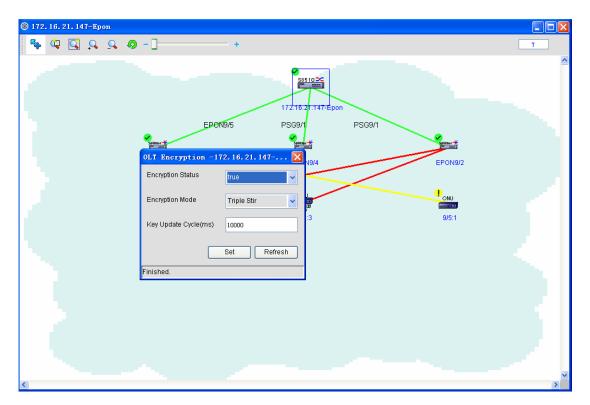
Click **Card's temperature** and you can browse the temperature of each OLT's card. See the following figure:

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		88510 ■ 172:16.21:147-Epon		
DLT Deivce Info-172.16	i. 21. 147-Epon			
OLT Deivce Info	U Distance 🔚 OLT Card Info		Spinter-K	
CardNumber	CardName	CpuTempCurr	EPON9/2	
$\frac{1}{2}$	MSU type III card LS_16PON_SFP_CARD	38		
2		32	! onu	
			9/5:1	
		Refresh		
J				
Finished.				
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### 5.3.2 OLT encryption

OLT encryption means to set the encryption status, the encryption mode and the key update time. The encryption mode only supports CTC-churning (2) at present. If any need, other encryption modes will be added later. right click the OLT icon and then click **Encryption settings**. A page then appears, as shown in the following figure:





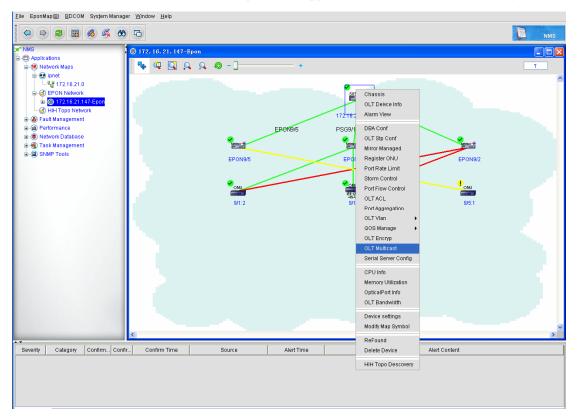
The configurations above are the default configuration, but you can set them according to your own requirements.

#### 5.3.3 OLT multicast configuration

Multicast transmission: a point-to-multipoint connection between the sender and each receiver will be established. If a sender transmits the same data to multiple receivers at the same time, the sender only needs to copy a same packet. So multicast transmission improves the efficiency of data transmission, and reduces the possibility of congestion in the backbone network.

IGMP runs between the host and its directly-connected multicast router, through which the host notifies the local router to join in and receive the information from a specific multicast group and at the same time through which the multicast router checks periodically whether a known multicast member in LAN is in positive status (whether the network segment has a member to belong to a multicast group). IGMP has three versions: IGMPv1, IGMPv2 and IGMPv3. The following is OLT multicast settings.

You can set some global attributes on the OLT multicast configuration page. Right click the OLT icon and then click **Multicast settings**. A page then appears, as shown in the following figure:



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	OLT Inlticast-172.16.	21. 147-Epon	172:16.21.14			
	DLF Drop	off	Route Age	260	Spinser +	
	V1 IGMP Count	0	MCST Status	disable 💌	EPON9/2	
	V2 IGMP Count	0	MCST Mode	igmp-snooping 💌		
	V3 IGMP Count	0	IGMP Proxy Status	disable 💌		
	Join IGMP Count	0	IGMP Query by IP Address	10 . 0 . 0 .200	9/5:1	
	Leaves IGMP Count	0	Maximal Query Response(s)	15		
	General IGMP Count	0	Last Member Query Interval(s)	1		
	Special Query IGMP Count	0	Last member query count	2		
			S	et Refresh		
	Finished.					
					-	
٢						>

Note: The grey part on the left of the figure above cannot be modified.

#### 5.3.4 OLT VLAN settings

#### 5.3.4.1 OLT VLAN

VLAN logically classes LAN equipment into different network segments and realizes the data exchange between different virtual groups. The emerging VLAN technology is applied in switches and routers, especially for the former. However, it does mean that all switches has this functionality , and only L3 switches with the VLAN protocol can own this functionality. You can browse the related information about the corresponding switches.

The emergence of VLAN is mainly to solve the problem that the broadcast cannot be limited during switches' interconnection in LAN. This technology can divide a LAN into multiple logical LANs. Each LAN functions as a broadcast area. The communication between hosts in VLAN is just like in one LAN and VLANs cannot directly interconnect. In this way, the broadcast packets are limited in one VLAN.

Right click the OLT icon and then click **VLAN management**. A page then appears, as shown in the following figure:

<u>File</u> EponMap( <u>B</u> ) <u>B</u> DCOM System Manag	ger <u>W</u> indow <u>H</u> elp						
							NMS
MMS  Applications    Revork Maps	<ul> <li>◎ 172. 16. 21. 147-E</li> <li>■</li> <li>■</li> <li>●</li> <li>■</li> <li>●</li> <li>■</li> <li>●</li> <li>■</li> <li>■<!--</td--><td>ipon 9 9 - ]</td><td>+</td><td></td><td></td><td></td><td>7</td></li></ul>	ipon 9 9 - ]	+				7
			EPON9/5	172.16.21. PSG9/1	Chassis OLT Deivce Info Alarm View		
<ul> <li>         ⊕ Network Database         ⊕          ⊕          ⊕</li></ul>		EPON9/5		EPON9/	DBA Conf OLT Stp Conf Mirror Managed Register ONU	EPON9/2	
		9/1:2		<b>ONU</b> <b>EF 1200</b> -654 9/1:3	Port Rate Limit Storm Control Port Flow Control OLT ACL	9/5:1	
					Port Aggregation OLT Vlan QOS Manage OLT Encryp OLT Multicast Serial Server Config	OLT Vian Conf Port Vian Conf PON Port Belong Vians	
					CPU Info Memory Utilization OpticalPort Info OLT Bandwidth		
	٤.	_			Device settings Modify Map Symbol		× >
Severity Category Confirm Cont	fir Confirm Time	Source	Alert Time		ReFound Delete Device	Alert Content	
					HIH Topo Descovery		

The VLAN configuration page is shown in the following figure:

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172.16.21.147-Epon	~
🖸 OLT Vlan Configuration-172.16.21.147-Epon	
VLAN ID VLAN Name Egress Ports ForbiddenEgressPorts UntaggedPorts	
1 Default EPON9/13,EPON9/14, VLAN1,Null0,GigaEthe EPON9/13,EPON9/14, EPON9/2	
9/5.1	1
Help Add Modify Delete Refresh	
Finished.	
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	>

The VLAN settings has the following functions:

• Add a VLAN:

Click Add. A page appears, as shown in the following figure:

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					172-16-21:147-Epon	4
	ol 1	¶lan C	onfig	uration-172.16.	21.147-Epon	
ļ	1	VLAN ID		VLAN Name Default	Egress Ports ForbiddenEgressPorts UntaggedPorts EPON9/13,EPON9/14, VLAN1,Null0,GigaEthe EPON9/13,EPON9/14, EPON9/2	
					dd OLT VLAN-172. 1 X /lan ID OK Cancel 9/5:1	1
Ī	Finishe	d.			Help Add Modify Delete Refresh	
<						>

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			172.16.21.147-Epon		~
🔎 OLT Vlan Confi	guration-172.16.2	1.147-Epon			
VLAN ID	VLAN Name Default		orbiddenEgressPorts Untag AN1,Null0,GigaEthe EPON9/13,	ggedPorts	
2	VLAN0002		AN1,EPON9/12,EPO	EPON9/14, EPON9/2	
	Vlan ID 2	T Vlan-172, 16, 21, 147	Cancel	CANU (2000) 9/5:1	
Succeed.	[	Help Add	Modify Delete	Refresh	
<pre></pre>					, ×

Enter a VLAN ID and then click **OK**. A VLAN is added. An existent VLAN ID cannot be added twice.

• Change the VLAN name:

On the VLAN configuration page, if you select a VLAN and click **Edit**, the following page appears:

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		172:16:21:147-Epon	~
📁 OLI Vlan Configur	ration-172.16.21		
	VLAN Name efault JAN0002	Egress Ports ForbiddenEgressPorts UntaggedPorts EPON9/13,EPON9/14,, VLAN1, Null0,GigaEthe EPON9/13,EPON9/14, VLAN1, EPON9/12, EPO	
	Vian ID 2	Vlan-172. 16. 21. 147-Epon           Image: Construction of the second s	
Succeed.		Help Add Modify Delete Refresh	
	_		×

Note: The VLAN whose VLAN ID is 1 cannot be modified.

• Delete one or multiple VLANs:

On the VLAN configuration page, if you select multiple VLANs and click **Delete**, the following page appears:

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			172:16:21:147-Epon	
	🔎 OLT Vlan Co	onfiguration-172.16.	1. 147-Epon	
	VLAN ID	VLAN Name	Egress Ports ForbiddenEgressPorts UntaggedPorts	
	1	Default	EPON9/13,EPON9/14, VLAN1,Null0,GigaEthe EPON9/13,EPON9/14, EPON9/2	
	2	VLAN0002	VLAN1,EPON9/12,EPO	
		Confirm ? co	eletion  TES NO	1
		(	Help Add Modify Delete Refresh	
	Succeed.			
<				

Click Yes and then you delete all selected VLANs; click No and then you do not delete the

chosen VLANs.

If you select the VLAN whose ID is 1, the following page appears and other VLANs will be deleted.

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172:16.21.147-Epon	
VLAN ID       VLAN Name       Egress Ports       ForbiddenEgressPorts       UntaggedPorts         1       Default       EPON9/13,EPON9/14,       VLAN1,Null(),GlgaEthe.       EPON9/13,EPON9/14,       EPON9/12,EPO         2       VLAN0002       VLAN1,EPON9/12,EPO       Image: Constraint of the deleted of the delet	
	×

#### • Refresh

Click **Refresh** and you will obtain related VLAN information again.

Note: There are 4 fields on the figure above:

Vlan Id: Stands for each VLAN.

Vlan name: It is used to identify VLANs so that the administrator can manage them easily.

Egress Ports: It is a port contained in the local VLAN. You can browse it by double clicking it.

ForbiddenEgressPorts: It is a port that is not contained in the local VLAN. You can browse it by double clicking it.

UntaggedPorts: It stands for the untagged ports.

#### 5.3.4.2 PON port's VLAN

Browsing a VLAN of a port helps you to browse which VLAN a specific port belongs to. Click **Browse a VLAN of a port** and you will find the following page appear:

Eile EponMap(B) BDCOM System Mana	ger <u>W</u> indow <u>H</u> elp						
a d e e 🕫 🏽 🤞 🎉 🕅	6						NMS
MMS Metwork Maps Metwork Maps Metwork Maps Metwork Maps Metwork Maps Metwork Datase Metwork Datase Met		ipon Q Q - ] EPON9/5 Sylic Sylic Sylic	+ EPon9/5	1727 PSG	Chassis OLT Deivce Info Alarm View DBA Conf OLT Sip Conf Mirror Managed Register ONU Pott Flow Control OLT Kate Limit Storm Control Pott Flow Control OLT Agregation OLT Van QOS Manage OLT Gever Config CPU Info Memory Utilization OpticalPot Info	EPON3/2 EPON3/2 9/5:1 OLT Vian Conf Port Vian Conf PON Port Belong Vians	T T T
					Device settings Modify Map Symbol		
• •	<			_	ReFound		>
Severity Category Confirm Con	fir Confirm Time	Source	Alert Time		Delete Device	Alert Content	
			1		HIH Topo Descovery		

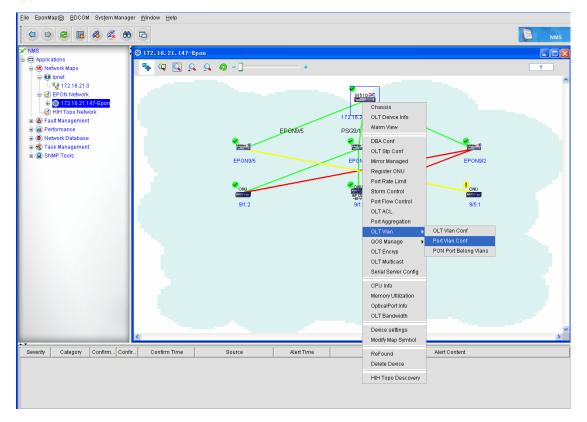
© 172.16.21.147-Epon	
🗛 🕼 🔍 S. S. 🔊 - 🕽 +	7
TZ-TE-ZD-TATE-EPON TZ-TE-	
	>

Select different PON ports from the PON port dropdown box. The VLAN that a PON port belongs to will be displayed in the affiliated VLAN list.

## 5.3.4.3 VLAN settings of a port

Different series of equipment have different port's VLAN configurations. The following describes the VLAN settings of the port of 3305 OLT and 8500 OLT.

In the OLT menu, click **VLAN management -> port VLAN settings**. A configuration page appears, as shown in the following figure:



				<b>1</b>				
🕈 Port Vlan	Configuratio	n-172, 16, 21	147-Epon					
Port No	Port Description	PVID	Port Type	Switching Mode	Allowed Vlans	Untagged Vlans		
2	EPON9/13	1	EPON	Access	1-4094	1		
13	EPON9/14	1	EPON	Access	1-4094	1		
14	EPON9/15	1	EPON	Access	1-4094	1		
15	EPON9/16	1	EPON	Access	1-4094	1	Splitter	
16	EPON9/9	1	EPON	Access	1-4094	1	EPON9/2	
17	EPON9/10	1	EPON	Access	1-4094	1	EPON9/2	
8	EPON9/11	1	EPON	Access	1-4094	1		
9	EPON9/12	1	EPON	Access	1-4094	1	•	
20	EPON9/5	1	EPON	Access	1-4094	1		
21	EPON9/6	1	EPON	Access	1-4094	1	9/5:1	
22	EPON9/7	1	EPON	Access	1-4094	1	9/0.1	
23	EPON9/8	1	EPON	Access	1-4094	1		
24	EPON9/1	1	EPON	Access	1-4094	1		
26	EPON9/3	1	EPON	Access	1-4094	1		
28	PSG9/1	1	PSG	Access	1-4094	1		
inished.				Help	Modify	Refresh		

PVID stands for Port Vlan ID and relates with the VLAN tag when a port sends or receives data frames. The ports of a switch can be classified into two kinds: access ports and trunk ports. The former ones are used on the access layer to directly connect equipments, while the latter ones are used between equipments to be in charge of aggregation. The characteristic of an access port is to allow those flows that comply with PVID to pass through. Different from the access ports, trunk ports have their own native VLANs that send some data or flows like CDP and BPDU for equipment connection and management. The data frames generated by a device itself have no tags when being transmitted (it is because VID is equal to PVID and the tags are removed); when a peer device receives these untagged data frames, the peer device will add its native VLAN's information to these data frames as their tags, browse the forwarding table, and then make one of the following choices: if it finds the destination MAC address is its MAC address it removes the tags, or if the destination MAC address it goes on forwarding them to other trunk ports and at the same time removes their tags.

In the port table, the port's PVID, the port types, the exchange modes, the allowed VLANs and the untagged VLANs are shown. Choose any row in the port table and then click **Edit**. A port configuration page appears, as shown in the following figure:

۲	172.	16.21.147	-Epon								
	R.	4	<u> </u>	- 🛛	+					7	
						•	_				^
h	јот р	ort Vlan	Configuratio	on-172.16.21.	147-Epon						
		Port No	Port Description	PVID	Port Type	Switching Mode	Allowed Vlans	Untagged Vlans			
	12		EPON9/13	1	EPON	Access	1-4094	1			
	13		EPON9/14	1	EPON	Access	1-4094	1			
	14		EPON9/15			l.	4094	1			
	15		EPON9/16	Port VLAN Con	figuration-1	72.16.21	<b>4</b> 1094	1	Splitter K		
	16		EPON9/9	Port No	12		1094	1			
	17		EPON9/10				1094	1	EPON9/2		
	18		EPON9/11	PVID	1		1094	1			
	19		EPON9/12	Switching Mode	Access	~	1094	1	•		
	20		EPON9/5	Allowed Vlan	1	-4094	1094	1			
	21		EPON9/6	raioned nan		-4094	1094	1	9/5:1		
	22		EPON9/7				4094	1	9/0:1		
	23		EPON9/8				4094	1			
	24		EPON9/1	Untagged Vlan	~ 1		4094	1			
	26		EPON9/3				4094	1			
	28		PSG9/1				1094	1			
					Set	Cancel	1				
							_				
						Help	Modify	Refresh			
	Finis	hed.									
											_
											~
<	_										

Only when the exchange mode is **trunk**, the allowed vlan and the untagged vlan can be set. The entered values can be 1, 3, 5, 7, or 1, 3-5, 7, or 1-7. The specific operation is shown below:

Allowed Vlan 1-9 : Set the allowed vlans of this port to be vlan1 to vlan9.

Allowed Vlan add 1-9 : Add the allowed vlans of this port to be vlan1 to vlan9.

Allowed Vlan except 1-9 : All are allowed vlans except vlan1 and vlan9.

Allowed Vlan remove 1-9 : Delete the allowed vlans of this port between vlan1 and vlan9.

Allowed Vlan all : All vlans between vlan1 and vlan4094 are allowed vlans.

Allowed Vlan none : This port has no allowed vlans.

The operations about the untagged vlans are the same as those of allowed vlans.

## **5.3.5 OLT DBA Settings**

DBA is a dynamic bandwidth distribution mechanism for the uplink broadband that can be done in a millisecond interval. The DBA settings of EPON is oriented for the uplink flows of each ONU.

Right click the OLT icon and then click **DBA settings**. A page then appears, as shown in the following figure:

Eile EponMap(B) BDCOM System Manage	r <u>W</u> indow <u>H</u> elp						
0 0 2 8 4 4							NMS
MMS	@ 172.16.21.147-Ep	on					
ia-⊂ Applications ia-⊛ Network Maps	🖳 🙀 🟹 🔍	<u> </u>					7
							<b>^</b>
<b>172.16.21.0</b>				6			
EPON Network 172.16.21.147-Epon				585	Chassis		
HIH Topo Network				172.18.2	OLT Deivce Info		
ia- A Fault Management ia- (iii) Performance					Alarm View		
•••••••••••••••••••••••••••••••••		• -	EPON9/5	PSG9/1	DBA Conf		
🖩 💰 Task Management		Spitter t		Spinner	OLT Stp Conf	Salimer <del>*</del>	
😐 🚇 SNMP Tools		EPON9/5		EPOI		EPON9/2	
					Register ONU		
		⊘oNU		<mark>⊘_₀n</mark>	Port Rate Limit Storm Control	ONU (mmartil	
					Port Flow Control		
		9/1:2		9/1	OLT ACI	9/5:1	
					Port Aggregation		
					OLT Vian 🕨		
					QOS Manage		
					OLT Multicast		
					Serial Server Config		
					CPU Info		
					Memory Utilization		
					OpticalPort Info		
					OLT Bandwidth		
					Device settings		×
	<u>&lt;</u>				Modify Map Symbol		>
Severity Category Confirm Confir	Confirm Time	Source	Alert Time		ReFound	Alert Content	
					Delete Device		
					HIH Topo Descovery		

172.16.21.147-Epon	
🥦 🕼 🖸 🔉 🦡 🔊 - ] +	7
EPON9/5 PSG9/1 PSG9/1 EPON9/5 PSG9/1 PSG9/1 EPON9/5 EPON9/4 EPON9/2	
OLT DBA and LLID Bandwidth Configuration-172.16.21.147-Epon	
DBA Global Attribute DBA Mode Hybrid DBA Cycle Time(TQ) Discovery Frequency 128 Refresh 9/5.1	
DBA Algorithm NONWORKCONSERV Discovery Time(TQ) 14000 Bandwidth	
Finished.	
	3
<u>&lt;</u>	∑ ∑

The figure above shows the global attributes of OLT DBA. You can click **Set** to configure the attributes or click **Refresh** to obtain the latest information about the device. During configuration, if the DBA mode is **hybrid DBA** or **Software DBA with dynamic cycletime**, the DBA cycletime cannot be set.

• 🗘 🞑	<u> </u>	+			7
OLT DBA an	l LLID Bandwidth C	onfiguration-172.16	. 21. 147-Epon		
)BA Global Attrib	ute				
BA Mode Hv	brid DBA	Cycle Time(	TQ)	Set	
		Discovery Fr	equency 128	Refresh	
BA Algorithm NO	WORKCONSERV				
		Discovery Til	me(TQ) 14000 Bai	andwidth	
Bandwidth				Spiner K	
Up Bandwidth				EPON9/2	
Name	ifIndex	Peak Bandwidth	Guaranteed Bandwi Fixed Band	dwidth	
root     FOR PSG9/1     FON9/5					
🎒 root ⊕-œ PSG9/1					
🎒 root ⊕-œ PSG9/1	; ;				
	; ;	Peak Bandwidth	Guaranteed Bandwi Fixed Band	9/5:1	
froot     i	ih ifindex			9/5:1	

Click Bandwidth. A page appears, as shown in the following figure:

Select a leaf node of the tree in the figure above and click **Edit**. A page appears, as shown in the following figure:

🧠 🙀 🖸 🔍 🧔 - ]	
	7
🔽 OLT DBA and LLID Bandwidth Configuration-172.16.21.147-Epon	
DBA Global Attribute DBA Mode Hybrid DBA Cycle Time(TQ) Discovery Frequency DBA Algorithm NORMORECONSERV Discovery Time(TQ) 14000 Bandwidth Comment	
Bandwidth	
Up Bandwidth       LLID Up Bandwidth Iodify       EPON9/2         Name       ifindex       name       PS09/1:2         root       PS09/1       Peak Bandwidth       100000         PS09/1:3       35       Guaranteed Bandwidth       0         Fixed Bandwidth       0       9/5:1	
Down Bandwidth Set Cancel	
Name ifIndex Bandwi Fixed Bandwidth Toot Toot Toot Toot Toot Toot Toot To	
Finished.	

You can modify the peak bandwidth, the certified bandwidth and the fixed bandwidth in the figure above. The fixed bandwidth, however, cannot be modified if the DBA mode is hardware DBA.

Click **Set** after modification. If the modification is successful, the above-mentioned page will be closed. Click **Cancel**. The entered value is invalid and the bandwidth cannot be set. The above-mentioned page will be closed.

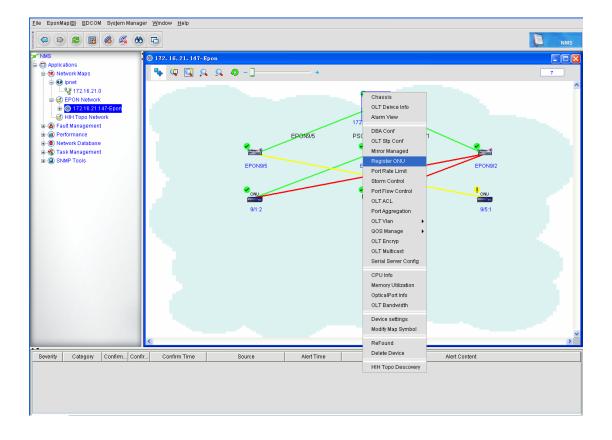
#### 5.3.6 ONU Registration

To make EPON work better, or manage ONU securely, ONU registration or deregistration is added to the EPON system. Only those ONUs that are authenticated by the port successfully can work normally.

EPON supports three ONU authentication modes: physical ID authentication, logical ID authentication and hybrid authentication.

The ONU registration is shown below:

Right click the OLT icon on which ONU will be registered, and then click
 Register ONU. The OUN registration page appears, as shown in the following figure:

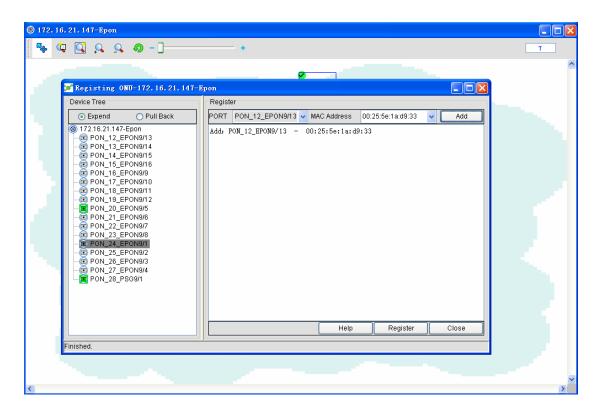


◎ 172.16.21.147-Epon		
🔩 🗘 🖸 🔍 🤦 🔊 - ]	+	7
	<b>9</b>	<u>~</u>
Registing ONU-172.16.21.147-E		
Device Tree	Register	
⊙ Expend         ○ Pull Back           @ 172.16.21.147-Epon         -           @ PON_12_EPON9/13         -           @ PON_12_EPON9/14         -           @ PON_14_EPON9/14         -           @ PON_15_EPON9/16         -           @ PON_16_EPON9/16         -           @ PON_17_EPON9/16         -           @ PON_17_EPON9/11         -           @ PON_17_EPON9/16         -           @ PON_17_EPON9/16         -           @ PON_18_EPON9/11         -           @ PON_20_EPON9/15         -           @ PON_21_EPON9/16         -           @ PON_22_EPON9/17         -           @ PON_23_EPON9/18         -           @ PON_25_EPON9/2         -           @ PON_26_EPON9/3         -           @ PON_28_PS09/1         -	PORT PON_12_EPON9/13 V MAC Address Add	
Finished.		
		×

In the ONU registration bar, select the to-be-registered OLT port and edit the MAC address of the to-be-registered ONU in the ONU MAC text box. After edition, click Add.

🔩 🗘 🞑 🔉 🤦 🔊 - ]	+	7
	Ø	^
💓 Registing ONU-172.16.21.147-1	Épon 📃 🗌 🔀	
Device Tree	Register	
⊙ Expend O Pull Back	PORT PON_12_EPON9/13 V MAC Address 00:25:5e:1a:d9:33 V Add	
<ul> <li>172.16.21.147-Epon</li> <li>PON_13_EPON9/13</li> <li>PON_13_EPON9/14</li> <li>PON_14_EPON9/15</li> <li>PON_15_EPON9/16</li> <li>PON_16_EPON9/16</li> <li>PON_17_EPON9/10</li> <li>PON_19_EPON9/11</li> <li>PON_19_EPON9/12</li> <li>PON_21_EPON9/6</li> <li>PON_21_EPON9/6</li> <li>PON_22_EPON9/7</li> <li>PON_23_EPON9/8</li> <li>PON_24_EPON9/11</li> <li>PON_25_EPON9/12</li> <li>PON_26_EPON9/2</li> <li>PON_27_EPON9/4</li> <li>PON_28_PS09/11</li> </ul>	Help Register Close	
[]	Heip Register Close	
Finished.		
<		>

The system prints and exports the MAC address of the to-be-added ONU to the following edition window. See the following figure:



Note: ONU registration supports multiple ONU registration on one port or on different ports.

Click Execute to register ONU. In this case the system will return the MAC addresses of unregistered ONUs back to the null window; if all registrations are successful, the null window will show that ONU registration is done.

<u>F</u> ile EponMa	p( <u>B)</u> <u>B</u> DCOM Sys <u>t</u> em Manager <u>W</u> indow	Help			
	2 🖪 🚳 🏂 66 🕞				NMS
MMS	3 172.16	. 21. 147-Epon			
🗄 🗇 Applica 🚊 🛞 Net	tions work Maps	QQQ			8
÷ 😢 i	ppet				
	· · · · · · · · · · · · · · · · · · ·				
<u>⊨</u> -⊛ <u>⊨</u> -	8	Register			
- <u>3</u>	H CExpend C Full Back	PORT PON_12_EPON9/13 V MAC AC		3 V Add	
🕀 🛞 Fau	PUN_12_EPUN9/13	Add: PON_12_EPON9/13 - 00:25:5 After trap received and system r		rod OWI will dign	
e-@ Perf ≘-® Net		Arter trap received and system r	erounded, New registe	PSG9/1	
🕀 💰 Tas	R PON_14_EPON9/15				Galitane-K
🗄 🚇 SNM	PUN_I6_EPUN9/9				EPON9/2
	0 PON_21_EPON9/6			ONU From 3	
				9/13:1	
	PON_24_EPON9/1 PON_25_EPON9/2				
	@ PON_26_EPON9/3				
		• • • • • • • • • • • • • • • • • • •		>	
			Help Register	Close	
	Finished.				
					~
	۲.				>
Severity	Category Confirm Confir Confi	rm Time Source	Alert Time	Alert Conter	t

The ONU deregistration is shown below:

 Select a to-be-deregistered ONU in the device tree node on the left of the ONU registration window and right click it. The following dialog box appears: The deregistered ONU will disconnect OLT and this ONU icon will be

deleted from the topology. If you want to manage this ONU again, you need registering it again.

© 172.16.21.147-Epon		
🍕 🗘 🔍 🔍 🔍 🥠 - ]	+	8
Registing ONU-172.16.21.147-E Device Tree		
Expend     O     Pull Back	Register         PORT         PON_12_EPON9/13         MAC Address         Add	
© 172.16.21.147-Epon □ PON_12_EPON9/13 □ PON_13_EPO □ PON_14_EPON9/15 □ PON_15_EPON9/16 □ PON_15_EPON9/16 □ PON_15_EPON9/10 □ PON_18_EPON9/10 □ PON_18_EPON9/11 □ PON_20_EPON9/5 □ PON_22_EPON9/6 □ PON_23_EPON9/6 □ PON_23_EPON9/8 □ PON_24_EPON9/1 □ PON_26_EPON9/1 □ PON_26_EPON9/3 □ PON_27_EPON9/4 □ PON_28_PSO8/1		u N9/2 3:1
	Help Register Close	
Finished.		×
		106

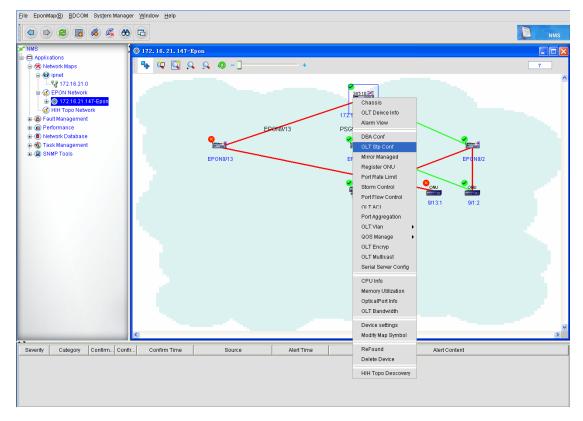
## 5.3.7 OLT STP Settings

Spanning-Tree Protocol (STP), defined in IEEE 802.1D, simplifies a LAN topology, which consists of several bridges, into a single spanning-tree, preventing network loopback and guaranteeing the stable operation of the network.

This section shows how to set OLT STP through NMS.

The detailed procedure is shown below:

 Open NMS and enter the EPON network topology. Select an OLT icon and right click it. See the following figure:



• Select **STP settings**. The STP settings page appears.

💓 STP Glo	bal /	lttri	.but e-172.	16.21.147	-Epon						
OLT-STP											
Specification	ı	3		StpMaxAge		20					
Priority		32768			HelloTime		2				
TopologyCh	ange	0 hours, 0 minutes, 0 seconds.				HoldTime 30					
TopChange	s	0				ForwardDelay 15					
Designated	Root	80:00	):00:e0:0f:8e:9	I1:b8		BridgeMaxAge 2					
Root Path C	Root Path Cost 0			BridgeHelloTime 2		2					
StpRootPort		0				BridgeForwardDelay 15					
FPORT STP C	ONF-										
Port	Prior	ity	Status	Enable	Path Cost	Designat	Bridge F	P	Designat	Designat	Forward
50	128		1	2	200000	00:00:00:0	0	0	0:00:00:0 0	)	0
*			[	Help	Refresh	Set	Clos	se	]		
Finished.											

The options that the administrator can execute include:

Priority of global STP attributes, BridgeMaxAge, BridgeHelloTime, ForwardDelay, STP settings of a port on OLT. The value of **BridgeMaxAge** ranges between 6 and 40. The configuration of the **MaxAgeTime** of spanning tree decides the maximum lifetime of packets in the spanning tree when a switch is used as a root.

**BridgeHelloTime** ranges between 1 and 10. The configuration of **HelloTime** of spanning tree decides the packet transmission interval when the related switch works as a root.

**ForwardDelay** ranges between 4 and 30. The configuration of **Forward Delay Time** of spanning tree decides the switch's status switchover interval when the related switch works as a root.

When the administrator sets the above-mentioned parameters, the system will automatically identify their values. For those exceeded values, the system will automatically delete the data in the text box.

• After related data is configured, you shall click **Set**. The configuration of global STP attributes is then finished.

STP settings of the OLT port: If you right click the port attribute list, you can get a detailed configuration menu. See the following figure:

• Select **STP settings**. The STP settings page appears.

The system supports to set the port's priority and the port's path cost. The port's path cost ranges between 1 and 65535.

• After configuration, click **Execute**. The **Default** button is used to resume the port's attributes to their original values.

# 5.3.8 Access Control List

The Access Control List (ACL) is a list of instructions of routers and switch's interfaces and is used to control the incoming and outgoing packets on interfaces.

This section gives a detailed description of the operations of the ACL module in the NMS.

ACLs have two types:

- ◆ IP ACL
- ♦ MAC ACL

The ACL has the following operations:

- Configuring ACL (IP ACL, MAC ACL)
- Creating ACL
- Setting the configuration rules for ACL
- ♦ Applying ACL
  - Distributing ACL to the PON port
  - Distributing ACL to the LLID of ONU
  - Distributing ACL to ONU

To create an ACL, you have to open the corresponding ACL window. Then you have to open the ACL configuration and application window by clicking **OLT -> ACL management**. See the following figure:

💓 Acl C	Acl Config And Apply-172.16.21.147-Epon								
IP ACL	IP ACL MAC ACL								
	IP ACL PON Port Config(IP ACL) List								
Acis						Port	ingress	egress	
ACLIN	Name	Rule Count	Rule Type	Rule Mergi	Current Sta	EPON8/9			
а		1	Standard Rul	e No	Yes	EPON8/10			
						EPON8/11			
						EPON8/12			
						EPON8/13			
						EPON8/14			
						EPON8/15			
						EPON8/16			
				CreateAcl	AddRule	EPON8/1			
				CreateAct	Addred	EPON8/2			
⊢AddRule						EPON8/3			
						EPON8/4			
Action		Deny			×	EPON8/5			
Mode			() IP RAM	IGE 💿 Any		EPON8/6			
_						EPON8/7			
Source	e IP	0	. 0	. 0	. 0	EPON8/8			
Source	e Mask	0	. 0	. 0	. 0				
Begin I	IP	0	. 0	. 0	. 0				
End IP		0	. 0	. 0	. 0				
log									
				Cancel	ок				
							CfnPc	n Delete	
					)()	· ][		]	
				Help	Refresh	Close			
Finished.									

### 5.3.8.1 Creating IP ACL

Select the **IP ACL** option and then click **Create an item**. An ACL item can be created. In a window appearing later, enter an ACL name.

After an ALC item is created, the ACL item will be added to the ACL configuration and application window. The number of regulations, however, is still zero. You can add here the regulations of the opposite type. The operation procedure is shown below:

1. Select an ACL item to which you will add regulations. Then the **Add regulations** button avails automatically.

2. Click **Add regulations**. You can then set regulations in the **Add regulations** bar. After setting the regulations you can click **OK**. See the following figure:

CL MAC A						IP ACL	PON Port Config(I		
Io						IF ACE			
ls							Port	ingress	egress
ACL Name	Rule Cou			Rule Mergi.		urrent Sta	EPON8/9		
	1	Standa	rd Rule N	0	Yes	3	EPON8/10		
							EPON8/11		
							EPON8/12		
							EPON8/13		
							EPON8/14		
							EPON8/15		
							EPON8/16		
				CreateAcl	٦٣	AddRule	EPON8/1		
							EPON8/2		
dRule							EPON8/3		
ction	Deny					~	EPON8/4		
cuon	Deny						EPON8/5		
lode	O IP	0	P RANGE	💿 Any	(		EPON8/6 EPON8/7		
ource IP	0	. (	) .	0		0	EPON8/7 EPON8/8		
ource Mask	0	. (	) .	0		0			I
legin IP	0	. (	) .	0	•	0			
nd IP	0	. (	) .	0		0			
og									
			Г	Cancel		ок			
								CfnPc	on Delete

Parameter description

Action: Deny and Permit When you choose **Deny**, it means the current ACL will be rejected. When you choose **Permit**, it means the current ACL is allowed.

For detailed operations about MAC ACL creation and its regulation, refer to the description of the operations of IP ACL.

## 5.3.8.2 Browsing and operating IPACL

• Browsing IP ACL and deleting ACL regulations

Right click an ACL item and then choose the **Detailed info** button. The regulations of the current ACL are shown. It is to be noted that if the number of regulations is 0 the system will automatically give notice and not show related information.

The following figure shows the ACL detailed information window.

)etail Info ACL Info		Info-172. 1				Samuel II			
Acl Name Seq No	a Action	AcITy Source IP	Mask	dard Rule 👻 BeginlP	ACL Rules ( EndIP	Count 1	Any	Rule Merge log	Current St
	Deny	0.0.0.0		0.0.0.0	0.0.0.0	Mask	Any	Disable	Disable

The administrator can choose the to-be-browsed ACL regulations from the **Item name** dropdown menu in the ACL information bar. The system will download a corresponding regulation according to the chosen ACL item name.

If you choose a regulation, the **Cancel regulation** button automatically avails. Click it and then the regulation is canceled.

• Canceling ACL

Click Cancel ACL in the right-key menu of the ACL. The chosen ACL items will be deleted.

## 5.3.8.3 Applying IPACL

Applying IP ACL means to distribute the created IP ACLs to the PON port, realizing the filtration function. The ACL configuration area of the PON port in the ACL configuration and application window is shown in the following figure:

💓 Acl Config	🖬 Acl Config And Apply-172.16.21.147-Epon							
IP ACL MAC AG	IP ACL MAC ACL							
				IP ACL	PON Port Config(I	IP ACL) List		
Acis					Port	ingress	egress	
ACL Name	Rule Count	Rule Type	Rule Mergi	Current Sta	EPON8/9			
а	1	Standard Rul	e No	Yes	EPON8/10			
					EPON8/11			
					EPON8/12			
					EPON8/13			
					EPON8/14			
					EPON8/15			
					EPON8/16			
			CreateAcl	AddRule	EPON8/1			
			CleateAct	Addrale	EPON8/2			
AddRule					EPON8/3			
	-				EPON8/4			
Action	Deny			*	EPON8/5			
Mode		O IP RAM	IGE 💿 Any		EPON8/6			
Source IP		_			EPON8/7			
Source IP	0	. 0	. 0 .	. 0	EPON8/8			
Source Mask	0	. 0	. 0 .	. 0				
Begin IP	0	. 0	. 0 .	. 0				
End IP	0	. 0	. 0 .	. 0				
log								
			Cancel	ок	<b> </b>			
						CfnPo	n Delete	
			Help	Refresh	Close			
, Finished.								

The operations about the PON port's settings are shown below:

• Configuration

Configuration here means to set ACL on the ingress or egress PON port. If you choose a to-be-configured PON port, the **Set** button automatically avails. See the following figure: Ingress: stands for the ingress ACL.

Egress: stands for the egress ACL.

							IP ACL	PON Port Config(I	P ACL) List	
cls							22	Port	ingress	egress
ACL Name	Rule Count	F	Rule Typ	e	Rule Merg	1	Current Sta	EPON8/9		
ì	1	Sta	ndard R	ule N	0	Ye	es	EPON8/10		
								EPON8/11		
								EPON8/12		
								EPON8/13		
								EPON8/14		
	Port Confi	g-17	2.16.	21.1	47-Epon			EPON8/15	a	
	CfnPon							EPON8/16		
		-					i	EPON8/1		
	Port	EPC	)N8/15					EPON8/2		
ddRule	🔽 Ingress	а					× 6	EPON8/3		
A	Egress	Ple	ase Sele	ect			~	EPON8/4		
Action		1.10						EPON8/5		
Mode			OK		Close			EPON8/6		
Source IP	Finished.					-		EPON8/7	1	
Source in								EPON8/8		
Source Mask	0	84	0	<u>_</u>	0	80) 1	0			
Begin IP	0	8	0	10	0	10	0			
End IP	0		0		0		0			
log										
					Cancel		OK	-		
									CfnPc	n Delete

### • Delete

The operation means to delete the ingress or egress ACL items on the PON port. See the following figure:

💓 Acl Config	🖬 Acl Config And Apply-172.16.21.147-Epon								
IP ACL MAC AG	IP ACL MAC ACL								
	IP ACL OP PON Port Config(IP ACL) List								
_Acls					Port	ingress	egress		
ACL Name	Rule Count	Rule Type	Rule Mergi	Current Sta	EPON8/9				
a	1	Standard Rul	le No	Yes	EPON8/10				
					EPON8/11				
					EPON8/12				
					EPON8/13				
					EPON8/14				
					EPON8/15	а			
					EPON8/16				
					EPON8/1				
			CreateAcl	AddRule	EPON8/2				
AddRule					EPON8/3				
					EPON8/4				
Action	Deny			~	EPON8/5				
Mode		O IP RAM	NGE (i) Any		EPON8/6				
					EPON8/7				
Source IP	0	. 0	. 0 .	. 0	EPON8/8				
Source Mask	0	. 0	. 0 .	. 0					
Begin IP	0	. 0	. 0 .	. 0					
End IP	0	. 0	. 0 .	. 0					
log									
log									
			Cancel	ок					
			Caliber			CfnPo	n Delete		
			Help	Refresh	Close				
Finished.									

IPACL       IPACL       IPACL       PON Port Config(IPACL) List         Acls       Pont       ingress       egress         Acls       Image: Standard Rule Type       Rule Mergi Current Sta       Pont       ingress       egress         Image: Standard Rule No       Yes       Pont       ingress       egress         Image: Standard Rule No       Yes       Pont       Image: Standard Rule No       Pont       Image: Standard Rule No         Image: Standard Rule No       Yes       Pont       Image: Standard Rule No       Pont       Image: Standard Rule No       Pont       Image: Standard Rule No       Image: Standard Rule No       Pont       Image: Standard Rule No       Pont       Image: Standard Rule No       Image: Sta	🗾 Acl Config	Acl Config And Apply-172.16.21.147-Epon									
Acts       Port       ingress       egress         a       1       Standard Rule No       Yes         a       1       Standard Rule No       Yes         PON8/10       EPON8/10       EPON8/11         EPON8/13       EPON8/13       EPON8/13         EPON8/14       EPON8/14       EPON8/14         EPON8/16       EPON8/16       EPON8/16         EPON8/17       EPON8/2       EPON8/2         EPON8/3       EPON8/3       EPON8/3         E	IP ACL MAC A	CL									
ACL Name       Rule Count       Rule Type       Rule Mergi       Current Sta         a       1       Standard Rule       Yes         EPON8/10       EPON8/10       EPON8/11         EPON8/11       EPON8/12       EPON8/13         EPON8/13       EPON8/14       EPON8/14         EPON8/14       EPON8/15       EPON8/16         EPON8/15       EPON8/16       EPON8/16         EPON8/16       EPON8/16       EPON8/16         EPON8/17       EPON8/16       EPON8/16         EPON8/16       EPON8/16       EPON8/16         EPON8/16       EPON8/16       EPON8/16         EPON8/16       EPON8/16       EPON8/16         EPON8/17       EPON8/16       EPON8/16         EPON8/16       EPON8/16       EPON8/16         EPON8/17       EPON8/16       EPON8/16         EPON8/17       EPON8/16       EPON8/16         EPON8/17       EPON8/16       EPON8/16         EPON8/17       EPON8/17       EPON8/16         EPON8/17       EPON8/17       EPON8/16         EPON8/18       O       O       O         Source IP       0       0       O         Ing       0								IP ACL	PON Port Config(	IP ACL) List	
a       1       Standard Rule No       Yes         a       1       Standard Rule No       Yes         EPON8/10       Image: Standard Rule No       Yes         EPON8/11       Image: Standard Rule No       Image: Standard Rule No         CreateAcl       AddRule       Image: Standard Rule No         AddRule       CreateAcl       AddRule         AddRule       Image: Standard Rule No       Image: Standard Rule No         AddRule       Image: Standard Rule No       Image: Standard Rule No         AddRule       Image: Standard Rule No       Image: Standard Rule No         AddRule       Image: Standard Rule No       Image: Standard Rule No         AddRule       Image: Standard Rule No       Image: Standard Rule No         AddRule       Image: Standard Rule No       Image: Standard Rule No         AddRule       Image: Standard Rule No       Image: Standard Rule No         Mode       IP       Image: Standard Rule No       Image: Standard Rule No         Source IP       0       0       0       Image: Standard Rule No         Source Mask       0       0       0       Image: Standard Rule No         Ing       Image: Standard Rule No       Image: Standard Rule No       Image: Standard Rule No	Acis								Port	ingress	egress
AddRule         AddRule         AddRule         AddRule         AddRule         Source IP       0         0       0         Begin IP       0         0       0         Ing	ACL Name	Rule Cou	int	Rule Typ	e I	Rule Mergi.		Current Sta	EPON8/9		
AddRule       EPON8/12       Image: CreateAcl         AddRule       EPON8/14       Image: CreateAcl         AddRule       EPON8/16       Image: CreateAcl         AddRule       Image: CreateAcl       AddRule         Source IP       0       0       0         Source Mask       0       0       0         Begin IP       0       0       0         Ing       Image: Create OK       Image: CreateAcl       Image: CreateAcl	а	1	Sta	indard Ri	ule Ni	0	Y	/es	EPON8/10		
AddRule       EPON8/13       EPON8/13         AddRule       EPON8/16       EPON8/16         AddRule       EPON8/16       EPON8/1         Action       Deny       PON8/2       EPON8/3         Mode       IP       IP RANGE       Any         Source IP       0       0       0         Source Mask       0       0       0         Begin IP       0       0       0         Iog       I       Cancel       OK									EPON8/11		
AddRule       EPON8/14       EPON8/16         AddRule       EPON8/16       EPON8/16         AddRule       EPON8/2       EPON8/3         Action       Deny       PON8/3       EPON8/3         Mode       IP       IP RANGE       Any         Source IP       0       0       0         Source Mask       0       0       0         End IP       0       0       0         Iog       Cancel       OK       OK									EPON8/12		
AddRule       CreateAcl       AddRule         AddRule       AddRule       EPON8/16         Action       Deny       Image: Control of the second s									EPON8/13		
AddRule         AddRule         Addown         Action       Deny         Mode       IP         IP       IP         Source IP       0         0       0         Begin IP       0         0       0         Indiana         CreateAcl         AddRule									EPON8/14		
CreateAcl       AddRule         AddRule       PON8/1         Action       Deny         Mode       IP         IP       IP RANGE         Source IP       0         0       0         Source Mask       0         0       0         End IP       0         IP       O         Cancel       OK									EPON8/15		
AddRule       AddRule       EPON8/2       EPON8/3         Action       Deny       IP       IP RANGE       Any         Source IP       0       0       0       EPON8/5         Source Mask       0       0       0       EPON8/6         End IP       0       0       0       0         Iog       Cancel       OK       OK       OK									EPON8/16		
AddRule         Action       Deny         Mode       IP       IP RANGE       Any         Source IP       0       0       0         Source Mask       0       0       0         Begin IP       0       0       0         Indiana       0       0       0         Cancel       OK       OK       OK						Ownerster Bart	ור	AddBuda	EPON8/1		
Addriftie       EPON8/4       EPON8/5         Mode       IP       IP RANGE       Any         Source IP       0       0       0       0         Source Mask       0       0       0       0         Begin IP       0       0       0       0         Iog       Cancel       OK       OK						CreateAct			EPON8/2		
Action       Deny       IP       IP RANCE • Any       IP       IP RANCE • Any         Source IP       0       0       0       0       IP       IP RANCE • Any         Source Mask       0       0       0       0       IP       IP RANCE • Any       IP         Begin IP       0       0       0       0       IP       IP RANCE • Any       IP         Indiana       0       0       0       0       IP	-AddRule-								EPON8/3		
Mode       IP       IP RANGE       Any         Source IP       0       0       0       0         Source Mask       0       0       0       0         Begin IP       0       0       0       0         Indiana       0 <t< th=""><th>Additione</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>EPON8/4</th><th></th><th></th></t<>	Additione								EPON8/4		
Mode         Or Provide         Or Provide <th>Action</th> <th>Deny</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>~</th> <th>EPON8/5</th> <th></th> <th></th>	Action	Deny						~	EPON8/5		
Source IP       0       0       0       0       0       10         Source Mask       0       0       0       0       10       EPON8/7       EPON8/7         Begin IP       0       0       0       0       0       0       10         End IP       0       0       0       0       0       10       10         log	Mode					(i) Anv			EPON8/6		
Source Mask         0         0         0         0         0           Begin IP         0         0         0         0         0           End IP         0         0         0         0         0           log				0		0,			EPON8/7		
Begin IP     0     0     0       End IP     0     0     0       log	Source IP	0		0		0		0	EPON8/8		
End IP 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0 . 0	Source Mask	0		0		0		0			
log Cancel OK	Begin IP	0		0		0		0			
log Cancel OK	End IP	0		0		0		0			
Cancel OK	1										
	log										
						Cancel				ComBr	on Delete
										CIIIFO	
Help Refresh Close						Help	][	Refresh	Close		
Finished.	Finished.										

## 5.3.9 QoS Management

Generally, the device always works in Best-Effort served mode. In this mode, the device treats all flows equally and tries its best to deliver all flows. Under this circumstance, if congestion occurs, all flows have the same possibility to be dropped. However, different flows in an actual network have different importance. The QoS function of the device provides different services to different flows according to their importance, so those relatively important flows can get relatively good service.

As to classify the importance of flows, there are two main ways on the current network:

- The tag in the 802.1Q frame header has two bytes and 3 bits are used to present the priority of the packet. There are 8 priorities, among which 0 means the lowest priority and 7 means the highest priority.
- The DSCP field in IP header of the IP packet uses the bottom 6 bits in the TOS domain of the IP header.

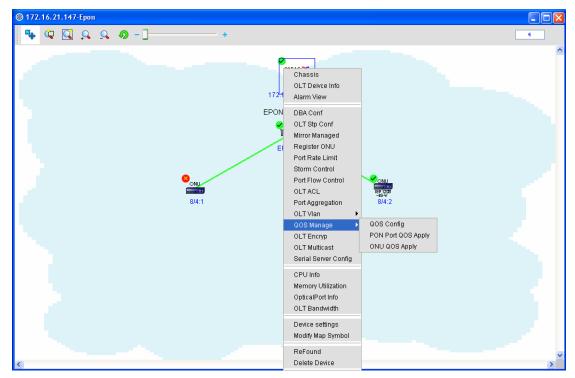
You can also set a device in a network to make it process those special packets specially. The special treatment of special packets is called as a one-hop behaviour.

The QoS function of the device enables the limited bandwidth to be used effectively, improving the performance of the entire network greatly.

QoS management includes QoS settings, QoS application on the PON port and ONU QoS application.

### 5.3.9.1 QoS settings

Right click the to-be-configured OLT icon. The right-key menu appears, as shown in the following figure:



📕 Qos Configuration-172.16.21.147-Epon	
Priority Queue Mapping         1 . 2 . 3 . 4 . 5 . 6 . 7 . 3         Scheduling Policy         SP           WRR Scheduling Queue         12 . 12 . 12 . 12 . 12 . 12 . 12 . 12         OK         Refresh	
GoS Policy Table	
Policy Name QoS Flow QoS Action	
SS Any Forward	
Help       Policy Create       Policy Delete       Flow Config       Refrest	h
Finished.	

Click **QoS management -> QoS settings**. A page appears, as shown in the following figure:

- The global attributes of QoS settings are shown in the figure above:
- Priority queue map

To configure the QoS priority queue is to map 8 IEEE802.1p-defined QoS CoS values to the priority queues of OLT. This type of OLTs have 8 priority queues. OLT adopts a corresponding schedule policy for a different queue, realizing QoS.

In global mode, configuring the CoS priority queue will affect the CoS priority queue maps of all ports. When a priority queue is configured on a L2 port, the priority queue will be used on this L2 port; if not, please use the global configuration.

Note: The CoS value ranges between 0 and 7, including 0 and 7.

Default CoS values

If a port receives a data frame without tag, OLT will add a default CoS priority to the data frame. Configuring a default global CoS value is to set the default CoS of the untagged data frame to a designated value.

This OLT only supports the default global CoS. When all ports receive the untagged data frame, they will add a same CoS value for this frame.

#### Schedule policy

There are four kinds of schedule policies: SP (Strict Priority) WRR (Weighted Round Robin) SP+WRR SP-EXOAM (Strict Priority Exclude OAM)

WRR

The bandwidth of priority queue means the bandwidth distribution ratio of each priority queue, which is set when the schedule policy of the CoS priority queue is set to WRR. Note: The bandwidth value ranges between 1 and 255, including 1 and 255.

After the above-mentioned values are set, please click **OK** to distribute the values to related devices.

- The bottom part of the following figure is the QoS policy settings:
- Creating a policy

Click Create a policy, the following figure appears:

🔎 Qos Configuration-172.16.21.1	147-Epon	
Priority Queue Mapping         1 . 2 . 3 . 4 . 5           WRR Scheduling Queue         12 12 12 12 12 12		SP V
QoS Policy Table		
Policy Name	QoS Flow	QoS Action
SS	Any	Forward
	Policy Name OK Cancel	
Help Policy Creat	e Policy Delete Flow Config	Action Config Refresh

Enter a policy name and then click **OK** to create a policy.

Setting flows Choose one policy and then click Flow settings. See the following figure:

	· 3 · 4 · 5 · 6 · 7 · 8	Scheduling Policy	SP OK	Refresh
ioS Policy Table	Classfiy Configuration	-172. 16. 21. 147-	🔀	
Policy Name	Policy Name	55		QoS Action
3	Matching any package	YES	-	
	Matching conditions			
	IP ACL Table		*	
	Diffserv field in IP packets			
	MAC ACL Table		*	
	VLAN ID			
	cos			
	Ethernet Type			
	Execute	Refresh Ca	ancel	
Help	Policy Create Policy Delete	Flow Config	Action	Config Refresh

In the following dialog box, set the data flow which matches up with the above-mentioned policy. See the following figure:

Classfiy Configuration-	172. 16. 21. 147 🔀
Policy Name	22
Matching any package	YES
Matching conditions	
IP ACL Table	· · · · · · · · · · · · · · · · · · ·
Diffserv field in IP packets	
MAC ACL Table	×
VLAN ID	
COS	
Ethernet Type	
Execute	Refresh Cancel

If you select **Yes** in the **Match any packet** dropdown list box, any data packet will be matched by default.

If you select **No** in the **Match any packet** dropdown list box, you shall then set the matchup conditions.

#### Setting actions

Choose one policy and then click **Action settings**. A dialog box appears, on which you can set to forward or drop data flows.See the following figure:

Action Configuration-	172.16.21.147 🔀
Policy Name	SS
Package Forwarding/Discard	Forwarding 🛛 🔽
COS	
Diffserv field in IP packets	
🔲 Outer VLAN tag	Modify 🗸
Execute	Refresh Cancel

#### Deleting policies

Choose one policy and then click **Cancel a policy**. A confirmation dialog box appears for to confirm whether to cancel the chosen policy.

#### 5.3.9.2 Applying QoS on the PON port

You can apply the QoS policies on a specific port. But this application is flexible and you can apply multiple policies on a same port or a policy on multiple ports. If two or more policies are applied on a same port, the firstly applied policy has the highest priority and the latter ones have the low priority.

Right click OLT and in the right-key menu select **QoS management** and then **Apply QoS on the PON port**. See the following figure:

© 172.16.21.147-Epon	
🥵 🔍 🔍 🗛 🗛 🔊 - 🕽 — — — +	4
EPON 8/4:1	Alarm View DBA Conf OLT Stp Conf

After Apply QoS on the PON port is clicked, the following window appears:

6 Apply-172.16.21.147-Epon	E
ort No Port Description Policy Name Ing	gress/Egress
Help Add Delete	Refresh
	Refresh
Help Add Delete	Refres

5 11 ,	6.6	
Port QoS Apply-	172.16.21.147-Epon	×
Port No	EPON8/9	-
Policy Name	ss	-
Ingress/Egress	ingress	-
(	Apply Cancel	

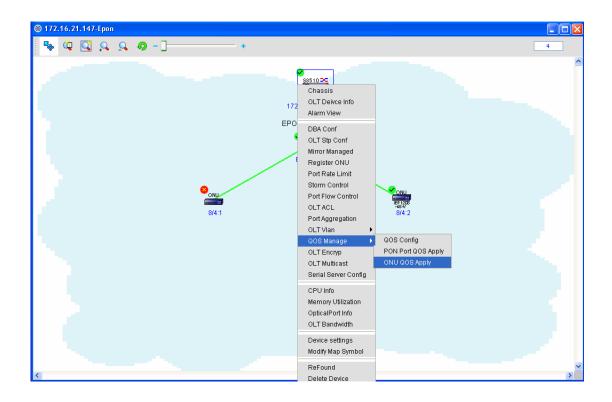
Click Add. A dialog box appears, as shown in the following figure:

Select a PON port and a corresponding policy name, and then click **Apply** to apply this policy on the PON port.

## 5.3.9.3 Applying QoS on ONU

You can set the QoS of ONU through one of the following two methods:

Right click OLT and in the right-key menu select **QoS management** and then **Apply QoS on ONU**. See the following figure: See the following figure:



QOS Apply-172.16	.21.147-Epon	
ONU Port	Port Description	Policy Name
	Help Add	Delete Refres
rent value.		

Click Add. A QoS policy is added on ONU.

2. Select the **ONU** icon on the topology and choose **Apply QoS** on the right-key menu.See the following figure:

ONU QOS Apply-172.16.2	1.147-Epon	×
ONU Port	Port Description	Policy Name
ONUF	OS Apply-172.16.21.147-E	pon 🔀
Finished.	Help Add	Delete Refresh

### **5.3.10** Saving the Settings

To save the settings means to save all the current OLT settings, and the saved settings will remain all the same even after rebooting. If the current OLT settings is not saved, all settings will be gone after rebooting.

### **5.3.11** Attribute Settings

The detailed procedure is as follows:

Right click OLT and then choose Set attributes. See the following figure:

© 172.16.21.147-Epon	
🎭 🕼 🖸 🔉 🤗 – ] +	4
EPON B/4:1	Mirror Managed Register ONU
	CPU Info Memory Utilization OpticalPort Info OLT Bandwidth
	Device settings Modify Map Symbol
	ReFound Delete Device
<	UIU Topo Doctovov

After Set attributes is clicked, a window appears, as shown in the following figure:

🔎 Device setting	gs-172.16.21.147-Epon	
Device settings		
🖳 SNMP Attribu	te 裪 Telnet Authen Properties Setting 🍓 Other settings	
Read Commu	bdcom	
Write Commu	bdcom	
SNMP Port	161	
SNMP Version	v2	<b>~</b>
	Refresh Set (	Close
Finished.		

# **5.3.12 Distance Measurement of ONU**

OUN distance measurement means to test the distance between the PON port and each downlink ONUs of the current OLT.Right click OLT on the topology and select **Basic Info**, as

I 172.16.21.147-Epon	
🗣 🕼 🔍 🔉 🥠 – 🕽 — — – +	4
1724 EPON B/4:1	Chassis OLT Deivce Info Alarm View DBA Conf OLT Stp Conf Mirror Managed Register ONU Port Rate Limit Storm Control Port Flow Control OLT AcL Port Agregation OLT Vian OLT Vian OLT Vian OLT Vian Strial Server Config CPU Info Memory Utilization OpticalPort Info OLT Bandwidth Device settings Modify Map Symbol ReFound Delete Device
<	

shown in the following figure:

After the **Basic Info** is clicked, a window appears, as shown in the following figure. In this window, select the **ONU distance measurement** tab.

CLT Deivce Info-172.16.21.147-Epon					
COLT Deivce Info					
OLT Chip Infomation 🏼 ONU Distance 📗 🤇	DLT Card Info				
ONU Name	Distance(Meter)				
8/4:1	0 (ONU status:deregistered)				
8/4:2	280 (ONU status:auto_config)				
	Refresh				
Succeed.					

# **5.3.13 Browsing Alarms**

Browsing OLT alarms includes browsing the current alarms and the past alarms. The current

172.16.21.147-Epon 🎭 🗘 🕰 🔍 🔍 🥠 - ] ÷ Chassis OLT Deivce Info 17 DBA Conf EPON OLT Stp Conf Mirror Managed Register ONU Port Rate Limit Storm Control Port Flow Control OLT ACL Port Aggregation OLT Vlan QOS Manage OLT Encryp OLT Multicast Serial Server Config CPU Info Memory Utilization OpticalPort Info OLT Bandwidth Device settings Modify Map Symbol ReFound Delete Device HIH Tono Descovery 📧 Alert-172.16.21.147-Epon × Current Alert Current Alert Time Alert Content Severity Category Hi story No current alert retrieved

alarms mean the ongoing alarms at present. The past alarm means the alarms that happended already. Right click OLT and then choose **Browse alarms**. See the following figure:

Click Past alarms. The following window appears:

🔎 Alert-172.1	16.21.147-Epon					
	History Alert					
Current	Search Items					
	Severity	ALL				
Hi story	Start Time	2012-06-	02 16:53:30	End Time	2012-06-04 16:53:27	Search
	Severity	<i>(</i>	Categ	gory	Alert Time	Alert Content
No history alert i	retrieved					

# 5.3.14 Link Aggregation

Link aggregation means to combine two or more data channels into a single channel, which shows as a logic link with larger bandwidth.Link aggregation is always used to connect one or multiple devices if they require a lot of bandwidth, such as the servers or server group in connection with the backbone network.

Link aggregation mainly realizes port aggregation on the network manager, that is, binding several physical ports, which are similar in their attributes, into a logic channel.

The operation procedure is shown below:

- 1. Open NMS.
- 2. Right click OLT.

© 172.16.21.147-Epon	
🎭 🕼 🖸 🔉 🔉 🧑 - ] +	4
EPONE B/4.1	DBA Conf OLT Stp Conf Mirror Managed Register ONU Port Rate Limit Storm Control OLT ACL Port Aggregation OLT ACL Port Aggregation OLT ACL Port Aggregation OLT Vian OLT Multicast Serial Server Config CPU Info Memory Utilization OpticalPort Info OLT Bandwidth Device settings
	Modify Map Symbol ReFound
<	Delete Device

3. Click Link aggregation. The following window appears:

Port Aggregator-172.16.21.147-Epon			
Logic Port	Logic Port Description	Physical Port Description	
3	Port-aggregator3		
Add	Config Delete	Refresh Help	
Finished			
Finished.			

4 Add a logic port and click **Add**. Then you have to enter the port ID and the aggregation. Note: the port ID cannot be duplicate and cannot surpass the allowable value range.

Port Aggregator-172.	16.21.147-Ep	oon	
Logic Port	Logic Port	Description	Physical Port Description
3	Port-aggregat	tor3	
Add ag	gregation po	rt	
Aggre	ation Port No		
Aggrei	gation Mode	static	Y ■ 1
	ОК	Cancel	]
Add	Config	Delete	Refresh Help
Finished.			

5. Select a logic port and click **Set** to set this logic port. To combine multiple physical ports into a logic port, select to-be-aggregated port IDs and then click **Execute**. If the physical ports you have chosen are already aggregated into a logic port, these physical ports, after **Execute** is clicked, will not belong to their previous logic port and be aggregated into a new logic port.

逻辑》	链路聚合端口配	置-172.16.21.73-Epon	×	口描述
1	逻辑端口号	1		(3,GigaEther
	物理端口	<ul> <li>☐ 1-GigaEthernet0/1</li> <li>☐ 2-GigaEthernet0/2</li> <li>☑ 3-GigaEthernet0/3</li> <li>☑ 4-GigaEthernet0/4</li> <li>☐ 5-GigaEthernet0/5</li> </ul>	<	
		执行 取消		关闭

6. Select a logic port and click **Cancel**. The logic port will be deleted.

Port Aggregator-1	72.16.21.147-Epon	
Logic Port	Logic Port Description	Physical Port Description
3	3 Port-aggregator3	
Delete ?	e aggregation port Are you sure to delete it? Yes <u>N</u> o	
Add	Config Delete	Refresh Help
Finished.		

## 5.3.15 Setting the Serial-Interface Server

OLT serial configuration of OLT includes the global session configuration and the attribute configuration of each serial interface.Right click OLT with the serial interface and select **Set the serial interface server**.

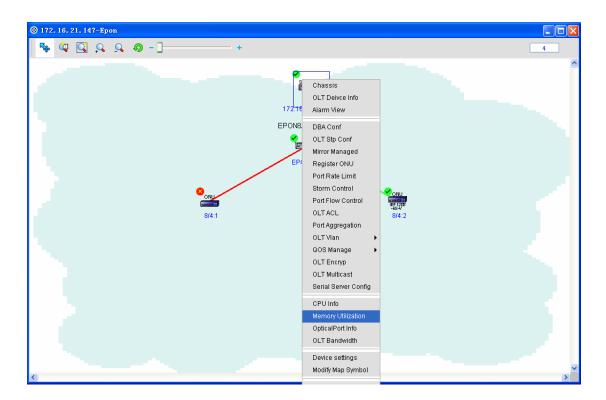
The above-mentioned figure shows the session configuration, which is effective to all serial interfaces.Click **Set serial interface**.

Click one row in the serial interface configuration list, that is, click some serial interface. The **Setup** button avails. Click **Setup**. A window for setting this serial interface appears.

## 5.3.16 Memory Usage

Open NMS.

Right click OLT and then the **Memory usage** option. The following figure appears. To set the polling interval, click **Draw map**. See the following figure:



🌌 Le	no	ry Utilization-172.16	5.21.147-Epon		
Real-	tim	e Performance Collection Hi	storical Performance Collectio	on	
	30				Data Information
	25				poll times 3 📫
(%)					
zatior	20				
Memory Utilization(%)	15				
mory	10				
Ā	5				
	0				
		06-05 14:08:19	06-05 14:08:24	06-05 14:08:29	
			Time(Seccond)		
		_	- Memory Utilization		Draw Close
Memo	ry U	tilization:29%			

History statistics: Click the **Historical Performance Statistics** tab and then choose conditions.Click **Draw map**.See the following figure:

🔎 Lemory Utilization-172.16.21.147-Epon	
Real-time Performance Collection Historical Performance Collection	
10	Data Information
09	Collection Mode:
€ 0.8 € 0.7	Sefore 24 hrs
(% 0.8 )u 0.7 (1110) 0.6 (1111) 0.5	🔿 Today
□ 0.4 □ 0.3 □ 0.3 □ 0.2	🔿 Last Week
	○ Self-definition
0.1	Begin Time: 06-05 10:17:23
01-01 08:00:00 Time(Seccond)	End Time: 06-05 14:17:33
Memory Utilization	Draw Close
Memory Utilization:29%	

# **5.3.17 Information About Optical Modules**

Open NMS.

Right click OLT and click Parameters of optical module. The following figure appears:

🔎 Current PO	N Info-172.16	. 21. 147-Epon				×
oplfDesc	oplfRxPowerCurr	oplfTxPowerCurr	TempratureCurr	oplfVolt	oplfCurrent	
EPON8/1						<u>^</u>
EPON8/2						
EPON8/3						1
EPON8/4	-31.5	3.6	40.8	3.2	20.2	1
EPON8/5						1
EPON8/6						1
EPON8/7						
EPON8/8						1
EPON8/13						1
EPON8/14						1
EPON8/15						1
EPON8/16						
EPON8/9						1
EPON8/10						~
	1	1	1	Refre	sh Close	
Finished.	inished.					

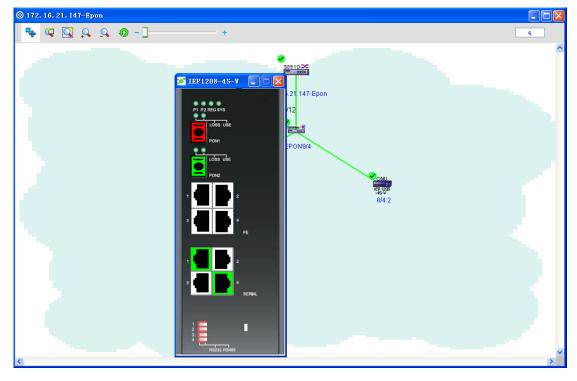
Note: If there is no data about a PON interface, the parameters of this PON interface are empty.

# **5.4 ONU Settings**

Right click ONU and select Device faceplate. The device faceplate appears.In the faceplate,

there are PON ports and common ports. On the 85 model, there are also the active and standby faceplates. These ports and faceplates have related operation menus.

The device's faceplate is shown in the following figure:



Port's status: If the port is red, it means that the port cannot be used. If the port is white, it means that the port can be used but is not connected to a network device. If the port is green, it means that the port can be used and has connected a network device.

### **5.4.1 Multicast Configuration**

#### 5.4.1.1 Configuring TagStri and MaxGroup

Right click the ONU icon and select **Device's faceplate** and then right click **Ethernet interface** on the faceplate.See the following figure:

Click Multicast Setup. A window appears, as shown in the following figure:

UNINCST Con	figuration	$\mathbf{X}$
	iguration	
McstTagStrip	false	~
McstMaxGroup	128	
Help	OK Config>> Close	
Getting Complet	ely!	

On this window, you can set TagStrip and MaxGroup.Set TagStrip and MaxGroup to **true** and **123** respectively and then click **OK**.See the following figure:

UNINCST Con	figuration	×			
	UNIMCST Configuration				
McstTagStrip	false	~			
McstMaxGroup	123				
Help	OK Config>> Close	]			
Set Success!					

### 5.4.1.2 Configuring the VLAN of a port

Click **Set>>**. The following page appears:

UNINCST Con	figur	ation			×
	īguratio	n			
McstTagStrip	false				~
McstMaxGroup	123				
Help		OK	Config≺∘	Close	
Select Al	I	Vlan	Index	Vlan ID	
Refresh		Add	Delete	Empty	

The VLANs for corresponding ports are shown in the figure above. You can add, delete and clear the VLAN of a port.

Adding VLAN

When adding VLAN, you should note that you can add at most 64 VLANs (VlanID range: 2-4094).

Click Add. The following page appears:

UNIMCST Con	figuration	X
[UNIMCST Con	figuration	
McstTagStrip	false	~
McstMaxGroup	123	
Help	OK Config<< Close	
Add V1	m 🛛 🔀	
Add Vla Vlan ID	n  OK Canc	
Refresh	Add Delete Empty	

In the **Add VLAN** text box, you can add one or multiple VLANs. As to adding a single VLAN, see the following figure:

UNINCST Con	figuration	×
[UNIMCST Conf	iguration	
McstTagStrip	false	~
McstMaxGroup	128	
Help	OK Config<< Close	
Add Vla	n 🛛	
⊢Add Vlar Vlan ID	2	
	OK Cancel	
Refresh	Add Delete Empty	

UNINCST Con	figur	ation			
	īguratio	n			
McstTagStrip	false				~
McstMaxGroup	128				
Help		OK	Config≺∘		Close
Select Al	I	Vlan	Index		Vlan ID
		1		2	
Refresh		Add	Delete		Empty
Performed comp	letely!				

As to adding multiple VLANs, see the following two figures:

UNINCST Con	figuration	×
	iguration	
McstTagStrip	false	~
McstMaxGroup	128	
Help	OK Config<< Close	
Add V1a	n 🔀	
Add Vlar	3,4,5,6	
	OK Cancel	
Refresh	Add Delete Empty	
Performed comp	letely!	

UNINCST Config	uration			×
CUNIMCST Configura	ation			
McstTagStrip fals	e			~
McstMaxGroup 128				
Help	ОК	Config<<	Close	
Select All	Vian	Index	Vian II	D
	1		2	
	2		3	
	3		4	
	4		5	
	5		6	
Refresh	Add	Delete	Empt	/
Performed complete	ly!			

UNIMCST Con	figuration	X
	figuration	
McstTagStrip	false	$\sim$
McstMaxGroup	128	
Help	OK Config<< Close	]
Add V1a	ın 🛛 🔀	
Add Vla Vlan ID	n 7-10	
	OK Cancel	
Refresh	Add Delete Empty	)
Performed comp	oletely!	

UNIMCST Con	figu	ation				×
CUNIMCST Conf	igurati	on				
McstTagStrip	false					~
McstMaxGroup	128					
Help		ОК	Config	j<<	Close	
Select All		Vlan In	dex		Vlan ID	
		1		2		^
		2		3		
		3		4		
		4		5		
		5		6		
		6		7		
		7		8		
		8		9		1
		9		10		-
Refresh		Add	Dele	te	Empty	
Performed comp	letely!					

> Deleting the VLAN of a port

Select a VLAN and then click **Delete**.See the following figure:

UNINCST Configu	ration		X	
CUNIMCST Configurat	ion			
McstTagStrip false				
McstMaxGroup 128				
Help	OK Cor	nfig<< Close		
Sele Confir				
	Are you sure to del Yes	Lete?		
	6	7		
	7	8		
	8	9		
	9	10	~	
Refresh	Add De	elete Empty		
Performed completely	!			

Click **OK**. The selected VLAN is deleted.See the following figure:

UNINCST Configur	ation					
CUNIMCST Configuratio	n					
McstTagStrip false	false					
McstMaxGroup 128						
Help	OK Cor	nfig<< Close				
Select All	Vlan Index	Vlan ID				
	1	2				
	2	3				
	3	4				
	4	5				
	5	6				
	6	7				
	7	8				
Refresh	Add	elete Empty				
Performed completely!						

If you click **All Select** and then **Delete**, all VLANs here will be deleted.

UNIMCST Con	figuration	X
	figuration	
McstTagStrip	false	~
McstMaxGroup	128	
Help	OK Config<< Close	]
Sel Cor	nfirm 🛛 🔀 🖸	
	Are you sure to clear ?	
	6 7	
	7 8	
Refresh	Add Delete Empty	
Performed comp	pletely!	

To clear all VLANs of a port, click Clear. See the following figure:

Click **OK**. All VLANs of the port will be cleared.See the following figure:

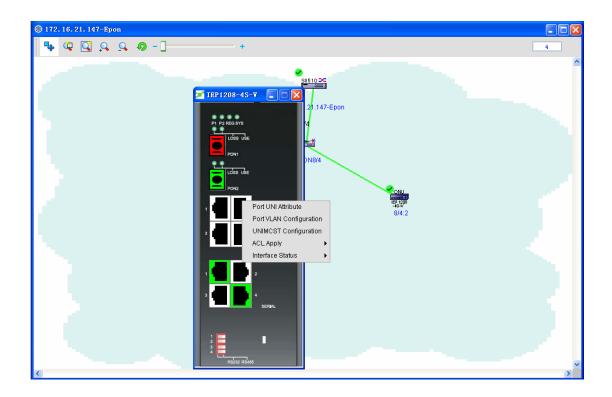
UNINCST Con	figur	ation				×
UNIMCST Conf	iguratio	n				
McstTagStrip	false					~
McstMaxGroup	128					
Help		OK	Config<<		Close	
Select Al	1	Vlan I	ndex	V	lan ID	
Refresh		Add	Delete	) E	impty	
Performed comp	letely!					
	,.					

#### 5.4.2 Changing the Status of a Common Port

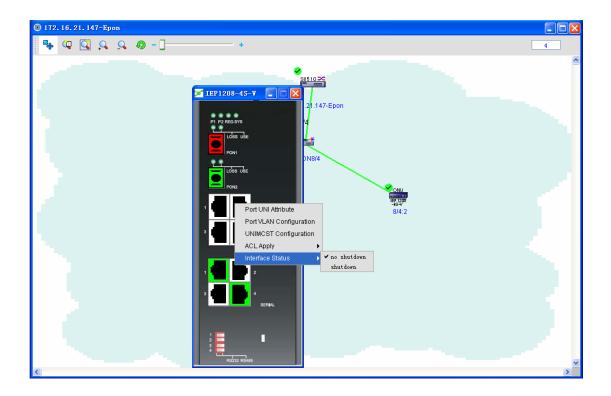
Common ports here mean the GigaEthernet ports and the FastEthernet ports.

If you want to change the status of a common port, you should follow the following procedure:

Right click the ONU icon and select **Device's faceplate** and then right click **Common port** on the faceplate.See the following figure:



Click **Port's status** and then select one of the two options: **shutdown** and **no shutdown**. The status of this port is changed.See the following figure:



# 5.4.3 QoS Application

In the topology, right click ONU. A menu appears, as shown in the following figure:

172.16.21.147-Epon	
💺 🔍 🖸 斗 🥠 - 🕽 — — — +	4
172.16.21.147-Epo EPON8/4 EPON8/4 8/4:1	Chassis QOS Apply UNI QOS Apply UNI Port Limit ONU VLAN CFN Conifg Info View ONU Distance ONU OptifPower ONU ponSwitch ONU Optical Port Info Alarm View Modify Map Symbol
	Serial Server Config
	ONU reset Delete Device
<	>

For more details, refer to "Applying QoS on the PON Port" and section 4.4.1 "Changing the Status of a Common Port."

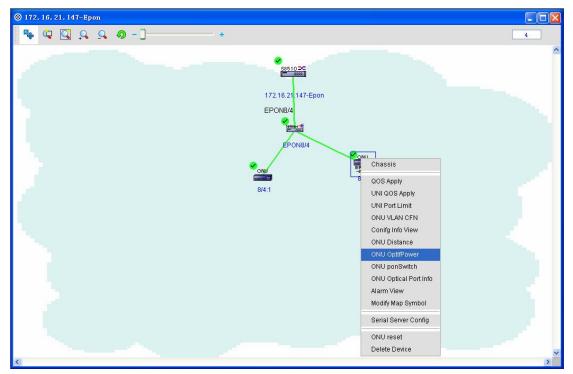
## **5.4.4 Optical Power Application**

Due to the distance between devices and the transmission medium, the signal attenuates during transmission.

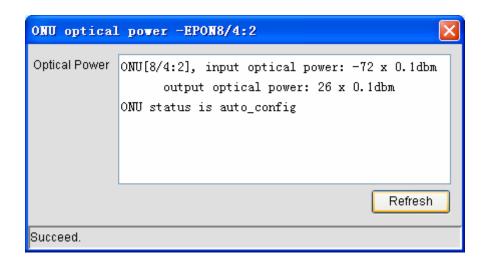
This function enables EPON NMS to browse the optical power of ONU.

The procedure is listed below:

1. Open NMS and right click the ONU icon in the EPON topology.See the following figure:



2. Select **Apply the optical power**. A page will appear to show the current optical power.See the following figure:



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#### **5.4.5 Browsing the Settings**

Browsing the settings here means browsing the current ONU settings, saving the current settings to the local file, and comparing two ONUs' settings.Right click **Browse the settings**. A window appears, as shown in the following figure:

🗣 🗘 🖸 🔍 🧟 🍠 - 🕽 — — — +	4
	~
	88510-D⊂ ■ REE 172.16.21.147-Epon PONB/4
	EPON8/4
	Chassis
8/4:1	QOS Apply
	UNI QOS Apply
	UNI Port Limit
	ONU VLAN CFN
	Conifg Info View
	ONU Distance
	ONU OptifPower
	ONU ponSwitch
	ONU Optical Port Info
	Alarm View
	Modify Map Symbol
	Serial Server Config
	ONU reset
	Delete Device

💓 ONU Info	rmation-EPON8/4:2
Config Info	
	Save File Compare Refresh
Succeed.	

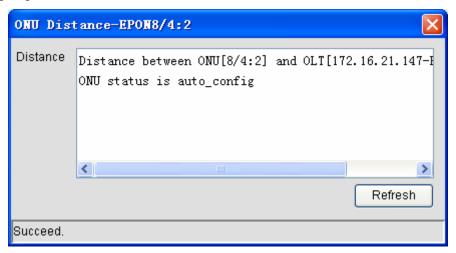
The **Save** button can be used to save the current ONU settings to the local file.

The File compare button can be used to open a comparision tool to check the settings of two

ONUs.

#### 5.4.6 Distance Measurement of ONU

ONU distance measurement is to check the distance between ONU and the PON port.Right click ONU and then choose **ONU distance measurement**. A window appears, as shown in the following fugre:

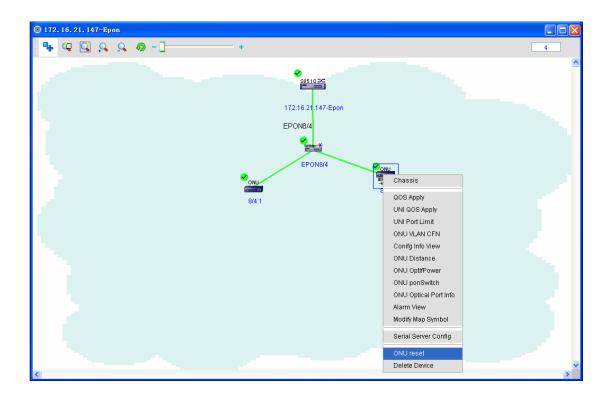


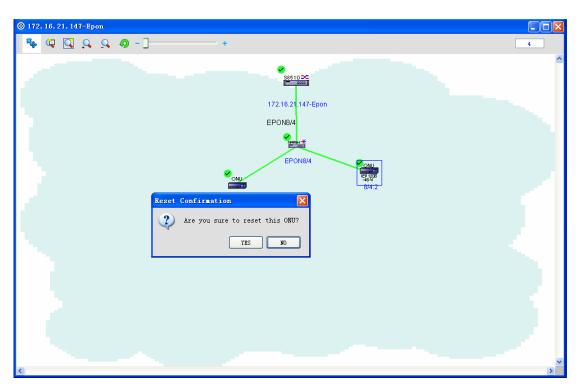
## **5.4.7 Browsing Alarms**

Browsing alarms is similar to browsing OLT alarms. Please refer to browsing OLT alarms.

## 5.4.8 Rebooting ONU

Choose and right click an ONU icon and **Reboot ONU**. The **Reboot ONU** dialog box appears. If you choose **Yes**, this ONU will be restarted; if you choose **No** or close the dialog box, this ONU will not be restarted.See the following figure:





## **5.4.9 Setting the Serial-Interface Server**

The settings of ONU serial-interface server includes setting global attributes of the serial interface and setting a single serial interface. The settings of a single serial interface includes setting its basic attributes and the attributes of its data cache area, and loopback shutdown and enabling. Right click ONU with the serial interface and select **Set the serial interface server**. The following window appears:

172. 16. 21. 147-Epon	
🎭 🕼 🔍 🔍 🤌 🥠 - ] +	4
2 2 2 2 3/2	GOS Apply
	Delete Device

💓 Serial Server C	onfig - EPON8/4:	2		
CSerial Port Common Co	nfig			
Serial Port Work Mode	🔿 None	🔿 Tcp-Client	🔿 Udp	🔿 Tcp-Server
Serial Port Work Port		Serial Port Server IP		Config
		Set	Refresh	Serial Config
Finished.				

The **Setup** button is to distribute the modified options to ONU.

Click **Setup**. The **Set the serial interface's address** window appears, as shown in the following figure:

🗲 ONU Serial Server Config	×
ONU Serial Server Index	ONU Serial Server IP
	Create Delete Modify
No serial port server	

In the window above, you can add, delete and modify the address of the serial interface of ONU. Click **Set the serial interface**. A dialog box appears, as shown in the following figure:

-	💕 Serial S	erver Con	fig - EPOR	18/4:2					
ſ	Serial Port Co	ommon Config	g						
	Serial Port Work Mode O None O Tcp-Client O Udp O Tcp-Server								ver
						_			_
	Serial Port Wo	ork Port		Seria	al Port Server	IP		Config	
Ļ					Set	- Pof	resh	Serial Config	_
					Jei				
ſ	Serial Port Co	onfig							
	Serial Port	Port Speed	Port Data	Port Halt B	Port Parity	Port Flow	Data Read	Data Read	Ke
	1	9600	8	1	None	None	100	100	Dis
	2	9600	8	1	None	None	100	100	Dis
	3	9600	8	1	None	None	100	100	Dis
	4	9600	8	1	None	None	100	100	Dis
	<								>
	Config								
F	Finished.								
4									_

The serial interface settings shown in the figure above is for the settings of each serial interface of ONU. If you select a random serial interface and click **Setup**, the following window appears:

📂 Serial	Server Co	nfig - EPO	N8/4:2		_	_		
CSerial Port C	ommon Conf	ig						
Serial Port V	/ork Mode	🔿 None	0	Tcp-Client	🔿 Ud	p	🔿 Top-Se	erver
Serial Port W	Serial Port Work Port Config							
				Set	Re	fresh	Serial Conf	ig
CSerial Port C	onfig							
Berial Port	Port Speed	Port Data	Port Halt B	Port Parity	Port Flow	Data Read	Data Read	Kee
	9600	8	1	None	None	100	100	Disa
	9600	8	1	None	None	100	100	Disa
	9600	8	1	None	None	100	100	Disa
	9600	8	1	None	None	100	100	Disa
							Config	
Finished.								

Serial Port Config-	Port Index(1)		
Serial Port Sequence No	1	Loopback Test	Close
Serial Port Basic Propertie	s		
Port Speed	9600	Port Parity	None 🔽
Port Data Bits	8	Port Flow Control	None
Port Halt Bits	1 🛩		
⊂Serial Port Data Buffer Pro	perties		
Data Read Interval	100	Data Read Bytes	100
Serial Port Keepalive Prop	erties		
Keepalive Mode	Disable 🗸	Keepalive Timeout	100
Keepalive Idle	100	Keepalive Probe Count	3
		Set	Default Close

# 5.4.10 Information About Optical Modules of the PON Port

Open NMS.

Right click ONU and click **Info about optical modules of the PON port**. The following figure appears:

© 172. 16. 21. 147-Epon	
👒 🔍 🖸 o. o. o ] +	4
IT2.16.21:147-Epon EPON8/4 EPON8/4 UNI QOS Apply UNI Port Limit ONU VLAN CFN Contig Info View ONU Distance ONU Optifearer ONU Optifearer	
Delete Device	×

Current OUN PON Info-EPON8/4:2						
TempratureCurr	oplfVolt	oplfCurrent	oplfRxPowerCurr	oplfTxPowerCurr		
59.8	3.3	21.1	-7.1	2.6		
Refresh Close						
<b>D</b> inish a d						
Finished.						

# **5.5 Operation Log**

The system will record all kinds of operations done by users.

Click **System Management -> Operation log**. The following page appears:

<u>F</u> ile EponMap(B) NMS(B)	System Manager Window Help				
	Runtime Administration Alt+R				
2	sysActionLogs Alt+L				NMS NMS
MMS		pon			
🛓 🗇 Applications	Change Password	<u> </u>	+		4
🚊 🥶 ipnet	<ul> <li>Real-time alarm display</li> </ul>				^
172.16.21.0			8		
■-  EPON Network ■-  PON Network	17 Enon		36 E	3510 X	
HIH Topo Netwo	ork			.21.147-Epon	
🖶 🛞 Fault Management					
			EPON8/	1	
Task Management			Spite E		
. SNMP Tools			FPC	DN8/4	
			ONU ONU	<b>CONU</b>	
			8/4:1	IEP 1205 -45-4/ 8/4:2	
				8/4:2	
					>
	<				2

💓 Epon C	onfiguration Log			
-Query Cond	ition			
Username	Please Select 🔽 IP Address 🛛 0	.0.0.0 Time		Query
Configuratio	in Log			
Username	Instructions	Operation Obje	ct Time	e Status
	Close		Delete	
	Close	Save As	Delete	
Finished.				

Query conditions:

1. Administrator: the login name of the administrator will be displayed in this option.

2. IP address: it means the IP address of a device. It can be used to query the to-be-operated device. You can enter no parameter here, which means a lot of operation logs will be displayed.

3. Time: It is for you to select the time of recording logs. If you enter no time, all logs will be queried.

After all the above-mentioned parameters are set, you can click **Query**. The results are shown, as shown in the following figure:

Epon Configuration Log								
Query Condition								
Username Please Select 🔽 IP Address 0.0.0.0 Time Query								
Configuration Log								
Username	Instructions	Operation Object	Time	Status				
root	webclient.security.authaudit.authentication		2012-06-05 15:50:55.296	SUCCESS 🔥				
root	webclient.security.authaudit.authentication		2012-06-05 15:50:58.312	SUCCESS				
root	Runtime Administration		2012-06-05 15:51:13.578	SUCCESS				
root	Runtime Administration		2012-06-05 15:51:32.656	SUCCESS				
root	Runtime Administration		2012-06-05 15:54:37.031	SUCCESS				
root	Runtime Administration		2012-06-05 15:55:27.171	SUCCESS 📃				
root	Delete Object	172.16.21.0	2012-06-05 15:55:35.5	SUCCESS				
root	Runtime Administration		2012-06-05 15:55:43.031	SUCCESS				
root	Runtime Administration		2012-06-05 16:00:09.765	SUCCESS				
root	Runtime Administration		2012-06-05 16:00:13.468	SUCCESS				
root	Runtime Administration		2012-06-05 16:12:10.828	SUCCESS				
root	Runtime Administration		2012-06-05 16:12:15.078	SUCCESS				
root	Delete Object	172.16.21.0	2012-06-05 16:12:23.734	SUCCESS				
root	Runtime Administration		2012-06-05 16:12:32.109	SUCCESS				
root	Runtime Administration		2012-06-05 16:17:12.203	SUCCESS 🗸				
Close Save As Delete								
Finished.								

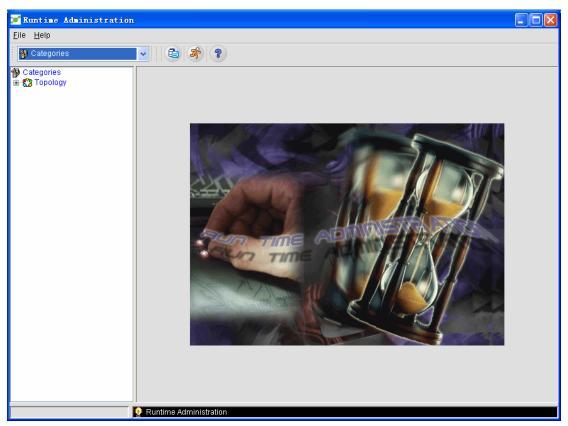
In the **Status** column, the operation results are shown. **SUCCESS** means this operation is successful and **FAILURE** means this operation fails. If you select a row and then click **Delete**, the selected record will be deleted.

## **5.6 Device Discovery and Log Deletion**

This function is to discover and delete the devices in the system, record the related operations and browse the operation status of the system.

The procedure is listed below:

1. Click NMS -> System Management -> Real-Time Management. See the following figure:



2. Unfold the **Topology** node and select **Device discovery log**. See the following figure:

<u>H</u> elp						
Discovery Logs	•	te 者 🔋				
ategories	queryC	onditionLabel				
Topology Discovery Configurator	devicel	PO.O.O.OdeviceT	ype please select	🗸 startTime	endTime	
Biscovery Logs	G Finished				query	
	index	deviceName	deviceType	operateType	operateTime	
	7	172.16.21.147	SnmpNode	added	2012-06-06 10:31:56	
	6	8/4:2(172.16.21.147)	EponONUDev	added	2012-06-06 10:31:56	
	5	8/4:1(172.16.21.147)	EponONUDev	added	2012-06-06 10:31:56	
	4	EPON8/4(172.16.21.147)	EponSplitter	added	2012-06-06 10:31:56	
	3	172.16.21.147-Epon	EponOLTDevi	added	2012-06-06 10:31:53	
	2	172.16.21.0	Network	added	2012-06-06 10:31:52	
	1	172.16.21.147	SnmpNode	deleted	2012-06-06 10:31:28	

Different from figure 4 and figure 8, this figure shows the device type: Node, NetWork, EPONONUDevice and EPONSplitter. The default device type is null.

### 5.7 Bandwidth Usage

Bandwidth usage is designed for monitoring the bandwidth occupancy of a device. The administrator can browse the bandwidth usage of a device so that he or she can regulate the bandwidth and make full use of network resources. The specific operation is shown below:

1. Select OLT and right click it.See the following figure:

2. Click **Bandwidth usage**, as shown in the following figure:

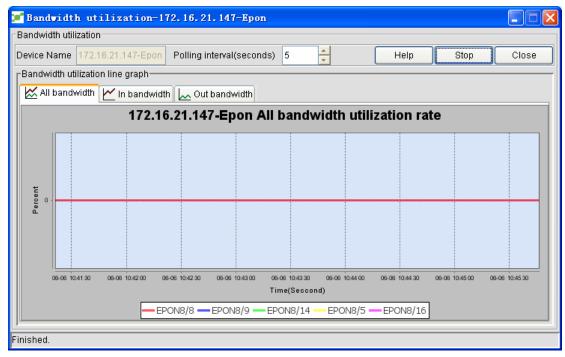
🖬 Bandwidth utilization-172.16.21.147-Epon							
Bandwidth utilization							
Device Name 172.16.21.147-Epon Polling interval(seconds) 5 + Help Start Close							
Configuration Option							
<ul> <li>OLT PON port bandwidth utilization rate</li> </ul>	ONU bandwidth utilization rate						
PON List	Selected PON						
EPON8/9							
EPON8/16							
EPON8/8							
EPON8/15							
EPON8/7							
EPON8/14							
EPON8/6							
EPON8/13							
EPON8/5							
EPON8/12							
EPON8/4							
EPON8/11							
Finished.							

3. Set the polling interval (default interval: 5s), select a port, and click to add this

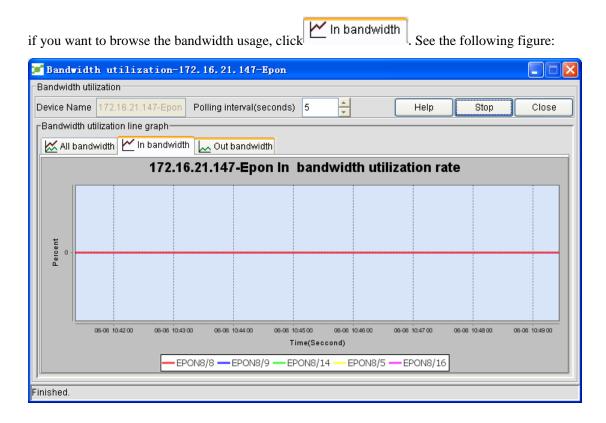
port to the monitor list or click to add all ports to the monitor list.See the following figure:

🖀 Bandwidth utilization-172.16.21.147-Epon								
Bandwidth utilization								
Device Name 172.16.21.147-Epon Polling interval(seconds) 5 🐥 Help Start Close								
Configuration Option								
<ul> <li>OLT PON port bandwidth utilization</li> </ul>	on rate 🛛 🤇	) ONU bandw	idth utilization	rate				
PON List		Selected PON	1					
EPON8/15	>	EPON8/8						
EPON8/7		EPON8/9						
EPON8/6	>>	EPON8/14						
EPON8/13	ليستنق	EPON8/5						
EPON8/12		EPON8/16						
EPON8/4								
EPON8/11								
EPON8/3	<<							
EPON8/10								
EPON8/2								
EPON8/1								
	J	L						
Finished.								

4. Click **Start**. The selected ports will be monitored.See the following figure:



By default, the total bandwidth usage is displayed. Here, you can browse the incoming bandwidth usage and the outgoing bandwidth usage. You just need to click the corresponding tab. For example,



### 6 Fault Management

If you can browse the information about corresponding trouble, it will be much convenient for network management. The administrator can locate the troubled devices and the reasons and make a rapid troubleshooting according to the information of network troubles.

This section gives a detailed description of alarm levels:

Alarms can be classified into five levels:

Critical, Major, Warning, Info, Clear

Critical: it refers those dangerous alarms which are shown in red, such as device's trouble or the disconnection of an interface.

Major: It means those serious alarms which are in yellow, such as node's trouble.

Warning: It refers to those general alarms not related with the device's troubles. These alarms are shown in blue.

Info: it refers to the general information, such as general network events. They are not shown in color.

Clear: It refers to clear-away alarms. When **Critical** or **Major** appears and the status gets normal again, a clear-away alarm will be generated, marking that the device has already got rid of alarm and functioned normally again. This kind of alarms are shown in green.

NMS provides the administrator detailed information, including network events and alarms.

#### **6.1 Network Events**

Network events list all information about status changes of all managed devices, such as node trouble, node recovery, port status change, failed polling and management information of NMS platform.Click **Network events**. The following page appears:



MS	🚳 Network Events			
Applications	-			
🖨 🛞 Network Maps	🔕 Network Events		Total 1317 Displaying 1268 to	o 1317 Page Length 50 💌 🖪 🔹 🕨
🚊 🥹 ipnet	1			
172.16.0.0	Status	Source	Date 🔻	Message
172.16.21.0	Info	172.16.21.147-Epon	Jun 01,2012 09:54:10 AM	No Trap Parser defined for received trap: Enterprise: .1.3.6.1
🖃 🥩 EPON Network	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:54:00 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault□
B-@ 172.16.21.147-Epon	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:53:53 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
B G SLOT_8	Info	172.16.21.147-Epon	Jun 01,2012 09:53:27 AM	No Trap Parser defined for received trap: Enterprise: .1.3.6.
HIH Topo Network	Info	172.16.21.147-Epon	Jun 01,2012 09:52:44 AM	No Trap Parser defined for received trap: Enterprise: .1.3.6.
- B Fault Management	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:51:09 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
- 🐼 Network Events	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:49:58 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
Alarms	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:48:52 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
H Performance	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:46:41 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
🗑 Network Database	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:46:09 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:45:31 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
- O Switches	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:45:05 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:41:43 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
ONU Reverse Lookup	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:38:59 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
🛞 Task Management	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:38:29 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
SNMP Tools	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:38:03 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
9	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:35:45 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:35:14 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:34:14 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	Info	172.16.21.147-EPON8/4:2	Jun 01,2012 09:34:09 AM	ONU Port[EPON8/4:2] status has changed into: Linkfault⊡
	Info	172.16.21.147-EPON8/4:2	Jun 01,2012 09:33:00 AM	ONU Port[EPON8/4:2] status has changed into: Linkfault□
	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:32:21 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:31:57 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:31:41 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	Info	172.16.21.147-EPON8/4:2	Jun 01,2012 09:31:09 AM	ONU Port[EPON8/4:2] status has changed into: Linkfault
	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:31:00 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
	Info	172.16.21.147-EPON8/4:1	Jun 01,2012 09:30:54 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault
	Infn く	172 16 21 147-EPON8/4-1	Jun 01 2012 09:30:44 AM	ONU Port/EPON8/411 status has changed into Linkfault

The above-mentioned list shows all network events. The following are some explanations about the above-mentioned list:

- Status: It stands for the alarm types: critical, major, clear and info. For more information, see their definitions.
- Source: It represents the device or the port on which a network event occurs.
- Date: It refers to the specific time when a network event occurs.
- Info: It represents the detailed explanation of an event.

If you double click a column in the list, you can make ordering of this list. For example, if you double click the **Date** column, the content in the list will be sequenced according to time.

In order to browse the information conveniently, you can add related "show" operations on the right top of the list, as shown in the following figure:



designate the range of displayed events. Page length: It represents the number of events displayed

in every page.

They stand for the page-turn button.

If you double click an event, the following page appears:

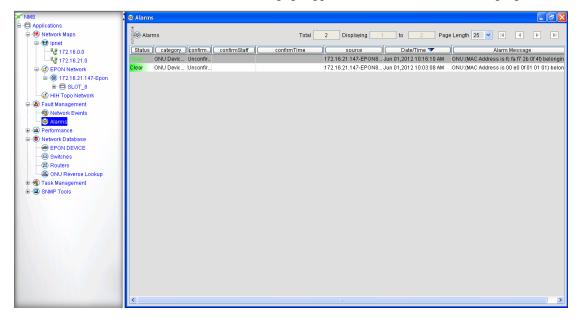
	nts		
👌 Network Ev	ents	Total 1383 Displaying 133	4 to 1383 Page Length 50 🗸 📢 🔹 🕨
Status	Source	Date 🔻	Message
	172.16.21.147-EPON8/4:1	Jun 01,2012 10:15:08 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21 💅 Event	X	No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33
	172.16.21 Event Details		ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21		No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33
	172.16.21 Index	4941	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21		ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21 Severity	Info	No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33
	172.16.21	ONU Port[EPON8/4:1] status has changed into:	No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33
	172.16.21 Message	Linkfault	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21		No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33.
	172.16.21		ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21 Category	LLID PORT	No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33.
	172.16.21 Domain		ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21		ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21 Network		No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33.
	172.16.21 Node	172.16.21.147-EPON8/4:1	No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33.
	172.16.21 Failure Object	172.16.21.147_llid_44	No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33.
	172.16.21 Source	172.16.21.147-Epon ONU 44	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21 Help URL		ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21		No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33.
	172.16.21 Date/Time	Jun 01,2012 10:14:41 AM	No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33.
	172.16.21 GroupName		ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21		No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33.
	172.16.21		ONU Port[EPON8/4:1] status has changed into: Linkfault□
	172.16.21	Close Help	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172.16.21.147-Epon	Jun 01,2012 10:05:42 AM	No Trap Parser defined for received trap: Enterprise: .1.3.6.1.4.1.33.
	172.16.21.147-EPON8/4:1	Jun 01,2012 10:05:35 AM	ONU Port[EPON8/4:1] status has changed into: Linkfault⊡
	172 16 21 147-Enon	Jun 01 2012 10:05:20 AM	No Trap Parser defined for received trap: Enterprise: 13614133

The above-mentioned page shows the detailed information about this event.

## 6.2 Network Alarms

Network alarms record the alarms of a device and provide solutions for related alarms, including the alarm notifications and alarm confirmations.

Click Network alarms. The Network alarms page appears, as shown in the following figure:



# 6.2.1 Alarm Notification

The alarm notification is added so that the administrator can know the network alarms on time. The alarm notification includes action limit, command running and E-mail generating.

#### 6.2.1.1 Adding the alarm notification

Click **Network Alarms -> alarm management -> Set alarm notification**.See the following figure:

File Custom Views	Alert Manager Alert View	System Mana	ger Window Help
	Alarm Filters	Ctrl+Shift+A	Road Director
	Alert Notifier	Ctrl+N	
ProadDirector	Alarm Type Managemen		
Applications	Delete(R)	Ctrl+R	
🖃 🛞 Network Ma	Pick Up / UnPick	Ctrl+U	Total 3 Displaying 1 to 3 Page Length 25 🛩 🗐 4 🕨 🕨
-€9 ipnet 	Clear	Ctrl+L	ategory   £onfirm  ( confirmStaff   ( confirmTime   ( source ) ( Date/Time 🔻 ) ( Alarm Message
E G EPON N	Save To File	Ctrl+I	Devic., Unconfi 172.16.21.147-EPON8 Jul 20,2012 07:13:30 AM ONU:(MAC Address is 00 e0 01 01 01) belo
⊞-⊛ 172.	Print	Ctrl+P	J Devic Unconfi ONU:(MAC Address is fc fa f7 2b 0f 4f) belong
	Search(F)	Ctrl+F	Devic Unconfi ONU:(MAC Address is 00 e0 0f 01 01 01) belo
<ul> <li>Fault Manage</li> <li>Network</li> <li>Atama</li> <li>Atama</li></ul>	Events ) abase ement		د

Click Set alarm notification:

🛓 Alert Filters		
Alert Filters		
	Filter Name	
	Match Criteria	
	Source	
	Severity	
		Advanced
	Actions List	쁂.
		2
B. B.		
Load/Save		OK Apply Cancel
Ready		

The alarm notification settings consists of two parts: one part is to set the matchup conditions of the alarm notification, and the other part is to set the action of the alarm notification.Before the alarm notification settings, you shall set **Alarm Filter and Matchup Standard**, and then **Action**.





Click Add . The page is available for entering information, as shown in the following figure:

🛓 Alert Filters	
Alert Filters	
New_Filter0	Filter Name New_Filter0     Match Criteria   Source   Severity   Question   Advanced     Actions List
B, B	
Load/Save	OK Apply Cancel
Ready	

The parameters in the above-mentioned figure are explained below:

- Filter's name: It stands for the name of the alarm notification.
- Alarm source: It shows on which device the alarm occurs. It is equivalent to the filtration condition of alarms.
- Importance: There are five options (Critical, Major, Minor, Warning, Clear), which correspond to different alarm levels. It is equivalent to the alarm filter.
- Advanced: If you click it, a page will appear for you to define the filtration conditions of alarms.See the following figure:

🖆 Latch criteria Properties 🛛 🔀						
Match		÷,				
Filter Criteria						
Message						
Category						
Domain						
Network						
Node						
Entity						
More Prop	More Properties OK Cancel					

After the above-mentioned parameters are selected, you can click . The following window appears:

≜ Add Action	
Notifications	
Email Suppress Run Command	
Filter Action List	General
	Notification Name
	SMTP Account Default
	Click to manage SMTP accounts Configure
	Subject
	Message
	File Attachment
	Add Edit Delete Reset
Help	Add Cancel

On this step, the alarm notification settings is done. Nextly you need to set **Trigger of alarm notification action**. **There are three options on the above-mentioned figure: E-mail, limit, and execute the command. The following are their explanations:** 

• E-Mail:

If you click **E-Mail**, the figure above appears.

The following are explanations of five parameters on the above-mentioned figure:

- A. Notification's name: It is the unique name for action trigger, consisting of letter, number and underline.
- B. SMTP account: It stands for the information about the SMTP account which sends

E-mail.You shall click Click to manage SMTP accounts Configure to add, delete or

modify the corresponding SMTP account, as shown in the following figure:

STIP Configuration		X
SMTP Accounts Default bramble	Account Details	
	Account Name	bramble
	SMTP Server	sohu.com
	From Address	nms@163.com
	To Address	Jack
	SSL Mode	
	Port	80
	Authentication Required	$\checkmark$
	User Name	Jack
	Password	•••
	Add Ec	lit Delete Reset
Help		OK Cancel

- Account's name: It is a unique name of the SMTP account.
- SMTP server: It is the address of the SMTP server.
- Sender: It means the address of mail transmission.
- Receiver's address: It means the address of the mail receiver.
- SSL mode: It means whether to conduct SSL encryption.
- Port: It stands for the ID of the mail transmission port.
- Checkup: It means whether this E-mail needs checkup.
- Username: It means the user name in the E-mail server.
- Password: It means the password which corresponds to the user name in the E-mail server.
- C. Subject: It means the subject of E-mail.
- D. Message: It means the body of the E-mail.
- E. Appendix: Click it and the E-mail can carry other files.

If you click **Send**, the configuration is done.

• Limit:

If you click Limit, the following window appears:

🛿 Add Action 💽
Notifications
Email Suppress Run Command
Filter Action List       General         Notification Name
Add Edit Delete Reset
Help Add Cancel

In the right part of the above-mentioned figure, there are three parameters : **notification name**, **limit all**, and **limit interval**. They are defined below:

- **A.** Notification name: it is the name of a notification, which consists of letter, number and underline.
- **B.** Limit all: If you choose tick out this parameter, the alarms will not appear and the system will automatically restrain this operation.
- **C.** Limit interval: If limit all is selected, this option is unavailable. If limit all is deselected, this option is available and can be set to a number, meaning the interval for the alarm reminder to appear.

After the above-mentioned parameters are set, the Limit settings is done.

#### • Command execution:

If you click **Command execution**, the following window appears:

🖆 Add Action	
Notifications	
Email Suppress Run Command	
Filter Action List	General
	Notification Name
	System Command
	append output with message
	append error with message
	Abort After 60 Seconds
	Add Edit Delete Reset
Help	Add Cancel

In the right part of the above-mentioned figure, there are five parameters: Notification name, Systematic command, Add the output to the Info, Add errors to the Info, and Forced end time. They are explained below:

- **A.** Notification name: it is the name of a notification, which consists of letter, number and underline.
- **B.** Systematic command: it represents any program name that can be executed in the command line.
- **C.** Add the output to the Info: It is to add the results of an execution command to the information.
- **D.** Add errors to the Info: It is to add the errors of an execution command to the information.
- **E.** Forced end time: If a command is still running after the forced end time, this command will be forced to end.

After the above-mentioned parameters are set, the Command execution settings is done.

After the above mentioned information is set, click **Add**, all the current settings will relate with the corresponding alarm filter. The view that appears in this case is shown below:

🛓 Alert Filters			
Alert Filters			
■ New_Filter0	Filter Name	New_Filter0	
	Source Severity	Critical Major Minor Warning Clear	
		Childar Major Minor Warning Crear	Advanced
	Actions I cmd	_ist	*
<b>L L</b>			
Load/Save		OK Apply	Cancel
Ready			

Click **OK**. The settings of alarm notification is finished.

There are also the following settings:

1. Installing or saving files:

Click Install/save file. The file textbox appears:

🛃 Alert Filters		
Alert Filters		1
New_Filter0	ne conf/alert.filters	
	Load Save Cancel ed	
Load/Save Ready	OK Apply Canc	el

The **File name** option in the above-mentioned text box cannot be modified, or the alarm notification will take no effect. Click **Save** and then **Apply**. The settings then takes effect.

2. Download from the file:

Download the settings directly from the file.

### 6.2.1.2 Canceling the alarm notification

The Cancel the alarm notification page appears as follows:

🛓 Alert Filters			
Alert Filters			
New_Filter0	Filter Name Match Criteria Source Severity	New_Filter0 Critical Major Minor Warning Clear	Advanced
<b>.</b>	Actions I cmd	_ist	*
Load/Save Ready		OK Apply	Cancel

In the above-mentioned figure, there exists one alarm notification. To delete this alarm notification,

select this alarm notification and click

### 6.2.1.3 Sound of the alarm notification

Click **Network Alarm -> Alarm Management**. A menu appears, as shown in the following figure:

File Custom Views	Alert Manager Alert Vie	w System Mana	iger Window Help
	Alarm Filters	Ctrl+Shift+A	
	Alert Notifier	Ctrl+N	Market Broad Directo
BroadDirector	Alarm Type Managerr	ient Ctrl+T	
😑 回 Applications	Delete(R)	Ctrl+R	
🖮 🛞 Network Ma	Pick Up / UnPick	Ctrl+U	Total 1 Displaying 1 to 1 Page Length 25 V (4 4 ) H
🖃 🤁 ipnet	Clear	Ctrl+L	
		Ctrl+I	ategory ) [confirm] ( confirmStaff ) ( confirmTime ) ( Source ) ( Date/Time 🔻 ) ( Alarm Message
😑 🧭 EPON N		Ctrl+P	Devic Unconfi 172.16.21.147-EPON8Jun 20,2012 04:49:45 PM ONU:(MAC Address is 00 e0 0f 01 01 01) belo
⊞-⊛ 172.			
HIH Top		Ctrl+F	
🖃 🛞 Fault Manag			
	< Events		
E-(1) Performanc			
	e red Collection		
	rformanceOnuFrame		
I O Network Da			
🗷 💰 Task Manad			
. SNMP Tools			
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
		<	

Click Sound of the alarm notification. The following window appears:

🗾 🖊	rm Audio	Notification		
Audio	o File Details	3		
	Critical	/audio/critical_voice.wav		Test
	Major	/audio/major_voice.wav		Test
	Minor	/audio/minor_voice.wav		Test
	Warning	/audio/warning_voice.wav		Test
	Clear	/audio/clear_voice.wav		Test
PlayB	lack Time	1 seconds		
			Apply	Cancel

On this window, you can select or cancel the sound of the corresponding alarm level by ticking or not.

Replay time: It means the time that the sound of alarm notification lasts (if the audio lasts too short, it will be replayed).

Test: This button is for you to test the sound beforehand.

Open file: You can select any audio file by clicking it.

Note: The audio files are all stored in the /audio sub-directory of the installation path.

### 6.2.1.4 Alarm type management

Click **Network Alarm -> Alarm Management**. A menu appears, as shown in the following figure:

File Custom Views	Alert Manager Alert View	System Mana	ger Window Help
	Alarm Filters	Ctrl+Shift+A	The Based Provide
	Alert Notifier	Ctrl+N	Broad Directo
ProadDirector	Alarm Type Manageme	nt Ctrl+T	
≟-œ Applications ≟-⊛ Network Ma	Delete(R) Pick Up / UnPick	Ctrl+R Ctrl+U	Total 1 Displaying 1 to 1 Page Length 25 V (4 4 ) H
🖃 🤁 ipnet	Clear	Ctrl+L	
	Save To File Print	Ctrl+I Ctrl+P	ategoryLonfirmConfirmStaffConfirmTimeSourceDaterTime ♥Alarm Message J Devic Unconfi172.16.21.147-EPON8Jun 20.2012 04.48.45 PM ONU(MAC Address is 00 e0 0f 01 01 01) belo
🥑 ΗΙΗ Τος	Search(F)	Ctrl+F	
	e red Collection rformanceOnuFrame labase iement	٤	

Click Alarm type management. A window appears, as shown in the following figure.

The following figure shows all kinds of alarms that the current NMS supports and their alarm levels.

Note: The frequent alarms include port's alarms (port up/down), CPU alarms, fan alarms, memory alarms, card alarms, and optical channel's error-code alarm.Additionally, this NMS also lists out specific EPON alarms, such as ONU port's alarms, chip's state alarm and PON port's alarms. Each alarm type has a default alarm level, but users can modify the alarm levels.

Alert Severity S	et			×	
Sequence No	Alert Type	Alert Severity	Alert Device Type		
1	ONU Port Alert	Major Alert	EPON DEVICE		
2	PON Port Alert	Critical Alert	EPON DEVICE		
3	Fan Alert	Major Alert	EPON DEVICE		
4	Chip Status Informati	Notification Event	EPON DEVICE		
5	-	Warning Alert	EPON DEVICE		
6	Logging Information	Notification Event	EPON DEVICE		
7	LLID Port Msg	Notification Event	EPON DEVICE		
8	ONU Device Alert	Critical Alert	EPON DEVICE		
9	CPU Util Alert	Warning Alert	EPON DEVICE		
10	PON Port llegal Reg	Notification Event	EPON DEVICE		
11	Port Optical Power Al	Warning Alert	EPON DEVICE		
12	Card Alert	Major Alert	EPON DEVICE		
13	CPU Temperature Alert		EPON DEVICE		
14	Optical Channel BER	Warning Alert	EPON DEVICE		
Help Modify Close					

As to how to modify the alarm levels, we take CPU usage alarm as an example. If you want to edit the alarm level of the CPU usage alarm from from Warning Alert to Critical Alert, first click CPU Util Alert, as shown in the following figure:

Alert Severity S	et			×	
Sequence No	Alert Type	Alert Severity	Alert Device Type		
1	ONU Port Alert	Major Alert	EPON DEVICE		
2	PON Port Alert	Critical Alert	EPON DEVICE		
3	Fan Alert	Major Alert	EPON DEVICE		
4	Chip Status Informati	Notification Event	EPON DEVICE		
5	Memory Alert	Warning Alert	EPON DEVICE		
6	Logging Information	Notification Event	EPON DEVICE		
7	LLID Port Msg	Notification Event	EPON DEVICE		
8	ONU Device Alert	Critical Alert	EPON DEVICE		
9	CPU Util Alert	Warning Alert	EPON DEVICE		
10		Notification Event	EPON DEVICE		
11	-	Warning Alert	EPON DEVICE		
12	Card Alert	Major Alert	EPON DEVICE		
13	CPU Temperature Alert	-	EPON DEVICE		
14	Optical Channel BER	Warning Alert	EPON DEVICE		
	Help Modif	íy Close			
Getting Completely!					

Then click **Modify**, a window appears, as shown in the following figure:

Alert Severi	ty Nodify 🛛 🔀
Sequence No	9
Alert Type	CPU Util Alert
Alert Severity	Critical Alert 🗸 🗸
	Modify Close

Select the corresponding alarm level in the **Alarm Severity** drop-down box and finally click **Modify**. The modified alarm level is stored to and applied on the NMS.

# 6.2.2 Right-Key Operations of Alarms

### 6.2.2.1 Alarm Details

If you click a specific item in the **Network alarm** list, a corresponding right-key menu appears, as shown in the following figure:

ه ،	larms	i											BX
E CONTRACTOR	🗿 Alarr	ns				Total	2 Displaying	1 to 2	Page	e Length 25 💌	M		
	Status	category	confirm.	.) confirmStaff	confirm]	lime 🛛	source	Date/Time	<b>V</b>		Narm Mes	sage	
Cle		ONU Devic	Unconfir	Í		_	172.16.21.147-EPON8	Jun 01,2012 03:29	3:05 PM	ONU: (MAC Addres	s is 00 e0	Of 01 01 0	)1) belon
Cle	ear	ONU Devic	Uncon	Details	Alt+D		172.16.21.147-EPON8	Jun 01,2012 03:20	0:01 PM	ONU: (MAC Addres	s is fc fa f	7 2b Of 4f)	belongin
				Events	Ctrl+E	:							
				Refresh	F5								
				Epon_Alert_Confin	m_Status								
				Alert_Goto_Map_B	ottom								
<													>

Click **Details**. The following window appears:

📧 172.16.21.147-EPON	8/4:1			$\mathbf{X}$
Message :	ONU:(MAC Address is 00 e0 Of registered.	01 01 01) belonging to	PON port:EPON8/4:1 has been	
Failure abiasts				_
Failure object :	172.16.21.147-EPON8/4:1	Source :	172.16.21.147-EPON8/4:1	
Owner:		Category:	ONU_DEVICE	
Created :	May 31,2012 09:06:58 PM	Modified :	Jun 01,2012 03:29:05 PM	
Group:	Severity:	Clear	Previous severity: Critical	
Other alarms in this group:				
Annotations for this alarm				
Pick Up A	nnotate Refresh Pr	operties View hist	tory Merge Close	

In the above-mentioned window, all detailed information about the corresponding alarm is listed out.

**Pick**: means the current user conducts the **Pick** operation to the current alarm. This operation records when and who to access the alarm. Different users can conduct this operation many times.

Note: means users can record the alarm processing suggestion to the current alarm.

**Update**: means the latest alarm information can be gained from the server. This function is similar to the **Update** function in the right-key menu in the alarm list.

Attribute: means some fields that users themselves define.

Browse history: means users can browse the alarms before the current alarm.

Combine: means to display the history alarms and the alarm processing suggestion together.

#### 6.2.2.2 Event

If you select **Event** in the right-key menu in the alarm list, the system will list out all historical events related with the current chosen alarm.

Alarms Alarms	3		Total	1 Displaying 1	to 1 Pa	ge Length 25 💌 📢 🗼 🕨
Status	category co	onfirm) confirmStaff (	confirmTime	source	Date/Time 🔻	Alarm Message
a C	DNU Device U	Details	Alt+D	172.16.21.147-EPON8/ Ju	in 04,2012 02:43:29 PM	ONU: (MAC Address is fc fa f7 2b 0f 4f) belon
		Events	Ctrl+E			
		Refresh Epon_Alert_Confirm_Stati Alert_Goto_Map_Bottom	F5 JS			

#### 6.2.2.3 Locating alarms

If you select **Locate alarm** in the right-key menu in the alarm list, the system will automatically locate the network source of the current alarm to a specific network topology.

Note: In case that the EPON network is contained, the system will automatically search the EPON network topology and locate a specific network component.

🚳 Alarms							
Alarms		Total 1	Displaying	1 to 1	Page Length 25 💌		M
	confirmStaff confi	mTime	source	Date/Time 🔻		Alarm Message	
Clear ONU Device Unconfir	Details	Alt+D 17	2.16.21.147-EPON8	/ Jun 04,2012 02:43:29	PM ONU:(MAC Addr	ess is fc fa f7 2b Of 4f) belo	onging
	Events	Ctrl+E					
	Refresh Epon_Alert_Confirm_Stat	F5					
	Alert_Goto_Map_Bottom	lus					
<							>

## 6.2.2.4 Confirming alarms

Click Alarm.	The network alarm pa	age appears.
--------------	----------------------	--------------

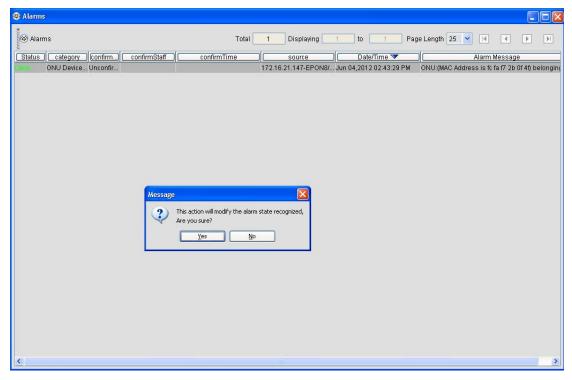
														_	
IS					Total 🗌	1 [	isplaying [	Ť	to 1	Page	Length 2	:5 💌	•	Þ	
	confirm	confirmStaff		confirmTi	me		ource		Date/Time	<b>~</b>		Ala	rm Messa	ge	
ONU Device	Unconfir					172.16.21	147-EPON	8/ Jun 0	04,2012 02:43	29 PM	ONU:(MAC	Address i	s fc fa f7 2	b 0f 4f) b	elor
	s category	s	s category (confirm) confirmStaff	s category [confirm] confirmStaff ]	s 	s Total category confirm) confirmStaff confirmTime	s Total 1 C category <u>Confirm. confirmStaff</u> <u>confirmTime</u> <u>s</u> ONU Device Unconfir 172.16.21	s Total 1 Displaying <u>category confirm. confirmStaff confirmTime source</u> ONU Device Unconfir 172.16.21.147-EPON	s Total 1 Displaying 1 Category [confirmStaff] [ confirmTime ] [ source ] [	s Total 1 Displaying 1 to 1 Category Confirm. confirmStaff ConfirmTime Source Date/Time ONU Device Unconfir 172.16.21.147-EPON8/ Jun 04.2012.02:43	s Total 1 Displaying 0 1 Page category confirm. confirmStaff confirmTime source Date/Time ONU Device Unconfir 172.16.21.147-EPON8/ Jun 04,2012 02:43:29 PM	s Total 1 Displaying 1 to 1 Page Length 2 category confirm confirmStaff confirmTime source Date/Time  CNU Device Unconfir ONU Device Unconfir ONU Device Unconfir	s Total 1 Displaying 1 to 1 Page Length 25	s Total 1 Displaying 1 to Page Length 25 K K Category Confirm. ConfirmStaff ConfirmTime Source Date/Time  Alarm Messa ONU Device Unconfir 172.16.21.147-EPON8/ Jun 04.2012 02:43.29 PM ONU (MAC Address is fc fa 17 2	s Total 1 Displaying 1 to 1 Page Length 25 K K P Category [confirm] confirmStaff confirmTime source Date/Time Alarm Message ONU Device Unconfir 172.16.21.147-EPON8/ Jun 04,2012 02.43.29 PM ONU.(MAC Address is fc fa f7 2b 0f 4b) b 172.16.21.147-EPON8/ Jun 04,2012 02.43.29 PM ONU.(MAC Address is fc fa f7 2b 0f 4b) b

In the above-mentioned figure, two alarms are shown. Alarm confirmation includes **Confirmation Status**, **Confirmation Person**, and **Confirmation Time**.To confirm an alarm, choose the alarm

row, right click it and choose **Confirm alarm**. See the following figure:

🖇 Alarms		and to				
🚳 Alarms		Total 1	Displaying	to Pa	age Length 25 💌 🖪 🖪	
	nfirmStaff cor	nfirmTime	source	Date/Time 🔻	Alarm Messa	
ONU Device Unconfir	Details	172 Alt+D	.16.21.147-EPON8/	Jun 04,2012 02:43:29 PM	ONU:(MAC Address is fc fa f7 2	o Of 4f) belongin
	Events	Ctrl+E				
	Refresh	F5				
	Epon_Alert_Conf	CONTRACTOR AND				
	Alert_Goto_Map_	Bottom				
<			Ш			3

Click Confirm alarm. The following dialog box appears.



Click Yes.

🏶 Alarr	ns					
🄕 Ala	irms	Total	1 Displaying	1 to 1 Pa	ige Length 25 💌 🔣	
Status	category confirm confirmStaff	confirmTime	source	Date/Time 🔻	Alarm Mes	sage
Clear	ONU Device Confirmed root	2012-06-04 15:08:36	172.16.21.147-EPON8/	. Jun 04,2012 03:08:38 PM	ONU:(MAC Address is fc fa fi	² 2b Of 4f) belonging
<						>

This alarm is then confirmed. The confirmation persion is the current administrator. The confirmation time is the time to confirm this operation. The confirmation status is Confirmed.

### 6.3 Alarm Toolbar

😮 Critical(0)

🕕 Major(0)

For the convenience of the administrator, NMS has the alarm toolbar at the bottom of its window.See the following figure:

Severity	Category	Confirm Status	Confirm Staff	Confirm Time	Source	Alert Time	Alert Content
Critical	ONU Device Alert	Unconfirmed			172.16.21.147-EPON8/4:2	2012-06-01 15:18:16	ONU:(MAC Address is fc fa f7 2b 0f 4f) belonging to PON port:EP
	(1) 🕕 Major(0) 🤑 Of	hore Alorto(0)					
Criticali	(1) 🙂 major(0) 😈 Ol	mens Alens(u)					

The above-mentioned figure is same to the alarm list, so please refer to the previous section.

Others Alerts(1) This small figure is shown at the left bottom of the above-mentioned figure. This small figure consists of three tabs: Emergency Alarm, Important Alarm, and Other Alarm.If you these tabs, the corresponding alarm levels will be shown. Emergency Alarm corresponds to the Critical level, Important Alarm the Major level, and Other Alarm the Clear level.

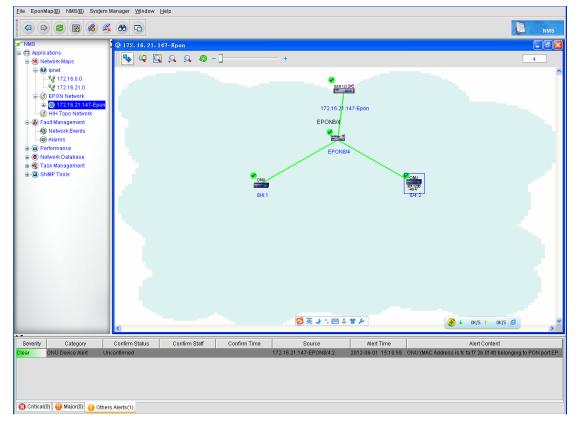
Select the alarm row and right click it. A menu appears, as shown in the following figure:

Severity	Category	Confirm Status	Confirm Staff	Confirm Time	Source	Alert Time	Alert Content
Clear	ONU Device Alert	Unconfirmed			172.16.21.147-EPON8/4:2	2012-06-01 15:19:59	ONU:(MAC Address is fc fa f7 2b 0f 4f) belonging to PON port:EP
			Alert Co	onfirm			
			Alert Lo	cation			
🔞 Critical	(0) 🕕 Major(0) 🕕 O	thers Alerts(1)					

• Confirm alarm: please refer to section "Confirming alarms."

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**Locate alarm**: If you click it, the **Network** page will be opened. On this page you can select the alarm source.See the following figure:



### 7 Performance Management

This chapter gives a detailed description of the performance statistics mode.Performance statistics means to browse the operation parameters of a device in a period of time and present these parameters on the statistics graphic on the window, so performance statistics helps you to know the running status of the device in a period of time.

This chapter consists of CPU performance statistics and port's traffic statistics.

CPU performance statistics: means to collect the information about CPU usage.

Port's traffic statistics: means to collect the information about traffic on some ports.

**ONU port's traffic**: means to display the traffic on each port of ONU. This option does not include the historical data.

**Performance statistics** is classified into **Real-time performance statistics** and **Historical performance statistics**.

**Real-time performance statistics**: means to collect the real-time data of a device and display these data in real time.

**Historical performace statistics**: means to browse the running data of a device during a past period.

### 7.1 CPU Performance Statistics

CPU performance statistics means to collect the information about CPU usage.

Click **EPON network -> EPON device -> CPU performance statistics** on the NMS window, as shown in the following figure:

📧 EPON Network	OLT Stp Conf
	Mirror Managed
🎭 🔍 🖸 🔍 🧔 – ] +	Register ONU
	Port Rate Limit
	Storm Control
	Port Flow Control
	OLT ACL
Y AND Y	Port Aggregation
	OLT Vlan 🔸
	QOS Manage 🔸
	OLT Encryp
	OLT Multicast
	Serial Server Config
	CPU Info
· · · · · · · · · · · · · · · · · · ·	Memory Utilization
\$8511	OpticalPort Info
	OLT Bandwidth
17 <mark>2.16.21</mark>	Device settings
	Modify Map Symbol
	ReFound
	Delete Device
5 marl	HIH Topo Descovery
<	>

The CPU performace statistics page appears:

CPU Performance Collection-172.16.21.147-Epon	
Real-time Performance Collection Historical Performance Collection	
172.16.21.147 <b>-E</b> pon	Data Information
1.00	Collection Mode:
	⊙ 5 second
8 0.75 - E	🔿 1 minute
No-data displayed	🔿 5 minute
8 0.25	
0.00	
01-01 08:00:00	
Time(Seccond)	Help Draw Close
Getting Completely!	

**Performance statistics** is classified into **Real-time performance statistics** and **Historical performance statistics**.

The above-mentioned figure shows the real-time performance statistics page. The figure below shows the historical performance statistics page.

💌 ci	U Performance Collection-172.16.21.147-Epon	
Real	time Performance Collection Historical Performance Collection	
	172.16.21.147-Epon	Data Information
	•	Collection Time: 5 minute
		Collection Mode:
(%) u(%)	75 -	Before 24 hrs
CPU Utilization(%)	so - No-data-displayed!	🔿 Today
U.C.		🔿 Last Week
5.	25 -	O Self-definition
0	00 -	Begin Time:
0	oriola.co.co Time(Seccond)	End Time:
	CPU Utilization	Help Draw Close
Gettin	g Completely!	

### 7.1.1 Real-Time Performance Statistics

Choose **CPU performance statistics** to enter the real-time performance statistics page:

🚰 CPU Performance Collection-172.16.21.147-Epon	
Real-time Performance Collection Historical Performance Collection	
172.16.21.147-Epon	Data Information Collection Mode:
No-data displayed!	<ul> <li>1 minute</li> <li>5 minute</li> </ul>
0.00 - 01-01 08:00:00 Time(Seccond)	
CPU Utilization	Help Draw Close

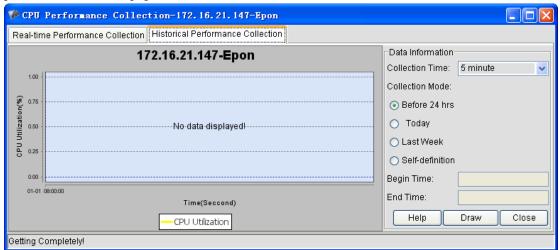
On the page you can choose the statistics interval. If you click **Draw map**, real-time performance statistics will be conducted. If you choose 5 seconds as the statistics interval, the corresponding statistics window is shown in the following figure:

Real-tin	ne Performance Collection	Historical Performance Collection	
	17	2.16.21.147 <b>-E</b> pon	Data Information
CLN CLIIIzation(%)			<ul> <li>5 second</li> <li>1 minute</li> <li>5 minute</li> </ul>
CPU Uti	05-31 17.43.59 05-31 17.	44:29 05:31 17:44:59 05:31 17:45:59 05:31 17:44 Time(Seccond) 	Help Stop Close

Each point in the curve stands for the CPU usage. The distance between points stands for the statistics interval. If you click **Stop**, the real-time CPU performance statistics will be stopped.

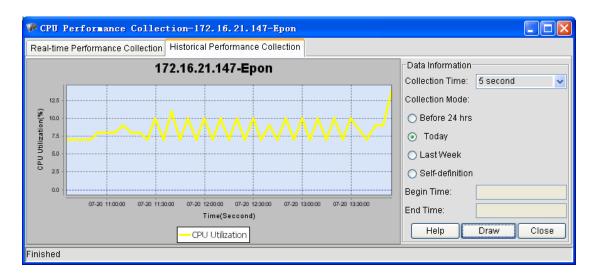
#### 7.1.2 Historical Performance Statistics

Click **CPU performance statistics -> Historical performance statistics** to enter the historical performance statistics page.



Statistics time stands for the interval of CPU usage statistics. Statistics mode stands for the data statistics period, which can be self-defined.

The following figure shows the statistics time is 5 seconds and the statistics mode is self-defined:



# 7.2 Port's Traffic Statistics

Port's data flow statistics means to collect the information about flows on a designated port.It is also classified into **Real-time performance statistics** and **Historical performance statistics**. Click **Performance management-> Performance statistics** in the NMS window, as shown in the following figure:

Image: Control of the second of the secon	Eile System Manager Window Help	
Configuring Port     Source     Source		Broad Director
Okapitations	ProadDirector	
	Constructions     Construction     Construction	Reat-time Performance Collection         Devices       Type         Ethernet Fort       Collection item         1         2         2         2         2         2         2         2         2         2         3         2         3         3         3         3

The performance statistics page appears, as shown in the following figure:

No. 2012 Performance Collection								_ 7 🛛
Retwork Device EPON Device	Real-time P	erformance Collec	tion Historica	I Performance Collectior				
	Devices		Туре	Ethernet Port 🗸		Received B 🗸	Polling Interval 15	
Switch Router					re(Seccond)			
	Configu	ring Port				Start	Stop	Help
	IfDesc		Sent Bytes F	Received Sent Unic	Cont Multi	Sent Broa Rece		iftable ifln
	ildesc	Received a	Deni byles F	Received Sent Onic	Sent Wult	Seni Broa Rece	weu Receiveu	inable lin
	<u>&lt;</u>							2

In the above-mentioned figure, its left part shows the classified devices and its right part shows the performance statistics page. The right part of the above-mentioned figure shows the real-time performance statistics page.

The figure below shows the historical performance statistics page.

							_ 7 🛛
Real-time Per	formance Collectio	n Historical Perfo	rmance Collection				
Devices							
Type E	thernet Port 🗸 🗸	Collection Item	Received B 🗸	Begin Time		End Time	
1							
0.6							
0.2							
			Time	e(Seccond)			
Configuring	g Port					Drawing	Save As
Port Name		Max		Minimum		Average	
	Devices E Type E 1	Devices Type Ethernet Port  I  A  Configuring Port  Ethernet Port  Configuring Port  Ethernet Port  Configuring Port	Devices Type Ethernet Port  Collection Item  Type Collection Item  Type Collection Item  Type Collection Item  Collection Item	Devices Type Ethernet Port  Collection Item Received B  Configuring Port	Devices Type Ethernet Port Collection Item Received B Begin Time as	Devices Type Ethernet Port  Collection Item Received B Begin Time	Devices Type Ethernet Port  Collection Item Received B Begin Time End Time Indexide a Begin Time End Time Indexide a Begin Time End Time Indexide a Begin Time Indexide a Beg

# 7.2.1 Real-Time Performance Statistics

It is to collect the information about the real-time traffic on some ports of a device.

Statistics options include Port type, Statistics item, and Polling interval.

Here Port type contains Ethernet port and PON port.

Statistics item contains **Port's incoming flow (Bps)**, **Port's outgoing flow (Bps)**, **Number of received unicast packets**, and **Number of transmitted unicast packets**.

Polling interval means the statistics interval, whose smallest value is 10 seconds.

If you click **Performance statistics**, the **Real-time performance statistics** page appears:

al Performance Collection
Ethernet Port 🕑 Collection Item Received B 🕑 Polling Interval 15
Time(Seccond)
Start Stop Help
Received   Sent Unic   Sent Multi   Sent Broa   Received   Received   iftable iftn

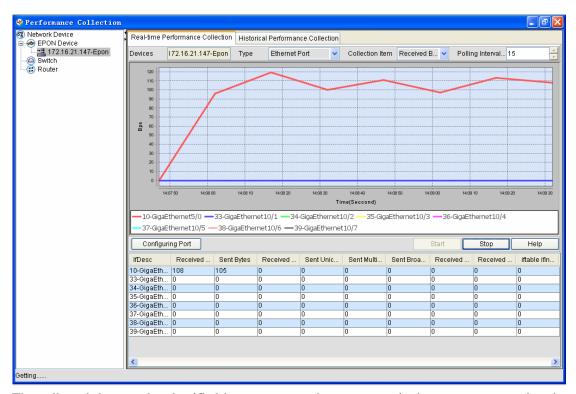
In the device list of the above-mentioned figure, double click an IP and enter a name in the **Device** textbox. Data statistics will be performance on this device. After the port type, statistics item and polling interval are set, click **Set port** tp set all ports on which data statistics will be conducted. See the following figure:

👋 Performance Collection										_ 7 🛛		
Network Device     Gevice	Real-time	Performance Collection	Historic	al Performanc	e Collection							
172.16.21.147-Epon	Devices	172.16.21.147-Epon	Туре	Ethernet P	ort 💌	Collection Iter	m Received	B 🔽 🛛 Po	olling Interval 15	-		
- @ Switch - @ Router	1	08 07 08										
	Add Por	t	×									
		lame: 172.16.21.147-Ep ype: EPON Device	on									
	🔽 10-Gig	aEthernet5/0	^									
	🔽 33-Gig	aEthernet10/1										
	🔽 34-Gig	aEthernet10/2	_		Time	(Seccond)						
	🔽 35-Gig	aEthernet10/3						Start	Stop ]	Help		
	<b>-</b> -	aEthernet10/4		Received	Sent Unic	Sent Multi	Sent Broa	Received	Received	iftable ifln		
	<b>-</b>	aEthernet10/5										
		aEthernet10/6										
	39-Gig	aEthernet10/7	lose									
	Finished.											
	<									>		

The figure above shows that 172.16.21.147-Epon is chosen, the port type is the Ethernet port, the statistics item is port's outgoing flow, the polling interval is 10 seconds and the **Set port** option stands for all Ethernet ports. After the settings, a window appears, as shown in the following figure:

No. 2012 Performance Collection										
8 Network Device Image: Second Sec	Real-time P	erformance Colle	ction Histor	ical Performan	ce Collection					
172.16.21.147-Epon	Devices	I72.16.21.147-E	oon Type	Ethernet P	Port 🔽	Collection Iter	m Received	B 🗸 I	Polling Interval 1	5 🕂
George Switch					Time	(Seccond)				
	Configu	ring Port						Start	Stop	Help
	IfDesc	Received	Sent Bytes	Received	Sent Unic	Sent Multi	Sent Broa	Receive	ed Received	iftable ifln
	10-GigaEth									
	33-GigaEth 34-GigaEth									
	35-GigaEth									
	36-GigaEth									
	37-GigaEth									
	38-GigaEth									
	39-GigaEth									
	<									>

On the above-mentioned figure, if you click **Start**, the data statistics will begin. The following figure shows data statistics:



The collected data can be classified into two parts: the upper part is the curve, representing the real-time data change, and the bottom part shows the port's traffic statistics list, in which the column stands for the port type.

The statistics items corresponding to the Ethernet port are **Port's incoming flow (Bps)**, **Port's outgoing flow (Bps)**, **Number of received unicast packets**, **Number of transmitted unicast packets**, **Number of transmitted multicast packets**, **Number of transmitted broadcast packets**, **Number of received multicast packets** and **Number of received broadcast packets**.

The statistics items corresponding to the EPON port are **Number of received correct packets**, **Number of transmitted correct packets**, **Number of received error packets**, **Number of transmitted error packets** and as well as all statistics items of the Ethernet port.

### 7.2.2 Historical Performance Statistics

Historical performace statistics means to browse the data of a device during a past period. The statistics procedure is performed by the back-stage program of the NMS and the statistics interval is generally 300 seconds.

Click **Historical performance statistics**. The **Historical performance statistics** window appears, as shown in the following figure:

Performance Collection								- 7 🛛
8 Network Device 9 Appendix Point Device	Real-time	Performance Collection	Historical Perfor	mance Collection				
☐ 172.16.21.147-Epon	Devices	172.16.21.147-Epon						
Router	Туре	Ethernet Port 🗸 🗸	Collection Item	Received B 🗸	Begin Time	E	End Time	
	1							
	0.9	ld Port	X					
	0.8 -	Device Name: 172.16.21						
		Device Type: EPON De						
	0.5 P	Port :						
	0.4	] 10-GigaEthernet5/0	^					
		33-GigaEthernet10/1						
		34-GigaEthernet10/2						
	UI-UI Uas	35-GigaEthernet10/3						
		36-GigaEthernet10/4		Time(Second)				
		] 37-GigaEthernet10/5					Drawing	Save As
		] 38-GigaEthernet1 0/6 ] 39-GigaEthernet1 0/7			Minimum		Average	
		_						
		Se	t Close					
	Fin	iished.						
Getting								

Performance Collection     Network Device     Performance Collection	Real-time	Performance Coller	ction Historical F	erformance Collectio	n		
172.16.21.147-Epon	Devices	172.16.21.147-E	pon				
Switch Router	Туре	Ethernet Port	Collection I	tem Received B	<ul> <li>Begin Time</li> </ul>	End Time	
	1				me(Seccond)		
	Configu	ring Port				Drav	wing Save As
	Port Nam		Мах		Minimum	Average	
	10-GigaEth 33-GigaEth 34-GigaEth 35-GigaEth 36-GigaEth	ernet1 0/1 ernet1 0/2 ernet1 0/3					
Getting							

Like real-time performance statistics in the previous section, you have to set the statistics items before browsing the data.

If you click **Draw map**, the historical data of all ports will be presented in the list. The following figure shows that the data is being read.

Real-time I	Performance C	ollection	Historical Perfor	rmance Collection				
n Devices	172.16.21.14	47-Epon						
Туре	Ethernet Por	t 🗸	Collection Item	Received B 🗸	Begin Time	012-07-1914:14:32	End Time	012-07-2
300.000 -								
275,000								
250,000 -								
225,000								
200,000 · v 175,000 ·								
L 1/5,000								
125,000								
100,000								
75,000								
	$\int$							
75,000 50,000	$\sum$							
75,000 50,000 25,000 0	10:40:00 07-20 11	1:00 00 07-21	0 11:20:00 07-20 11:40		20 12:20 00 07-20	12:40:00 07:20 13:00:00 07	7-20 13:20:00 07-	20 13:40 00 07
75,000 50,000 25,000 0 07-20				т	'ime(Seccond)			
75,000 50,000 25,000 0 07-20	- 10-GigaEthen			т	'ime(Seccond)	12:40:00 07:20 13:00:00 07 - 35-GigaEthernet10/	/3 — 36-Giga	Ethernet10
75.000 50.000 25.000 0 0 7-20 Configu	- 10-GigaEther ring Port		- 33-GigaEtherne	т	ime(Seccond)		/3 — 36-Giga Drawi	Ethernet10
75,000 - 50,000 - 25,000 - 0 0 0 7-20 7-2	- 10-GigaEthen ring Port	net5/0 —	- 33-GigaEtherne Max	т	Time(Seccond) thernet10/2 Minimum	- 35-GigaEthernet10/	/3 36-Giga Drawi Average	Ethernet10
75.000 25.000 0 0 0 0 0 0 0 0 0 0 0 0	= 10-GigaEther ring Port	net5/0 —	- 33-GigaEtherne Max  308624	т	thernet10/2 - Minimum 22746	- 35-GigaEthernet10/	/3	Ethernet10
75000 25000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	= 10-GigaEthen ring Port emet5/0 ermet5/0	net5/0 —	- 33-GigaEtherne Max  308624 0	т	Time(Seccond) thernet10/2 Minimum	- 35-GigaEthernet10/	/3 36-Giga Drawi Average	Ethernet10
75000 50000 0 0 0 0 0 0 0 0 0 0 0 0 0 0	= 10-GigaEther ring Port emet5/0 emet10/1 emet10/2	net5/0 —	- 33-GigaEtherne Max  308624	т	thernet10/2 - Minimum 22746 0	- 35-GigaEthernet10/	(3	Ethernet10

# 7.3 ONU Port's Flow

ONU port's flow is designed for users to know the ONU flow in time. This function is only for ONU and the displayed data are all real-time data.

Click ONU port's flow, as shown in the following figure:

ProadDirector	👋 ONU port flow				. • 🛛
Applications	⊂UNI port flow				
⊜-® Network Maps ⊜-® ipnet	Device Name	Polling interval(seconds)	10	Start	Stop Help
	r Device Tree	-Configuration Option	ONU Description	Port	choose deleted
Performance Management     Performance Collection     Performance Coll					
		-Line Graph-			Empty
		🖄 total flow 🚩 Into the flow	V Out of flow		
		1 0.75 0.75 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.			
		or or otherda	Tin	ne(Seccond)	
	Getting Completely!				

The **OUN port's flow** page appears, as shown in the following figure:

JNI port flow								
Device Name	Polling interval(seconds) 10							
Device Tree	Configuration Option							
	choo Ifindex ONU Description Port deleted							
	Emp							
	Line Graph							

The left part of the above-mentioned figure shows the device tree list, where only EPONs are supported. If you double click EPON, its PON ports and their mounted ONUs are listed out. See the following figure:

😵 ONU port flow						_ 7
UNI port flow						
Device Name 172.16.21.147-Epon	Polling interval(seconds)	10	*	Start	Stop	Help
Device Tree EPON Device Pont	Configuration Option ifindex	ONU Description	Port	Start	cl deleted	Help hoose
Finished.						

If you then double click an ONU, the ports of this ONU will be displayed on the left part.

JNI port flow				
Device Name 172.16.21.147-Epon	Polling interval(seconds)	10	Start	Stop Help
Device Tree-	Configuration Option			
← EPON Device =-····································	UNI Port: 1	UNI Port: 2 📃 UNI	l Port: 3 📃 UNI Por	t 4
EPON8/9 EPON8/16 EPON8/8				choose
	ifindex	ONU Description	Port	deleted
EPON8/12     EPON8/12     EPON8/12     Statistical and a stat				Empty
EPON8/1	🔣 total flow 🚩 Into the flow	V 🗠 Out of flow		
	t (cecoud) 0.5			
	01-01 08:00:00		ie(Seccond)	

In the left part, that is, the **Configuration choice** sub-window, you can choose the port whose flow you want to check:

NU port flo					
evice Name	172.16.21.147-Epon	Polling interval(seconds)	10	Start	Stop Help
Device Tree		Configuration Option			
EPON Device 0 (0) 172.16.21		UNI Port: 1 UNI	NI Port: 2 🔽 🔽 🛛	Port: 3 🛛 🗌 UNI Port	: 4
EPON EPON	8/9 8/16				choose
EPON8/16     EPON8/16     EPON8/16     EPON8/16     EPON8/17     EPON8/17     EPON8/17     EPON8/14     EPON8/13     EPON8/13     EPON8/12     EPON8/12     EPON8/14     EPON8/1     EPON8/1     EPON8/1     EPON8/1     EPON8/1     EPON8/1     EPON8/1	ifindex	ONU Description	Port	deleted Empty	
- 🛅 EPON	8/2	Line Graph	🗻 Out of flow		
		0.25			

Click **Select**. A page appears, as shown in the following figure:

⊗ ONU port flow				
UNI port flow				
Device Name 172.16.21.147-Epon	Polling interval(seconds)	10	Start	Stop Help
Device Tree	Configuration Option			
<ul> <li>EPON Device</li> <li>Interpretation</li> <li>Interpretation</li></ul>	UNI Port: 4			
EPON8/16				choose
🔂 EPON8/15	ifindex	ONU Description	Port	deleted
EPON8/7	65	8/4:1 (fc:fa:f7:2b:0f:4f)	UNI Port: 1	deleted
	65	8/4:1 (fc:fa:f7:2b:0f:4f)	UNI Port: 2	deleted
	65	8/4:1 (fc:fa:f7:2b:0f:4f)	UNI Port: 3	deleted
	Line Graph total flow rinto the flor arrs ars			Empty
inished.	þ			

In the above-mentioned figure, there still exists a port, which is not selected during statistics. If you want to delete a chosen port, click **delete**.

Select **Polling interval** and click **Begin**. The system will make statistics of the flows of all ports in the list. The broken line at the right bottom part will shows the changes of these data:

© ONU port flow				
UNI port flow Device Name 172.16.21.147-Epon	Polling interval(seconds	) 5	Start	Stop Help
Device Tree	Configuration Option			
EPON Device     If 2,16,21,147-Epon     EPON8/9     EPON8/16     EPON8/8				choose
- C EPON8/15	ifindex	ONU Description	Port	deleted
EPON8/7	65	8/4:1 (fc:fa:f7:2b:0f:4f)	UNI Port: 1	🔀 deleted
EPON8/6	65	8/4:1 (fc:fa:f7:2b:0f:4f)	UNI Port: 2	deleted
EPON8/13	65	8/4:1 (fc:fa:f7:2b:0f:4f)	UNI Port: 3	deleted
EPON8/3     EPON8/10     EPON8/2     EPON8/1	Line Graph	low 🗠 Out of flow		Empty
		172.16.21.147	7-Epon:total flow	
	ĝ			
	bit(second)			
	07-20 14:22 22 07-		07-20 14-22 24 07-20 14-22 24 07-20 14-22 29 ime(Seccond)	5 07-20 14:22:25 07-20 14:22:26 07-20 14:2
	-8/4:1(fc	:fa:f7:2b:0f:4f):3 -8/4:1(fc	:fa:f7:2b:0f:4f):2 -8/4:1(fc:fa	:f7:2b:0f:4f):1
nished.	- P			

The broken line contains three options: **Total traffic**, **Incoming traffic** and **Outgoing traffic**. You can click each of them to see the statistics data of the three traffics.

If you want to reselect ports or ONUs, you shall stop statistics and repeat the above-mentioned statistics procedure. To stop statistics, please click **Stop**.

## **8 Network Resource**

Network resource is also called as Resource management. It is to summarize the basic attributes and project information about the currently discovered and managed devices and their related devices. They can be classified into 4 types according to the device type:

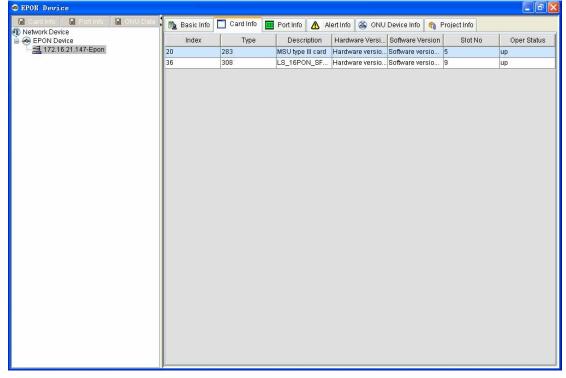
- EPON devices
- Switches
- Routers
- ONU devices

It deserves special attention that NMS in the EPON devices supports the backup of the project information (saving as the Excel list), which will be described in detail.

### 8.1 EPON Devices

The EPON devices include EPON OLTs and EPON ONUs, which summarize and manage uniquely all the managed devices in the current EPON network.

The NMS can automatically obtain EPON OLTs and present them in the device tree on the left, as shown in the following figure:



You can find from the above-mentioned figure that each EPON OLT has the following tabs: Basic

#### Info, Card Info, Port Info, Alarm Info, ONU Info and Project Info.

You can do some simple configuration to the current EPON OLT on the left device tree node. For example, if you click **172.16.21.147-Epon**, the following window appears and on this window you can do specific configuration.

Card Info 🛛 🔛 Port Info 🖉 ONU Data	📕 🔂 Basic Info	🔲 Card Info 🚦	Port Info 🔥	Alert Info 🚳 OI	NU Device Info 🛛 🄇	Project Info	
etwork Device EPON Device	Index	Type	Description		Software Versi	Slot No	Oper Status
OLT Deivce Info	20	283		Hardware versi		5	up
Link Aggeragation	32	308	LS_16PON_SF	Hardware versi	Software versio	8	up
DBA Configuration							
STP Configuration							
OLT Encryption							
OLT Multicast							
SET HURSON							

To browse the data about an EPON OLT, you just need to click this EPON OLT icon in the left tree node. The system then automatically reads the corresponding data according to the chosen device name and displays them in the right sub-window. The following sections all take **172.16.21.147-Epon** as example.

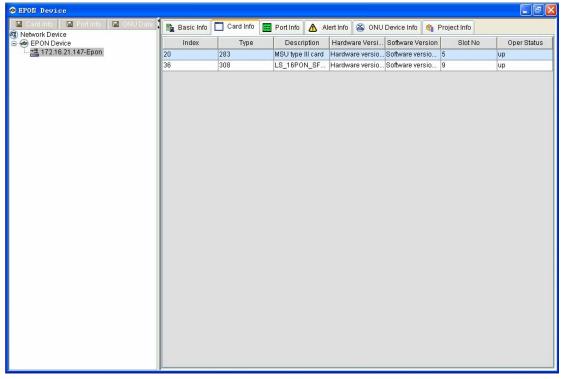
### 8.1.1 Basic Info

The basic information about the current EPON OLT includes the IP, the device type, the running time, and the version.

SEPOE Device		
Network Device	IP Address System Uptime	Cand Info Port Info Alert Info CONU Device Info R Project Info ITZ - 16 - 21 - 147 Device Type BBCOM SB510 0 boars, 25 einstex, 40 seconds
	Version Info	BDCOM(hm) MSUB510 Software, Version 0.0.0 Build 6909 Compiled: 2012:1-13 16:9:50 by SYS ROM: System Bootstrap, Version 0.4.5, Serial num 45000110
		<u>c</u>

### 8.1.2 Card Info

The card information refers to the basic data of one or multiple cards on the current EPON OLT. The system presents the basic data of each card to users, as shown in the following figure:



Additionally, the card-info form can also be obtained.To obtain the card-info form, choose the corresponding device and then click **Card-info form**;

👁 EPON Device								- 7 🛛
	ort Info 🛛 📓 ONU Data	🖹 Basic Info	🗖 Card Info  🔛	Port Info 🔥 A	lert Info 🚳 ONU	Device Info 🛯 🏫 Pri	oject Info	
Retwork Device Retwork Device		Index	Type	Description	Hardware Versi	Software Version	Slot No	Oper Status
<sup>™</sup> ≓ <u></u> 172.16.21.147	?-Epon	20	283	MSU type III card	Hardware versio	. Software versio 5	i	up
		36	308	LS_16PON_SF	Hardware versio	. Software versio 9		up
		Information ? Are yo	ou sure generate t	o interface card	information repor	<b>X</b> •• ?		

#### Click Yes.

	d Info							
<b>B</b> s	O H I			0%				
				Card Info				
	Index	Turns	Description	Hardware Version	Software Version	Clat No.	Once Status	
	20	Type 283	Description MSU type III card	Hardware version 0.0.2	Software version 11.0.1F	Slot No 5	Oper Status up	
	36	308	LS_16PON_SFP_CAR	Hardware version 0.0.2	Software version 11.0.1F	9	up	
			DS_INION_DIT_CAR	Hardware veision 0.0.2	Software version 11.0.11	× *	up	
								~
<								>
				Page 1 of 1				

The card-info form is displayed. To save this form, click

Select File type and name this form.

### 8.1.3 Port Info

Port information refers to the basic information about the ports on EPON OLT, including Index,
Description, Management status, Operation status, Port's rate and MAC.

👁 EPON Device						- 7 🛛
📓 Card Info 🔛 Port Info 🔛 ONU Data	💼 Basic Info 🥅	Card Info 🛄 Port I	nfo 🔥 Alert Info	🙈 ONU Device Info	🏫 Project Info	
Retwork Device     Generation     Generati	Index	Description	Admin Status	Oper Status	Port Rate	MAC Address
172.16.21.147-Epon	10	GigaEthernet5/0	up	up	100000000	00 e0 0f 8e 91 b8
	11	NullO	up	up	1410065408	
	12	EPON9/13	down	down	100000000	00 e0 0f c2 34 0c
	13	EPON9/14	down	down	100000000	00 e0 0f c2 34 0d
	14	EPON9/15	down	down	100000000	00 e0 0f c2 34 0e
	15	EPON9/16	down	down	100000000	00 e0 0f c2 34 0f
	16	EPON9/9	up	down	100000000	00 e0 0f c2 34 08
	17	EPON9/10	up	down	100000000	00 e0 0f c2 34 09
	18	EPON9/11	up	down	100000000	00 e0 0f c2 34 0a
	19	EPON9/12	down	down	100000000	00 e0 0f c2 34 0b
	20	EPON9/5	up	up	100000000	00 e0 0f c2 34 04
	21	EPON9/6	up	down	100000000	00 e0 0f c2 34 05
	22	EPON9/7	up	down	100000000	00 e0 0f c2 34 06
	23	EPON9/8	up	down	100000000	00 e0 0f c2 34 07
	24	EPON9/1	up	down	100000000	00 e0 0f c2 34 00
	25	EPON9/2	up	down	100000000	00 e0 0f c2 34 01
	26	EPON9/3	up	down	100000000	00 e0 0f c2 34 02
	27	EPON9/4	up	up	100000000	00 e0 0f c2 34 03
	31	VLAN1	up	up	1000000000	00 e0 Of 8e 91 b8
	32	EPON9/5:1	up	up	100000000	00 e0 0f c2 34 04
	34	EPON9/4:1	up	up	100000000	00 e0 0f c2 34 03
	35	EPON9/4:2	up	up	100000000	00 e0 0f c2 34 03

Additionally, the port-info form can also be obtained.To obtain the port-info form, choose the corresponding device and then click **Port-info form**.See the following figure:

👁 EPON Device										
📓 Card Info 📓 Port Info	📓 ONU Data		Basic Info	C:	ard Info 🔛 Po	ort In	fo 🔥 Alert Info	S ONU Device Info	🏫 Project Info	
Network Device EPON Device			Index		Description	1	Admin Status	Oper Status	Port Rate	MAC Address
172.16.21.147-Epon		10		G	igaEthernet5/0		up	up	1000000000	00 e0 0f 8e 91 b8
		11			ullO	_	up	up	1410065408	
		12		E	PON9/13	_	down	down	100000000	00 e0 0f c2 34 0c
		13		E	PON9/14	(	down	down	100000000	00 e0 0f c2 34 0d
		14		E	PON9/15	0	down	down	100000000	00 e0 0f c2 34 0e
		15		E	PON9/16	(	down	down	100000000	00 e0 0f c2 34 0f
		16		E	PON9/9	I	up	down	100000000	00 e0 0f c2 34 08
		17		E	PON9/10	-	up	down	100000000	00 e0 0f c2 34 09
		18		E	PON9/11	-	up	down	100000000	00 e0 0f c2 34 0a
		19		E	PON9/12	(	down	down	100000000	00 e0 0f c2 34 0b
		20	6						100000000	00 e0 0f c2 34 04
		21	Informat	tion	<b>L</b> -				100000000	00 e0 0f c2 34 05
		22	0					-	100000000	00 e0 0f c2 34 06
		23	- 😲 A	re yo	ou sure to gener	rate	port information a	report?	100000000	00 e0 0f c2 34 07
		24		13		_			100000000	00 e0 0f c2 34 00
		25			<u>I</u> es		No		100000000	00 e0 0f c2 34 01
		26		E	PUN9/3	μ	up	aown	100000000	00 e0 0f c2 34 02
		27		E	PON9/4	1	ир	up	100000000	00 e0 0f c2 34 03
		31		VI	LAN1	1	up	up	1000000000	00 e0 Of 8e 91 b8
		32		E	PON9/5:1	I	up	up	100000000	00 e0 0f c2 34 04
		34		E	PON9/4:1	I	up	up	100000000	00 e0 0f c2 34 03
		35		E	PON9/4:2	I	up	up	100000000	00 e0 0f c2 34 03

		10%				_
		Ро	ort Info			
Index	Description	Admin Status	Oper Status	Port Rate	MAC Address	
10	GigaEthernet5/0	up	up	100000000	00 e0 0f 8e 91 b8	
11	Null0	up	up	1410065408		
12	EPON9/13	down	down	100000000	00 e0 0f c2 34 0c	
13	EPON9/14	down	down	10000000	00 e0 0f c2 34 0d	
14	EPON9/15	down	down	100000000	00 e0 0f c2 34 0e	
15	EPON9/16	down	down	10000000	00 e0 0f c2 34 0f	
16	EPON9/9	up	down	100000000	00 e0 0f c2 34 08	
17	EPON9/10	up	down	10000000	00 e0 0f c2 34 09	
18	EPON9/11	up	down	100000000	00 e0 0f c2 34 0a	
19	EPON9/12	down	down	10000000	00 e0 0f c2 34 0b	
20	EPON9/5	up	up	100000000	00 e0 0f c2 34 04	
21	EPON9/6	up	down	10000000	00 e0 0f c2 34 05	
22	EPON9/7	up	down	100000000	00 e0 0f c2 34 06	
23	EPON9/8	up	down	10000000	00 e0 0f c2 34 07	
24	EPON9/1	up	down	100000000	00 e0 0f c2 34 00	
25	EPON9/2	up	down	100000000	00 e0 0f c2 34 01	
26	EPON9/3	up	down	100000000	00 e0 0f c2 34 02	
27	EPON9/4	up	up	10000000	00 e0 0f c2 34 03	
31	VLAN1	up	up	100000000	00 e0 0f 8e 91 b8	

#### Click Yes.

The port-info form is displayed. To save this form, click

Select **File type** and name this form.

### 8.1.4 ONU Data Form

The system makes statistics of the incoming traffic and outgoing traffic on each ONU port every hour, and then draws line maps. All these will be shown in the ONU data form.

The detailed procedure is as follows:

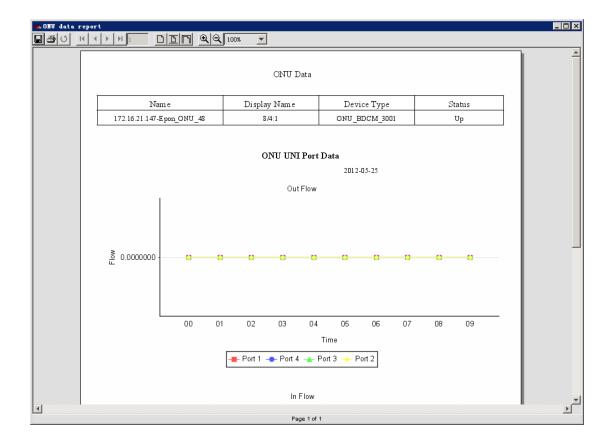
Click **Resource Management -> EPON device -> ONU data form**, as shown in the following figure:

🐟 EPON Device	•										
📓 Card Info	🛛 📓 Port Info	📓 ONU	Data	🐚 Basic Info	Card Info	📰 Port Info	🔥 Aler	rt Info 🛛 🚳 O	NU Device Info	🟫 Project Info	
🚳 Network Devi 🖃 🛷 EPON De	evice			IP Address	172 .	16 . 21	. 147	Device	e Type BDCOM Sa	510	
<u>≓</u> ≣ 172.1	6.21.147-Epon			System Uptime	23 hours 37	minutes, 43 s	econds.				
				-,	,	,					
	🎾 OIIV data r							×		stem Software	
	-Conditions Set									L DOI HMARE	
	Belong Olt	172.16.21.	147-Epo	n 💌	Search Items	ALL		•			
	Inquiry				report date	2012-05-25		Search			
	Query Result										
	Symbol	name	0	Display Name	Devi	се Туре	Status	choose			
	172.16.21.147-	Epon_ON	8/4:1		ONU_BDCM	_3001	Up	<b>v</b>			
	172.16.21.147-	Epon_ON	8/4:2		ONU_OPL_:	2009	Up				
	<u> </u>										
				Refresh Re	eport Close	,					
					4				-		

Choose an entry in **Query Result** by ticking it and then click **Form**.See the following figure:

🐟 EPON Device	
🔚 Card Info 🔛 Port Info	📓 ONU Data 🖡 🍢 Basic Info 📘 Card Info 🗮 Port Info 🔥 Alert Info 🌋 ONU Device Info 🍖 Project Info
Retwork Device E ← Second Device	IP Address 172 . 16 . 21 . 147 Device Type BDC0M S8510
	System Uptime 23 hours, 37 minutes, 43 seconds.
📁 OHU data re	port Operating System Software 02, RELEASE SOFTWARE
Conditions Set	
Belong Olt	172.16.21.147-Epon Search Items ALL
Inquiry	report date 2012-05-25 Search
-Query Result	
Symbol 1 172.16.21.147- 172.16.21.147-	Epon_C ? Are you sure to generation ONU data report?
	Refresh Report Close

Click **Yes**. The form is then generated.See the following figure:



### 8.1.5 Alarm Info

The alarm information refers to the events and alarm indicators that the current EPON OLT sends to the NMS. The alarm information includes two parts: Current alarm information and Historical alarm information.

#### Current alarm

It refers to the information that the device sends to the NMS currently, including **Alarm level**, **Alarm type**, **Alarm time**, and **Alarm content**.See the following figure:

🗢 EPON Device					
EPON Device     Card Into     Portino     ONU Data     Setwork Device     PON Device     T172.16.21.147-Epon	Basic Info	Current Alert	 Alert Info	ONU Device Info	
	No current alert	retrieved			

#### Historical alarm

It refers to the historical records of the alarms. The to-be-queried content is same to the previous section. The difference is that you can browse the alarm record according to the alarm level, the start time and the end time. See the following figure:

🐟 EPON Device		
EPON Device     Card Info     Pot Info     ONU Date     S     Network Device     EPON Device     FPON Device     172.16.21.147-Epon	Basic Info Card Info   History Alert   Search Items   Severity   Click here to choose severity   Start Time   Severity   Category   Alert Time	Project Info
	No history alert retrieved	

# 8.1.6 ONU Information

ONU information includes the EPON ONU summary information, EPON ONU project information, EPON ONU basic information, EPON ONU ports' information, backup and introduction of EPON ONU project information. See the following figure:

🕗 EPON Device		
🛛 🖬 Card Info 🖉 Port Info 🖉 ONU Data	🐚 Basic Info 🦳 Card Info 📰 Port Info	🗴 Alert Info 🚳 ONU Device Info 🍖 Project Info
Network Device	Filter Info	
EPON Device	Belonged PON All Solution Display Na	ame 🔍 Search 📓 Bakup 😭 Import
	Name Display Name	e Device Type Belonged PON MAC Address Status
	172.16.21.147-Epon_ONU 9/4:2	ONU_BDCM_3001 EPON9/4 fc fa f7 2b 0f 4f auto_config
	172.16.21.147-Epon_ONU 9/4:1	ONU_OPL_2009 EPON9/4 00 e0 0f 01 01 01 auto_config
	🍖 ONU Project Info 📓 ONU Basic Info	ONU Port Info
	Display Name 9/4:2	Project Name
	Station	Basic Station
	Installation time	Regional
	Contact Info	Vendor
	Remarks	>

#### **EPON ONU summary**

In the initialized window, the system displays all ONUs, which are connected to all PON ports of the chosen EPON OLT. ONU information includes **Name**, **Displayed Name**, **Device Type**, **PON Port**, **MAC**, and **Status**.

#### **EPON ONU project information**

If you select an ONU and double click it in the previous queried ONU list, the system will automatically read its ONU project information according to the chosen ONU name. The above-mentioned figure shows that the project information about ONU **0/4:1** is null.You can edit the project information of ONU according to actual requirements and save the project information. Step 1: Select the t0-be-queried ONU and double click it;

Step 2: Click **Edit** on the **ONU project information** tab. All attributes of ONU project information are then available to edition, as shown in the following figure:

🗢 EPON Device					
📓 Card Info 🛛 📓 Port Info 🔹 📓 ONU Data 🔞 Network Device	陸 Basic Info	🔲 Card Info 🔳 Port Info 🛕	Alert Info 🚳 O	DNU Device Info 🚳 Project Info	
EPON Device	Display Name	172.16.21.147-Epon	Project Name 1	72.16.21.147-Epon	Save
172.10.21.147-Epon	Station		Basic Station		<b>Ú</b> Cancel
	Installation time		Regional		Bakup
	Contact Info		Vendor		
	Remarks	172.16.21.147-Epon rems	ırks		
		<			×

Step 3: Enter a value for each attribute and then click **Save**(The previous **Edit** button changes into the **Save** button). The current ONU project information is then saved.Of course you can click **Cancel** not to save the current settings.

The Backup and Import functions are also provided for the EPON ONU project information.

#### ♦ Backup

Backup means to save all the EPON ONU project information in the EXCEL format, which will be used as the import file later.

Step1: Click Backup after the EPON ONU project is modified and saved.

Step2: Specify the backup file's storage location and name in the corresponding dialog box, as shown in the following figure:

🐟 EPON Device								
Card Info Port Info Source PON Device	📓 ONU Data	Basic Info	Card Info		_	8 ONU Device Info		Edit
172.16.21.147-Epon		Station			Basic St	ation		Cancel
	🔎 Save							🕞 Loading
	Save <u>i</u> n:	My Recent De	ocuments		<b>~</b>	🏂 🕬 🛄 📰		]
	My Recent Documents							
	Desktop							
	<u>ن</u>							
	My Computer							
	S		20.14.01.147.5	- Ducks strafe vila				
	My Network Places		.xls	- Projectinio, XIS		Save Cancel		
	Places	r nes or lype.	AIS			Cancer		
			<				>	

Note: If there is no special need, do not change the content of the backup file, or the import of the ONU project information will fail.

#### ♦ Import

Import means to upload the stored EPON ONU project file to the system, avoiding the trouble of editing EPON ONU project information one by one. Click **Import** and select the to-be-imported file in the following dialog box.

🐟 EPON Device									
📓 Card Info 📓 Port Info	📓 ONU Data	📴 Basic Info	Card Info	🚥 Port Info 🔒	🔥 Alert Info	0 🚳 0	NU Device Info	🏟 Project Info	
8 Network Device EPON Device		Display Name	172.16.21.147-		_		72.16.21.147-Ep	ion	Edit
172.16.21.147-Epon			112.10.21.141	Lpon			12.10.21.141 Ep		Ú Cancel
		Station			Basic S	tation			Bakup
	💓 Open						E.	X]	🕞 Loading
		My Recent Do	numents		~	ø 🕫			]
	My Recent Documents		7-Epon_ ProjectInfo	.xls					
	Desktop								
	4								
	My Computer								
		File <u>n</u> ame: 1	.72.16.21.147-Epon	_ ProjectInfo.xls			<u>O</u> pen	1	
	My Network Places	Files of type:	xls			~	Cancel	í l	
							<u>_</u>	, ,	
			<					>	

#### **EPON ONU basic information**

After you edit and save the EPON ONU project information, click the Basic info tab. The system

EPON Device

 Network Device

 Projecting

 Paderes

 System Uptime

 Version Info

will then read the corresponding device information automatically according to the chosen ONU's name, as shown in the following figure:

#### **EPON ONU port information**

If you click the ONU port info tab, you can obtain the port's information.

Network Device	🐚 Basic Info 🔲	Card Info 🛄 Port	Info 🛕 Alert Info	🚳 ONU Device In	fo 🔹 Project Info	
- 📀 EPON Device	Index	Description	Admin Status	Oper Status	Port Rate	MAC Address
172.16.21.147-Epon	10	GigaEthernet5/0	up	up	100000000	00 e0 Of 8e 91 b8
	11	Null0	up	up	1410065408	
	31	VLAN1	up	up	1000000000	00 e0 Of 8e 91 b8
	32	EPON8/13	down	down	10000000	00 e0 0f c2 34 0c
	33	EPON8/14	down	down	10000000	00 e0 0f c2 34 0d
	34	EPON8/15	down	down	10000000	00 e0 0f c2 34 0e
	35	EPON8/16	down			00 e0 0f c2 34 0f
	36	EPON8/9	down	down	10000000	00 e0 0f c2 34 08
	37	EPON8/10	down	down	10000000	00 e0 0f c2 34 09
	38	EPON8/11	down	down	100000000	00 e0 0f c2 34 0a
	39	EPON8/12	down		10000000	00 e0 0f c2 34 0b
	40	EPON8/1	down			00 e0 0f c2 34 00
	41	EPON8/2	down			00 e0 0f c2 34 01
	42	EPON8/3	down			00 e0 0f c2 34 02
	43	EPON8/4			100000000	00 e0 0f c2 34 03
	44	EPON8/4:1		up	10000000	00 e0 0f c2 34 03
	45	EPON8/4:2				00 e0 0f c2 34 03
	46	EPON8/5	up			00 e0 0f c2 34 04
	47	EPON8/6	up			00 e0 0f c2 34 05
	48	EPON8/7	up			00 e0 0f c2 34 06
	49	EPON8/8	down	down	10000000	00 e0 0f c2 34 07

Note: In the right-key menu of **ONU information**, you can conduct the basic EPON settings to the currently chosen ONU.See the following figure:

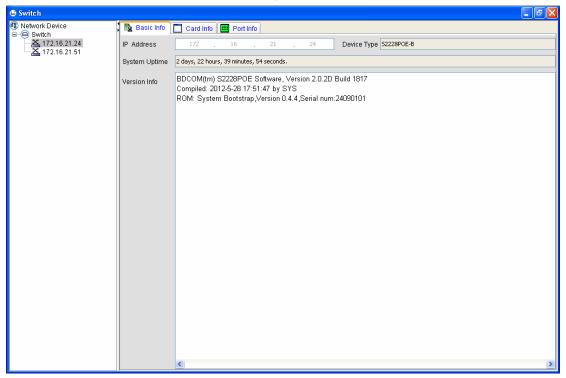
### 8.1.7 Project Information

Here it means the EPON OLT project information. Its operations are same to those of the EPON ONU project information. For related operations, refer to the previous section.

🐟 EPON Device									
Card Info Port Info DOU Data	🕒 Basic Info	Card Info	😐 Port Info	≙	Alert Info	8	ONU Device Info	🏟 Project Info	
<ul> <li>Instance</li> <li>Instance</li></ul>	Display Name	172.16.21.14	7-Epon		Project Na	me	172.16.21.147-Ep	on	Edit
172.10.21.147-Epon	Station	Basic Station				<b>U</b> Cancel			
	Installation time				Regional				Bakup
	Contact Info				Vendor				
		170.14.01	147 - 20 - 0		- 1				1
	Remarks	172.16.21	.147-Epon r	ema	rks				
								>	
		<		_		_		>	

# 8.2 Switch

This function means that the NMS uploads the discovered and managed switches to the network device node tree on the left automatically for users to browse a node's information. As shown in the following figure, you can read the switch's information, including **Basic Info**, **Card Info** and **Port Info**. Take switch 172.16.21.29 as an example:



# 8.2.1 Basic Info

If you choose a to-be-browsed device and click it, the system will automatically read and show you the basic configuration information about this device, including **IP**, **Device Type**, **Running Time** and **Version**.

# 8.2.2 Card Info

If you click a to-be-browsed device, click it and then select **Card Info**, the system will automatically read and show you the basic configuration information about this card, including **Index**, **Type**, **Description**, **Hardware Version**, **Software Version**, **Slot ID** and **Operation Status**. See the following figure:

🖨 Switch							
Network Device     Switch	🛯 🐚 Basic Info	Card Info 🔛 Por	t Info				
Switch 	Index	Туре	Description	Hardware Version	Software Version	Slot No	Oper Status
172.16.21.51	1	178	the card is unknown			0	up

You can know from the above-mentioned figure that the currently chosen switch has a 2228 mother card, whose operation platform is up.

## 8.2.3 Port Info

Select a to-be-browsed device node, click it and then select **Port Info**. The system will automatically read and show you the information about this device's ports, including **Index**, **Description**, **Management Status**, **Operation Status**, **Port's Rate** and **MAC**. See the following figure:

💼 Basic Info 📘	Card Info 🔛 Port Info				
Index	Description	Admin Status	Oper Status	Port Rate	MAC Addre
1	GigaEthernet0/1	up	down	100000000	00 e0 Of ac 32 c
2	GigaEthernet0/2	up	down	100000000	00 e0 Of ac 32 c
3	GigaEthernet0/3	up	down	100000000	00 e0 Of ac 32 c
4	GigaEthernet0/4	up	down	100000000	00 e0 0f ac 32 d
5	FastEthernet0/1	up	down	10000000	00 e0 Of ac 32 c
6	FastEthernet0/2	up	down	10000000	00 e0 Of ac 32 c
7	FastEthernet0/3	up	down	10000000	00 e0 Of ac 32 o
8	FastEthernet0/4	up	down	10000000	00 e0 Of ac 32 c
9	FastEthernet0/5	up	down	100000000	00 e0 Of ac 32 c
10	FastEthernet0/6	up	down	10000000	00 e0 Of ac 32 c
11	FastEthernet0/7	up	down	10000000	00 e0 Of ac 32 c
12	FastEthernet0/8	up	down	10000000	00 e0 Of ac 32 c
13	FastEthernet0/9	up	down	10000000	00 e0 Of ac 32 c
14	FastEthernet0/10	up	down	10000000	00 e0 Of ac 32 c
15	FastEthernet0/11	up	down	10000000	00 e0 Of ac 32 c
16	FastEthernet0/12	up	down	10000000	00 e0 Of ac 32 c
17	FastEthernet0/13	up	down	100000000	00 e0 0f ac 32 c
18	FastEthernet0/14	up	down	10000000	00 e0 Of ac 32 c
19	FastEthernet0/15	up	down	10000000	00 e0 Of ac 32 c
20	FastEthernet0/16	up	down	10000000	00 e0 Of ac 32 c
21	FastEthernet0/17	up	down	10000000	00 e0 Of ac 32 d
22	FastEthernet0/18	up	down	10000000	00 e0 Of ac 32 d
23	FastEthernet0/19	up	down	10000000	00 e0 Of ac 32 d
24	FastEthernet0/20	up	down	10000000	00 e0 Of ac 32 c
25	FastEthernet0/21	up	down	10000000	00 e0 Of ac 32 d
26	FastEthernet0/22	up	up	10000000	00 e0 Of ac 32 d
27	FastEthernet0/23	up	down	10000000	00 e0 Of ac 32 d
28	FastEthernet0/24	up	down	10000000	00 e0 Of ac 32 d
29	VLAN1	up	up	100000000	00 e0 0f ac 32 c

## 8.3 Router

The way of browsing the configuration information about a router is same to that about a switch, so you can refer to the previous section for the similar operation.

# 8.4 Querying ONU

The function to query ONU is different from the above-mentioned three functions: EPON device, switch and router. It means to detect an EPON ONU according to the set query conditions first and then query the PON ports and slots of the EPON OLT which connects the detected EPON ONU. See the following figure:

<u>F</u> ile Sys <u>t</u> em Manager <u>W</u> indow <u>H</u> elp							
							NMS
🔎 NMS	NU Reverse Lookup						- 6 🛛
- Applications	ery Condition						
🖻 🛞 Network Maps					_ Operator	Action	
E 😢 ipnet	e please select	Mark Start With	Value		● And ● Or		Q Search
					10.000		
172.16.21.0	type	Mark	Value		Operator	deleter	1
EPON Network	000		14140		oporator		·
III Topo Network							
B - B Fault Management							
B- (III) Performance							
. Network Database							
EPON DEVICE							
🖨 Switches							
- 🕄 Routers							
ONU Reverse Lookup	U Infos						
E - C Task Management	idex ONU Name	Display Name	ONU Type	status	MAC Address	BelongPonPort	Slot No
. SNMP Tools	and offertante	bropial raine	0110 1380	onnico		bolongi oli oli	0.01110
						Help	Bakup

Step1: Set the type of query condition, which including MAC, device type, telephone ID and OLT. MAC: it refers to the MAC addresses of all EPON ONUs.

Device type: It refers to the types of all currently managed EPON ONUs, such as ONU\_8016\_D201.

Telephone ID: It refers to the telephone ID in the project information that stores in each EPON ONU.

OLT: it refers to the EPON OLT that each EPON ONU connects.

Choose a condition type, set its value, select the operational character of the query condition (and/or), and click **Add**.The currently set query condition will then be added to the query condition set (query condition summary area).

Step 2: Delete the unnecessary conditions by choosing them in query condition summary area and clicking **Delete**.

Step3: Choose the query conditions and then click **Query**. The EPON ONU's information, which complies with the query conditions, is displayed, including **Name**, **Displayed Name**, **Device Type**, **Status**, **MAC**, **Uplink PON Port**, **Slot ID**. If you directly click **Query** without setting the query conditions beforehand, the system will query all currently managed EPON ONUs by defaul.See the following figure:

type Mark Value Operator deleted	uery C	ondition						
type     Mark     Value     Operator     deleted       NU Infos       NU Infos       index     ONU Name     Display Name     ONU Type     status     MAC Address     BelongPonPort     Sic       172.16.21.147-Epon     8/4:1     ONU_OPL_2009     up     00 e0 0f 01 01 01     EPON8/4     8	12				Condition	ns Set- Coperator-		
NU Infos         Image: Status         MAC Address         BelongPonPort         Size           Infos         0NU Name         Display Name         ONU Type         status         MAC Address         BelongPonPort         Size           172.16.21.147-Epon         8/4:1         ONU_OPL_2009         up         00 e0 0f 01 01 01         EPON8/4         8	/pe pl	ease select	Mark Start With	Value		Or	R, added	Q Search
Index         ONU Name         Display Name         ONU Type         Status         MAC Address         BelongPonPort         Status           172.16.21.147-Epon         8/4:1         ONU_OPL_2009         up         00 e0 0f 01 01 01         EPON8/4         8		type	Mark		Value	Operator	deleted	
Index         ONU Name         Display Name         ONU Type         Status         MAC Address         BelongPonPort         Status           172.16.21.147-Epon         8/4:1         ONU_OPL_2009         up         00 e0 0f 01 01 01         EPON8/4         8								
172.16.21.147-Epon 8/4:1 ONU_OPL_2009 up 00 e0 0f 01 01 01 EPON8/4 8								
			Diaplaublema	Oblittme	etetue	MIC Address	PelongDopDort	Cloth
	index	ONU Name						Slot N
	index	ONU Name						_

At the bottom of the query results, you can find the summary information about the query results, including the totol number of ONUs, number of online ONUs and number of offline ONUs. At the same time the system supports to backup the current query results. You can save the query results in the excel format by clicking **Backup**.

### 9 Task Management

Task policy configuration provides users some simple and visuable batch task processing tasks, reducing repeated operations and saving the configuration time of device initialization. Task policy configuration also provides the functions such as adding the time policy and executing related tasks in a designated time auatomatically, which enable users to arrange network management time freely.

Task policy configuration includes the following functions:

- Backuping the database
- Distributing the version file of the IP device
- Distributing the ONU version file
- Distributing the configuration file of the IP device
- Distributing the ONU configuration file
- Distributing the line-card version file
- Distributing the PON chip's drive
- Backuping the version file of the IP device
- Backuping the configuration file of the IP device
- Backuping the ONU configuration file

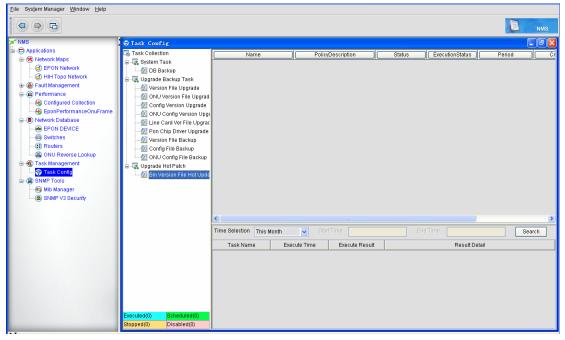
Task policy configuration includes the following operations:

- Adding the task policy
- Changing the task policy
- Deleting the task policy
- Modifying the execution interval of the task policy
- Stopping the task policy

The above-mentioned functions and operations are described below:

### 9.1 Functions of Task Policy Configuration

### 9.1.1 Starting the Functions of Task Policy Configuration



On the NMS client, open the NMS program tree on the left, click **Task Management** and then **Task Configuration**. The following window appears:

🕏 Task Config							- 7 🛛
🔜 Task Collection	Name	Policy	Description	Status	ExecutionStatus	Period	Cr
🖕 🐺 System Task							
DB Backup							
😑 🐺 Upgrade Backup Task							
🚽 💁 Version File Upgrade							
- 💁 Config Version Upgrade							
- 🕺 ONU Config Version Upgi			3				
- 💯 Line Card Ver File Upgrac							
- 💁 Pon Chip Driver Upgrade							
Version File Backup							
Config File Backup							
ONU Config File Backup							
😑 🐺 Upgrade Hot Patch							
Bin Version File Hot Upda							
1							
÷							
	<						>
	Time Selection This Mor	nth 🔽 Star	Time	Er	nd Time		Search
	Task Name	Execute Time	Execute Result		Result De	etail	
		4					
2							
Executed(0) Scheduled(0)							
Stopped(0) Disabled(0)							

All the functions of task policy configuration are set on this window, and all running results are displayed on this window: The following are some descriptions about this window:

Area 1 is the task function list, in which all task functions supported by NMS are listed.

Area 2 is where the running statuses of all tasks are shown. The statuses include:

- Running: means the number of the running tasks.
- ◆ To be run: means the number of to-be-run tasks whose time policies are already set.
- Stopped: means the number of stopped tasks.
- Invalid: means the number of tasks that are labeled as invalid.

Area 3 is the task list, in which all tasks will be shown, including:

- Name: means the name of a task, which is used to differentiate and define the tasks.
- ◆ Task description: it is used to give a detailed description of the task's function.
- Enablement status: It means whether a task is forbidden. If a task is defined as invalid, this task cannot be executed.
- Running status: It means the running status of a task.
- ◆ Cycle: it means the execution cycle of a task. The task will be automatically performed when the cycle comes.
- Creation user: it means the username that is used by the task creator to log in to NMS.
- Creation time: It means the time when a task is created.

Area 4 is where the running results of a task are shown. You can select a time segment to query the historical running results of the corresponding task, including **Task Name**, **Running Time**, **Running Results** and **Detailed Info**.

#### 9.1.2 Backuping the Database

The database backup function supports the manual or fixed automatic backup and saves all the running information of NMS.In case of system breakdown, this function can resume all the running information, including all discovered device information, topologies and all the database's information.

Note: All the information that is stored in the configuration files will not be backuped. For example, the configured discovery information need be reset.

#### ■ The procedure of adding a database backup task is shown below:

1. Click Task Collection -> System Task -> Database Backup and then right click Database Backup. The Add task button appears, as shown in the following figure:

😌 Task Config							- 7 🛛
🗟 Task Collection	Name	Polic	/Description	Status	ExecutionStatus	Period	
System Task Upgrade Backup rask Vugrade Backup rask Vugrade Backup rask ONU Version File Upgrade ONU Config Version Upgrade ONU Config Version Upgrade ONU Config File Backup Version File Backup ONU Config File Backup Bin Version File Hot Upda							
	<						>
	Time Selection This M	onth 🔽 Sta	rt Time	End	Time	s	earch
	Task Name	Execute Time	Execute Result		Result De	etail	
Executed(0) Scheduled(0) Stopped(0) Disabled(0)							

2. Click Add task. The following window appears:

😌 Task Config					- 7
🗔 Task Collection	Name	PolicyDescription	Status	ExecutionStatus	Period Cr
Task Collection     Backup     Backup     DB Backup     Dggrade Backup Task     OV Version File Upgrade     ONU Version File Upgrade     ONU Config Version Upgrade     ONU Config Version Upgrade     ONU Config File Backup     Ontif File Backup     ONU Config File Backup	Dat abase Backup Policy Details Policy Name Policy Status Enabled PolicyDescription				Period Cr
	Task Name Exe	ecute Time Execute	Result	Result De	tail
Executed(0) Schedule400					
Executed(0) Scheduled(0) Stopped(0) Disabled(0)					

**3**. Set the policay name, the enablement staus and the task description, and then click **Apply**. The database backup task is done.

If you select **Invalid** in the **Enablement status** dropdown box, the task will not be performed; if you do not click the time table, the task should be manually performed.For how to set the time policy in the time table, see section 8.3.5.2.

# 9.1.3 Distributing/Backuping Devices

Step 1: Start this task, that is, enter the basic information of this task.

Click Task Collection -> System Task -> Distribute/Backup and then right click Distribute/Backup. The Add task button appears. Click Add task to open the following window:

🕏 Task Config	
🐼 Task Collection Name PolicyDescription Status Execu	utionStatus Period Cr
System Task	
DB Backup	
😑 🔩 Upgrade Backup Task	
- 💁 Version File Upgrade	
- 💇 ONU Version File Upgrad	
2 Config Version Ungrade	
- 💯 ONU Co 🔽 Add policy:Version File Upgrade	
Line Cal	
Pon Chi	
O Version Policy Name: version	
O Config F Villy Natifie. version	
Coperator: root	
Policy Description	
off version	
	>
EndTime	
Operation Type: Version File Upgrade	Search
	Result Detail
To be continue.	
Executed(0) Scheduled(0)	
Executed(0) Scheduled(0) Stopped(0) Disabled(0)	

You must enter values in the **Task name** textbox and the **Task description** textbox. The task name cannot be same to other task names, or the task cannot be added successfully. The adder is the name of the current user who logs in to NMS. The operation type is alos the current operation.

Step 2: Select a target device.

When you add a task, you must add a target device to execute this task. The target devices have the following types:

- IP management device
- 1. Router
- 2. Switch
- 3. OLT
- Non-IP management device
- 1. ONU

	Router	Switch	OLT	ONU
Distributing the version				
file of the IP device				
Distributing the ONU				
version file				
Distributing the				
configuration file of the				
IP device				
Distributing the ONU				
configuration file				
Distributing the line-card				
version file				
Distributing the PON				
chip's drive				
Backuping the version				
file of the IP device				
Backuping the				
configuration file of the				
IP device				
Backuping the ONU				
configuration file				

The following table shows the relationship of the device type and the operation type:

The following shows the window to select each type of device:

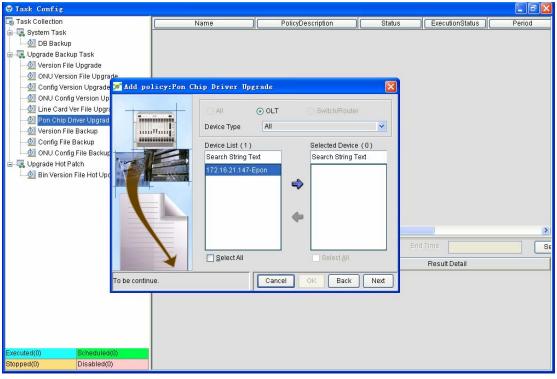
### ■ IP device selection window

😌 Task Config						
🗟 Task Collection	Name	PolicyDescription	Status	ExecutionStatus	Period	Cr
🖃 🐺 System Task						
DB Backup						
🖶 🌄 Upgrade Backup Task						
Version File Upgrade						
ONU Version File Upgrad						
	7:Version File Upgrade					
Line Cal	.version File opgrade					
Pon Chi		DLT O Switch/Router				
Version		~				
	Device Type A	1	~			
	Device List (5)	Selected Device (0	<u> </u>			
🗄 🖳 Upgrade Ho	Search String Text	Search String Text				
🔤 Bin Vers	172.16.21.147-Epon		_			
	172.16.21.147-Epon 172.16.21.147					
	172.16.21.99	=>				
	172.16.21.24					
	172.16.21.55	de l				
		-				>
			En	d Time	Sear	rch
				Result De	itail	
	Select All	Select <u>A</u> ll		Tresure	-tan	
To be continue.		ancel OK Back	Next			
Executed(0) Scheduled(0)						
Stopped(0) Disabled(0)						

		eenon window			
🕏 Task Config					- 6 🛛
Task Collection	Name	PolicyDescription	Status	ExecutionStatus	Period
🖨 🔩 System Task					
DB Backup					
🖃 🐺 Upgrade Backup Task 🤄 💇 Version File Upgrade					
ONU Version File Upgrade					
Config Version Ungrade					
ONU Co 🗾 Add policy:ONU Co	nfig Version Upgrade				
- O Pon Chi	Select OLT all	~			
Version	Device Type all	~			
Config F					
ONU Co	Device List (2)	Selected Device (0)			
Bin Vers	Search String Text	Search String Text			
	172.16.21.147-Epon_ON				
	172.16.21.147-Epon_ON	⇒			
		6			
		4m			>
			End	Time	Se
		Select All		Result Detail	
	Select	Select Air			
To be continue.	Cancel	OK Back Next			
Executed(0) Scheduled(0)					
Stopped(0) Disabled(0)					

#### ONU device selection window

#### OLT device selection window



#### ■ Filter

The **Filter** option is on the right top of each window.

♦ When selecting IP devices, you can filter them by selecting OLT/switch/router and then conduct detailed filtration through the device type.

- ♦ Before selecting ONU, you can select an OLT and then filter ONUs through the ONU type.
- $\diamond$  When selecting OLT, you can filter OLTs only through the device type.

#### Select

The right bottom of the window is the filtered device list and the selected device list:

♦ [Device list] means the number of the filtered devices. You can enter the device name in the Search textbox to further select them.

Step 3: Complete the task policy configuration.

It is the last step of task policy configuration. All functions have only two kinds of differences: the backup difference and the distribution difference.

#### Last configuration of the distribution task

You need to set the following attributes in this last configuration:

- Source location of the distributed file
  - ✤ From the NMS server: Click a selected file to open a window for selecting files in the NMS root directory.
  - ✤ From the third-party TFTP server: Enter the IP address of TFTP and the source file name.
- Destination file's name in the device

Here you shall select a name as the file name of the source file which has been distributed to the device. The file names include:

- $\diamond$  Switch.bin: It is recommended to name the switch's bin files.
- $\diamond$  Router.bin: It is recommended to name the router's bin files.
- $\diamond$  olt\_blob: It is recommended to name the drive file of the PON chip.
- ♦ LS16PON\_bin: It must be used to name the version file of the 16PON line-card.
- $\diamond$  LS24GE\_bin: It must be used to name the version file of the 24GE line-card.
- ♦ LS12GE\_bin: It must be used to name the version file of the 12GE line-card.

- $\diamond$  LS24FE\_bin: It must be used to name the version file of the 24FE line-card.
- $\diamond$  LS48FE\_bin: It must be used to name the version file of the 48FE line-card.
- $\diamond$  ONU.zblob: It must be used to name the version file of the ONU.
- $\diamond$  For those recommended file names, you can name the destination files by yourself.
- Task Status
  - $\diamond$  Invalid policy: it means that this policy cannot be executed.
  - $\diamond$  Valid policy: it means that this policy can be executed.
- Setting the time table

			-			
🕏 Task Config						- 2 🛛
🗟 Task Collection		Name	PolicyDescription	Status	ExecutionStatus	Period
Config F ONU Co Upgrade Ho Bin Vers	de Jpgrade urade policy:Confit Confit	Je NMS Sever	×		Time Result Detail	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
	pled(0)					
Disar		1				

#### ■ Last configuration of the backup task

You need to set the following attributes in this last configuration:

- Source location of the distributed file
  - ✤ From the NMS server: Click a selected file to open a window for selecting files in the NMS root directory.
  - ✤ From the third-party TFTP server: Enter the IP address of TFTP and the source file name.
- Destination file's name in the device

Here you shall select a name as the file name of the source file which has been distributed to the device. The file names include:

- $\diamond$  Switch.bin: It is recommended to name the switch's bin files.
- $\diamond$  Router.bin: It is recommended to name the router's bin files.
- $\diamond$  olt\_blob: It is recommended to name the drive file of the PON chip.

- $\diamond$  LS16PON\_bin: It must be used to name the version file of the 16PON line-card.
- $\diamond$  LS24GE\_bin: It must be used to name the version file of the 24GE line-card.
- $\diamond$  LS12GE\_bin: It must be used to name the version file of the 12GE line-card.
- $\diamond$  LS24FE\_bin: It must be used to name the version file of the 24FE line-card.
- $\diamond$  LS48FE\_bin: It must be used to name the version file of the 48FE line-card.
- $\diamond$  ONU.zblob: It must be used to name the version file of the ONU.
- $\diamond$  For those recommended file names, you can name the destination files by yourself.
- Task Status
  - $\diamond$  Invalid policy: it means that this policy cannot be executed.
  - $\diamond$  Valid policy: it means that this policy can be executed.
- Setting the time table

For details, see section 8.2.1.2.

### 9.1.4 Setting the Time Policy of Task Execution

Task Collection					Name			PolicyDescription	St	atus	ExecutionStatus	Period
– 🐺 System Task												
DB Backu												
Upgrade Bacl												
ONU Vers		rade										
🔤 Config Ve												
🚽 💁 ONU Co	🕈 Add pol	licy:Co	nfig Fi						X			
Line Cal												
	Policy So	chedule	ſ			0.1						
								y based on				
🔤 ONU Co						⊙p	ates	O Days				
	Select Dat	es for scl	heduling	policy				Select the So	cheduling Hours			
🔤 Bin Vers		0	) Select A	II Datas	O Proci	ño.			🔘 Select All H	ours 💿 Sp	ecific	
		-	JelettA	ui Dates	O opeci			0:00	1:00	2:0	0 3:00	
	1	2	3	4	5	6	7	4:00	5:00	6:0		
	8	9	10	11	12	13	14	-	-	+		
	15	16	17	18	19	20	21	8:00	9:00	10:0	00 11:00	
I	22	23	24	25	26	27	28	12:00	13:00	14:0	0 15:00	
I	29	30	31					16:00	. 17:00	18:0	00 19:00	
	23	J		J				20:00	21:00	22:0	23:00	
						OK	Canc	el Help				
-												
ecuted(0)	Schedule	ed(0)										
pped(0)	Disabled	(0)										

😌 Task Config						Digiti di	- 6 🛛
ask Collection		Name	PC PC	licyDescription	Status	ExecutionStatus	Period
🖨 🐺 System Task							
DB Backi							
Version F							
	sion File Upgrade						
	ersion Ungrade						
	🗲 Add policy:Config	File Backup		×			
Line Cal							
Version	Policy Scheduler						
Config F			Schedule Policy				
ONU Co			O Dates	<ul> <li>Days</li> </ul>			
🖨 🐺 Upgrade Ho		ng policy		Select the Schedu	ling Hours		n l
🛄 🔤 Bin Vers	and the second se				elect All Hours 🕘		
	🔿 Select Al	I Days 💿 Specific					
				0:00	1:00	2:00 3:00	
			WED	4:00	5:00	5:00 7:00	
			VVCD	8:00	9:00 1	0:00 11:00	>
				12:00	13:00 1	4:00 15:00	Se
	тни	FRI	SAT	16:00	17:00 1	8:00 19:00	
				20:00	21:00 2	2:00 23:00	
							<u>_</u>
			OK Cancel	Help			
Executed(0)	Scheduled(0)						
Stopped(0)	Disabled(0)						

The time policy settings are shown in the above-mentioned two figures.

- On the left part, you can select the date.
  - ♦ When the time policy is based on the date, select a date between 1 and 31. It means that the task will be automatically executed on the date of each month.
  - ♦ When the time policy is based on the day, select a week day between Sunday and Saturday. It means that this task will be automatically executed on this week day.
- On the right part, you can select the specific time.
- You can also select all the hours in this day.

After you set the time policy, click **OK**. If the task policy is valid, the task will be executed at the designated hour(s).

## 9.2 Operations of Task Policy

The operations of task policy are shown below:

🕏 Task Config								
🗟 Task Collection	Name	Poli	cyDescription		Status	ExecutionStatus	Period	Cr
🖨 🖳 System Task	A	back up cor	Update Policy	Ctrl+V	id	Scheduled	Time Task	root
- 💁 DB Backup				cario				
🖨 🐺 Upgrade Backup Task			<u>D</u> elete Policy	Ctrl+C				
- 💇 Version File Upgrade			Execute Policy	Ctrl+X				
- 💆 ONU Version File Upgradı			Stop Policy	Ctrl+T				
- 💁 Config Version Upgrade			Schedule Policy	Ctrl+H				
- 💆 ONU Config Version Upgr								
🗏 🛄 Line Card Ver File Upgrad								
- 💇 Pon Chip Driver Upgrade								
- 💁 Version File Backup								
Config File Backup								
0NU Config File Backup								
😑 🐺 Upgrade Hot Patch								
🛄 💁 Bin Version File Hot Upda								
	<							>
			art Time		Text	Time		
	Time Selection This N	Nonth 🖌 Sta	antime		Ena	TIME.		earch
	Task Name	Execute Time	Execute Res	ult		Result D	etail	
Executed(0) Scheduled(1)								
Executed(0) Scheduled(1) Stopped(0) Disabled(0)								

• Adding the task policy

Step1:

🕏 Task Config				~ ~	- 2 🛛
🗟 Task Collection	Name	PolicyDescription	Status	ExecutionStatus	Period
🖨 🐺 System Task					
DB Backup					
🖃 🌄 Upgrade Backup Task					
ONU Version File Upgrade					
Config Version Ungrade					
ONU Co F Add policy:Config	File Backup				
🚽 🖉 Line Ca					
Version     Config F     ONU Co	Policy Name: config_file_ba	k			
Upgrade Ho     Din Vers	Operator: root				
	Policy Description				
	back up config file.				
					>
	Operation Type: Config File	e Backup 🔽	End	Time	Se
				Result Detail	
To be continue.	Cancel	OK Back Next			
Executed(0) Scheduled(0)					
Stopped(0) Disabled(0)					
Disablea(c)					

#### Step2:

🗲 Add policy:Config	; File Backup	×
	⊙ All O OLT	O Switch/Router
mutun	Device Type All	<b></b>
	Device List (5)	Selected Device (1)
	Search String Text	Search String Text
	172.16.21.147-Epon	172.16.21.147-Epon
	172.16.21.99	⇒
	172.16.21.147	
	172.16.21.24 172.16.21.55	
	172.10.21.33	
*	📃 <u>S</u> elect All	Select <u>A</u> ll
To be continue.	Can	cel OK Back Next

Step3:

💓 Add policy:Confi	g File Backup	×
	Use NMS Sever	
	Use Other TFTP Sever Source Filename: Tftp Sever IP: 172 . 16 . 21 . 177	
	Destination Filename: startup-config	
	Other Setting Status Policy Ena 🗸 🛄 Set Schedule	
To be continue.	Cancel OK Back Next	

Step 4:

					Sch	edule Polic	y based on			
					📀 D	ates	🔿 Days			
lect Date	s for scl	neduling	policy				Select the Sched	uling Hours		
	C	) Select A	II Dates	Specif	fic		0	Select All Ho	urs 💿 Specific	
	2	3		5	6	7	0:00	1:00	2:00	3:00
			4				4:00	5:00	6:00	7:00
8	9	10		12	13	14	8:00	9:00	10:00	11:00
15	16	17	18	19	20	P	12:00	13:00	14:00	15:00
22	23	24	25	26	27	28				-
29	30	31					16:00	17:00	18:00	19:00
			10				20:00	21:00	22:00	23:00

#### Step 5:

🛛 Task Config							
🗟 Task Collection	Name	Poli	cyDescription	Status	ExecutionStatus	Period	
🖨 🐺 System Task	config_file_bak	back up cont	ig file.	Enabled	Scheduled	Time Task	root
🗆 💇 DB Backup							
😑 🐺 Upgrade Backup Task							
- 💇 Version File Upgrade							
- 💆 ONU Version File Upgrad							
- 💇 Config Version Upgrade							
- 💆 ONU Config Version Upgr							
🕂 💇 Line Card Ver File Upgrad							
Pon Chip Driver Upgrade							
Version File Backup							
- 💇 Config File Backup							
0NU Config File Backup							
🖻 🐺 Upgrade Hot Patch							
🔤 🔤 Bin Version File Hot Upda							
	Information Mess	age					
	-						
	🚺 Policy - con	fig_file_bak added s	accessfully				
		OK					>
	1113 1			End	d Time		Search
	Task Name	Execute Time	Execute Result		Result Deta	il	
Executed(0) Scheduled(1)							
Stopped(0) Disabled(0)							
Disabled(0)							

• Changing the task policy

Select a task in the task policy list, right click it and select the update policy. The corresponding dialog box appears. It is similar to adding the task in section 9.1. However, the task name cannot be modified.

• Deleting the task policy Select a task in the task policy list, right click it and select **Delete**. The corresponding dialog box appears. Click  $\mathbf{O}\mathbf{K}$  to remove the task from the database.

- Modifying the execution interval of the task policy Refer to section 9.1.4.
- Stopping the task policy
- Select a task in the task policy list, right click it and then click **Stop**. The time policy of this task will be stopped.

# 9.3 Browsing the Results of Task Policy

After a task is done, the corresponding results will be shown in a window. See the following figure:

back up conf	yDescription [		ecutionStatus) duled Time Ta	Period Contraction Contractic Contraction Contractic Contract
back up conf	ig file. E	inabled Schei	duled Time Ta	sk root
nis Month 💽 St	art Time	End Time		Search
Execute Time	Execute Result		Result Detail	
2012-05-21 17:44:04	succes	[172.16.21.147]Policy s	uccessfully	
	Execute Time	nis Month Start Time Execute Result	nis Month Start Time End Time Execute Time Execute Result	nis Month Start Time End Time End Time Education End Time Execute Result Result Detail

- Time selection: it is for you to designate a time segment. After you set a time segment and click **Query**, the task running information in this time segment will be shown.
  - $\diamond$  This month: The running information about all tasks in this month will be shown.
  - $\diamond$  This week: The running information about all tasks in this week will be shown.
  - $\diamond$  Today: The running information about all today's tasks will be shown.
  - Self-define: The running information about all tasks in the self-defined time segment will be shown.
    - ✓ **Start time** and **End time** need be designated.

■ If you double click a running result, yopu can get the detailed running information about this task.

Task Name	config_file_bak
Execute Time	2012-05-21 17:44:04
Execute Result	succes
Result Detail	[172.16.21.147]Policy successfully

# **10 Patch Upgrade**

Pathc upgrade helps users to update their software to the lastest version and guarantees users to use new functions normally.NMS releases these upgrade patches irregularly to add new functions or fix safety problems.

## **10.1 Installing the Upgrade Program**

Open the installation directory of the NMS server, find the **UpdataManager.bat** upgrade tool in the **bin** folder, and double click the upgrade tool. The following window then appears:

	Install Software Upgrade or Service Pack, click 'Install' button. This will open the Installation Wizard which will guide you through the upgrade process.
D:\nr	ms\BroadDirector5\SPCreation\NMS_2011_N-3_0_1_ Browse
	Readme Install
	Installed Service Pack
ß	Service Pack(s) installed is(are) listed below. To view the details of a particular Service Pack, either double-click on it or click 'Details' button.To uninstall a particular Service Pack, select and click 'Uninstall' button.
μ	Uninstall Details
	E <u>x</u> it <u>H</u> elp

The top part of this window is for users to install the upgrade program, while the bottom part of this window is to show the installed upgrade program.Click **Browse** to choose the path of the existing upgrade program.Click the **Install...** button. The following figure appears:

Installation Status Installation Path: C:\Program Files\BDC Service Pack Size: 0.00 bytes	COM\Broad Director
Service Pack installed successfully	
✓ View Readme and Installed files.	
	Fi <u>n</u> ish <b>Close</b>

When the installation of the upgrade program shows 100%, the upgrade is successful. If you want to browse the detailed information about the upgrade description file and updates, click **Browse the installation file and its description file**. Then the following window appears:

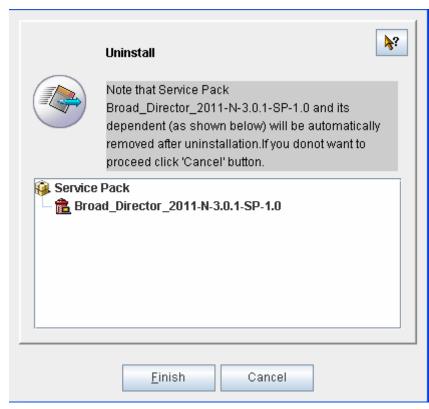
Readme Installed files
Installed files
Broad_Director_2011-N-3.0.1-SP-1.0
BE context
Close

# **10.2 Uninstalling the Upgrade Program**

Open the installation directory of the NMS server, find the **UpdataManager.bat** upgrade tool in the **bin** folder, and double click the upgrade tool. The following window then appears:

	Install To install a Software Upgrade or Service Pack, click 'Install' button. This will open the Installation Wizard which will guide you through the upgrade process.
D:\nm	Is\BroadDirector5\SPCreation\NMS_2011_N-3_0_1       Browse         Readme       Install
	Installed Service Pack Service Pack(s) installed is(are) listed below. To view the details of a particular Service Pack, either double-click on it or click 'Details' button.To uninstall a particular Service Pack, select and click 'Uninstall' button.
Broad_Dire	ector_2011-N-3.0.1-SP-1.0 [Patch]
	<u>U</u> ninstall <u>D</u> etails
	E <u>xit</u> <u>H</u> elp

At the bottom part of this window, select a installed upgrade program and then click **Uninstall**. Then the following window appears:



Click **Finish**. The system then uninsta;;s the selected upgrade program automatically, as shown in the following figure:

Uninstallation status
Uninstalled successfully
Automatically close after uninstallation
<u>F</u> inish <u>Close</u>

Click **Close** after the uninstallation is done.

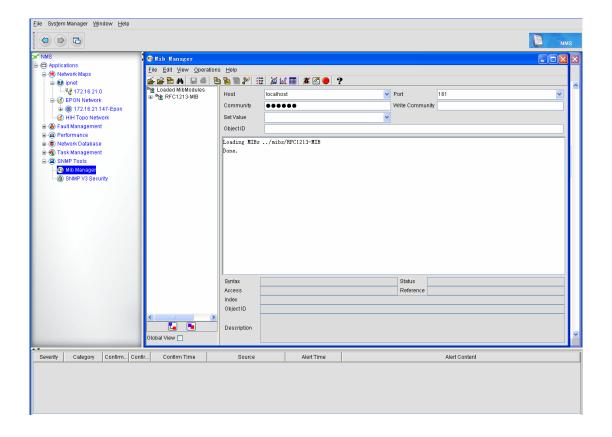
#### **11 SNMP Tool**

SNMP stands for Simple Network Management Protocol. This chapter will describe how to manage SNMP, including how to set the MIB browser and SNMPv3 parameters.

### **11.1 MIB Browser**

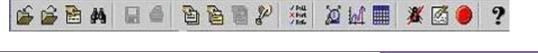
MIB is a defined attribute set for managed objects.Each attribute of a managed object in MIB has a unique ID, which consists of the object type, read/write permission, the size limit and the range.MIB is an abstract data interface provided by the managed device, not a physical object.

NMS provides the MIB browser, helping users to obtain or browse the MIB information through graphic window.Click **SNMP tool -> MIB browser** to open the MIB browser, as shown in the following figure:



#### 11.1.1 Toolbar

The toolbar lies on the top of the MIB browser, as shown in the following figure:



You can conduct the operations related to the MIB browser by clicking the corresponding icons in the toolbar. If the cusor is put on an icon, the function of this icon will be shown. To show or hide the toolbar, you can click **Show -> Toolbar**.

Icon	Name	Remarks
<b>D</b>	Install MIB	It is used to download the MIB files in the MIB
		browser. If you click this icon, a dialog box appears for
		you to enter the URL or filename of a MIB file.
1	Uninstall MIB	It is used to uninstall the installed MIB.
1	Description	It is used to see the detailed description of a MIB node
		after you select this MIB node.
<i>i</i> ۹	Browse the MIB node	It is used to find a specific node in the MIB tree.
1	Save the results of the	It is used to save the results of the MIB browser. If you
	MIB browser	click this icon, a window appears for you to enter a file
		name. After you enter this file name, the results will be
		saved in this file.
đ)	Print the results of the	It is to print the results of MIB query.
	MIB browser	
回	Get SNMP	It is to designate a MIB node and a MIB instance and
		then conduct a GET operation.
個	Get NEXT SNMP	It is used to conduct a GET NEXT operation.If you
		click this icon, you will get the value of the next
		variable of the designated variable.
P	Get Bulk SNMP	Click this icon and you will get the next object of the
		designated object.
J.	Set SNMP	It is to designate a MIB node to conduct a SET
		operation.
✓ Poll. × Port ✓ Rofe	Set the MIB browser	It is used to set the MIB browser.
Q	Trap observer	It is used to browse the received traps in a designated
		port.
A	Check the real-time	It is used to browse a designated OID curve.
••••	graphic	6
	Check the SNMP data	It is used to check the SNMP data form.
	form	
<b>X</b>	Debug	It is used to browse the debug output.
	Clear the displayed	It is used to clear the displayed results in the textbox.
	results	
	Stop the query	It is to stop the query.
?	Help	It is used to browse the online help of the MIB
	_	browser.

The following table shows the functions of each icon in the toolbar:

#### **11.1.2 Menu Description**

The menu of the MIB browser are desribed below:

• File menu

🧐 Mib Manager									
<u>File E</u> dit <u>V</u> iew <u>O</u>	perations	<u>H</u> elp							
L <u>o</u> ad MIB	Ctrl+0	🔁 📲 🥙 🗯	🛛 📈 🔳 🚿	<b>Ø</b>	?				
UnLoa <u>d</u> MIB Lo <u>a</u> d All MIBs <u>U</u> nLoad All MIBs	Delete Ctrl+A Ctrl+V	Host Community	localhost				Port Write Community	161	~
Save Results As Print Results		Set Value Object ID				~			
RFC1213-MIB		Loading MIBs . Done.	./mibs/RFC1213-	MIB					
		Syntax					Status		
		Syntax Access Index Object ID					Reference		
Clobal View	>	Description							

- Upload MIB: Upload the MIB file in the MIB browser.
- Uninstall MIB: Uninstall the selected MIB files.
- Upload all MIBs: Upload all previously uploaded MIBs.
- Uninstall all MIBs: Uninstall all uploaded MIB files from the MIB tree.
- Save results: Save the MIB query results.
- Print results: Print the MIB query results.

All lately uploaded MIBs (stores up to 5 file names) are listed out in the bottom of the menu.

• Edit menu

🔊 Mil	b Manager					
_	Edit View Operations	Help				
- 6			🎽 🖬 🔳 🌋 🙆 🔴 🤶			
948 Π Ω	Eind Node Ctrl+F	Host Community Set Value Object ID	Iocalhost	Port Write Community	161	
Global		Syntax Access Index Object ID Description		Status Reference		

- Set: It is used to set the MIB browser.
- Browse the node: It is used to search for a required node.

🤏 Mib Ma	mager								
<u>F</u> ile <u>E</u> dit	View Operation	ins <u>H</u> elp							
🖆 🚔 🖻	Tra <u>p</u> Viewer	Alt+P 📄 🥍	🎬 🛛 🖬 🔳	X 🛃 🔴	?				
එලි Loaded ⊞්ලි RFC	<u>L</u> ine Graph <u>B</u> ar Graph Snmp <u>T</u> able	Alt+B	localhost			<b>P</b>	Port Vrite Community	161	▼
	De <u>s</u> cription	de luce				~			
	Debug	Alt+D ICTID							
	✔ ToolBa <u>r</u>	ling M	IBs/mibs/RFC12	213-MIB					
	<u>D</u> isplay	•							
		Syntax					Status		
		Access					Reference		
		Index Object ID							
Clobal View									

• Show menu

• Trap observer: It is used to browse and resolve all received traps.

- Linear graphic: It is to browse the value in the linear graphic.
- Histogram: It is to browse the value in the histogram.
- SNMP table: It is used to browse the SNMP table.
- Description: It is used to browse the description of a selected node.
- Debug: It is used to browse the debug output.
- Toolbar: It is used to show or hide the toolbar.
- Show: It is used to switch over the current view.

#### • Operation menu

🐴 Mib Manager							
<u>File Edit View Or</u>	perations <u>H</u> e	elp					
🗳 🚔 🖻 🗛 📗	Get Ctrl	1+G 🎾 🎇	i 🔟 🖬 🔳 🗶 🙆 🔴	?			
ੋਡਿ Loaded MibMo ⊞-ੋਡਿ RFC1213-N	Get <u>N</u> ext Ctr1 Get <u>B</u> ulk Ctr1 Set Ctr1 Sto <u>p</u> Ctr1 Clear Ctr1	1+N 1+B 1+W e 1+C 0 1+L ading MIBs	localhost	an a	Port Write Community	161	
K The second sec	Acc Ind Ob	ntax cess Jex ject ID escription			Status Reference		

- Get: It is used to conduct a SNMP GET operation.
- GetNext: It is used to conduct a SNMP GetNext operation.
- GetBulk: It is used to conduct a SNMP GetBulk operation, v2c & v3.
- Set: It is used to conduct a SNMP Set operation.
- Stop: It is to stop the query.
- Clear: It is used to remove the query results in the textbox. information.

#### 11.1.3 Uploading MIB

To upload the MIB files, do as follows:

Click **File -> Upload file** or directly click in the toolbar. The **Upload MIB** dialog box opens, as shown in the following figure:

🧟 Mib Manager								
<u>File E</u> dit <u>V</u> iew <u>O</u> pe	erations	<u>H</u> elp						
L <u>o</u> ad MIB (	Ctrl+O	隆 🗃 🎢 🏦	2 🖌 🎹	X 🛃 🔴	?			
Lo <u>a</u> d All MIBs (	Ctrl+A Ctrl+V	Host Community Set Value	localhost			Port Write Community	161	~
<u>S</u> ave Results As ( <u>P</u> rint Results (	Ctrl+S Ctrl+P	Object ID Loading MIBs	/mibs/RFC1	213-MIB				
RFC1213-MIB		Done.						
		Sector						
		Syntax				 Status		
		Access Index Object ID				 Reference		
Clobal View	>	Description						

🗾 Load a IIB File			×
Open Mib Settings Recen	t		
Look in: mibs		*	1
.∧ CVS nat	Printer-MIB rds0.mib rds1.mib		•
	RFC1066-MIB RFC1155-SMI rfc1155.smi RFC1156-MIB		
	RFC1158.MIB rfc1212.smi RFC1213-MIB RFC1213-MIB.xml		
	rfc1213.mib RFC1215-TRAP rfc1215.smi RFC1229-MIB		×
File name: RFC1158. MIB			Open
File of type: All Files(*.*)		~	Cancel

Click **MIB Settings**. The **MIB setup** window appears, as shown in the following figure:

🔎 Load a IIB File	N 1997
Open Mib Settings Recen	t
Mib Loading Options	
🚫 Com <u>p</u> iled File	Overwrite existing Compiled MIB Files
🔿 Data <u>b</u> ase	Overwrite MIBs in Database. JDBC Parameters
Load recently loaded M	bs at startup
Set Parser Level	
Parsing Level For	
⊙ Main <u>F</u> ile	O Import File
Parsing Levels <ul> <li>Lenient</li> <li>Normal</li> <li>Serious</li> <li>Critical</li> <li>User Defined</li> </ul>	User Defined Levels Current Level Add Modify Delete

The MIB browser provides the following options to upload the MIB:

- Directly upload MIB.
- Upload MIB from the encoded files.
- Upload MIB from the database.

#### **11.1.4 Uninstalling MIB**

You can uninstall the uploaded MIBs through the following method:

Select a node in the MIB tree, and then click **File -> Uninstall MIB** or directly click **b** to uninstall this MIB.

# 11.1.5 MIB Browser—Setup

You can set the MIB browser through the following operation:

Click Edit -> Setup or directly click  $\underbrace{\begin{subarray}{c} \begin{subarray}{c} \begi$ 

🔎 Libbrovs	er Setting	s				X
General Mib	Settings					
-SNMP Versio	in					
•	) v <u>1</u>	<u> </u>		(	<u>○ v3</u>	
General Opti	ons		-Get Bulk	Options		
<u>T</u> ime Out <u>R</u> etries	5		Ma <u>x</u> , Re	petitions 50	)	
Encoding	0 ISO8859_1	· · ·	<u>N</u> on Re	peaters <sub>0</sub>		
Validate	Broadcast Add	ress	-V3 Optio			
Net Mask	·		Context N			
_V3 Settings−						
Save V3 S	Bettings to File	S	et Enginel	D For Adding	g V3 ent	try
Save V3 S	Settings to Data	base				
User Se	cu Auth	Priv Auth	Priv	Targ T	Farg	Engi
	dd	<u>M</u> odify			<u>)</u> elete	
Restore Def	faults			ОК		Cancel

The options in the **Common** attribute page of the **MIB browser setup** window are shown below:

Option	Default Value	Other Values
SNMP version	V1	V2c or V3
Timeout	5 seconds	User-defined value
Retry	0	User-defined retry times
Maximum repeated times	50	User-defined value
Diagram type	Linear graphic	Histogram
Trap port	182	User-defined port
Encode	ISO8859_1	User-defined value
Non-transmitter	0	User-defined value

# 11.1.6 MIB Browser – SNMP Operations

You can conduct some regular SNMP operations through the MIB browser, such as GET, GET NEXT, GET BULK and SET.

- ◆ To conduct a GET operation, select a node in the MIB tree and click <sup>™</sup> or GET. The value of the selected MIB variable will be obtained.
- ◆ To conduct a GETNEXT operation, select a node in the MIB tree and click a or GetNext. The value of the next variable of the selected variable will be obtained.
- ◆ To conduct a GETBULK operation, select a node in the MIB tree and then click or GetBulk. A series of next objects of the designated object will be obtained.
- ◆ To conduct a SET operation, select a node in the MIB tree, enter values in the textbox and then click **Set** or **₽**.

## **11.1.7 MIB Browser – Table Operations**

The MIB browser provides a friendly window for users to browse the data in the SNMP table. You can browse the information in the SNMP table by performing the following procedure:

- Designate the host agent's name or IP in the host textbox in the MIB browser.
- Upload MIB in the MIB browser.
- Designate a valid OID (OID must be an OID table).

To browse the SNMP table, you must select a table variable and click the SNMP table. The system then displays the SNMP table.Click **Start** to get the details.See the following figure:

Nib Manager Elle Edit View Operations Help E 2 2 3 4 4 9 4 1 2 4 2 2 2 2 3 2 3 2 3 3 4 4 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5	: ≱ ₩ <b>=</b>	× 🗹 🔴 📍				
E NE RFC1158-MIB	ableiso.	org. dod. inte	rnet.mgmt.mib-2.int	erfaces.ifTabl	•	
🖕 🦰 mih-2	Index	ifDescr	ifType	ifMtu	ifSpeed	
interfaces 10	Gi	gaEthernet5/0	ethernet-csmacd(6)	1500	100000000	
ifNumber 11		110	other(1)	1500	1410065408	
ifTable 12		ON9/13	other(1)	1500	10000000	
⊕ 📄 at 13		ON9/14	other(1)	1500	10000000	
ip <u>14</u>		20N9/15 20N9/16	other(1) other(1)	1500 1500	10000000	
in in in in it is in the interview of th		ON9/16 ON9/9	other(1)	1500	10000000	
		ON9/10	other(1)	1500	10000000	
⊕ in the second		ON9/11	other(1)	1500	100000000	
transmission 19	EF	ON9/12	other(1)	1500	10000000	
🛨 🦳 snmp 🛛 🚺 20		ON9/5	other(1)	1500	10000000	
		ON9/6	other(1)	1500	10000000	
■ B RFC1213-MIB     22		ON9/7	other(1)	1500	10000000	
		ON9/8	other(1)	1500	10000000	~
TRAPS		ON9/1	other(1)	1500	10000000	
TEXTUAL CONVENTION	n ⊙ <u>O</u> rigin ) <u>I</u> r	idex 0	Host	72. 16. 21. 147 Page	:1 Rows :23	
s s	ta <u>r</u> t	Next	<u>P</u> rev Sta	rtPolling Sto	ppPolling Refresh	
	\dd	Delete	<u>G</u> raph Orig	inalTa <u>b</u> le Ind	dgxEditor Close	
	Index					
	Object ID	. 1. 3. 6. 1. 2. 1. 2.	2			
ta 💿	Description	n				

The related operations in the SNMP table faceplate are described below:

- Page: It has two options, that is, Start and Index.If the Start option is chosen, the table will be searched from its beginning.If the Index option is chosen, you need to set an index value in the textbox and the table will be searched from the designated value.
- Host: It is used to designate the host's name.
- Set: If you click it, a dialog box appears. You need to set the following options in the dialog box:
  - Polling interval: It is used to set the interval of table search. Its default value is 5 seconds.
  - Page size (row): It is used to set the number of rows in the search table.
  - Number of rows: It is used to set the number of rows shown in the SNMP faceplate. The default number of rows is 5.
  - Port ID: It is used to set the ID of a required port.
  - SNMP version: It is used to set the version of SNMP.
  - Search mode: It is used to set the search mode for getting the SNMP table's information.
- Start: It is used to start the search of the table.
- Next, Previous: They represent the next row and the previous row in the table respectively.
- Start polling: It is used to start the polling of this table.
- Stop polling: It is used to stop the polling of this table.
- Update: It is used to update the data in the table when the polling is stopped.
- Add: It is used to add a row to the table.
- Delete: It is used to delete a row from this table.
- Curve: It is used to show the change trend of a selected variable.

# 11.1.8 MIB Browser – Trap Oberser

The trap oberser is used to receive traps. After you set the port ID and the community name in the trap oberser, the received trap information will be displayed in the table. See the following figure:

🔰 TrapViewer 📃 🗖 🔀							
Class	Туре	Source	C	Date		Message	
Clear	v1 Trap	172.16.2	1.147 Mc	Mon May 21 09:35:5		.iso.org.dod.interne	
Enable Logging 👽 Authenticate v3 Trap 🔽 Authenticate v1/v2c traps (Community)							
Port 1	.62	TrapList	162:public	*	Add		Del
Community <sub>I</sub>	oublic Tr	apParser					Load
Start	Stop	Show De	tails	Delete E	ntry	Parse	rEditor
Traps : 1 Inform : 0         Status : Listening for Traps							

Related explanations about the trap observer are shown below:

- Trap table: It is used to list all received traps.
- Port: It is used to designate the port which the observer will monitor.
- Community: It is used to set the value of the community.
- Trap list: It is a trap list dropdown box.
- Trap resolver: It is used to upload the trap resolver files.
- Start and Stop: They are used to start and stop trap monitoring respectively.
- Details: It is used to check the detailed information about a trap.
- Delete trap: It is used to delete a trap from the trap list.
- Resolution editer: It is used to open the resolution editer.

### 11.1.9 MIB Browser -- Curve

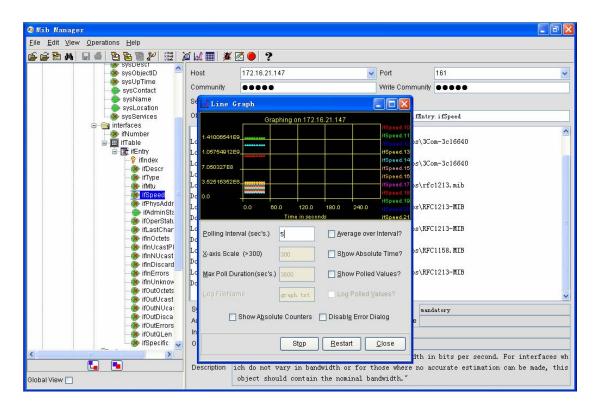
The MIB browser can draw the curve of SNMP data in real time. The system supports two kinds of curves: Linear diagram and histogram. The polled SNMP variable must be an integer or no-character integer.

You can follow the following procedure to draw the curves of the SNMP data:

- Designate the host agent's name or IP in the host domain in the MIB browser.
- Upload MIB in the MIB browser.
- Designate a valid variable (note: this variable must be an integer or a non-character integer).

Click Show -> Linear diagram/Histogram or directly click M. An automatically updated diagram appears, showing the OID polling results of the designated agent.By default, a polling will be conducted every 5 seconds.

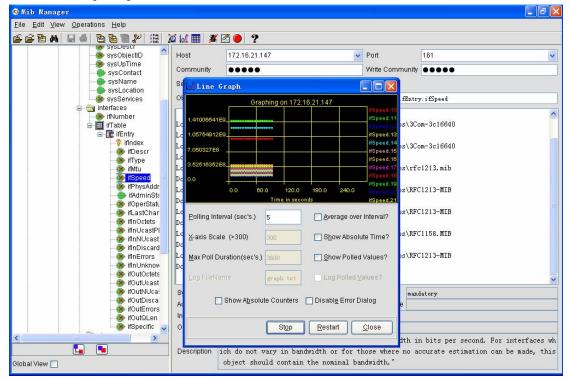
The following is a simple linear diagram:



You can set the related options on the above-mentioned window:

- Polling interval: you can enter a value as the polling interval, whose default value is 5 seconds.
- Get the average value of the polling interval: It is used to get an average value of a given polling interval.
- ♦ X axis' scale: It is used to set the X axis' scale, whose minimum value is 300 seconds.
- Show absolute time: It is used to show the time in the "hour:minute" format or in the "second" format.
- Maximum polling time: It is used to set the maximum time that the curve can draw. The default value is 3800 seconds.

- Show the polling value: If it is selected, all polling values will be shown in an accurate cycle.By default, it is forbidden.
- Log file name: It is used to set the name of a log file.By default, the log file is named as graph.txt.If you select Write polling values into the log, all polling values will be recorded in the file.
- Write polling values into the log: If it is clicked, all polling values will be recorded.By default, it is forbidden.
- Show the absolute counter: It is used to show the absolute values.By default, the curve only draws the differences between two values.
- Stop: It is used to stop the variable polling.Reboot: It is used to restart the polling.Close: It is used to close the curve.



### 11.2 SNMPv3 Security

SNMPv3 has three important services: ID checkup, ID encryption and ID access control.Each SNMP entity includes a SNMP engine.The SNMP engine has the following functions: Sending and receiving information, ID checkup, data encryption and de-encryption, and access control.Multiple applications, which are set by the SNMP engine, consist of a SNMP entity.NMS supports the SNMPv3 protocol.

### **11.2.1 Adding the Protocol Information**

Click SNMPv3 security to open the following window:

<u>F</u> ile Sys <u>t</u> em Manager <u>W</u> indow <u>H</u> elp								
								NMS
MMS	SNMP V3 Sec	urity						- 7 🛛
Applications     Network Maps     Genet     Genet	UserNama	Security Level	Auth Protocol	Priv Protocol	Auth Password	Priv Password	Target Host	Target Port
	Target Host 100				Priv Protocol CBC-D	ES		~
	Target Port 161 UserName				Auth Protocol MD5 Auth Password			<u> </u>
	Security Level noA	ath, noPriv		~	Priv Password			
				Refresh Add I	Entry Delete Entry			

The options in the above-mentioned figure are described below:

- Destination host: it stands for the IP address of a managed device.
- Destination port: it stands for the SNMPv3 port.
- Username: It is used to set the to-be-verified username.
- Security level: there are two security settings: Auth (authentication) and Priv (privacy). The two security settings consist of three options: "noAuth, noPriv", "Auth, noPriv" and "Auth, Priv".

**Auth**: it means authentication. After you select it, you shall select the related protocol (MD5 and SHA) in the **Authorized protocol** dropdown box.Enter the password in the **Authorized password** box.

Priv: It stands for privacy, corresponding to the **Priv password** box. If you select this option, you shall enter the password in the **Priv password** box.

**noAuth,noPriv**: it means not to require authentication, authorization and encryption.

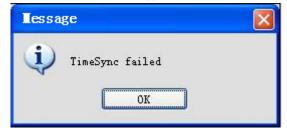
Auth,noPriv: it means to require authentication and authorization, but not encryption.

Auth, Priv: it means to require authentication, authorization and encryption.

- Priv protocol: it means to support the encrypted protocol information. This option is not available for you to enter values.
- Authorized protocol: It has two options: SHA and MD5.
- Authorized password: If you choose **Auth** for **Security level**, you need to enter a value here.
- Priv password: If you choose Priv for Security level, you need to enter a value here.

After you enter the corresponding data and click Add entry, the entered data will be added.If

the data is successfully added, the data will be shown on the above-mentioned table. If the data fails to be added, an alarm message will appear, as shown in the following two figures:



#### **11.2.2 Changing the Protocol Information**

Click a row in the table to show the related data at the bottom area.See the following figure:

serName	Security Level	Auth Protocol	Priv Protocol	Auth Password	Priv Password	Target Host	Target Port
ot	noAuth,noPriv	NO_AUTH	NO_PRIV	1		172.16.21.147	161
				211			
arget Host 11	72 16 21 147			Priv Protocol CBC-D	RS		
Target Port 16				Auth Protocol MD5			
				Auth Password			1
JserName							
JserName ro ecurity Level n	aduth noPriv		~	Priv Password			

After modifying some data, click **Update**. These data will be updated.

#### **11.2.3** Canceling the Protocol Information

To cancel data, select a row in the table and then click **Cancel entry**. There is no notification when you cancel data, so please be cautious when you conduct this operation.

#### **Appendix 1 Operation Problems about NMS Server**

#### Q1: The NMS server cannot be run

A: In general, after the NMS server is installed the system will automatically upload services and start the NMS server. However, in some special cases, the NMS server cannot be started or the NMS server fails to be connected after the client is started. We list out all the reasons one by one and help users to use this NMS server better:

#### 1) Overdue license

If the license overdued during server startup, it means that the trial version is overdue and the NMS server therefore cannot be started. To solve this problem, you shall start the **NmsReg.exe** program in the **Installation -> Bin** directory and then enter the sequence ID and the corresponding license file according to requirements. It is OK after the NMS server is rebooted.

#### 2) Chinese characters exist in the installation path

If there are Chinese characters in the installation path, the third-party Apache software cannot work normally. It is OK if the installation path has no Chinese characters.

#### 3) MySql has been installed before

Our installation program includes a third-party **MySql** database. If you have previously installed the MySql database, the NMS server cannot be started. The solution is to find the **my.ini** file in the C disk and then delete it.

#### 4) Improper operating system and language version

At present, the NMS server supports the following platforms: Windows Server 2003, Windows Server 2008, Windows XP, Windows Vista and Windows 7.

#### 5) Port 9090 is occupied

The running of this NMS server needs to start port 9090. If port 9090 is occupied, the NMS server cannot be started. In this case, you need to use **netstat** –**ao** in the command line of the operating system to check whether a process occupies port 9090. If a process occupies port 9090, you need to shut down the ID of this process.

#### 6) The NIC is not activated and the license cannot be authenticated

Our authentication mechanism is bound to the NIC. If the NIC of the NMS server is not activated or the NIC is not connected, the license cannot be authenticated.Before starting the NMS server, make sure that the host on which the NMS server is installed has activated its NIC.

#### 7) Check whether the server was normally shut down last time

If there are **Mysqlm**, **rmi register**, and **apache** in the process list, it indicates that the server was shut down abnormally. The system therefore cannot be started normally. To solve this problem, you need delete the **MySql.exe** process, the **rmiregistry.exe** process, the **apache.exe** process and the **java.exe** process in **Windows task manager** and then restart the server.

8) The current user has no write permission towards the installation path

Run /bin/startPostgreSQL.bat in the DOS window. If the following information appears,

#### G:\Program Files\NZone\NZone NMS\bin>2012-01-13 01:21:08.330 GMTFATAL: could no t create lock file "postmaster.pid": Permission denied

check whether the current user has the write permission to the installation directory.

#### Q2: Why cannot the traps be received?

It has the following reasons:

1) The trap host is not set and its IP address is not the IP address of the current network management host.

In this case, you need to check whether the **Trap host** option is set during the configuration of the command line and set the IP address of the trap host to be IP address of the current network management host.

#### 2) Port 162 is occupied.

You can use the **netstat** –**ao** command to check whether port 162 of the current network management host is occupied by other process. If it is occupied by other process, you shall shut down the network management software (NMS) and then release port 162 and then restart NMS.

#### 3) The firewall of the NMS server blocks port 162.

If port 162 is not occupied by other process but the trap message cannot still be received, check whether the firewall of the NMS server blocks the trap message of port 162. If the firewall blocks the trap message, you need to close the firewakk and then restart NMS.

#### 4) Check whether there are 3 switches in the command.

解答: You shall add **trap host x.x.x.x community authentication snmp configuration** in the command line during the command line configuration.

#### Q3: The hand-in-hand topology cannot be discovered.

To find the EPON hand-in-hand topology, you shall set the standard SNMP options and the trap and then other related requirements.Do as follows:

#### 1) Use the **epon ip-address** command to ser the device.

In the hand-in-hand topology, two OLTs connect the same ONU through their PON ports. The PON port of the current active OLT needs to record the IP address of the OLT on which the peer PON port locates. During the shift of the PON ports, OLT needs to know which IP address shall be written into the ONU's information.Before discovering the hand-in-hand topology, OLT must set **epon ip-address x.x.x.** 

### 2) After PON port shift, ONU needs to record the IP address of the peer OLT.

In the hand-in-hand topology discovery, the PON port of the OLT on which the current online ONU locates needs to record the address and index of the PON port of another OLT. The premise to record this information is that ONU has been registered on two PON ports. In general, after ONU is registered, you shall switch the current ONU over on another PON port and then switch it back. In this way, the ONU information will be recorded on two PON ports of two OLTs.

#### Q4: A device cannot be discovered or its type cannot be identified.

All device types can be detected and their models can be displayed in normal case if you click **Real-time management -> Topology discovery**. But in special cases, the devices cannot be discovered or the device types are incorrect even though the devices are discovered. The possible reasons are listed below:

#### 1) Check whether this device's SNMP attribute is set.

During discovery settings, the SNMP community of a device should be set. If device discovery fails, you need to confirm whether the device has contained the SNMP community settings.

## 2) Check whether the community used during discovery is the same as that of the device.

When you conduct the discovery settings on the NMS terminal, guarantee the community of the NMS terminal and that of the device terminal are same.

#### 3) Check whether a device can be reached.

When device discovery fails, you should test whether the device can be detected. You can ping it or conduct SNMP operations on it. If the two operations can be done successfully, the device is reachable.

#### 4) The network condition is poor or the device response times out.

In this case, click **Real-time management -> Discovery configuration -> Regular -> Initialized parameter** to set a relatively big value for SNMP timeout time and retry times.

#### 5) The device type is not supported by the NMS server.

A device type cannot be detected correctly, but all SNMP configurations are correct.In this

case, you need to check whether the current NMS server supports the device type. You need to communicate with related testers and rearchers. Generally speaking, the latest released device types may not be supported by the NMS server.

#### 6) If ONU type cannot be identified, check vendor ID and model ID.

Before ONU discovery, check whether the ONU version is compatible with the NMS server's version (both are NMS versions, neutral versions, or customized versions).

## 7) The EPON device cannot be discovered, or the EPON device is not displayed in the EPON network tree node after the EPON device is discovered.

In this case, the most possible reason is that the PON card of the current EPON device is not started or the type of the PON card cannot be identified by NMS.You should conduct the SNMP operations to check whether the current PON card can be identified on the device layer.The OID of the SNMP table is 1.3.6.1.4.1.3320.3.6.10 (bdcardTable). For the SNMP operations, see figure 2.Check whether the **bdcardDescr** option in the SNMP table contains the type of the corresponding PON card.If it contains the type of the corresponding PON card, the device can be identified; if not, the correspond cannot be discovered.

<b>III</b> 172.	III 172.16.21.72:bdcardTable								
<b>C</b> 🛞	172.16.21.72	• 🔉	] <u>Poll every</u> 600	÷ seconds	<u> </u>				
Instance	bdcardIndex(IDX)	bdcardType	bdcardDescr	bdcardSerial	bdcardHwVe	bdcardSwVersion	bdcardSlotNumber	bdcardContainedByIndex	bdcardOperStatus
<b>8</b> 1	1	238	IEP3314 MCARD	0	(zero-length) [	(zero-length) [ (h	0	0	up(2)

Figure 2: SNMP operations of the PON card's type

#### Q5: The settings cannot be distributed through the NMS window.

Do as follows:

#### 1) Check whether the device type is normal.

Ping or telnet a device to check whether it is reachable. Then perform the SNMP operations to check whether the device responses.

#### 2) Check whether a device can be reached.

Conduct the SNMP operations.

#### 3) Check whether the write community is set on NMS.

Check whether the community of the device, which is accessed currently be the NMS, has the write permission.

#### 4) Other reasons exist, such as the device itself is abnormal.

If all above-mentioned options have no problems, try to distribute the same settings on the device terminal through the telnet or console mode and see whether it can be done successfully. If it is done successfully, the **snmp set** operation of the device terminal has problem. If it fails, the

device itself is abnormal. In this case, please contact related technicials or researchers.

#### Q6: The client cannot log onto the server.

Because NMS server is in C/S mode, you need to start the NMS server and the server at the client terminal. The NMS window then appears. If the NMS window does not appear, do as follows:

#### 1) Check whether the server is normally started.

Check whether the NMS server is successfully started by clicking **Start log** at the right bottom corner of the NMS server. What's more, you can check the log files in the **logs** directory of the installation path to see whether the NMS server is normally started.

#### 2) Check whether the login password is correct.

If the server is normally started but cannot be logged, please check the username and the password are right.

#### 3) Check whether the IP address of the server is correct.

When logging on to the client, click **Advanced** and check whether the IP address and port of the server, which you enter on the cureent client, are the same as those of the real server.

### 4) Check whether the communication between the client and the server is normal.

If the server cannot be connected, ping on the client the corresponding port of the server to see whether the port can be connected.

#### 5) Check whether the firewall of the server is enabled.

If the server cannot be connected, it is possible that the firewall of the server blocks the current communication. So you should check this case.

#### Q7: The NMS window has no response.

A client is successfully enabled, but after an operation or just after a while the client's window has no response if you click this window. The possible reasons are shown below:

#### 1) Uncertain window exists in the backstage.

In many cases, you open a lot of windows and do related configurations at the same time. The current window may cover the dialog box of the NMS window. In this case, press **ALT** and **TAB** at the same time to switch over to the dialog box of the NMS window.

2) The network is slow or CPU is busy.

Due to heavy load, the window of the NMS client may not response to the cursor's or keyboard's operations. In this case, you'd better wait for a minute. If there is no response for a long time, you can close the NMS client and restart it. If the NMS client cannot be connected, you need to restart the NMS server. It is noted that you store the logs about abnormities and send these logs to our technicians for problem locating and resolving. The storage address of the client's logs is the **clientlog** folder under the installation path, while that of the server's logs is the **logs** folder under the installation path.

# **Q8:**During the removal of the PON port, the plug or insertion operation cannot be done simultaneously or rapidly, or the devices cannot be fully displayed or deleted.

In some cases, you may remove a PON card on a slot to another slot of the local machine. The NMS has to process ONUs and PON cards one by one and, if the number of related PON cards and ONUs is large, NMS needs to take a lot of time. So if you want to remove one PON card and then another one, the interval should be at least several minutes.

### Q9: If you start multiple servers and at the same time access devices or conduct operations to the devices, the read and access or the settings will time out.

The response of SNMP packet on a device is a single-process one, so only one SNMP request can be answered at a time.So when you conduct SNMP operations to a device, you should avoid starting multiple NMS servers at the same time.

## Q10: During device discovery, you may discover a device in the IP network but cannot discover it in the EPON network all the time.

The reason may be that it times out when SNMP obtains related MIBs or that the PON card is not inserted when this device is detected. To advoid this case, you should first detect the device in the IP network topology, delete it from the IP network topology and then rediscover it in **Discovery Management**. (If the network is good and the device is not busy, this case will not occur; otherwise, packet loss occurs or the SNMP request times out)

#### Q11: The device's status on the topology cannot be updated

In most cases, the real-time update of the device's status or line's status on the NMS window depends on the trap message, which is transmitted from a device. Furthermore, when a trap message is sent and its IP address is not designated, the IP address of the trap message is an address, which is in the same network segment with the trap host's address. If the IP address of the trap message, which is transmitted by a device, is not the IP address of the device when NMS detects it, NMS may regard that this device is not discovered after receiving the trap message and therefore cannot update the real-time status.

#### Q12 How to backup the NMS database regularly?

Considering the complexity of the real network and historical data backup, NMS provides the function of regular database backup. For details, see the database backup function at the **Task Management -> Task Configuration** directory.

#### Q13: The configured tasks fail to run.

The running of a configured task relates to a lot of function configurations. If a problem occurs in any function configuration, the configured task cannot be run normally.

#### 1) The Telnet authentication information is not set for a device.

During execution of configured task, the administrator needs to conduct related settings to the device through Telnet. Hence, you have to conduct the Telnet authentication on the device.

### 2) The task operation times out due to network congestion and heavily loaded CPU.

You have to wait for a few minutes and then reset and run it.

#### 3) The third-party TFTP server cannot access the IP layer of the device.

On failing to execute a configured task, you have to confirm whether the communication between TFTP server and device is normal.

## 4) The device gets offline or the configuration information of the device is changed (add or delete ONUs).

Before setting ONU, you should check whether the current ONU is online. If the device is offline or disconnected for some reason, the settings and its distribution must fail.

## 5) When the NMS server is used as the operation source or destination, you should check whether the occupation of the TFTP port causes the TFTP

#### server to be started unsuccessfully.

In this case, you should check whether the TFTP port of the current NMS host is used by the current NMS.

#### Q14: Check whether the version of the installed server is consistent

#### with that of the client.

The interconnection and startup of the server and the client may fail because the version of the client is inconsistent with that of the client.

#### Q15: Qestions about performance collection

1) During the collection of historical performance, the server cannot display related data unless it has run for a long time.

The system sets the historical performance collection interval to 5 minutes. After starting the server, you have to wait for at least 10 minutes and then the system shows the curve.

2) Make sure that the RMON configuration has been done on the port on which the performance collection or historical collection is conducted.

The performance data collection of an Ethernet port is realized through the RMON performance collection, so you must conduct the ROMN configuration before historical performance collection.

#### **Q16:** How to save the configurations?

After you have done related configurations on a device through the NMS, you have to save these configurations on the device by right clicking **Save configuration**.

## Q17: Why can the boders of a button on the window not be displayed?

In some special cases, NMS is installed on the Windows operating system but its client's window cannot display some window components normally, such as the button, the table's head and the list. To solve this problem, you have to confirm whether the window style on the current Windows operating system is the classical one. If not, please set the window style to the classical style.

## Q18: Why is Ifindex of a PON port inconsistent with the port description after NMS is closed and the device is restarted?

Each time you discover OLT and ONU, there is a unique index in the software corresponding to them. This unique index is also the system ID. The system ID may change after device reboot. In this case, the system cannot correspond to the related PON port and ONU correctly. Therefore, after device discovery, you should enter **write ifIndex** in the command line on the OLT.

#### Q19: After a service is enabled, the log window appears. But why is

#### the log window then closed instantly?

Because the **mysql-d** process exists, you have to kill this process and then you can start the server. After the server is normally started, the following window appears.

ᡖ Log	Panel							
RUNNING LOSS								
No	Time	Information	Status					
1	2012-06-07 10:04:33	Validating License	succeed					
2	2012-06-07 10:04:48	Initializing The Database	succeed					
3	2012-06-07 10:04:53	Starting The Server Service	succeed					
4	2012-06-07 10:05:08	Checking Connection To The Ser						
5	2012-06-07 10:05:09	Service Is Started	succeed					
Clear Close								

#### Q20: Why is the icon of a switch or router a PC icon?

The possible reasons are shown below:

1. After OLT is restarted, its current settings is not saved and the SNMP related parameters in

the previous settings are discarded. The SNMP packets then cannot respond.

2. OLT is busy and the SNMP packets time out, which causes NMS to regard this device is not the SNMP device.

3. The community is entered incorrectly during NMS discovery. The community on the NMS server is not the same as that on the device.

The solution is:

You can delete the device that the PC icon corresponds to, check the configuration and the device and then rediscover this device.

#### Q21: In what cases device deletion and then device rediscovery

#### should be conducted?

In the following cases, you should do as the above-mentioned:

- 1. All OLT configurations are deleted and then OLT is restarted.
- 2. PSG configuration is reset (specifying the PON port of a member again).
- 3. OLT is restarted without saving the **ifIndex** information.
- 4. The PON card is removed (the PON card is removed from one slot to another slot).

#### Q22: Why does it fail if you conduct device settings through the NMS

#### window?

It has the following reasons:

- 1. The BIN version itself has problems and the corresponding MIB does not support.
- 2. The SNMP's write community on the NMS server is inconsistent with that on the device, so the settings is unsuccessful.
- 3. The device itself cannot be accessed or the network connection has problems.