M6500 Series 100G/200G Muxponder/Transponder NE Configuration Manual

FS



Contents

Preface	7
1. Preparation Before Configuration	9
1.1. Configuration Process	9
1.2. Connect NMS System & NE	9
1.3. Start Network Management Service	
1.3.1. Start Server Program	
2. Create Network	12
2.1. Network Creation Process	12
2.2. Login NMS Interface	13
2.3. Create Groups	
2.4. Add NE	15
2.4.1. Add NE	
2.4.2. Modify NE	
2.4.3. Delete NE	
2.4.4. Add a Line-card	17
2.4.5. Delete a Line-card	
2.5. NE IP Address Management	
2.5.1. Node IP Configuration	
2.5.2. NMS IP1 Configuration	
2.5.3. NMS IP2 Configuration	
2.5.4. Local NMS IP (LCT IP) Configuration	
2.5.5. Gateway Configuration	
2.6. Configure FTP Server	
2.7. SNMP Trap Configuration	
2.8. Configure NE Time	
2.8.1. Configure NTP Server	
2.8.2. Configure NE Time	25
2.9. Configure NE Data	
2.9.1. Save NE Configuration	26
2.9.2. Upload NE Configuration	
2.9.3. Download NE Configuration	
2.9.4. Restore NE Default Configuration	
2.10. Create Fiber Optic	

2.10.1. Adjust NE Layout	
2.10.2. Create Link between NEs	
2.10.3. Save Layout	
3. DCN Configuration	
3.1. DCN Introduction	
3.2. Configuration Steps	
3.2.1. Direct Connection between PC and Device	
3.2.2. Forwarding through Router	
3.3. Configuration Example	
3.3.1. Direct Connection between PC and Device	
3.3.2. Forwarding Trough Routers	
4. NE & Board Configuration	41
4.1. Shelf Information	
4.1.1. M6500-CH2U	41
4.1.2. M6500-CH5U	
4.2. LED Indicator Information	
4.2.1. NMU Board	
4.2.2. System Interface LED Indicator	44
4.2.3. Service Board LED Indicator	44
4.2.4. Fan Tray LED Indicator	45
4.2.5. Port LED Indicator of Service Board	
4.2.6. LED Indicator of WDM Service Board	45
4.2.7. Power Tray LED Indicator	
4.3. View Single Board Information	46
4.4. Port Configuration	
4.4.1. Basic Information	47
4.4.1.1. Interface Configuration	
4.4.1.2. ODU2/ODU2e Configuration	
4.4.1.3. OTU2/OTU2e Configuration	
4.4.1.4. ODU4 Configuration	53
4.4.1.5. OTU4 Configuration	
4.4.1.6. OTUC2 Configuration	
4.4.2. Parameter Description	54
4.5. Configuration of Optical Module Information	56
4.5.1. SFP/SFP+ Optical Transceiver Information	

4.5.2. WDM CFP Optical Transceiver Information	
4.5.3. WDM CFP Optical Transceiver Configuration	
4.5.4. WDM CFP2 Optical Transceiver Information	60
4.5.5. WDM CFP2 Optical Transceiver Configuration	60
5. Service Configuration	63
5.1. Electric Cross-Connect Introduction	63
5.1.1. Unidirectional Cross-Connection without Protection	64
5.1.2. Bidirectional Cross-Connection without Protection	65
5.1.3. Unidirectional Cross-Connection with Protection	
5.1.4. Bidirectional Cross-Connection with Protection	68
5.2. Service Type	69
5.2.1. Service Type	69
5.2.2. Service Mapping	70
5.2.2.1. AMP	70
5.2.2.2. BMP	71
5.2.2.3. GMP	71
5.2.2.4. GFP-F	72
5.2.2.5. GFP-Fextp	72
5.3. Service Configuration Process	73
5.4. Configuration instructions	74
5.4.1. M6500-MXP10	74
5.4.1.1. Service Type	74
5.4.1.2. Time Slot Configuration	75
5.4.1.3. Cross-Connection Configuration	
5.4.1.4. FEC Configuration	80
5.4.2. M6500-TMXP2	81
5.4.2.1. Service Type	81
5.4.2.2. Time Slot Configuration	85
5.4.2.3. Cross-Connection Configuration	
5.4.2.4. FEC Configuration	88
5.4.3. M6500-TMXP5	
5.4.3.1. Service Type	90
5.4.3.2. Time slot configuration	
5.4.3.3. Cross configuration	
5.4.3.4. FEC Configuration	

5.5. Configuration Example	
5.5.1. Configuration Example of Ring Network Service	
6. Overhead Configuration	
6.1. Configuration Rules	
6.1.1. SM, PM & TCMi Overhead Introduction	
6.1.2. Overhead Configuration Rules	
6.1.3. TTI Configuration Rules	
6.2. Configuration Steps	
6.2.1. SM Configuration Steps	
6.2.2. PM Configuration Steps	
6.3. Configuration Examples	
7. SNC Protection Configuration	
7.1. Introduction of SNC Protection	
7.2. Configuration Steps	
7.3. Configuration Example	
8. Alarm Management	
8.1. Alarm Management Introduction	
8.2. Main Interface of Alarm Management	
8.2.1. Current Alarm	
8.2.2. History Alarm	
8.3. Alarm Configuration	
8.3.1. Alarm Configuration	
8.3.2. Alarm Notification Configuration	
8.3.3. Alarm Mailbox Server Configuration	
8.3.4. Enable the Alarm Sound	
8.3.5. Custom Alarm Sound	
9. Performance Management	
9.1. Performance Management Introduction	
9.1.1. Filter Box	
9.1.2. Performance Monitoring Point Introduction	
9.1.3. Enable Performance Monitoring Point	
9.1.4. Disable Performance Monitoring Point	
9.1.5. Attentions for Monitoring Performance	
9.2. Current Performance Statistics	
9.2.1. Monitoring of Optical Power	

9.2.1.1. Introduction of Optical Power Monitoring Parameters	
9.2.1.2. View Optical Power Monitoring Information	
9.2.1.3. Reset Optical Power Monitoring Data	150
9.2.1.4. Optical Power Monitoring Data Shown As"-"	151
9.2.2. OCh Current Performance Statistics	
9.2.2.1. OCh Monitoring Parameters Introduction	152
9.2.2.2. View OCh Monitoring Information	152
9.2.2.3. Reset OCh Monitoring Data	153
9.2.2.4. OCh Monitoring Data Shown As"-"	154
9.2.3. FEC Current Performance Statistics	155
9.2.3.1. FEC Monitoring Parameters Introduction	155
9.2.3.2. View FEC Monitoring Information	155
9.2.3.3. Reset FEC Monitoring Data	156
9.2.3.4. FEC Monitoring Data Shown As"-"	156
9.2.4. OTUk/ODUk Current Performance Statistics	157
9.2.4.1. OTUk/ODUk Monitoring Parameters Introduction	
9.2.4.2. View OTUk/ODUk Monitoring Information	
9.2.4.3. Error Generation Conditions for Monitoring Parameters	
9.2.4.4. OTUk/ODUk Monitoring Data Reset	
9.2.4.5. OTUk/ODUk Monitoring Data Shown As"-"	160
9.2.5. Current Performance Statistics of SDH Regeneration Segment	161
9.2.5.1. Monitoring Parameters Introduction of SDH Regeneration Segment	
9.2.5.2. View Monitoring Information of SDH Regeneration Segment	161
9.2.5.3. SDH Regeneration Segment Monitoring Data Reset	
9.2.5.4. Monitoring Data of SDH Regeneration Segment Shown As NA	163
9.2.6. Current Performance Statistics of Ethernet	164
9.2.6.1. Ethernet Monitoring Parameters Introduction	
9.2.6.2. View Ethernet Monitoring Information	
9.2.6.3. Ethernet Monitoring Data Reset	
9.2.6.4. Ethernet Monitoring Data Shown As NA	
9.3. History Performance Statistics	166
9.3.1. History Performance Statistics of Optical Power	166
9.3.1.1. History Monitoring Parameters Introduction of Optical Power	166
9.3.1.2. View History Monitoring Information of Optical Power	
9.3.1.3. Export History Monitoring Information of Optical Power	

9.3.2. OCh History Performance Statistics	169
9.3.2.1. OCh History Monitoring Parameters Introduction	169
9.3.2.2. View OCh History Monitoring Information	170
9.3.2.3. Export OCh History Monitoring Information	171
9.3.3. FEC History Performance Statistics	172
9.3.3.1. FEC History Monitoring Parameters Introduction	172
9.3.3.2. View FEC History Monitoring Information	172
9.3.3.3. Export FEC History Monitoring Information	174
9.3.4. OTUk/ODUk History Performance Statistics	174
9.3.4.1. OTUk/ODUk History Monitoring Parameters Introduction	174
9.3.4.2. View OTUk/ODUk History Monitoring Information	175
9.3.4.3. Export OTUk/ODUk History Monitoring Information	176
9.3.5. History Performance Statistics of SDH Regeneration Segment	177
9.3.5.1. History Monitoring Parameters Introduction of SDH Regeneration Segment	177
9.3.5.2. View SDH Regeneration Segment History Monitoring Information	177
9.3.5.3. Export SDH Regeneration Segment History Monitoring Information	179
9.3.6. History Performance Statistics of Ethernet	180
9.3.6.1. Ethernet History Monitoring Parameters Introduction	180
9.3.6.2. View Ethernet History Monitoring Information	180
9.3.6.3. Export Ethernet History Monitoring Information	181
10. Abbreviation	183

Preface

Overview

Chapter Number	Description
Preface	This chapter introduces contents, version information and explanation of special symbols.
Chapter 1 Preparation Before Configuration	This chapter describes the preparation work required before configuring network elements.
Chapter 2 Create A Network	This chapter introduces how to build a network environment.
Chapter 3 DCN Configuration	This chapter introduces the configuration method of DCN in band.
Chapter 4 NE & Board Configuration	This chapter introduces NE and board configuration instructions, configuration steps and explanation.
Chapter 5 Service Configuration	This chapter introduces the service configuration scheme of network element under different service types and different environments.
Chapter 6 Overhead Configuration	This chapter introduces the traditional overhead configuration scheme of OTN.
Chapter 7 SNC Protection Configuration	This chapter introduces the SNC protection configuration and the protection conditions etc.
Chapter 8 Alarm Management	This chapter introduces the current alarm and history alarm of NE and NMS system.
Chapter 9 Performance Management	This chapter introduces the current and history performance statistics of optical power, OCh, FEC, OTUk/ODUk, SDH regeneration segment and Ethernet.
Abbreviation	

Product Version

Product Number	Version Number
M6500 Series NMS	R6.4.23_v13530

Content Introduction

This manual mainly introduces the general operation of the network management platform, including installation and startup of the NMS system, login, exit, password change, security management, system management of network element, alarm management, log management, performance management, routine maintenance of the NMS system, common problems and so on.

Explanation of Special Symbols

The following symbols may appear in this manual, which respectively represent the following meanings:

Symbol	Description
Danger	Special attention should be paid to the content. If the operation is improper, it may cause serious injury to the person.
Attention	It reminds the matters for attention. Improper operation may cause loss of data or damage to the device.
Hint	It represents the operation or information that requires special attention to ensure the success of the operation or the normal work of the device.
R Knack	A skill or a knack which helps to solve a problem and save time.
Explain	The necessary supplement and explanation for the description of the text.
Note Note	Notes contain helpful suggestions or references to material not covered in the manual.

Note

- It is not allowed to make modification if the input box or the drop-down box is grayed out.
- The add, delete, modify and refresh buttons are all on the toolbar.
- One and only one data in the table must be selected first while doing the modification operation.
- At least one data in the table must be selected while doing the deletion operation.

1. Preparation Before Configuration

1.1. Configuration Process

When configuring M6500 devices on M Series NMS system, some rules and orders must be followed.

If the whole project and its configuration are initially created, please refer to process in 1-1 to complete the operation. If the project has been created, only the configuration of one NE or single card needs to be changed, please perform the operation according to relevant content of chapters in Figure 1-1.

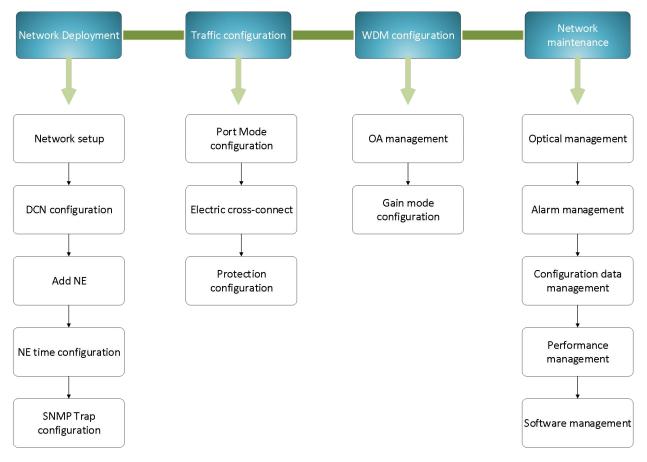


Figure 1-1 M6500 Service Configuration Process

M Series NMS system mainly contains operations such as parameter configuration of single card service, protection, in-band management as well as alarm query and performance query etc.

🕜 Hint

It is recommended that the configurations of M Series NMS equipment be completed according to the sequence of operation in the flowchart.

1.2. Connect NMS System & NE

For different network devices, there are multiple connection ways to connect M Series NMS network management computer and M6500 network elements. Normally the M Series NMS Server and M6500 network Element are both connected to a HUB by direct connection network cable. But the M Series NMS Server can also

be directly connected to M6500 network element's management port through twisted pair cable or direct connection network cable.

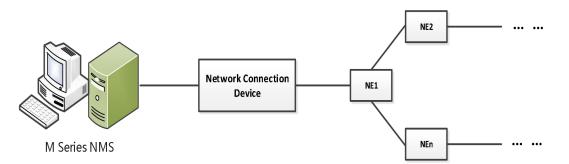


Figure 1-2 Connection Schematic Diagram of Network Management System and Network Elements

Prerequisite

The deployment of network cables between the NMS system and NE has been completed.

Steps

Here we take the connection mode of "cable+HUB" direct-connect network as an example to introduce the steps to connect the NMS system and the network elements:

- Turn on the network management computer and take a network cable to connect one end to the network card interface of the host computer, and connect the other end to the Ethernet port of HUB.
- Take another network cable and connect one end to the Ethernet port of HUB and connect the other end to MGMT1/MGM2 of NMU board for M Series NMS equipment.
- Check on the network management computer to see if the network cable is connected to a device network card; if not, connect the network cable to another network card of the network management computer.

1.3. Start Network Management Service

Prerequisite

Ensure that the M Series NMS system has been installed on the network management host.

1.3.1. Start Server Program



Double click on "NMS Server" **NMS** Server on the network management computer, the "NMS" server window pops up. Then double click on "Start NMS Server", as shown in Figure 1-3:



4	N	NMS	- 🗆 🗙
<u>O</u> ptions E <u>d</u> it <u>H</u> elp			
PR & & 91			
	Start NMS Server	Shutdown NMS Server	Reinitialize NMS
	Start NMS Server	Shuldown NMS Server	Remualize NMS
Start NMS Server Starts the NMS Server			
Starts the MMS Server			
Start NMS Server			
TTOCESS . Wapt L	[otaneu]		
Process : PolicyFE	[Started]		
	[Started]		
Process : UserConfigProcessFE	[Started]		
Process : ConfigFE Process : NmsMainFE	[Started]		
Process : AuthorizationManagerFE	[Started] [Started]		
Process : WebNMSMgmtFEProcess			
riocess webrinding in Errocess	[Statled]		
Verifying connection with web serve	verified		
NMS modules started successfully	at Feb 26,2019 10:32:21 AM		
Please connect your client to the we	b server on port: 9090		
			•

Figure 1-3 Start NMS Server

2. Create Network

Create network topology, that is, create corresponding network model of actual project according to the configuration of actual engineering (such as networking, single site configuration etc.), so as to realize the monitoring of devices.

Before creating a network topology, operators need to know the relevant engineering configuration files, including:

- Information such as the NE type and single card configuration of each site.
- Network topology of engineering.
- Service scheduling and protection scheme.

If an operator only needs to add a network element to an existing project, he only needs to know the location and topological connection of the network element in the actual network.

It will introduce the creation steps of the network topology according to the configuration process in the following passage. Moreover, it will focus on the parameter configuration related to M6500in each step, and only the sections of the reference book will be provided for the common configuration steps for each device. M Series NMS related software was pre-installed when the network management host was manufactured. When the network management host was turned on, the network topology could be created according to the configuration process. This chapter includes the following content:

- Create Network Flow
- Login NMS Interface
- Create Nodes
- Add NE
- Establish Network Element connection
- Management of Network Elements
- Check Configuration Data
- Save Configuration Data

2.1. Network Creation Process

The topology of subnet, network element and fiber cable can be created in M Series NMS. Network element data can be configured. The single board parameters can be checked or modified, and further the subnet, network element or fiber cable can be managed by M Series NMS.

To create network, you can take the following process as reference:

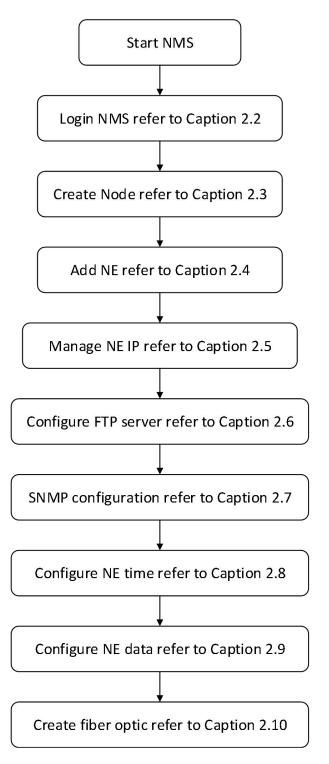


Figure 2-1 Flow Chart of Create Network Topology

2.2. Login NMS Interface

Prerequisite

The installation of NMS system is completed, and NMS server has been started.

Steps

Open Google Chrome and type in the address bar the following network address:

- 1. Network management host: localhost:9090
- 2. Remote network management server: xxx.xxx.xxx.xxx:9090.

Enter your user name and password to login. Default user name:root Default password:public

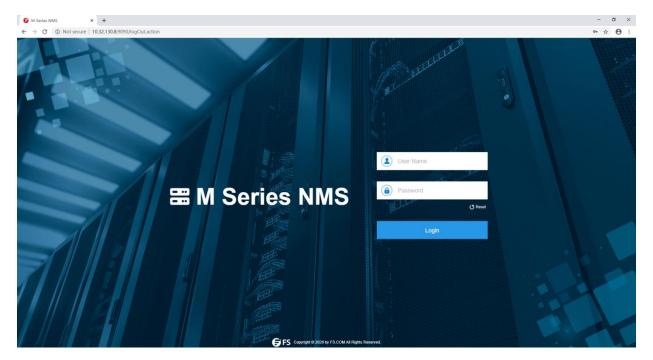


Figure2-2 Login NMS System

2.3. Create Groups

Steps to add a group:

- 1. Click on"Global View", and select"Group Configuration" on the right;
- 2. Enter the node name and description information in the "*Add Group*" module. The description information can be blank.
- 3. Click on "*Apply*" to save the new group information.

Global View	Global View Global Co	nfiguration	
 ➡ ➡ M6800-TSP16(10.32.130.112) ➡ ➡ M6200-CH5U(10.32.130.180) 	Add Group		
	Parent Node	Global View	
	* Group Name	Please input content	
	Describe Info	Please input content	
		Apply	

Figure2-3 Add a Group

Steps to add a child group:

- 1. Click on the created group;
- 2. Click on"Group Configuration" on the right to continue adding a child group;
- 3. Enter the name of the child group in the"*Add Group*" module;
- 4. Click on "*Apply*" to add a child group.

🖃 😵 Global View	Group view	Group Configration
■ ■ M6200-CH2U(10.32.130.116)		
🗐 📄 M6800-TSP16(10.32.130.112)	Modify Group	
田 📄 M6200-CH5U(10.32.130.180)		
■ ■ M6500-CH2U(10.32.130.160)	Parent Node	Global View
	* Group Name	M6500-CH5U
	Describe Info	Please input content
		Apply Delete
	Add Group	
	Parent Node	M6500-CH5U
	* Group Name	Please input content
	Describe Info	Please input content
		Apply

Figure2-4 Add a Child Group

2.4. Add NE

2.4.1. Add NE

Steps:

- 1. Click on the group which has been added, and select "Group Configuration" on the right;
- 2. Input the NE name, NE IP address, subnet mask, Trap host name, Trap host IP address in the "Add NE" module;
- 3. Click on "*Apply*" to save the configuration.

Note : The trap host IP address is the network management server IP address.

☐ 😵 Global View	Group view	Group Configration
 ■ M6200-CH2U(10.32.130.116) ■ M6800-TSP16(10.32.130.112) 	* Group Name	Please input content
⊞ 📄 M6200-CH5U(10.32.130.180)	Describe Info	Please input content
⊞…] M6500-CH2U(10.32.130.160)		Apply
	Add NE	
	Parent Node	M6500-CH5U
	* Display Name	M6500-TMXP5
	* IP Address	10.32.130.120
	* Subnet Mask	255 255 255 0
	* Trap Name	trap
	* Trap Host	10.32.130.32
		Apply

Figure2-5 Add NE

2.4.2. Modify NE

Steps:

- 1. Click on the NE which has been added and select" Group Configuration" on the right;
- 2. Modify the"*Modify Group*"module.

Note : Only the display name of the network element can be modified here.

Group view	Group Configration	
Modify Group		
Parent Node	Global View	
* Group Name	test	
Describe Info	test	
	Apply Delete	

Figure2-6 Modify NE

2.4.3. Delete NE

- 1. Click on the NE which has been added; and select" Group Configuration" on the right;
- 2. Click on"*Delete*" in the "*Modify Group*" module.

Group view	Group Configration	
Iodify Group		
Parent Node		Global View
* Group Name		test
Describe Info		test

Figure2-7 Delete NE

2.4.4. Add a Line-card

Steps:

- 1. Select an empty slot on the added network element;
- 2. Click on the empty slot; and select"*Card Mode Configuration*" module;

🖂 😵 Global View	Card Mode Configurati	on	
M6200-CH2U-No.2(10.32.130.116)	Card Mode	Empty	•
🕀 🛑 M6800-TSP16(10.32.130.112)			
🖽 🛑 M6200-CH5U(10.32.130.180)		Арріу	
🖨 🛑 M6500(10.32.130.160)			
🗄 🗮 Shelf01			
Slot2 M6500-40G-TMXP2 : normal			

- Figure2-8 Add a line-card
- 3. Select the card mode in the list;

Card Mode Configuration

Card Mode

Empty	v
M6500-MXP10	
M6500-40G-TMXP2	
M6500-100G-TMXP2	
TMXP5-2X100G	
TMXP5-20X10G	
TMXP5-100G-10X10G	
TMXP5-4X40G-4X10G	
TMXP5-100G-2X40G	

Figure2-9 Select a Card Mode



🕀 😵 Global View	Card Mode Configuration	n	
■ ■ M6200-CH2U-No.2(10.32.130.116)	Card Mode	M6500-40G-TMXP2	•
🕀 🛑 M6800-TSP16(10.32.130.112)			
⊕ ● M6200-CH5U(10.32.130.180)		Apply	
⊟ ■ M6500-CH2U(10.32.130.160)			
Shelf01			
Slot1 M6500-40G-TMXP2 : absent		· ·	
Port1		Success	

Figure 2-10 Add a line-card successfully

2.4.5. Delete a Line-card

Prerequisite

The line-card to be deleted has no single-board crossover or cross-board crossover services, otherwise it cannot be deleted.

🖂 🔞 Global View	Group view Grou	p Configration
🗎 🛑 M6800-TSP16(10.32.130.111)		
🕀 📄 10G(10.32.130.110)	Modify Group	
🛱 🗐 M6500(10.32,130.120)	mouly croup	
⊞ 🗐 DC-B(10.32,130.160)	Parent Node	Global View
🖽 💼 TSP16(10.32.130.112)	* Group Name	test
🕀 🗊 M6500-TMPX5(10.32.130.220)		
	Describe Info	test
] test		Apply Delet

- 1. Click on the line-card and select" *Delete Card*" module on the right;
- 2. Click on"*Delete*".

🖂 😵 Global View	Card Current Alarm			
■ ■ M6800-TSP16(10.32.130.112)	Card Current Alarm	View the current board alarm information	Check	
🕀 🛑 M6200-CH5U(10.32.130.180)				
🖨 🛑 M6500-CH2U(10.32.130.160)	Delete Card			
🗄 🔚 Shelf01	Denote Card			
Slot1 M6500-MXP10 : normal	Delete Card	The board will restart and the board status will reset	Delete	
B Slot2 M6500-40G-TMXP2 : absent				
🗊 📮 Slot3 M6500-NMU : normal	Card Mode Configuration			
Slot4 Empty : available	Card Mode	M6500-40G-TMXP2	•	
Slot5 M6500-2UPSM : normal				
Slot6 Empty : available		Apply		

Figure2-11 Delete a line-card

Attention

- 1. Users can only add line-card in the slots in available state.
- 2. Users can only delete line-card whose slot status is absent.

2.5. NE IP Address Management

There are three types of NE IP address:

Name	Description	Note
Node IP address	In-band management IP address	Suitable for DCN transmission
IP1/IP2 address	Out-band management IP address	Can be modified by the client
Local NMS IP address	default IP address, 192.168.126.2	

Use of DCN: The NMS system of the transmission products will manage thousands of network elements in most cases. Using this technology, all network elements can be managed by one or several access network elements.

2.5.1. Node IP Configuration

Steps:

- 1. Click on the NE which has been added;
- 2. Click on"MGMT IP Configuration" on the right;

NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
MGMT IP Cor	nfiguration					
* Node IP		192.168.155.111		(.1.1.1)		

Figure 2-12 Manage IP Configuration

3. Input the node IP address in the"Add NE" module,

4. Click on"*Apply*" to save the configuration.

arent Node	test	
Display Name	Please input content	
* IP Address	Please input content	
* Subnet Mask	Please input content	
* Trap Name	Please input content	
* Trap Host	Please input content	

Figure 2-13 Manage IP Configuration

2.5.2. NMS IP1 Configuration

Steps:

- 1. Click on the NE which has been added;
- 2. Click on"*MGMT IP Configuration*" on the right.
- 3. Input NMS IP1 address in the NMS IP1 (MGMT_Port1, 3, 4) box
- 4. Click on "*Apply*" to save the configuration.

🕀 🐨 Global View	NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configur	ation	Software Update	OSPF Information
⊞ ∰ M6200-CH2U(10.32.130.116)								
🕀 🛑 M6800-TSP16(10.32.130.112)	MGMT IP Config	ouration						
⊞ — ■ M6200-CH5U(10.32.130.180)								
🗖 🛑 M6500-CH2U(10.32.130.160)	* Node IP		192.168.120.1		(1.1.1.	1)		
🗄 🔛 Shelf01								
🗐 🖸 Slot1 M6500-MXP10 : normal	NMS IP1							
- O Port1								
Port2	* IP Address		10.32.130.160		(1.1.1.	1)		
Port3	Subnet Mask		0000000000					
Port4	* Subnet Mask		255.255.255.0		(1.1.1.	1)		
- Dert5	* OSPF		Disable		Ŧ			

Figure2-14 NMS IP1 Configuration

2.5.3. NMS IP2 Configuration

- 1. Click on the NE which has been added;
- 2. Click on"*MGMT IP Configuration*" on the right.
- 3. Input NMS IP2 address in the NMS IP1 (MGMT_Port2) box
- 4. Click on "*Apply*" to save the configuration.

1	NE View	NE Management	NE Configuration	MGMT IP Configuration	Server	Configuration	Software Update	OSPF Information
N	IGMT IP Config	uration						
	* Node IP		192.168.120.71			(1.1.1.1)		
	NMS IP1(MGM	T_Port1,3,4)						
	IP Address		10.32.135.155			(1.1.1.1)		
	Subnet Mask		255.255.255.0			(1.1.1.1)		
	OSPF		Disable		*			
	NMS IP2(MGM	T_Port2)						
	* IP Address		10.32.130.220			(1.1.1.1)		
	* Subnet Mask		255.255.255.0			(1.1.1.1)		
	* OSPF		Disable					

Figure 2-15 NMS IP2 Configuration

2.5.4. Local NMS IP (LCT IP) Configuration

The default local NMS IP address is 192.168.126.1; The default Subnet Mask is 255.255.255.252.

LCT IP(MGMT_Port2)		
IP Address	192.168.126.1	
Subnet Mask	255.255.255.252	
* Gateway	0.0.0.0	(1.1.1.1)
* Default route re-distribution	Disable	
	Apply	

Figure 2-16 Local NMS IP Configuration

2.5.5. Gateway Configuration

- 1. Click on the NE which has been added;
- 2. Click on"*MGMT IP Configuration*" on the right;
- 3. Select "*Gateway*" box, input gateway IP address;
- 4. Click on *"Apply"* to save the configuration.



NE View	NE Management	NE Configuration	MGMT IP Configuration	Server	Configuration	Software Update	OSPF Information
OSPF		Disable		Ŧ			
NMS IP2(MGM	T_Port2)						
* IP Address		10.32.130.220			(1.1.1.1)		
* Subnet Mask		255.255.255.0			(1.1.1.1)		
* OSPF		Disable		Ŧ			
LCT IP(MGMT	_Port2)						
IP Address		192.168.126.1					
Subnet Mask		255.255.255.252					
* Gateway		0.0.0.0			(1.1.1.1)		
* Default route	re-distribution	Disable		Ŧ			
		Apply					

Figure2-17 Gateway Configuration

2.6. Configure FTP Server

In the following cases, you must configure the FTP server address:

- NE Software Upgrade
- NE Configuration Upload & Download
- NE Log Upload
- NMU/LC Card BSP Upgrade
- Performance Management

Rote

During the use of the FTP server, one and only one server address can be configured. For different FTP servers, different FTP server addresses can be configured.

- 1. Click on the NE which has been added;
- 2. Click on"Server Configuration" on the right;
- 3. Select"FTP Server Configuration" module;
- 4. Input the FTP server address;
- 5. Click on "*Apply*" to save the configuration.

Current Value	10.32.130.8	
* Set Value	Please input content	



2.7. SNMP Trap Configuration

- 1. Click on the NE which has been added;
- 2. Click on"*Server Configuration*" on the menu bar;
- 3. Select" SNMP Trap Configuration" module ;

🖂 😨 Global View	NE View NE Manageme	nt NE Configuration	MGMT IP Configuration	Server Configuration Softw	are Update OSPF Information
⊞ - 🗊 M6200-CH2U(10.32.130.116)				× ·	
🖽 🛑 M6800-TSP16(10.32.130.112)	FTP Server Configuration				
🖽 🛑 M6200-CH5U(10.32.130.180)					
E _ M6500-CH2U(10.32.130.160)	Current Value	localhost			
🖨 📲 Shelf01	Set Value	Please input content			
🗄 📮 Slot1 M6500-MXP10 : normal					
		Apply			
Port2					
	SNMP Trap Configuration				
	Please input content		Search		
	Add Refresh	Delete			
	Reliesh	Delete			
	ID +Name	↑ Trap Host	↑ Trap Port		
Port8	1 120	10.32.130.1	16222	NonVolatile	Active
Port9	2 1313131313	10.32.130.2	16222	NonVolatile	Active
Port10	3 Trap	192.168.126.2	16222	NonVolatile	Active

Figure 2-19 SNMP Trap Configuration

- 4. Click on "*Add*" button to add SNMP Trap information. The default Trap Port is 16222. It is not recommended to modify it.
- 5. Click on "*Apply*" to save the configuration.

* Trap Host Please input content	
* Trap Host Please input content	
	(1.1.1.1)
* Trap Port 16222	



Attention

The newly-added Trap name or Trap IP cannot be same as that of the trap which has been added, or the add operation will fail.

2.8. Configure NE Time

2.8.1. Configure NTP Server

Click on the NE which has been added \rightarrow Click on "Server Configuration" on the right \rightarrow Select" NTP Configuration "module to make relevant configuration.

Steps:

- 1. Click on the NE which has been added;
- 2. Click on"Server Configuration" on the menu bar;
- 3. Select"NTP Configuration" module to enter the configuration interface;

E Slobal View	NE View NE Man	agement NE Configuration	MGMT IP Configuration	Server Configuration	Software Update OSPF Information
🖽 💼 M6200-CH2U(10.32.130.116)				V	
🕀 💼 M6800-TSP16(10.32.130.112)	4 UP	10.32.130.9	16222	NonVolatile	Active
🖽 🛑 M6200-CH5U(10.32.130.180)	5 internal0	127.0.0.1	162	ReadOnly	Active
🖻 🗃 M6500-CH2U(10.32.130.160)	6 internal1	127.0.0.1	162	ReadOnly	Active
🗄 🗮 Shelf01	7 trap	10.32.130.8	16222	NonVolatile	Active
🗄 📮 Slot1 M6500-MXP10 : normal					
🙆 Port1	Total: 7 records				10 V Previous 1 Ne
Port2					
🔂 Port3	NTP Configuration				
Port4					
Port5	Please input content		Search		
Port6	Basic Info	Add Refresh Delete			
- Port7	Dassic Into	Delete			
Port8					

Figure 2-21 NTP Configuration

4. Click on "Add" button and input the of NTP server IP,

5. Click on *"Apply"* to save the configuration.

	5	Trap	Add NTP Con	figuration	IonVolatile
	6	Trap1			IonVolatile
	7	internal0	* Server IP	Please input content	leadOnly
	8	internal1			(1.1.1.1) leadOnly
	9	trap	Apply	Close	IonVolatile
Total:		uration			
P Cor	nfigu			Search	
P Cor Plea	nfigu	nput content	Delete	Search	
P Cor Plea	nfigu ase in asic li	nput content	Delete		Server Status

Figure2-22 NTP Server Configuration

2.8.2. Configure NE Time

Steps:

- 1. Click on the NE which has been added;
- 2. Click on"*NE Configuration*" on the right to enter the configuration interface;

NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Soft
NE Basic Info					
System Location		-			
Contact Info		20			
Device Identifier		M Series NMS 200G			
System Up Time		1 day, 4 hours, 26 minutes, 1	9 seconds.		
Serial Number	(302D16HRS20050037			
Hardware Version		3.0			
Software Version		R6.3.31_v9116_release			
System Name		Please input content			
System Description	n	Please input content			

Figure 2-23 NE Time Configuration

3. Configure the current time of NE,

4. Click on "*Apply*" to save the configuration.

FS M Series NMS	Monit		Configuration	X Maintain	
Global View	NE View NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update
➡ ■ M6200-CH5U(10.32.130.180)	Serial Number	2022B00SN19030028			
☐ — M6500-CH2U(10.32.130.160)	Hardware Version	2.0			
占 🗮 Shelf01	Software Version	R6.3.24_v10387_release			
Slot1 M6500-MXP10 : normal Port1	System Name	Please input content			
Port2	System Description	Please input content			
Port4		Refresh Apply			
🙆 Port5 🙆 Port6	NE Time Configuration				
Port7	Time Zone	(GMT)		Ŧ	
Port9	NE Current Time	2020-10-26 06:28:13			
Port10		Refresh Apply			

Figure 2-24 NE Time configuration

2.9. Configure NE Data

Configure NE Data:

- Save NE Configuration: In the case of configuring the network element, in order to prevent the network element from abnormal restarting, the network element configuration is saved regularly. At present, the configuration data of the network element is automatically saved once per minute.
- Upload NE Configuration: In order to avoid data loss caused by abnormal operation, it needs to upload the NE configuration to local NMS server regularly.
- Download NE Configuration: In order to avoid the loss or modification of the original configuration caused by the abnormal operation of the network element by the engineer, the previous configuration is downloaded from the local NMS server to the network element. After it is successfully downloaded, the network element will be restarted automatically. After the restart, the configuration will be automatically saved on the network element.
- To restore NE default configuration: In the case of field debugging, various configurations of the network element have been made. After debugging, in order to prevent some of the configurations from being not restored, it needs to use this configuration to restore the network element to the factory settings.

2.9.1. Save NE Configuration

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the right \rightarrow Select" *Configuration Data Save*" module and Click on "*Save*".

📄 🚱 Global View	NE View NE Management	NE Configuration MGMT IP Configuration	Server Configuration	Software Update C	SPF Information
⊞ ■ M6800-TSP16(10.32.130.112)	Time Zone	(GMT)	•		
■ ■ M6200-CH5U(10.32.130.180)	THIS LONG	County			
E ■ M6500-CH2U(10.32.130.160)	NE Current Time	2020-10-26 06:28:13			
🕀 🗮 Shelf01					
🖽 📮 Slot1 M6500-MXP10 : normal		Refresh Apply			
Port1					
🖾 Port2	NE Configuration Management				
Port3	NF 1				
Port4	NE Log Upload	The NE log will be uploaded from the ne to the NMS server	Upload		
Port5	Configuration Data Save	The NE configuration will be saved to the flash of the device	Save		
Port6					
- G Port7	Default Configuration Data Restore	The existing configuration will be lost, and the NE will be restored and restarted	Recovery		
	Configuration Data Upload				
- 🙆 Port9	Configuration Data Opload	The NE Configuration will be uploaded from the NE to the NMS server	Upload		
Port10	Configuration Data Download		Download		
Port11					

Figure 2-25 Configuration Data Save

2.9.2. Upload NE Configuration

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the right \rightarrow Click on "*Configuration Data Upload*".

NE View	NE Management	NE Configuration	MGMT IP Configuration	Server (Configuration	Software Update	OSPF Information
System Name	3	Please input content					
System Desci	ription	Please input content					
		Refresh Apply					
NE Time Config	quration						
Time Zone		(GMT+8:00)		¥			
NE Current Ti	ime	2020-09-18 15:47:44					
		Refresh Apply					
NE Configurati	on Management						
NE Log Uploa		The NE log will be uploaded fro	om the ne to the NMS server		Upload		
Configuration	Data Save	The NE configuration will be sa	aved to the flash of the device		Save		
Default Config	guration Data Restore	The existing configuration will b restarted	be lost, and the NE will be restored ar	nd	Recovery		
Configuration	Data Upload	The NE Configuration will be up	ploaded from the NE to the NMS serv	ver	Upload		
Configuration	Data Download	10.32.130.110_config.tar.gz		•	Download		

Figure2-26 Configuration Data Upload

Input the name of the configuration file which needs to be uploaded, and click on "Upload".

Configuration Data Upload

The NE Configuration will be uploaded from the NE to the NMS server

Upload

Figure 2-27 Input NE Configuration File Name

The path to upload network element configuration is: the NMS installation directory \rightarrow TFTP \rightarrow config folder, as shown in the figure below:

2.9.3. Download NE Configuration

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the right \rightarrow Select" *Configuration Data Download*" module.

NE Configuration Management			
NE Log Upload	The NE log will be uploaded from the ne to the NMS server		Upload
Configuration Data Save	The NE configuration will be saved to the flash of the device		Save
Default Configuration Data Restore	The existing configuration will be lost, and the NE will be restored and restarted		Recovery
Configuration Data Upload	The NE Configuration will be uploaded from the NE to the NMS server		Upload
Configuration Data Download	10.32.130.111_config.tar.gz	*	Download

Figure 2-28 Configuration Data Download

Select the configuration file which needs to be downloaded, and click on "Download".

Configuration Data Download	10.32.130.111_config.tar.gz	v	Download

Figure 2-29 Select Configuration File To Be Downloaded

2.9.4. Restore NE Default Configuration

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the right \rightarrow Select" *Default Configuration Data Restore*" module \rightarrow Click on "*Recovery*" button.



System Name Please input content System Description Please input content Refresh Apply NE Time Configuration (GMT+8:00)	sof
Refresh Apply NE Time Configuration	
NE Time Configuration	
Time Zone (GMT1+8:00)	
NE Current Time 2020-09-18 15:47:44	
Refresh Apply	
NE Configuration Management	
NE Log Upload The NE log will be uploaded from the ne to the NMS server Uploa	Id
Configuration Data Save The NE configuration will be saved to the flash of the device Save	
Default Configuration Data Restore The existing configuration will be lost, and the NE will be restored and restarted	very
Configuration Data Upload The NE Configuration will be uploaded from the NE to the NMS server	Id
Configuration Data Download 10.32.130.111_config.tar.gz	load

Figure 2-30 Default Configuration Data Restore

2.10. Create Fiber Optic

2.10.1. Adjust NE Layout

Click on Global View, and click on NE or node in the global view and then drag it to the right place.

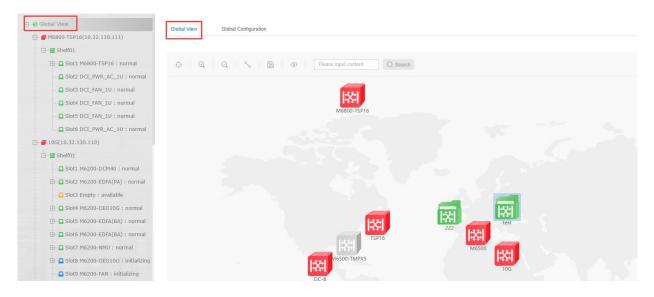


Figure 2-31 Adjust NE Layout

2.10.2. Create Link between NEs

Click on"Connect" button in the global view.

🚍 😵 Global View	Global View	Globa	l Configurat	ion			
 ➡ ● M6800-TSP16(10.32.130.111) ➡ ■ Shelf01 			-				
🗄 🗖 Slot1 M6800-TSP16 : normal	$\oplus \odot$	Q	%		\odot	Please input content	Q Search
Slot2 DCI_PWR_AC_1U : normal							
Slot3 DCI_FAN_1U : normal							



Input name, NE IP address, shelf number, slot number and port number in the pop-up, and then click on "Apply".

	_	Create Link		×	
a e		Name			
		Source			
		* Network	Please Select	•	
		* Shelf	1	*	
		* Slot		*	
		* Port		*	
		Dest			
		* Network	Please Select	*	
		* Shelf	1	*	
		* Slot		•	
		* Port		*	
		Apply	Close		

Figure2-33 Create Link between NEs

2.10.3. Save Layout

Click on"*Save*" button in the global view.

Global View	Global Configuration
\bigcirc \bigcirc	Q % 📓 💿 Please input content Q Search
	20-50
	10G M6500

Figure2-35 Save Layout

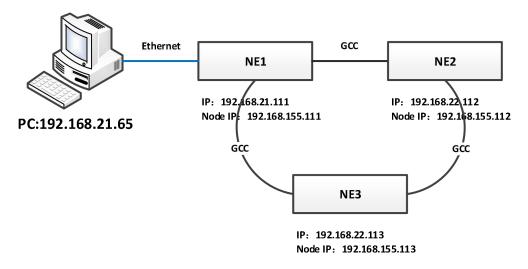
3. DCN Configuration

3.1. DCN Introduction

DCN (Data Communication Network) controls remote NE through optical fiber and forms the in-band management channel of NE through GCC.

OTN provides a dedicated communication channel (GCC0/1/2/1+2) which can realize in-band management.

The basic environment of DCN is as shown in the figure below:





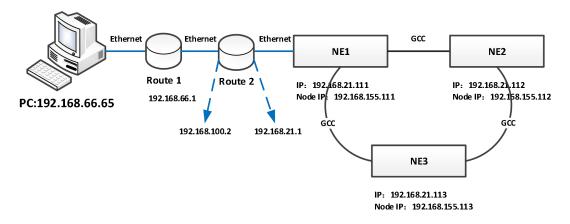


Figure 3-2 Basic Environment Map of Connection between PC and Router

3.2. Configuration Steps

3.2.1. Direct Connection between PC and Device

- Open the GCC channel of the occupied port
- Configure the node IP of the gateway NE and enable OSPF function
- Configure the node IP of the remote NE

- Configure routing on the NMS server
- Connect the occupied port through optical fiber
- Manage the device through the node IP

3.2.2. Forwarding through Router

- Open the GCC channel of the occupied port
- Configure the node IP of the gateway NE as well as enable OSPF and default routing redistribution function
- Configure the node IP of remote NE
- Configure routing on the NMS server
- Connect the occupied port through optical fiber
- Manage the device through the node IP

3.3. Configuration Example

Here we take M6500-MXP10 as an example.

3.3.1. Direct Connection between PC and Device

Step 1:

Open the GCC channel of the occupied port: the NMS port of PC is connected with the MGMT2 port of the device. Add the IP of 10.32.130.220 on NMS. Operations of the device can be made through NMS.

Enable the management status of the occupied port. The port mode needs to be set as OTU2/OTU2e/OTU4/OCh (OTU4).

		Monitor	Global	Configuration	X Maintain	
 Global View M6800-TSP16(10.32.130.112) M6200-CH5U(10.32.130.180) 	Port Management	Pluggable Configur		e en gendion	in call i fadi i	
☐	BasicInfo					
🗄 🗮 Shelf01	Administrative State	Disable	ed		Ψ.	
🕀 📮 Slot1 M6500-MXP10 : normal	Operational State	Down				
🔂 Port2 🔂 Port3	Availability	Empty				
Port4	Port Mode	XGE_E			Ŧ	
Port5 Port6	Port Description	XGE_E XGE_C XGE_C STM64	GFPF GFPFextp			(Can not contain / : * ? " < > special chan
Port7		OC192 OTU2	AMP			
Port8		OTU26 STM64	BMP			
C Port9	Port Configuration	OC192	_BMP]

Figure 3-3 Enable OTU2/2e Port

🖯 🔞 Global	View			
🖶 🛑 мб	6800-TSP16(10.32.130.112)	Port Management PI	uggable Configuration	
🖽 🛑 M6	200-CH5U(10.32.130.180)			
🖨 🛑 Мб	5500-CH2U(10.32.130.160)	BasicInfo		
ė- =	Shelf01			*
	Slot1 M6500-MXP10 : normal	Administrative State	Enabled	÷
	- Dort1	Operational State	Up	
	🔂 Port2			
	- Dort3	Availability	Normal	
	🔂 Port4			
	- Dort5	Port Mode	OCh(OTU4) OTU4	· ·
	- Dort6	Port Description	OCh(OTU4) Please input content	(Can not contain / : *? " <> special charac
	- Dort7			
	Dort8		Apply	
	- Dort9	Port Configuration		
	- Dort10	Fort Conliguration		
	Port11	Choose State	port OTU4 ODU4	

Figure3-4 Enable OTU4/OCh (OTU4) Port

Click on OTU2/OTU2e/OTU4/OCh (OTU4) or ODU2/ODU2e/ODU4 which is on the left of "Port Configuration" interface

🗑 Global View						
M6800-TSP16(10.32.130.112)						
	Port Management F	luggable Configuration				
⊞ ■ M6200-CH5U(10.32.130.180)	Port Configuration					
M6500-CH2U(10.32.130.160)						
🖻 🚟 Shelf01	Choose State	OTU2 ODU2				
🗄 📮 Slot1 M6500-MXP10 : normal	Administrative State	Enabled	v	Degrade Interval	2	
Port1						
Port2	Operational State	Up		Degrade Threshold	12304	
Port3						
Port4	Availability State	Normal	Ŧ	Near End ALS	No	
Port5	Loopback	NONE	*	FEC Type	G709FEC	
Port6	Loopbuck			1 LO IVA		
Dert7						
Port8	TIM Mode	NONE	Ŧ	Expected SAPI	Please input content	
Port9	TIM AIS Insertion	False	*	Expected DAPI	Please input content	
Port10				Experies Die 1		
Port11	Rx SAPI			Tx SAPI	Please input content	
🗄 🔲 Slot2 M6500-40G-TMXP2 : absent						
🗊 🖸 Slot3 M6500-NMU : normal	Rx DAPI	() = + () M2 = 2 = - + () M2 = - + + + + + + + + + + + + + + + + + +		Tx DAPI	Please input content.	
Slot4 Empty : available	Rx Operator	}»□"□ÇþÜ□□D6a7úÌpÆn⊡a□ÊMIJi¢C*é		Tx Operator	Please input content	
Slot5 M6500-2UPSM : normal						
Slot6 Empty : available		DCN Apply				



Global View						
■ ■ M6800-TSP16(10.32.130.112)	Port Management P	luggable Configuration				
M6200-CH5U(10.32.130.180)	Port Configuration					
H6500-CH2U(10.32.130.160)	Choose State	OTU2e ODU2e				
Slot1 M6500-MXP10 : normal	Administrative State	Enabled	Ŧ	Degrade Interval	2	
- Port1 - Port2	Operational State	Up		Degrade Threshold	12748	
Port3	Availability State	Normal	Ŧ	Near End ALS	No	
Port5	Loopback	NONE	٣	FEC Type	G709FEC	
Porte Port7 Port8	TIM Mode	NONE	Ŧ	Expected SAPI	Please input content	
Port9	TIM AIS Insertion	False	Ŧ	Expected DAPI	Please input content	
Port10	Rx SAPI			Tx SAPI	Please input content	
Slot2 M6500-40G-TMXP2 : absent	Rx DAPI	[j==~j]M2=8=K=		Tx DAPI	Please input content	
🗄 🚨 Slot3 M6500-NMU : normal						
Slot4 Empty : available	Rx Operator	}»⊡"DÇþÜ⊡D6a7úÍpÆn⊡a⊡ÊMUI¢C*é		Tx Operator	Please Input content	
Slot5 M6500-2UPSM : normal		DCN Apply				

Figure3-6 Preparation before Enable GCC Channel of OTU2e/ODU2e

🖯 😵 Global View	Port Management	Pluggable Configuration			
⊞ ● M6800-TSP16(10.32.130.112)	Ded Gardener Fra				
■ ■ M6200-CH5U(10.32.130.180)	Port Configuration	· · · · · · · · · · · · · · · · · · ·			
🖯 🗃 M6500-CH2U(10.32.130.160)	Choose State	port OTU4	ODU4		
🗄 🖀 Shelf01	Administrative State			Operational State	Down
🗄 🗖 Slot1 M6500-MXP10 : normal	Putrimibiliative State			Operational State	
Port1	Availability State	Normal	Ψ.	Degrade Interval	0
Port2					
Port3	Near End ALS	No	٣	Degrade Threshold	0
Port4	Loopback	NONE	*	FEC Type	·
Port5	Loopbuck			r no type	
Port6					
Port7	TIM Mode	NONE	Ŧ	Expected SAPI	Please Input content
Port8	TIM AIS Insertion	True	*	Expected DAPI	Please input content
Port9					
Port10	Rx SAPI			Tx SAPI	Please input content
Port11					
B Slot2 M6500-40G-TMXP2 : absent	Rx DAPI			Tx DAPI	Please input content
🕀 📮 Slot3 M6500-NMU : normal	Rx Operator			Tx Operator	Please Input content
- Slot4 Empty : available				- Provinces I in a subservery	
- Slot5 M6500-2UPSM : normal		DCN Apply			

Figure3-7 Preparation before Enable GCC Channel of OTU4/ODU4

Then click on DCN in the lower to enter DCN configuration interface. Select GCC type (The GCC type of OTU layer is GCC0 and the GCC type of ODU layer is GCC1, GCC2 and GCC1+2), as shown in the figure below:

Port Management	Pluggable Configuration				
Port Configuration					
Choose State	OTU2e	ODU2e			
Administrative State	Enabled	•	Degrade Interval	2	
Operational State	OTU2DCN		×	12748	
Availability State	GCC Туре	Disabled Disabled	*	No	v
Loopback	Ifindex	6CC0 0		G709FEC	
TIM Mode	PPP Status	Offline		Please input content	
TIM AIS Insertion	Apply Close			Please input content	

Figure 3-8 Open GCC Channel of OUT Layer

Port Management P	luggable Configuration			
Port Configuration				
Choose State	port OTU4	ODU4		
Administrative State	Enabled		Opu State	Intact
Operational State	Up		Degrade Interval	2
Availability State	ODU4DCN Norm		×	128459
PLM AIS Insertion	GCC Type	Disabled Disabled	*	
Rx PT	Ifindex	GCC1 GCC1+2		
NIM	PPP Status	Offline		
	Apply Close			
TIM Mode	NONL	*]	Exharran ovici	Please input content

Figure 3-9 Open GCC Channel of ODU Layer

The GCC types of the occupied ports for adjacent NE need to be set as the same.

Step 2:

Configure the node IP of the gateway NE and enable OSPF function: Select a NE as the gateway NE. After selecting the NE, click on *"MGMT IP Configuration"* and select *"MGMT IP Configuration"* module .

192	.168.155.111		(1.1.1.1)	
10.3	32.130.111		(1.1.1.1)	
255	255.255.0		(1.1.1.1)	
Disa	ble		•	
192	168.126.1			
255	255.255.252			
0.0.	0.0		(1.1.1.1)	
tion Disa	ble			
	10.3 255. Disal 192. 255. 0.0.1	192.168.155.111 10.32.130.111 255.255.255.0 Disable 192.168.126.1 255.255.255.252 0.0.0 Disable	10.32.130.111 255.255.255.0 Disable 192.168.126.1 255.255.255.252 0.0.0	10.32.130.111 (1.1.1.1) 255.255.255.0 (1.1.1.1) Disable ▼ 192.168.126.1 255.255.255 0.0.0 (1.1.1.1)

Figure3-10 Select NE and Manage IP Configuration

Node IP	192.168.155.111	(1.1.1.1
NMS IP1		
IP Address	10.32.21.111	(1.1.1.1
Subnet Mask	255.255.255.0	(1.1.1.1
OSPF	Enable	•



Configure node IP (The node IP cannot be in the same network segment with the out-band management port IP), and click on "*Apply*" after enabling OSPF function.

* Node IP	192.168.155.111	(1.1.1.1
NMS IP1		
* IP Address	10.32.21.111	(1.1.1.1
Subnet Mask	255.255.255.0	(1.1.1.1



The method to configure node IP of remote NE is the same as that to configure the node IP of gateway NE. However, the node IP should be different from that of the gateway NE and the IP of NMS IP1 cannot be in the same network segment with the gateway NE IP.

IGMT IP Configuration		
* Node IP	192.168.155.112	(1.1.1.1)
NMS IP1		
* IP Address	10.32.22.112	(1.1.1.1)
* Subnet Mask	255.255.255.0	(1.1.1.1)
* OSPF	Disable	*



Step 3:

Configure the route on the computer to run CMD as an administrator and enter following two routes: route add 192.168.155.111 mask 255.255.255.255 192.168.21.111 and route add 192.168.155.112 mask 255.255.255.255 192.168.21.111.

C:\Windows\system32>route	add	192.	168.	155.	111	mask	255.	255.	255.	255	192.	168.	21.	111	
C:\Windows\system32>route	add	192.	168.	155.	112	mask	255.	255.	255.	255	192.	168.	21.	111	

Figure 3-14 Add Local Route

Check the input route through route print command.

	IPv4				
Í					
	0.0.0.0	0.0.0.0	192.168.30.1	192. 168. 30. 243 55	
	0.0.0.0	0.0.0.0		192. 168. 66. 65	121
	127.0.0.0	255.0.0.0		127.0.0.1	331
	127.0.0.1	255.255.255.255		127.0.0.1	331
	127.255.255.255	255. 255. 255. 255		127.0.0.1	331
	192.168.0.0	255.255.0.0	192.168.66.1	192.168.66.65 121	
	192.168.30.0	255.255.254.0		192.168.30.243	311
	192.168.30.243	255.255.255.255		192.168.30.243	311
	192. 168. 31. 255	255. 255. 255. 255		192.168.30.243	311
	192.168.66.0	255.255.255.0		192.168.66.65	376
	192.168.66.65	255.255.255.255		192. 168. 66. 65	376
	192 168 66 255	255 255 255 255		192 168 66 65	376
	192. 168. 155. 111	255.255.255.255	192. 168. 21. 111	192.168.66.65 121	
	192.168.155.112	255.255.255.255	192. 168. 21. 111	192.168.66.65 121	
	224.0.0.0	240.0.0.0		127.0.0.1	331
	224.0.0.0	240.0.0.0		192. 168. 66. 65	376
	224.0.0.0	240.0.0.0		192.168.30.243	311
	255. 255. 255. 255	255.255.255.255		127. 0. 0. 1	331
	255. 255. 255. 255	255. 255. 255. 255		192. 168. 66. 65	376
	255. 255. 255. 255	255. 255. 255. 255		192. 168. 30. 243	311

Figure3-15 View Local Route

Use optical fiber to connect occupied ports: Use optical fiber to connect the occupied ports of the two network elements, and to form fiber-optic channels.

Manage the equipment through the node IP, unplug the network cable of the remote NE, and add the two IP addresses of 192.168.155.111 and 192.168.155.112 to the NMS system. After the IP addresses are successfully added, normal management of the two devices can be achieved.

3.3.2. Forwarding Trough Routers

The configuration method is the same as that described in 3.3.1. Besides that, the following configuration needs to be added:

Add configuration 1:

Enable the default route redistribution function of the gateway NE, as shown in the figure below:



NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configura
GMT IP Configur	ation			
* Node IP		192.168.155.111		(1.1.1.1
NMS IP1				
* IP Address		10.32.21.111		(1.1.1.1
* Subnet Mask		255.255.255.0		(1.1.1.1
* OSPF		Enable		v
LCT IP				
IP Address		192.168.126.1		
Subnet Mask		255.255.255.252		
* Gateway		0.0.0.0		(1.1.1.1

Figure 3-16 Enable Default Route Redistribution Function of the Gateway NE

Add Configuration 2: Set the gateway of the remote NE as 0.0.0.0.

LCT IP

IP Address	192.168.126.1	
Subnet Mask	255.255.255.252	
* Gateway	0.0.0.0	(1.1.1.1
* Default route re-distribution	Disable]
	Apply	

Figure 3-17 Modify Gateway

Add Configuration 3 :

When there are many devices, you can configure the node IP of the remote NE to the same network segment. For example, if you set the node IP of the remote NE to 155 network segment, you can add only one route to the computer: route add 192.168.155.0 mask 255.255.0 192.168.155.1 (Here the network segment of 192.168.155.0 is the actually configured node IP segment. 192.168.66.1 is the network segment of NMS server local IP.)



1. The Ethernet IP address and the node IP address of all network elements can not be in the same network segment.

2.PC direct connection: the Ethernet IP addresses of gateway network element NE1 and remote network element N2 and NE3 cannot be in the same network segment.

4. NE & Board Configuration

Prerequisite

- 1. Network devices and lines are normal.
- 2. Click on the desktop icon of "Run NMS Server" to open the NMS software.
- 3. Click on the icon of "Start NMS Server" in the software interface to open the NMS server.
- 4. Open the client Web server port on Google Browser: localhost: 9090, log in to the NMS root account.
- 5. The M Series NMS interface is displayed after successful login.

4.1. Shelf Information

Select NE and click on "*Shelf01*", then click on "*Shelf information*" on the right to open the Shelf information interface. Information such as Shelf type and temperature is displayed in this interface, as shown in Figure 4-1:

		Monitor	(Siobal	Configuration	X Maintain	
Global View	Shelf View Shelf Info	slot Information	Card Informati	on SC1+1	Configuration	Business Configuration
 M6200-CH5U(10.32.130.180) M6500-CH2U(10.32.130.160) 	Shelf Inventory					
🖨 🚆 Shelf01	Shelf Type	M6500-CH2U				
🕀 🖸 Slot1 M6500-MXP10 : normal	HW Version	2.0				
Port1	Mac Address	60:E6:BC:02:9F:AD				
Port2	Fan Speed Pwm	70%				
Port3	Fan Top Speed	False				
Port4	PN	20.010.5175				
Port5	SN	2022B00SN19030028				
Port6	Shelf Id	1				
Port7	Temperature(°C)	27				

Figure 4-1 Operation Steps to View Shelf Inventory

4.1.1. M6500-CH2U

The Shelf information interface of 2U device is as shown in the figure below:



Shelf View	Shelf Information	Slot Information	Card Information	SC1+1 Configuration	Business Configuration
Shelf Inventory					
Sheir inventory					
Shelf Type		M6500-CH2U			
HW Version		2.0			
Mac Address		60:E6:BC:02:9F:AD			
Fan Speed Pwm		70%			
Fan Top Speed		False			
PN		20.010.5175			
SN		2022B00SN19030028			
Shelf Id		1			
Temperature(°C)		27			
Location		Please input content		(Can not conta	in / : * ? * <> special characters)
Auto Regulate Sp	eed	True		*	
		Apply LampTest			

Figure4-3 M6500-CH2U Shelf Information

4.1.2. M6500-CH5U

The Shelf information interface of 5U device is as shown in the figure below:

Shelf View	Shelf Information	Slot Information	Card Information	SC1+1 Confi	guration	Business Configuration
Shelf Inventory						
Shell Inventory						
Shelf Type		M6500-CH5U				
HW Version		1.0				
Mac Address		60:E6:BC:02:42:47				
Fan Speed Pwm		70%				
Fan Top Speed		False				
PN		20.010.5215				
SN		1025B00SN18110006				
Shelf Id		1				
Temperature(°C)		25				
1000400		-				
Location		Please input content				n / ; * ? " <> special characters)
Auto Regulate Sp	beed	True		*		
	3					
		Apply LampTest)			

Figure 4-4 M6500-CH5U Shelf Information

4.2. LED Indicator Information

The LED indicators on different series of network elements, ports, boards, systems are different. The following is a list of LED indicator status of all series of boards, ports, systems and power indicators.

4.2.1. NMU Board

Attention

When M6500 series network element replaces NMU board, pay attention that the SD board files must be consistent with those on the replaced NMU board. If not, it may cause all the LED lights of the NMU board flashing, and the NMS system cannot be connected. Therefore, it needs to be dealt with in time.

Table4-1 LED Indicator Status of Separate NMU Board

		M6500-CH5U	M6500-CH2U
NMU Control System LED indicator	RUN	Green Light Quick Blink: Software startup completed.	NA
(Separate NMU Board)		Green Light Off: The software is not started.	
	ACTIVE	Green Light On: NMU is Active. Green Light Off: NMU is Standby.	NA
	FAULT/ALM	Red Light Slow Flash: There is latch-open alarm.	NA
		Red Light On: Alarm exists in NE. Red Light Off: There is no alarm in NE.	

Table4-2 LED Indicator Status of Integrated NMU Board

		M6500-CH5U	M6500-CH2U
NMU Control System LED Indicator	RUN	NA	Green Light Slow Flash: The software is successfully started, and it is Active
(NMU Board, Service			board.
Board Integration)			Green Light On: The software is successfully started, but it is Standby board.
			Green Light Off: The software is not started.
	FAULT/ALM	NA	Red Light Quick Blink: The board is mismatched.
			Red Light Slow Flash: There is latch-open alarm.
			Red Light On: There is alarm.
			Red Light Off: There is no alarm.

		M6500-CH5U	M6500-CH2U
System Board Optical Management	Monochromatic Green Light	Off: The port is disabled/ There is los alarm.	Off: The port is disabled/There is los alarm.
Port (MGMT) LED Indicator		Green Light On: There is no los alarm and the port is enabled.	Green Light On: There is no los alarm and the port is enabled.

Table4-3 LED Indicator Status of System Board Optical Management Port

4.2.2. System Interface LED Indicator

Table4-4 System	Interface	LED In	dicator	Status
rabier roystern	miceriace		arcator	Status

		M6500-CH5U	M6500-CH2U
System Interface LED Indicator	SYS	Located in Fan Tray: Green Light On: The system is successfully started. Green Light Off: The system is not started.	On NMU Board: Green Light On: The system is successfully started. Green Light Off: The system is not started.
	CR/MJ/MN	Located in Fan Tray: CR: Red Light On: There is Critical alarm. MJ: Orange Light On: There is Major alarm. MN: Yellow Light On: There is Minor alarm.	On NMU Board: CR: Red Light On: There is Critical alarm. MJ: Orange Light On: There is Major alarm. MN: Yellow Light On: There is Minor alarm.

4.2.3. Service Board LED Indicator

Table4-5 Service Board LED Indicator Status

		M6500-CH5U	M6500-CH2U
Service Board LED Indicator		Green Light Off: The	Green Light Slow Flash: The software is successfully started and it is active board. Green Light On: The software is successfully started but it is standby board. Green Light Off: The software is not started.
	FAULT/ALM	Red Light Quick Blink: The board is mismatched. Red Light Slow Flash: There is latch-open alarm. Red Light On: There is alarm. Red Light Off: There is no alarm.	Red Light Quick Blink: The board is mismatched. Red Light Slow Flash: There is latch-open alarm. Red Light On: There is alarm. Red Light Off: There is no alarm.

4.2.4. Fan Tray LED Indicator

Table4-6	Fan	Trav	LED	Indicator	Status
Tuble To	i uii	iiuy		marcator	Status

	M6500-CH5U	M6500-CH2U
Fan Tray LED IndicatorRUN (Monochrome)FAULT/ALM (Monochrome)FAN (Two Colors)	 Green Light On: The system NMU board starts to manage the fan. Green Light Off: The system NMU board does not manage the fan.	NA
	 Red Light On: There is alarm of the fan. Red Light Off: There is no alarm of the fan.	NA
	NA	Red Light On: There is alarm of the fan. Green Light On: There is no alarm of the fan.

4.2.5. Port LED Indicator of Service Board

		M6500-CH5U	M6500-CH2U
Service Board	Bi-Color LED Indicator	Off: The port is disabled.	Off: The port is disabled.
Port LED Indicator	malcator	Red Light Quick Blink: There is mismatch alarm of the port.	Red Light Quick Blink: There is mismatch alarm of the port.
		Red Light On: There is los alarm of the port.	Red Light On: There is los alarm of the port.
		Green Light On: There is no los or mismatch alarm of the port.	Green Light On: There is no los or mismatch alarm.

4.2.6. LED Indicator of WDM Service Board

Table4-8 WDM Service Board LED Indicator Status

		M6500-CH5U	M6500-CH2U
LED Indicator of	Monochrome Green Light	Off: The port is disabled/There is LOS alarm of the port.	Off: The port is disabled/There is LOS alarm of the port.
OA/OLP Board		Green Light On: There is no los alarm and the alarm is enabled.	Green Light On: There is no los alarm of the port and the port is enabled.

4.2.7. Power Tray LED Indicator

Table4-9 Power Tray LED Indicator Status

M6500-CH5U M6500-CH2U

Power Tray LED Indicator	PWR (Monochrome)	NA	Off: The power tray is not powered. Green Light On: Normal power supply.
	FAULT (Monochrome)	Off: There is not any alarm of the power tray. Red Light On: There is alarm that the power supply is not powered on or there is power failure.	Off: There is not any alarm of the power tray. Red Light On: There is alarm that the power supply is not powered on or there is power failure.
	PWR1 (Monochrome)	Off: The power tray is not powered. Green Light On: Normal power supply.	NA
	PWR2 (Monochrome)	Off: The power tray is not powered. Green Light On: Normal power supply.	NA

4.3. View Single Board Information

Select NE and click on *"Shelf01"*, and then click *"Card information*" on the right.

			Monitor	Global Configuration	X Maintain	0	Inspect Lock root o
Global View							
□ ■ M6800-TSP16(10.32.130.112)	Shelf View	Shelf Information	Slot Information	Card Information SC1+1	Configuration Business Configuration	n	
B ■ M6200-CH5U(10.32.130.180)							
□ ■ M6500-CH2U(10.32.130.160)	Card Inventory						
🖨 🗮 Shelf01	Please input of	ontent		Search			
🗄 📮 Slot1 M6500-MXP10 : normal							
Port1	Slot ID	Туре		SN	PN	HW Version	SW Version
Port2	1	M6500-MXP10		272AHB0RS19010009	20.010.5121	20.010.5121	R6.3.24_v1038
- Port3	2	Empty		-	-	-	-
Port4	3	M6500-NMU		2022100RS19030007	20.010.5177	20.010.5177	-
0.0.15							

Figure4-5 View Single Board Information

After selecting "*Card information*", the interface as shown in the figure below pops up. Information such as board type, hardware version, software version software version, Kernel version, Uboot version, central temperature and outlet temperature of each slot can be checked in this interface.

d Inventory					
Please input cor	tent	Search			
Slot ID	Туре	SN	PN	HW Version	SW Version
1	M6800-NMU	242AC00RS1810033	20.010.5123	20.010.5123	R6.3.24_v9558_rele
2	M6500-MXP10	272AHB0RS19010009	20.010.5121	20.010.5121	R6.3.24_v9558_rele
3	M6500-TMXP2	212AH3MRS19030008	20.010.5168	20.010.5168	R6.3.24_v9558_rele
4	M6500-TMXP2	212AH3MRS19030009	20.010.5168	20.010.5168	R6.3.24_v9558_rele
5	Empty	-		-	-
6	Empty	-	-	-	-
7	Empty				=
8	Empty		-		-
9	PWR_DC_5U	1125P00BQ1806006	20.010.5218	20.010.5218	
10	PWR_DC_5U	1125P00YD1809023	20.010.5218	20.010.5218	-

Figure4-6 Board Information Interface

4.4. Port Configuration

Select NE-Slot1 click on "Port1", and then select "Port Management" on the right, as shown in the figure below:

M6800-TSP16(10.32.130.112)	Port Management PI	uggable Configuration	
☐ ● M6200-CH5U(10.32.130.180)	BasicInfo		
M6500-CH2U(10.32.130.160) Shelf01	Administrative State	Disabled	•
🗄 🗖 Slot1 M6500-MXP10 : normal	Operational State	Down	
Port1	Availability	Empty	
Port3	Port Mode	XGE_BMP	*
Port4	T OF WOOL	Xoc_biii	
Port6	Port Description	Please input content	(Can not contain /: *? " <> special characteristics
- Dort7		Apply	

Figure 4-7 View Port Configuration Information

4.4.1. Basic Information

There are two port types: client side port and line side (system side) port.

Client side port type supports: FE, GE, 10GE, 40GE, and 100GE, STM-1/4/16, OC-3/12/48, STM-64, OC-192 and OTU2 (2e)/OTU3/OTU4.

For line side (system side) port type, the grey light supports OTU2/2e and OTU4, and the color light supports OCh (OTU2/2e) and OCh (OTU4).

Select NE-Slot 1, click on "*Port1*", and select "*Port Management*" on the right, the interface as shown in the figure below pops up. The configuration status and port mode can be modified in basic information.

ort Management P	luggable Configuration	
sicInfo		
Administrative State	Enabled	v
Operational State	Up	
Availability	Normal	
Port Mode	HGE_GMP	v .
Port Description	Please input content	(Can not contain / : * ? " <> special characters)

Figure 4-8 Port Management Interface

The client side port mode of M6500-TMXP2 board is different from that of other boards. When the port 2 is disabled, it is in unused status, as shown in the figure below:

Port Management	Pluggable Configuration	
BasicInfo		
Basicinio		
Administrative State	Disabled	w.
Operational State	Down	
Availability	Empty	
Port Mode	Unused	v
Port Description	Please input content	(Can not contain / : * ? * <> special characters)
	Apply	

Figure 4-9 M6500-TMXP2 Board Client Side Port Disabled Interface

While enabling the port, firstly select the port mode and click on apply. After clicking on apply, you can make selection in the management status bar, as shown in the figure below:

Port Management	Pluggable Configuration	
asicInfo		
Administrative State	Enabled	•
Operational State	Up	
Availability	Normal	
Port Mode	HGE_GMP	v
Port Description	HGE_GMP HGE_GFPF	(Can not contain / : * ? " <> special characters)
	Apply	

Figure4-10 M6500-TMXP2 Client Side-Select Port Mode

Select "Enable" in the management status bar to enable the port, as shown in the figure below:

asicInfo			
Administrative State	Enabled	v]
	Disabled		
Operational State	Enabled Up		
Availability	Normal		
		*	
Port Mode	HGE_GMP		
Port Description	Please input content		(Can not contain / : * ? " <> special character

Figure4-11 Enable M6500-TMXP2 Client Side Port

4.4.1.1. Interface Configuration

Select NE-Slot 1, click on "Port1" and select "Port Management" on the right, the port management interface shows up.Select the interface options of the "Port Configuration" module, the information such as management status, the near-end no light laser shutdown (ALS), turn off light while alarm occurs, loop-back, patch trace mismatch (TIM) mode can be modified in the toolbar interface.

🕀 😵 Global View	Port Management Pluggab	le Configuration	
🖽 🛑 M6800-TSP16(10.32.130.111)		o congution	
🖽 🛑 M6200-CH2U(10.32.130.110)	BasicInfo		
🖽 🗃 M6200-CH2U-No.2(10.32.130.116)	Administrative State	Disabled	
🖽 🗊 M6500-CH5U(10.32.130.220)			
🖻 🛑 M6500-CH2U(10.32.130.120)	Operational State	Down	
🕀 🗮 Shelf01			
🖨 🛑 M6500-CH2U-No.2(10.32.130.160)	Availability	Empty	
🖨 🖀 Shelf01	Port Mode	XGE_BMP	
🖯 🗖 Slot1 M6500-MXP10 : normal			
Port1	Port Description	Please input content	(Can not contain /: *? * <> special characters)
Port2			
- 🔂 Port3		Apply	
- 🙆 Port4	Port Configuration		
- Port5	.	Interface ODU2e	
- Dert6	Choose State	Interface Oboze	
- C Port7	Administrative State	Enabled	
- Port8			
- Port9	Operational State	Up	
- 🖸 Port10	Availability State	Normal	
Port11			
🗄 🚨 Slot2 TMXP5-2X100G : normal	LoopBack	NONE	
🗄 🚨 Slot3 M6500-NMU : normal	No. 5 1 1 0	No	
Slot4 Empty : available	Near End ALS	No	
Slot5 M6500-2UPSM : normal	Client Shutdown (CSD) by Alarm	No	

Figure 4-12 Port Management-Interface Information

4.4.1.2. ODU2/ODU2e Configuration

• ODU2 Configuration

Select NE-Slot 1, click on "Port1" and select "Port Management" on the right, the port management interface shows

up (here we take ODU2 corresponding to XGE_GFPF port mode as an example) . Click on ODU2 option

from"Port Configuration" in this interface, as shown in the figure below. It shows ODU2 toolbar interface.

🖽 😵 Global View						
M6800-TSP16(10.32.130.111)	Port Management	Pluggable Configuration				
⊞ = M6200-CH2U(10.32.130.110)						
M6200-CH2U-No.2(10.32.130.116)	BasicInfo					
M6500-CH5U(10.32.130.220)	Administrative State	Disabled				
M6500-CH2U(10.32.130.120)						
M6500-CH2U-No.2(10.32.130.160)	Operational State	Down				
📩 🖀 Shelf01	Availability	Empty				
📋 📮 Slot1 M6500-MXP10 : normal						
🔂 Port1	Port Mode	XGE_GFPF				
🖸 Port2						
🖸 Port3	Port Description	Please input content				
🖸 Port-4		Apply				
🙆 Port5						
🔂 Port6	Port Configuration					
🔂 Port7	Choose State	Interface ODU2				
Dert8	Please input content	2				
- Dert9	Prease input coment		Search			
- 🔂 Port10	ODU2	+ Administrative State		+ Operational State	+ Operation	
Port11	0	Enabled		Up	Management	
Slot2 TMXP5-2X100G : normal						
🔛 🖸 Slot3 M6500-NMU : normal	Total: 1 records				10	Previous 1 Next

Figure4-13 ODU2 Toolbar Interface

Click on "*Management*" button in ODU2 toolbar interface, the toolbar management interface pops up. Detailed information about ODU2 can be viewed in the interface, as shown in the figure below:

Port Management	Pluggable Config	Management ODU2		×	
Basicinfo		Administrative State	Enabled	•	
Administrative State	Enat	OPU State	Client		
Operational State	Dow	Operational State	Up		
Availability	Noti	Rx PT	0x76		
Port Mode	XGE	Availability State	NotConnected		
Port Description	Plea	Tx PT	0x5		
		PLM AIS Insertion	True	*	
Port Configuration		Expected PT	0x5		
Choose State	Int	Degrade Interval	2		
Please input content	_	Degrade Threshold	12304		
ODU2	↑ Administrativ				
0	Enabled	TIM Mode	NONE	٣	Management
Total: 1 records		Expected SAPI	Please input content		10 - Previous 1 Next
		Apply Close			



• ODU2e Configuration

Select NE-Slot 1, click on "*Port1*" and select "*Port Management*" on the right, the port management interface shows up (here we take ODU2e corresponding to XGE_BMP port mode as an example). Click on ODU2e option from "*Port Configuration*" in this interface, as shown in the figure below. It shows ODU2e toolbar interface.

Port Management Plug	gable Configuration		
BasicInfo			
Administrative State	Enabled		
Operational State	Down		
Availability	Notinstalled		
Port Mode	XGE_BMP		
Port Description	Please input content	(Can not contain / ; * ? * < > special characters)	
	Apply		
Port Configuration	Interface ODU2e		
Choose State Please input content	Search		
ODU2e	Administrative State		+ Operation
0	Enabled	Up	Management
Total: 1 records			10 Previous 1 Next

Figure4-15ODU2e Toolbar Interface

Click on "*Manage*" button in ODU2e toolbar interface, the toolbar management interface pops up. Detailed information about ODU2e can be viewed in the interface, as shown in the figure below:

Port Management	Pluggable Config	Management ODU2e		×	
		Administrative State	Enabled	•	
BasicInfo					
Administrative State	Enat	OPU State	Client		
Operational State	Dov	Operational State	Up		
Availability	Noti	Rx PT	0xff		
Port Mode	XGE	Availability State	NotConnected	*	
Port Description	Plea	Tx PT	0x3		
		PLM AIS Insertion	True	•	
Port Configuration		Expected PT	0x3		
Choose State) Int	Degrade Interval	2		
Please input content	_	Degrade Threshold	12748		
ODU2e					
0	Enabled	TIM Mode	NONE	•	Management
Total: 1 records		Expected SAPI	Please input content		10 • Previous 1 Next
		Apply Close			

Figure 4-16 ODU2e Toolbar Management Interface

4.4.1.3. OTU2/OTU2e Configuration

• OTU2 Configuration

Select NE-Slot 1, click on "*Port1*" and select "*Port Management*" on the right (here we take OTU2 corresponding to OTU2 port mode as an example), the port management interface pops up. Click on OTU2 option from "*Port Configuration*" in this interface, as shown in the figure below. It shows OTU2 toolbar interface.

Global View	Port Management PI	uggable Configuration				
B 🖪 M6800-TSP16(10.32.130.111)						
M6200-CH2U(10.32.130.110)	Port Configuration					
M6200-CH2U-No.2(10.32.130.116)	Choose State					
# M6500-CH5U(10.32.130.220)	Choose State	0.111				
M6500-CH2U(10.32.130.120)	Administrative State	Enabled	*	Degrade Interval	2	
M6500-CH2U-No.2(10.32.130.160)						
🗄 📟 Shelf01	Operational State	Up		Degrade Threshold	12304	
🖯 🗖 Slot1 M6500-MXP10 : normal	Availability State	Normal	*	Near End ALS	No	
Port1						
Port2	Loopback	NONE	Ψ.	FEC Type	G709FEC	
Port3						
Port4	TIM Mode	NONE	×	Expected SAPI	Please input content	
Port5						
Port6	TIM AIS Insertion	False	Ψ.	Expected DAPI	Please input content	
- Port7						
Port8	Rx SAPI			Tx SAPI	Please input content	
Port9	Rx DAPI	□D#jq□=*Eægsp		Tx DAPI	Please input content	
Port10						
Port11	Rx Operator	C*3ÔDYWÙÔJDĂÇ+à R [™] hÆIOSYJDDDù¤		Tx Operator	Please input content	
B Slot2 TMXP5-2X100G : normal						
E Slot 3 M6500-NMU : normal		DCN Apply		A B Flights Pressured		

Figure4-17 OTU2 Toolbar Interface

• OTU2e Configuration

Select NE-Slot 1, click on "*Port1*" and select "*Port Management*" on the right, the port management interface pops up (here we take OTU2e corresponding to OTU2e port mode as an example). Click on OTU2e option from "*Port Configuration*" in this interface, as shown in the figure below. It shows OTU2e toolbar interface.

Port Management Pl	uggable Configuration				
Port Configuration					
Choose State	OTU2e ODU2e				
Administrative State	Enabled	Ŧ	Degrade Interval	2	
Operational State	Up		Degrade Threshold	12748	
Availability State	Normal	٣	Near End ALS	No	•
Loopback	NONE	•	FEC Type	G709FEC	•
TIM Mode	NONE	*	Expected SAPI	Please input content	
TIM AIS Insertion	False	*	Expected DAPI	Please input content	
Rx SAPI			Tx SAPI	Please input content	
Rx DAPI	[jDD~åxErDâDKD		Tx DAPI	Please input content	
Rx Operator	}»□"□Çü□□¼D¶a7úlðĨn□>ā□ÚMIJI"C*é		Tx Operator	Please input content	
	DCN Apply Convrint	ht @ 2020 by ES COM	All Rights Reserved		

Figure4-18 OTU2e Toolbar Interface

4.4.1.4. ODU4 Configuration

Select NE-Slot 2, click on "*Port1*" and select "*Port Management*" on the right, the port management interface shows up (here we take ODU4 corresponding to HGE_GMP port mode as an example). Click on ODU4 option from "*Port Configuration*" in this interface, as shown in the figure below. It shows ODU4 toolbar interface.

🕀 🐨 Global View	Port Management	Pluggable Configuration	
🕀 📄 M6800-TSP16(10.32.130.111)			
■ ■ M6200-CH2U(10.32.130.110)	BasicInfo		
🕀 🛑 M6200-CH2U-No.2(10.32.130.116)			
⊞	Administrative State	Disabled	T
- ■ M6500-CH2U(10.32.130.120)	Operational State	Down	
🗄 🗮 Shelf01			
Slot1 TMXP5-100G-10X10G : norma	Availability	Empty	
🕀 🖸 Slot2 M6500-100G-TMXP2 : normal			
D Port1	Port Mode	HGE_GMP	
Port2	Port Description	Please input content	(Can not contain /: *? " <> special characters)
Port3			
🕀 🗖 Slot3 M6500-NMU : normal		Apply	



4.4.1.5. OTU4 Configuration

Select NE-Slot 2, click on "*Port 3*" and select "*Port Management*" on the right, the port management interface pops up (here we take OTU4 corresponding to OCh (OTU4) port mode as an example). Click on OTU4 option from "*Port Configuration*" in this interface, as shown in the figure below. It shows OTU4 toolbar interface.

🖯 🐨 Global View	Port Management F	Pluggable Configuration				
🖶 🛑 M6800-TSP16(10.32.130.111)						
🖯 🗐 M6200-CH2U(10.32.130.110)	Port Configuration					
🗄 📲 Shelf01	Choose State	port OTU4 ODU4				
■ ■ M6200-CH2U-No.2(10.32.130.116)	Choose State					
■ ■ M6500-CH5U(10.32.130.220)	Administrative State	Enabled	Ψ.	Operational State	Up	
🖯 🛑 M6500-CH2U(10.32.130.120)	Availability State	Normal	*	Degrade Interval	2	
🖨 📲 Shelf01	Availability State	Nottidi		Degrade mervar	2	
🗊 🚨 Slot1 TMXP5-100G-10X10G : norma	Near End ALS	No	Ψ.	Degrade Threshold	128459	
Slot2 M6500-100G-TMXP2 : normal						
Port1	Loopback	NONE	Ŧ	FEC Type	SDFEC3	*
Port2						
Port3	TIM Mode	NONE	Ŧ	Expected SAPI	Please input content	
🗄 🖪 Slot3 M6500-NMU : normal						
Slot4 Empty : available	TIM AIS Insertion	False	*	Expected DAPI	Please input content	
Slot5 M6500-2UPSM : normal	Rx SAPI			Tx SAPI	Please input content	
Slot6 Empty : available						
Slot7 M6500-2UPSM : normal	Rx DAPI	&«uõøiÔås⊡e⊡رd		TX DAPI	Please input content	
Slot8 Empty : available						
Slot9 Empty : available	Rx Operator	hýÙ_Î= ¿&+i==0=ëtZêhàiñ=vOp;?×		Tx Operator	Please input content	
Slot10 M6500-2UFAN : normal		DCN Apply				
			nht /5 2020 hv ES COM	All Dinhte Decenied		

Figure4-20 OTU4 Toolbar Interface

4.4.1.6. OTUC2 Configuration

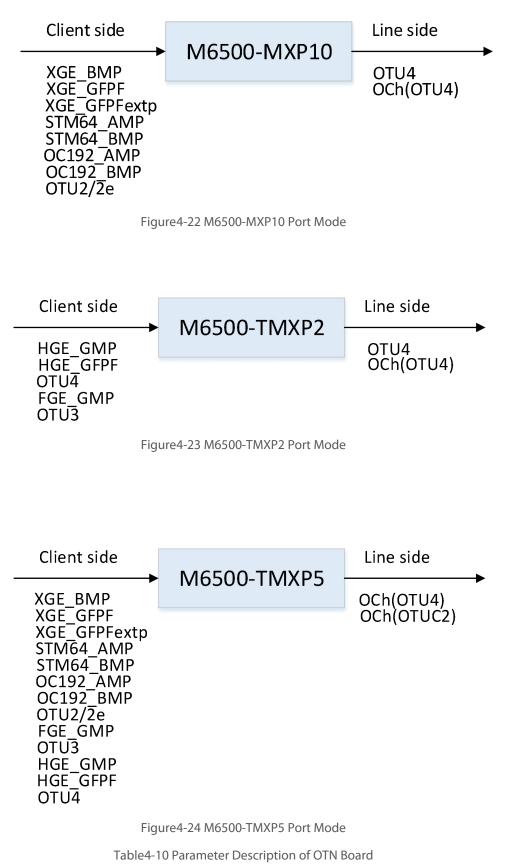
Select NE-Slot 2, click on "*Port 1*" and select "*Port Management*" on the right, the port management interface shows up (here we take OTUC2 corresponding to OCh (OTUC2) port mode as an example). Click on OTUC2 option from "*Port Configuration*" in this interface, as shown in the figure below. It shows OTUC2 toolbar interface.

Port Management PI	uggable Configuration				
BasicInfo					
Administrative State	Enabled	٣			
Operational State	Down				
Availability	Notinstalled				
Port Mode	OCh(OTUC2)	*			
Port Description	Please input content	(Can not	contain / ; * ? * < > special characters)		
	Apply				
Port Configuration					
Choose State	Interface OTUC2 ODU4				
Administrative State	Enabled	w	Operational State	Up	
Availability State	Normal	Ŧ	FEC Type	SDFEC3_16QAM	•
Loopback	NONE	٣			
	Apply				



4.4.2. Parameter Description

For different service boards, their client sides and system sides support different port modes, as shown in the figure below:



Board	Interface	Description



M6500-MXP10	1*100G line side interface (CFP) 10 * 10G client side interface (SFP+)	 The client side signal (10GE, STM-64/OC-192) is mapped to ODU2/2e. The line side signal is demultiplexed from ODU4 to ODU2/2e and connected to the client side signal. 100G line side supports G.709 general FEC or Soft-Decision FEC. 10G OTU2/2e supports I.4 and I.7 EFEC, or G.709 general FEC Support GCC0, GCC1 and GCC2 in-band management
M6500-TMXP2	1*100G line side interface (CFP) 1*100G (QSFP28) or 2*40G client side interface (QSFP+)	 Support SNC/I and SNC/N transmission protection The client side 100G signal (100GE or OTU4) is mapped to ODU4. The client side 40G signal (40GE or OTU3) is mapped to ODU3. The line side signal is terminated to ODU4 or ODU3, and is connected to the client side signal. 100G line side supports G.709 general FEC or Soft-Decision FEC Support GCC0, GCC1 and GCC2 in-band management Support SNC/I and SNC/N transmission protection
M6500-TMXP5	1*100G/200G line side interface (CFP2) 2*100G (QSFP28) or 4*40G client side interface (QSFP+) or 20* (4x5) 10G client side interface	 The client side 100G signal (100GE or OTU4) is mapped to ODU4 The client side 40G signal (40GE or OTU3) is mapped to ODU3. The client side 10G signal (10GE, STM-64/OC-192) is mapped to ODU2/2e The 100G signal on the line side is demultiplexed by ODU4 to ODU2/2e or ODU3, and is connected to the client side signal The 200G signal on the line side is demultiplexed from ODUC2 to ODU4, and then demultiplexed to low-order ODU2/2e or ODU3, which is connected to the client side signal 100G line side supports G.709 general FEC or Soft-Decision FEC 200G line side supports Soft-Decision FEC 10G OTU2/2e supports I.4 and I.7 EFEC, or G.709 general FEC Support GCC0, GCC1, GCC2, GCC1+2 in-band management

4.5. Configuration of Optical Module Information

The operation steps to view optical module information are as follows:

Select NE-Slot1, click on "Port" and select "Pluggable Configuration" on the right, as shown in the figure below:

🗄 🐨 Global View						
🖽 🛑 M6800-TSP16(10.32.130.111)	Port Management	Pluggable Configuration				
■ ■ M6200-CH2U(10.32.130.110)						
🗐 🛑 M6200-CH2U-No.2(10.32.130.116)	Pluggable BasicInfo					
□	Туре	M6500-CFP				
🗄 🛑 M6500-CH2U(10.32.130.120)	Present or Absent	Work				
G M6500-CH2U-No.2(10.32.130.160)	Vendor SN	184155622				
🖨 🔛 Shelf01	Vendor PN	AC100-ZX1-400				
Slot1 M6500-MXP10 : normal	Vendor OUI	00-00-00				
C Port1						
DPort2	Application Code	Application_Unknown				
Port3	CLEI					
Port4	LaneNum	1				
Port5	Firmware	03.00.22				
Port6						
Port7	Optics Paramete					
Port8	Please input content		Search			
Port9						
Port10	↓ Lane ID	+ Lane TxPower(dBm)	+ Lane RxPower(dBm)	+ Laser Temperature(°C)	+ Laser Blas(mA)	
Port11	1	-30.50	-40.00	42.0	20	3.23

Figure4-25 View Optical Module Information

When the optical module is DWDM and the wavelength is tunable, its frequency and wavelength can be configured. The configuration interface is under the port configuration-interface menu.

4.5.1. SFP/SFP+ Optical Transceiver Information

The SFP and SFP + optical module information of M Series NMS system is not separately distinguished. Open the optical module configuration interface; you can see the basic information and parameter information of the optical module, as shown in the figure below:

Port Management	Pluggable Configuration	
Pluggable BasicInfo -		
Туре	SFP/SFP+	
Present or Absent	Alarm	
Vendor SN	F1811010306	
Vendor PN	SFP-10GLR-31	
Vendor OUI	00-90-65	
Application Code	Ethernet 10GBASE_LR	
CLEI		
LaneNum	1	
Firmware		
Tunable	False	
Wavelength(nm)	1310	

Figure4-26 Basic Information of SFP/SFP+ Optical Transceiver

Port Management	Pluggable Configuration				
Present or Absent	Alarm				
Vendor SN	F1811010306				
Vendor PN	SFP-10GLR-31				
Vendor OUI	00-90-65				
Application Code	Ethernet 10GBASE_LR				
CLEI					
LaneNum	1				
Firmware					
Tunable	False				
Wavelength(nm)	1310				
Optics Paramete					
Please input content		Search			
↓ Lane ID				↑ Laser Bias(mA)	
1	-1.20	-40.00	23.0	31	3.28
Total: 1 records					10 Trevious 1 Next

Figure4-27 Parameter Information of SFP/SFP+ Optical Transceiver

4.5.2. WDM CFP Optical Transceiver Information

Port Management	Pluggable Configuration
Pluggable BasicInfo	
Туре	M6500-CFP
Present or Absent	Work
Vendor SN	184155622
Vendor PN	AC100-ZX1-400
Vendor OUI	00-00-00
Application Code	Application_Uni
CLEI	-
LaneNum	1
Firmware	03.00.22

Figure4-28 Parameter Information of WDM CFP Optical Transceiver

Please input content		Search			
↓ Lane ID				+ Laser Bias(mA)	
1	-4.10	-40.00	38.0	20	3.22

Figure 4-29 Parameter Information of WDM CFP Optical Transceiver

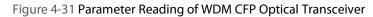
4.5.3. WDM CFP Optical Transceiver Configuration

Configure the port mode as OCh (OTU4), insert a WDM CFP optical module and select the interface; you can configure the working wavelength and transmitting optical power of the optical module, as shown in the figure below:

t Configuration				
Choose State	● port ○ OTU4 ○ ODU4 ○ C ○ ○ ○ ○ ○ ○ ○ □	DDU2e		
Administrative State	Enabled	*	Operational State	Down
Frequency(set value)	195.20THz-1535.822nm-C52	•	Frequency(current value)	195.20THz-1535.822nm-C52
Near End ALS	195 15THz-1536.216nm-H51 195.20THz-1535.822nm-C52 195.25THz-1535.429nm-H52 195.30THz-1535.036nm-C53	•	Availability State	Normal
TxPower(set value)	195.35THz-1534.643nm-H53 195.40THz-1534.250nm-C54 195.45THz-1533.858nm-H54 195.50THz-1533.465nm-C55		TxPower(current value)	~4.1dBm
DGD(ps)	195.55THz-1533.073nm-H55 195.60THz-1532.681nm-C56 195.65THz-1532.290nm-H56		OSNR(db/0.1nm)	N/A
CD(ps/nm)	195.70THz-1531.898nm-C57 195.75THz-1531.507nm-H57 195.80THz-1531.116nm-C58 195.85THz-1530.725nm-H58			
CD Auto Search Range Threshold Configuration	195.90THz-1530.334nm-C59 195.95THz-1529.944nm-H59 196.00THz-1529.553nm-C60 196.05THz-1529.163nm-H60		High Value(Effective)	-22500
Low Value(Effective)	196.10THz-1528.773nm-C61 2000	*	High Value(Supported)	-40000



Port Management Pluggable	Configuration		
Port Configuration			
Choose State	port OTU4 ODU4 ODU2e		
Administrative State	Enabled	Operational State	Down
Frequency(set value)	195.20THz-1535.822nm-C52	Frequency(current value)	195-20THz-1535.822nm-C52
Near End ALS	No	Availability State	Normal
TxPower(set value)		TxPower(current value)	-4.1dBm
DGD(ps)	0	OSNR(db/0.1nm)	N/A
CD(ps/nm)	0		
CD Auto Search Range Threshold Configuration	Default	High Value(Effective)	-22500
Low Value(Effective)	2000	High Value(Supported)	-40000
High Value(Setting)			
	Арріу		

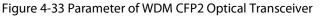


4.5.4. WDM CFP2 Optical Transceiver Information

Port Management	Pluggable Configuration	
Pluggable BasicInfo		
Туре	M-CFP2-DCO	
Present or Absent	Alarm	
Vendor SN	193753195	
Vendor PN	AC200-D23-005	
Vendor OUI	00-00-00	
Application Code	Application_Unknown	
CLEI	_	
LaneNum	1	
Firmware		
Tunable	True	

Figure 4-32 Basic Information of WDM CFP2 Optical Transceiver

1 U.UU 4U.UU 45.U NVA U.32	



4.5.5. WDM CFP2 Optical Transceiver Configuration

Configure the port mode as OCh (OTUC2), insert a WDM CFP2 optical module and select the interface; you can configure the working wavelength and transmitting optical power of the optical module, as shown in the figure below:

Port Management Pluggable	e Configuration			
Port Configuration				
Choose State	Interface OTUC2 ODU4			
Administrative State	Enabled	Ŧ	Operational State	Up
Frequency(set value)	193.60THz-1548.515nm-C36	Ŧ	Frequency(current value)	193.60THz-1548.515nm-C36
Near End ALS	192.65THz-1556.151nm-H26 192.70THz-1555.747nm-C27 192.75THz-1555.343nm-H27 192.80THz-1554.940nm-C28	*	Availability State	Normal
TxPower(set value)	192.85THz-1554.537nm-H28 192.90THz-1554.134nm-C29 192.95THz-1553.731nm-H29 193.00THz-1553.329nm-C30		TxPower(current value)	0.0dBm
DGD(ps)	193.05THz-1552.926nm-H30 193.10THz-1552.524nm-C31 193.15THz-1552.122nm-H31		OSNR(db/0.1nm)	33.3
CD(ps/nm)	193.20THz-1551.721nm-C32 193.25THz-1551.319nm-H32 193.30THz-1550.918nm-C33 193.35THz-1550.517nm-H33			
CD Auto Search Range Threshold Configuration	193.40THz-1550.116nm-C34 193.45THz-1549.715nm-H34 193.50THz-1549.315nm-C35 193.55THz-1548.915nm-H35		High Value(Effective)	0
Low Value(Effective)	193.60THz-1548.515nm-C36 0	•	High Value(Supported)	0
High Value(Setting)				
	Apply			



rt Configuration			
Choose State	Interface OTUC2 ODU4		
Administrative State	Enabled	 Operational State 	Up
Frequency(set value)	193.60THz-1548.515nm-C36	 Frequency(current value) 	193.60THz-1548.515nm-C36
Near End ALS	No	 Availability State 	Normal
TxPower(set value)	0.0dBm -9.5dBm	TxPower(current value)	0.0dBm
DGD(ps)	-9.00Bm -9.00Bm -8.5dBm -8.0dBm -7.5dBm	OSNR(db/0.1nm)	33.3
CD(ps/nm)	-7.30Bm -7.0dBm -6.5dBm -6.0dBm		
CD Auto Search Range Threshold Configuration	-5.5dBm -5.0dBm -4.5dBm -4.0dBm -3.5dBm	High Value(Effective)	0
Low Value(Effective)	-3.0dBm -2.5dBm -2.0dBm	High Value(Supported)	0
High Value(Setting)	-1.5dBm -1.0dBm -0.5dBm		

Figure 4-35 Configure WDM CFP2 Transmit Optical Power

Port Management Pluggable	Configuration		
Port Configuration			
Choose State	Interface OTUC2 ODU4		
Administrative State	Enabled	Operational State	Up
Frequency(set value)	193.60THz-1548.515nm-C36	Frequency(current value)	193.60THz-1548.515nm-C36
Near End ALS	No	Availability State	Normal
TxPower(set value)	0.0dBm 💌	TxPower(current value)	0.0dBm
DGD(ps)	2	OSNR(db/0.1nm)	33.3
CD(ps/nm)	5		
CD Auto Search Range Threshold Configuration	Default	High Value(Effective)	0
Low Value(Effective)	0	High Value(Supported)	0
High Value(Setting)			
	Apply	A A B Prinkle Prince and	

Figure 4-34 Parameter Reading of WDM CFP2 Optical Transceiver

5. Service Configuration

Prerequisite

- 1. Network devices and lines are normal.
- 2. The NE and the NMS system have been configured.
- 3. The NMS server has been running and logged into the NMS system.

5.1. Electric Cross-Connect Introduction

OTN electric cross-connect technology is based on ODUk as the particle for mapping, multiplexing and cross-connection. OTN electric cross-connect equipment also introduces high-order / low-order optical channel data unit (ODUk / ODUj). There are four types of OTN electric cross-connect:

- Unidirectional cross-connection without protection: one-way cross-connection, that is, the service is transmitted from site A--->site Z without line protection.
- Bidirectional cross-connection without protection: bidirectional cross-connection, that is, the service is transmitted from site A--->site Z and from site Z--->site A without line protection.
- Unidirectional cross-connection with protection: one-way cross-connection, that is, the service is
 transmitted from site A--->site Z. You can choose site A or site Z as the protection site (either of them). If
 site A is selected as the protection site, the service will be received only. When the service of site A fails,
 the service will be sent from A site protection (A') to Z site. If Z-site protection is selected, the service is
 double transmitted, that is, the service of site A is simultaneously sent to site Z- and Z site protection (Z').
- Bidirectional cross-connection with protection: bidirectional cross-connection, that is, the service is transmitted from site A--->site Z and from site Z--->site A. The service is double transmitted and selectively received. If Z site protection is selected, the service of site A is simultaneously transmitted to site Z and Z protection site (Z'); otherwise, if A site protection is selected, the service of site Z is simultaneously transmitted to site A and A protection site (A').

Configuration Steps

Select NE, click on "Shelf01" and select "Business Configuration" on the right, the operation steps are as shown in

the figure below:

Global View	Shelf View	Shelf Information	Slot Information	Card Information	SC1+1 Configuration	Business Configuration	
🕀 🛑 M6800-TSP16(10.32.130.111)							
由 ■ M6200-CH2U(10.32.130.110)	SNC Configurat	ion					
🕀 🛑 M6200-CH2U-No.2(10.32.130.116)							
🖽 💼 M6500-CH5U(10.32.130.220)	Please input	content		Search			
➡ ■ M6500-CH2U(10.32.130.120)	Add	Delete					
🖨 📕 M6500-CH2U-No.2(10.32.130.160)	_						
🖨 🖀 Shelf01	÷l	D					
Slot1 M6500-MXP10 : normal							
🗉 🖪 Slot2 TMXP5-2X100G : normal							

Figure 5-1 Operation Steps of SNC Configuration

The"SNC Configuration" interface shows up, as shown in the figure below:

elf View	Shelf Information	Slot Information	Card Information	SC1+1 Configuration	Business Configuration				
Configura	tion								
Please inpu	t content		Search						
Add	Delete								
Add		↑ Circuit ID	+ Src TpID	↑ Des TpID		↑ DesProt TpID	+ Opera	tion	
	ID + Snc Type			+ Des TpID Slot3-port3-ODU4(0)	+ SrcProt TpID		↑ Opera Delete	tion Protect	

Figure 5-2 Traffic Configuration Interface

The configuration includes two types—with protection and without protection. For the type with protection, there are A protection and Z protection, as shown in the figure below:

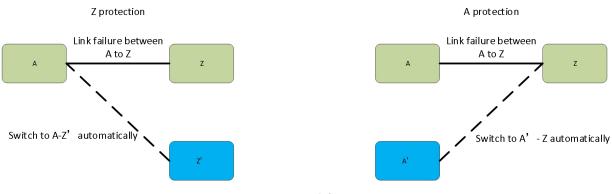


Figure 5-3 Protection Schematic Diagram

5.1.1. Unidirectional Cross-Connection without Protection

M6500 Series NE Configuration Manual

Select NE, click on "*Shelf01*" and select "*Add*" button in "*SNC Configuration*" of "*Business Configuration*" interface; you can create unidirectional cross-connection without protection (here we take M6500-MXP10 port 1-port 11 cross-connection as an example to select the corresponding slot, cross-connection type and capacity information).

Add		>
Label	2	
Туре	1WAY	*
Capacity	ODU2e	v
A		
Shelf	1	•
Slot	2	
Port	1	v
TP	ODU2e(0)	
Z		
Shelf	1	*
Slot	2	•
Port	11	*
TP	ODU2e(1)(TS:1,2,3,4,5,6,7,8)	*

Figure 5-4 Configuration of Unidirectional Cross-Connection without Protection

Shelf Viev	v	Shelf Information	Slot Information	Card Information	SC1+1 Configuration	Business Configuration				
NC Cont	figuration									
Pleas	e input cont	ent		Search						
Add		Delete								
	ΦID		+ Circuit ID		↑ Des TpID			↑ Opera	tion	
0	↑ ID 1		↑ Circuit ID 2		+ Des TpID Slot2-port11-ODU2e(1)		↑ DesProt TpID	↑ Opera Delete	tion Protect	

Figure 5-5 Configuration Result of Unidirectional Cross-Connection without Protection

5.1.2. Bidirectional Cross-Connection without Protection

Select NE, click on "*Shelf01*" and select "*Add*" button in "*SNC Configuration*" of "*Business Configuration*" interface; you can create bidirectional cross-connection without protection (here we take M6500-MXP10 port 1-port 11 cross-connection as an example to select the corresponding slot, cross-connection type and capacity information).

Add		
* Label	3	
* Туре	2WAY	~
* Capacity	ODU2e	Ŧ
A		
* Shelf	1	v
* Slot	2	
* Port	1	
* TP	ODU2e(0)	-
Z		
* Shelf	1	~
* Slot	2	
* Port	11	
* TP	ODU2e(1)(TS:1,2,3,4,5,6,7,8)	~

Figure 5-6 Configuration of Bidirectional Cross-Connection without Protection

Shelf View		Shelf Information	Slot Information	Card Information	SC1+1 Configuration	Business Configuration			
SNC Conf	iguration								
Please	e input cont	ent		Search					
Add		Delete							
	ΦID							on	
	1	2WAY	3	Slot2-port1-ODU2e(0)	Slot2-port11-ODU2e(1)		Delete	Protect	
Total: 1	records filte	red from 2 total entries					10 💌	Previous	1 Next

Figure 5-7 Configuration Result of Bidirectional Cross-Connection without Protection

5.1.3. Unidirectional Cross-Connection with Protection

Select NE, click on "*Shelf*", click on "*Business Configuration*" and select "*Add*" button in "*SNC Configuration*" of "*Business Configuration*" interface; you can create unidirectional cross-connection with protection (here we take M6500-MXP10 as an example, the 11 ports from Port 1-Port 11 of one board create unidirectional cross-connection with protection, and the 11 ports of the other board act as the protection to select the corresponding slot, cross-connection type and capacity information).

Label	1	
Туре	1WAYPR	¥
Capacity	ODU2e	v
A		
Shelf	1	×
Slot	2	*
Port	1	v
TP	ODU2e(0)	v
z		
Shelf	1	v
Slot	2	v
Port	11	*
ТР	ODU2e(1)(TS:1,2,3,4,5,6,7,8)	v
A Protecti	on 🔘	
* Shelf	1	v
* Slot	2	Ŧ
Port	1	· •
TP		Ŧ
Z Protectio	on 🖲	
Shelf	1	Ŧ
	3	Ŧ
Slot		
Slot Port	11	~

Figure 5-8 Configuration of Unidirectional Cross-Connection with Protection

elf View	Shelf Information	Slot Information	Card Information SC	1+1 Configuration	Business Configuration	
C Configura	ation					
Please inpu	ut content		Search			
Add	Delete					
	Delete	+ Circuit ID		↑ Des TpID		
		+ Circuit ID	+ Src TpID Slot2-port1-ODU2e(0)			

Figure 5-9 Configuration Result of Unidirectional Cross-Connection with Protection

5.1.4. Bidirectional Cross-Connection with Protection

Select NE, click on "*Shelf*" and select "*Add*" button in "*SNC Configuration*" of "*Business Configuration*" interface; you can create bidirectional cross-connection with protection (here we take M6500-MXP10 as an example, the 11 ports from Port 1-Port 11 of one board create bidirectional cross-connection with protection, and the 11 ports of the other board act as the protection to select the corresponding slot, cross-connection type and capacity information).

Add		×
* Label	2	
* Туре	2WAYPR	•
* Capacity	ODU2e	•
А		
* Shelf	1	•
* Slot	2	•
* Port	1	•
* TP	ODU2e(0)	•
z		
* Shelf	1	•
* Slot	2	*
* Port	11	•
* TP	ODU2e(1)(TS:1,2,3,4,5,6,7,8)	v

Shelf	1	Ŧ
Slot	2	
Port	1	~
TP		*
Z Protect	ion 🖲	
Shelf	1	
Slot	3	
Port	11	

Figure 5-10 Configuration of Bidirectional Cross-Connection with Protection

Configurati	tion						
Please input	t content		Search				
Add	Delete						
Add	Delete						
	Delete		+ Src TpID	↑ Des TpID	+ SrcProt TpiD	+ DesProt TpID	+ Operation
		↑ Circuit ID 2				⊕ DesProt TpID Slot3-port11-0DU2e(1)	+ Operation Delete Unprotect PPG Switc

Figure 5-11 Configuration Result of Bidirectional Cross-Connection with Protection

5.2. Service Type

5.2.1. Service Type

Select NE-Slot 1, click on "Port1" and select "Port Management" on the right, as shown in the figure below:

🖂 😵 Global View	Port Management P	uggable Configuration		
🕀 🛑 M6800-TSP16(10.32.130.111)				
⊞ — — M6200-CH2U(10.32.130.110)	BasicInfo			
🗄 🛑 M6200-CH2U-No.2(10.32.130.116)				
🖽 💣 M6500-CH5U(10.32.130.220)	Administrative State	Disabled	×	
🕀 📄 M6500-CH2U(10.32.130.120)	Operational State	Down		
🖯 🛑 M6500-CH2U-No.2(10.32.130.160)	State of the state			
🖨 🖀 Shelf01	Availability	Empty		
🖯 📮 Slot1 M6500-MXP10 : normal				
Port1	Port Mode	OTU2	v	
Port2	Port Description	Please input content		(Can not contain / : * ? " < > special characters)
Port3				
Port4		Apply		

Figure 5-12 Operation Steps of How to View Service Type

As shown in the figure below, open the port management interface, and select the service type from basic information-port mode.

Port Management F	Pluggable Configuration		
BasicInfo			
Administrative State	Enabled	¥	
Operational State	Down		
Availability	NotInstalled		
Port Mode	XGE_BMP	•	
Port Description	XGE_BMP XGE_GFPF XGE_GFPFextp STM64_AMP OTU2 OTU2 OTU2e STM64_BMP OC192 BMP	(Can not contain / : * ? * < > special characters)	

Figure 5-13 Port Service Type Interface

5.2.2. Service Mapping

In M Series NMS, you can select the service mapping mode in the port management-port mode interface. Here we take the M6500-MXP10 board as an example. As shown in the figure below, the left of the underline is port mode and the right is the mapping mode (OTU signal is not included).

STM64_AMP	*
XGE_BMP XGE_GFPF	
XGE_GFPFextp	
STM64 AMP	
OC192_AMP	
OTU2	
OTU2e	
STM64 BMP	
OC192 BMP	

Figure 5-14 Mapping Mode Interface

5.2.2.1. AMP

AMP (Asynchronous Mapping Procedure)has no restrictions on the structure of the mapped signal (whether the signal has a frame structure or not), and no need to synchronize with the network (for example, PDH signal and SDH network are not fully synchronized). The mapping method of adapting the signal into VC by adjusting the code rate makes the rate of the service layer signal match that of the client layer signal.

Here we take M6500-MXP10 board as an example. Select NE-Slot, click on "*Port1*" and select "*Port Management*" on the right, and then select STM64_AMP mode.

Port Management P	luggable Configuration	
BasicInfo		
Administrative State	Enabled	¥.
Operational State	Down	
Availability	NotInstalled	
Port Mode	STM64_AMP	▼.
Port Description	Please input content	(Can not contain / : * ? " <> special characters)
	Apply	

Figure 5-15 STM64_AMP Mapping Mode

5.2.2.2. BMP

BMP (Bit-synchronous Mapping Procedure BMP) requires the rate of the service layer signal to match that of the client layer signal, and there is no frequency deviation.

Here we take M6500-MXP10 board as an example. Select NE-Slot, click on "*Port1*" and select "*Port Management*" on the right, and then select XGE_BMP mode.

Port Management Plu	Iggable Configuration	
BasicInfo		
Administrative State	Enabled	T
Operational State	Down	
Availability	Notinstalled	
Port Mode	XGE_BMP	~
Port Description	Please input content	(Can not contain / : * ? " < > special character
	Apply	



5.2.2.3. GMP

For GMP (Generic Mapping Procedure), in all cases (such as the maximum ppm frequency offset of the client signal and the minimum ppm frequency offset of the server signal), the rate of the server signal must be higher than the rate of the client signal. Any rate of the client signal can be mapped to any server payload rate by using this method, that is, the rate of the service layer is required to be greater than that of the client layer; otherwise, it cannot be transmitted.

Here we take M6500-TMXP5 board as an example. Select NE-Slot, click on "*Port 3*" and select "*Port Management*" on the right, and then select HGE_GMP mode.

Port Management	Pluggable Configuration	
BasicInfo		
Administrative State	Enabled	
Operational State	Up	
Availability	Normal	
)
Port Mode	HGE_GMP •)
Port Description	Please input content	(Can not contain / : * ? " < > special characters)
	Apply	

Figure 5-17 HGE_GMP Mapping Mode

5.2.2.4. GFP-F

The encapsulation of GFP-F (Frame mapped Generic Framing Procedure) can completely map the traffic signal frame into a GFP frame with variable length and there is no need to make any changes to the encapsulated data. In this method, data processing is performed after receiving a complete data frame, which is most suitable for packet data with variable length such as Ethernet services.

Here we take M6500-MXP10 board as an example. Select NE-Slot, click on "*Port1*" and select "*Port Management*" and then select XGE_GFPF mode.

sicInfo			
Administrative State	Enabled	•	
Operational State	Down		
Availability	Notinstalled		
Port Mode	XGE_GFPF	~	
Port Description	Please input content	(Can not contain / : * ? " <	> special characters)

Figure 5-18 XGE_GFPF Mapping Mode

5.2.2.5. GFP-Fextp

Here we take M6500-MXP10 board as an example. Select NE (10.32.130.160)-Slot 2, right click on "*Port 1*" and select "*Port Management*", and then select XGE_GFPFextp mode.

Port Management	Pluggable Configuration	
BasicInfo		
Administrative State	Enabled	~
Operational State	Up	
Availability	Normal	
Port Mode	XGE_GFPFextp	Ŧ
Port Description	Please input content	(Can not contain / : * ? " <> special characters)
	Apply	

Figure 5-19 XGE_GFPFextp Mapping Mode

5.3. Service Configuration Process

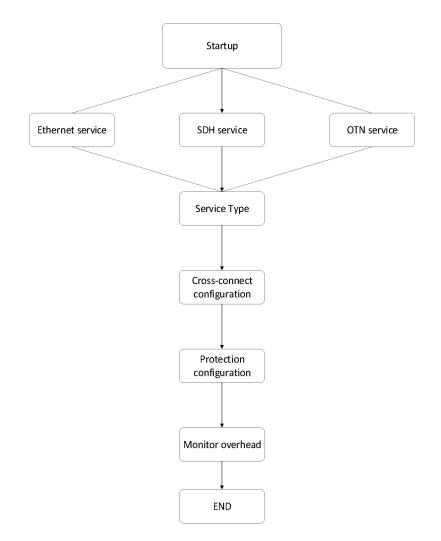


Figure 5-20 Service Configuration Process

5.4. Configuration instructions

5.4.1. M6500-MXP10

The port type of M6500-MXP10 includes 1 (port 11)*100G line side interface (CFP) and 10 (port 1-10)*10G client side interfaces (SFP+).

5.4.1.1. Service Type

• Line Side Port

Select NE-Slot 1, click on "Port11" and select "Port Management" on the right, the operation interface is as shown

in the figure below:

🖯 😨 Global View	Port Management	Pluggable Configuration			
🕀 🛑 M6800-TSP16(10.32.130.111)	×				
🗐 🛑 M6200-CH2U(10.32.130.110)	BasicInfo				
🖽 🛑 M6200-CH2U-No.2(10.32.130.116)					
M6500-CH5U(10.32.130.220)	Administrative State	Enabled	Ŧ		
⊕ ● M6500-CH2U(10.32.130.120)	Operational State	Up			
🖯 🛑 M6500-CH2U-No.2(10.32.130.160)					
🖨 🖀 Shelf01	Availability	Normal			
🖯 🗖 Slot1 M6500-MXP10 : normal					
Port1	Port Mode	OTU4	*		
- Port2	Port Description	Please input content		(Can not contain / : "?" < > special ch	aracters)
Port3					
Port4		Apply			
Port5	Port Configuration				
Port6	Port Conliguration				
Port7	Choose State	OTU4 ODU4			
Port8	Administrative State	Enabled	*	Operational State	Down
Port9					
Port10	Availability State	Failed	Ŧ	Degrade Interval	2
Port11					
B Slot2 TMXP5-2X100G : normal	Near End ALS	No	*	Degrade Threshold	128459

Figure5-21 M6500-MXP10 Line Side Port Information

The line side port management interface is as shown in the figure below, and the service type can be selected in port mode.

Port Management PI	uggable Configuration		
asicInfo			
Administrative State	Enabled	¥	
Operational State	Up		
Availability	Normal		
Port Mode	OCh(OTU4)		
Port Description	OTU4 OCh(OTU4) Please input content	(Can not contain / : * ? * <> spec	cial characters;



• Client Side Port

Select NE-Slot 1, click on "*Port1*" and select "*Port Management*" on the right, the operation interface is as shown in the figure below:

🖂 🐨 Global View	Port Management	Pluggable Configuration		
⊞ ■ M6800-TSP16(10.32.130.111)				
🕀 🛑 M6200-CH2U(10.32.130.110)	BasicInfo			
■ ■ M6200-CH2U-No.2(10.32.130.116)				
🖽 💼 M6500-CH5U(10.32.130.220)	Administrative State	Disabled	T	
🖽 🛑 M6500-CH2U(10.32.130.120)	Operational State	Down		
M6500-CH2U-No.2(10.32.130.160)				
🖨 🚆 Shelf01	Availability	Empty		
🖯 🗖 Slot1 M6500-MXP10 : normal				
Port1	Port Mode	XGE_BMP	*	
	Port Description	Please input content	(Can not contain / : * ? " <	> special characters)
- 🗗 Port3				
- Dert4		Apply		

Figure 5-23 M6500-MXP10 Client Side Port Information

The client side port management interface is as shown in the figure below and the service type can be selected in port mode.

Port Management PI	uggable Configuration	
BasicInfo		
Administrative State	Enabled	v
Operational State	Down	
Availability	Notinstalled	
Port Mode	XGE_BMP	•
Port Description	XGE_BMP XGE_GPPF XGE_GPPFextp STM64_AMP OC192_AMP OTU2 OTU2 STM64_BMP	(Can not contain / : * ? " < > special characters)
Port Configuration	OC192_BMP	

Figure 5-24 M6500-MXP10 Client Side Port Interface

5.4.1.2. Time Slot Configuration

Select NE and click on "*Slot 1*", and then select "*TP Multiplexing Structure*" module on the right, as shown in the figure below:

🖻 🚱 Global View	Card Current Alarm		
🖶 🛑 M6800-TSP16(10.32.130.111)	Card Current Alarm	View the current board alarm information	Check
☐			
■ ■ M6200-CH2U-No.2(10.32.130.116)	Slot Reboot		
🗐 🗊 M6500-CH5U(10.32.130.220)			Contrast.
🗎 🛑 M6500-CH2U(10.32.130.120)	Card WarmReboot	The board will restart and the board configuration will not be lost	Reboot
☐	Card ColdReboot	The board will restart and the board configuration will reset	Reboot
🖨 📲 Shelf01			
E Slot1 M6500-MXP10 : normal	TP Multiplexing Structure		
Port1	Port	11	
Port2	T OIL		
Port3		🖺 ODU4(0)	
Port4		Clear All	
- 🙆 Port5			

M6500 Series NE Configuration Manual

FS

Figure 5-25 Operation Steps of M6500-MXP10 TP Multiplexing Configuration

Click on"ODU4" button and the interface is as shown in the figure below. Select ODU4 to demultiplex to ODU2/ODU2e.

P Multiplexing Struct	Ire	
Port	11	•
	⊞- > ODU4(0)	
	ODU2 ODU2e Clear All	

Figure 5-26 M6500-MXP10 Demultiplexing Configuration Interface

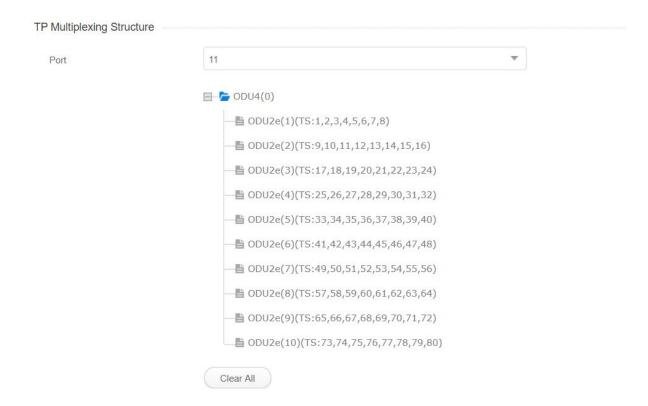
ODU4 can be demultiplexed to 10*ODU2/ODU2e (here we take ODU2e as an example), 8 time slots need to be configured for each ODU2/ODU2e.

ParentName	ODU4			
TP ID	2			
TS	TS(#1)	□TS(#2)	TS(#3)	□TS(#4)
	TS(#5)	TS(#6)	TS(#7)	TS(#8)
	☑TS(#9)	☑TS(#10)	ITS(#11)	✓TS(#12)
	✓TS(#13)	☑ TS(#14)	INCENTIAL INTERNA	✓TS(#16)
	TS(#17)	TS(#18)	TS(#19)	TS(#20)
	TS(#21)	TS(#22)	TS(#23)	TS(#24)
	TS(#25)	TS(#26)	TS(#27)	TS(#28)
	TS(#29)	TS(#30)	TS(#31)	TS(#32)
	TS(#33)	TS(#34)	TS(#35)	TS(#36)
	TS(#37)	TS(#38)	TS(#39)	TS(#40)
	TS(#41)	TS(#42)	TS(#43)	TS(#44)
	TS(#45)	TS(#46)	TS(#47)	TS(#48)
	TS(#49)	TS(#50)	TS(#51)	TS(#52)
	TS(#53)	TS(#54)	TS(#55)	TS(#56)

Figure 5-27 M6500-MXP10 Demultiplexing ODU2e Configuration

The result when it is with full configuration of 10*ODU2e is as shown in the figure below:

77





5.4.1.3. Cross-Connection Configuration

For example, if we need to create bidirectional cross-connection with protection of port 1 to port 11, the operation is as follows: Select XGE_BMP at the client side and select OCh (OTU4) at the line side, then ODU2e cross-connection is established correspondingly, as shown in the figure below:

* Label	2	
* Туре	2WAYPR	
* Capacity	ODU2e	
A		
* Shelf	1	,
* Slot	2	3
* Port	1	
* TP	ODU2e(0)	
z		
* Shelf	1	,
* Slot	2	3
* Port	11	
* TP	ODU2e(1)(TS:1,2,3,4,5,6,7,8)	
A Drotte at	ion 🔘	
A Protect		
	1	
* Shelf	2	v
* Shelf * Slot		
* Shelf * Slot * Port	2	
* Shelf * Slot * Port	2	
 Shelf Slot Port TP Z Protect 	2	▼ ▼ ▼ ▼
 Shelf Slot Port TP Z Protect Shelf 	2 1	▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼
* Shelf * Slot * Port * TP	2 1 1 1 1	

Figure 5-29 M6500-MXP10 Bidirectional Cross-Connection with Protection

The following figure shows that the cross-connection is successfully established.

elf View	Shelf Information	Slot Information	Card Information SC	1+1 Configuration	Business Configuration		
C Configurati	on						
Please input	content		Search				
Add	Delete						
Add	Delete	+ Circuit ID	♦ Src ToID	♦ Des ToID		⊕ DesProt ToID ■	♦ Operation
_	Delete ID + Snc Type 2WAYPR	+ Circuit ID 2				+ DesProt TpID Stot3-port11-ODU2e(1)	+ Operation Delete Unprotect PPG Swit

Figure 5-30 Successful Establishment of M6500-MXP10 Bidirectional Cross-Connection with Protection

5.4.1.4. FEC Configuration

FEC is only configurable on OUT layer.

• Line Side Port

Select NE-Slot 1, click on "*Port11*" and select "*Port Management*", and then select OCh (OTU4) as the port mode. In "*OTU4*" interface under "*Port Configuration*" on the right, select "*FEC type*" to view the configuration. There are in all 7 FEC modes for M6500-MXP10 line side, which are respectively

G709FEC/SDFEC1/SDFEC2/SDFEC3/SDFEC1_Non-diff/SDFEC2_Non-diff/SDFEC3_Non-diff. SDFEC2 is the default mode, as shown in the figure

below:

Port Management P	Pluggable Configuration		
Port Configuration			
Choose State	port OTU4 ODU4 ODU2e ODU2 ODU2e ODU2 ODU2 OD		
Administrative State	Enabled	Operational State	Up
Availability State	Normal	Degrade Interval	2
Near End ALS	No	P Degrade Threshold	128459
Loopback	NONE	FEC Type	SDFEC3
TIM Mode	NONE	Expected SAPI	SDFEC1 SDFEC2 SDFEC1_Non-diff SDFEC2_Non-diff
TIM AIS Insertion	False	Expected DAPI	SDFEC3_Non-diff
RX SAPI		Tx SAPI	Please input content
Rx DAPI	'Cé,qªåU□□4 1□	Tx DAPI	Please input content
Rx Operator	P}~1□[H□□¦¿Ĭ□+«h□~×™AÆnE [−] ª±[)ův	Tx Operator	Please input content
	DCN Apply		

Figure 5-31 FEC Configuration of M6500-MXP10 Line Side Port

Client Side Port

Select NE-Slot 2, click on "Port11" and select "Port Management" on the right, and then select OTU2/OTU2e as the port mode. In "OTU2/OTU2e" interface under "Port Configuration", select "FEC type" to view the configuration. There are in all 4 FEC modes for M6500-MXP10 client side, which are respectively NOFEC/G709FEC/I.4EFEC/I.7EFEC. G709FEC is the default mode, the configuration is as shown in the figure below:

Port Management Pluggab	le Configuration		
Port Configuration			
Choose State	OTU2 ODU2 ODU2		
Administrative State	Enabled	Degrade Interval	2
Operational State	Up	Degrade Threshold	12304
Availability State	Normal	Near End ALS	No
Loopback	NONE	FEC Type	G709FEC G709FEC G709FEC
TIM Mode	NONE	Expected SAPI	I.4EFEC I.7EFEC
TIM AIS Insertion	False	Expected DAPI	Please input content
Rx SAPI		Tx SAPI	Please Input content
RX DAPI	(j00~i)600Â0(00	Tx DAPI	Please input content
Rx Operator	}»□"□ÇþÞ□□D¶!7úÌñ/En□>à□ÚMIJM¢C*é	Tx Operator	Please input content
	DCN Apply		



Port Management	Pluggable Configuration				
Port Configuration					
Choose State	OTU2e ODU2e ODU2 ODU2e ODU2 ODU2				
Administrative State	Enabled	*	Degrade Interval	2	
Operational State	Up		Degrade Threshold	12748	
Availability State	Normal	Ŧ	Near End ALS	No	Ŧ
Loopback	NONE	Ŧ	FEC Type	G709FEC NoFEC	•
TIM Mode	NONE	*	Expected SAPI	G709FEC 1.4EFEC 1.7EFEC	
TIM AIS Insertion	False	×	Expected DAPI	Please input content	
Rx SAPI			Tx SAPI	Please input content	
Rx DAPI	(j00~ij600Å0(00		Tx DAPI	Please input content	
Rx Operator	}»D"DÇÞÞDDD¶I7úlñÆnD>aDÚMIJM¢C*é		Tx Operator	Please input content	
	DCN Apply		in a sector scores and		

Figure5-33 FEC Configuration of M6500-MXP10 Client Side (OTU2e) Port

5.4.2. M6500-TMXP2

The port type of M6500-TMXP2 includes 1 (port 3)*100G line side interface (CFP), 1 (port 1)*100G rate client side interface (QSFP28) or 2 (port 1-2)*40G client side interfaces (QSFP+).

5.4.2.1. Service Type

• Line Side Port

Select NE-Slot 2, click on "*Port 3*" and select "*Port Management*" on the right, the operation steps are as shown in the figure below:

🖂 😵 Global View	Port Management	Pluggable Configuration	
🕀 🗐 M6200-CH2U(10.32.130.110)	- or management		
⊞ 🛑 M6200-CH2U-2(10.32.130.116)	BasicInfo		
⊞- ■ M6500-CH2U(10.32.130.120)			
🖨 🛑 M6500-CH5U(10.32.130.220)	Administrative State	Enabled	Ŧ
🖨 🚆 Shelf01	Operational State	Up	
🗄 🖸 Slot1 M6500-NMU : normal			
🕀 🖸 Slot2 M6500-100G-TMXP2 : normal	Availability	Normal	
Port1	Port Mode	OTU4	¥
Port3	Port Description	Please input content	(Can not contain /: *? " <> special characters)
□ Slot4 TMXP5-2X100G : absent		Apply	



The line side port management interface is as shown in the figure below and the service type can be selected in port mode.

BasicInfo			
Administrative State	Enabled	*	
Operational State	Up		
Availability	Normal		
Port Mode	OCh(OTU4)	•	
	OTU4 OCh(OTU4)		
Port Description	Please input content	(Can not con	tain / : * ? " < > special characters)

Figure 5-35 M6500-TMXP2 Line Side Port Interface

• Client Side 100G Port

Select NE-Slot 2, click on "*Port1*" and select "*Port Management*" on the right, the operation steps are as shown in the figure below:

Global View	Port Management PI	uggable Configuration		
➡ ■ M6200-CH2U(10.32.130.110)	V			
🗄 🗃 M6200-CH2U-2(10.32.130.116)	BasicInfo			
⊞ ■ M6500-CH2U(10.32.130.120)				
🖨 🗃 м6500-СН5U(10.32.130.220)	Administrative State	Disabled	•	
🖨 🖀 Shelf01	Operational State	Down		
🗄 🗖 Slot1 M6500-NMU : normal				
🖯 🗖 Slot2 M6500-100G-TMXP2 : normal	Availability	Empty		
- 🗗 Port1				
Port2	Port Mode	HGE_GMP	Ŧ	
Port3	Port Description	Please input content	(Ca	n not contain / : * ? " < > special characte
🗊 🗖 Slot3 M6500-MXP10 : absent				
□ □ Slot4 TMXP5-2X100G : absent		Apply		

Figure 5-36 M6500-TMXP2 Client Side 100G Port Information

The client side port management interface is as shown in the figure below and the service type can be selected in port mode.

Port Management PI	uggable Configuration	
BasicInfo		
Administrative State	Enabled	V
Operational State	Up	
Availability	Normal	
Port Mode	HGE_GMP	· ·
Port Description	HGE_GMP HGE_GFPF	(Can not contain / ; * ? " < > special characters
	Apply	

Figure 5-37 M6500-TMXP2 Client Side 100G Port Interface

• Client Side 40G Port

The current board mode is 100G; you need to change the board mode to 40G mode. Select NE (10.32.130.220)-Slot2, click on "*Slot2*" and select "*Card Mode Configuration*" module on the right, as shown in the figure below:

🛛 🚱 Global View	Card Current Alarm		
☐	Card Current Alarm	View the current board alarm information	Check
🕀 💼 M6200-CH2U-2(10.32.130.116)			
🗇 💼 M6500-CH2U(10.32.130.120)	Slot Reboot		
 ➡ M6500-CH5U(10.32.130.220) ➡ ■ Shelf01 	Card WarmReboot	The board will restart and the board configuration will not be lost	Reboot
Slot1 M6500-NMU : normal Slot2 M6500-100G-TMXP2 : normal	Card ColdReboot	The board will restart and the board configuration will reset	Reboot
Port1	Card Mode Configuration		
Port3	Card Mode	M6500-100G-TMXP2	*
🕀 🗖 Slot3 M6500-MXP10 : absent		Apply	

Figure 5-38 Operation Steps of M6500-TMXP2 Card Configuration

After the window to select card mode appears, select M6500-40G-TMXP2.

rd Mode M6500-40G-TMXP2 M6500-40G-TMXP2	MEEDO 40C TMYP2	
M6500-40G-TMXP2	vidde Midoud-1MXP2	v
WOOUUF4UGELWATZ	MSEON AND THYDD	
M6500-100G-TMXP2		

Figure 5-39 Selection of M6500-TMXP2 Card Mode

Apply M6500-40G-TMXP2 mode.

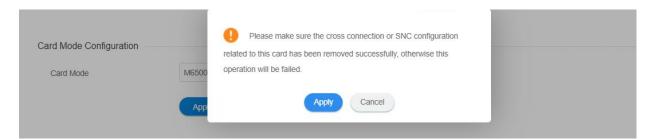


Figure 5-40 Apply M6500-TMXP2 Board Mode

After successful application, the board is initialized, as shown in the figure below:



Figure 5-41 M6500-TMXP2 Board Initialization

After a moment,NE synchronization is performed. The latest mode of M6500-TMXP2 board is synchronized.The operation steps are as follows: select NE, and click and select "*NE Management*" on the right , then click "*synchronization*" button on the right side of the NE synchronization module, the interface is as shown in the figure below:

🖹 😨 Global View	NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
 M6200-CH2U(10.32.130.110) M6200-CH2U-2(10.32.130.116) 	Modify NE						
🖽 🛑 M6500-CH2U(10.32.130.120)	modily HE						
□	Parent Node		Global View				
🕒 🚆 Shelf01	Group Name		M6500-CH5U				
🕀 📮 Slot1 M6500-NMU : normal							
Slot2 M6500-100G-TMXP2 : initializ	IP Address		10.32.130.220				
🗄 🗖 Slot3 M6500-MXP10 : absent							
Slot4 TMXP5-2X100G : absent	Subnet Mask		255.255.255.0				
- Port1			Apply Delete				
Port2							
Port3	Synchronize NE						
Slot5 TMXP5-2X100G : absent	Synchronize NE		Synchronization				
Port1							
Port2	Synchronize Cur	rrent Alarm	Synchronization				
Port3							
Slot6 M6500-MXP10 : normal	NE Current Alarm	ı					
Port1	NE Current Alarr	m	Check				

Figure 5-42 NE Synchronization

After successful synchronization, it is successfully switched to the M6500-40G-TMXP2 board mode, as shown in the figure below:

M6500 Series NE Configuration Manual

🗄 🚱 Global View	Card Current Alarm		
 M6200-CH2U(10.32.130.110) M6200-CH2U-2(10.32.130.116) 	Card Current Alarm	View the current board alarm information	Check
🗐 🛑 M6500-CH2U(10.32.130.120)	Slot Reboot		
☐	Card WarmReboot	The board will restart and the board configuration will not be lost	Reboot
🗄 🗖 Slot1 M6500-NMU : normal	Card ColdReboot	The board will restart and the board configuration will reset	Reboot
Slot2 M6500-40G-TMXP2 : normal			
🗄 🗖 Slot4 TMXP5-2X100G : absent	Card Mode Configuration	M6500-40G-TMXP2	-
□ □ Slot5 TMXP5-2X100G : absent	Card Would		
▲ Port1	TP Multiplexing Structure	Apply	
Port2 Port3	Port	3	*
Port4		■ ODU4(0)	
Port5		Clear All	

FS

Figure 5-43 Successful Switch of the Board Mode

At this time, 40G client side port mode can be selected: select NE-Slot 2, click on "*Port1*" and select "*Port Management*" on the right, the interface is as shown in the figure below:

Port Management F	luggable Configuration		
asicInfo			
Administrative State	Disabled		
Operational State	Down		
Availability	Empty		
Port Mode	FGE_GMP	•	
Port Description	OTU3 FGE_GMP Please input content		(Can not contain /: *? " <> special characters



5.4.2.2. Time Slot Configuration

When the board is in 100G mode, there is no need to configure time slot. When the board is in 40G mode, it needs to configure time slot.

Select NE, click on "Slot 2" and select "TP Multiplexing Structure" module, the steps are as shown in the figure below:

🖂 🐨 Global View	Card Current Alarm	
🕀 📄 M6800-TSP16(10.32.130.111)	Card Current Alarm	View the current board alarm information Check
🕀 📄 M6200-CH2U(10.32.130.110)		
🕀 📄 M6200-CH2U-No.2(10.32.130.116)	Slot Reboot	
 M6500-CH5U(10.32.130.220) M6500-CH2U(10.32.130.120) 	Card WarmReboot	The board will restart and the board configuration will not be lost Reboot
Shelf01	Card ColdReboot	The board will restart and the board configuration will reset
G Slot2 M6500-40G-TMXP2 : normal	Card Mode Configuration	
Port2	Card Mode	M6500-40G-TMXP2
Port3		Apply
 Slot3 M6500-NMU : normal Slot4 Empty : available 	TP Multiplexing Structure	
Slot5 M6500-2UPSM : normal	Port	3
Slot6 Empty : available		B ODU4(0)
Slot7 M6500-2UPSM : normal		
Slot8 Empty : available		Clear All

Figure 5-45 Operation Steps of M6500-TMXP2 TP Multiplexing

The interface is as shown in the figure below. Select ODU4 to demultiplex to ODU3 (ODU2&ODU2e are unavailable).

TP Multiplexing Structure		
Port	3	•
	■ ODU4(0)	
	ODU2 ODU2e ODU3 Clear All	

Figure 5-46 M6500-TMXP2 Demultiplexing Configuration Interface

ODU4 can be demultiplexed to 2*ODU3 and 31 time slots are configured for each ODU3.

ParentName	ODU4			
TP ID	1			v
TS	✓TS(#1)	✓TS(#2)	✓TS(#3)	✓TS(#4)
	✓TS(#5)	Image: Image	⊠ TS(#7)	Image: Image
	Image: Image	ITS(#10)	Image: Image	Image: Image
	✓TS(#13)	Image: TS(#14)	✓TS(#15)	Image: Image
	Image: Image	Image: TS(#18)	☑TS(#19)	Image: Image
	INC TS(#21)	Image: Image	☑ TS(#23)	✓TS(#24)
	INC TS(#25)	IS(#26)	☑TS(#27)	☑TS(#28)
	INTS(#29)	✓TS(#30)	✓TS(#31)	TS(#32)
	TS(#33)	TS(#34)	TS(#35)	TS(#36)
	TS(#37)	TS(#38)	TS(#39)	TS(#40)
	TS(#41)	TS(#42)	□TS(#43)	TS(#44)
	TS(#45)	TS(#46)	□ <mark>T</mark> S(#47)	TS(#48)
	TS(#49)	TS(#50)	TS(#51)	TS(#52)
	TS(#53)	TS(#54)	TS(#55)	TS(#56)

Figure 5-47 Time Slot Configuration of M6500-TMXP2 Demultiplex ODU3

When it is fully configured with 2*ODU3, the interface is as shown in the figure below:

TP Multiplexing Structure		
Port	3	v
	□→ b→ ODU4(0)	
	目 ODU3(1)(TS:1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	5,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31)
	DDU3(2)(TS:32,33,34,35,36,37,38,39,40,41,42,43,4	44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62)
	Clear All	



5.4.2.3. Cross-Connection Configuration

For example, if we need to create bidirectional cross-connection without protection of port 1 to port 3, the operation is as follows: Select HGE_GMP at the client side and select OCh (OTU4) at the line side, then ODU4 cross-connections established correspondingly, as shown in the figure below:

Add × 2 * Label 2WAY * Type Ŧ ODU4 Ŧ * Capacity A 1 * Shelf Ŧ 3 Ŧ * Slot 1 * Port Ŧ ODU4(0) * TP Ŧ Ζ 1 Ŧ * Shelf * Slot 3 Ŧ 1 * Port Ŧ ODU4(0) Ŧ * TP Add Close

Figure 5-49 M6500-TMXP2 Bidirectional Cross-Connection without Protection

The following figure shows that the cross-connection is successfully established.

Shelf View		Shelf Information	Slot Information	Card Information	SC1+1 Configuration	Business Configuration			
SNC Confi	iguration								
Please	e input conte	ent		Search					
Add		Delete							
	ΦID						↑ Oper	ation	
	2	2WAY		Slot3-port1-ODU4(0)	Slot3-port3-ODU4(0)		Delete	Protect	
	**			(- <i>)</i>	,, ,				

Figure 5-50 Successful Establishment of M6500-TMXP2 Bidirectional Cross-Connection without Protection

5.4.2.4. FEC Configuration

FEC is only configurable on OUT layer.

• Line Side Port

Select NE-Slot 2, click on "*Port 3*" and select" *Port Management*" on the right, and then select OCh (OTU4) as the port mode. In"*OTU4*" interface under "*Port Configuration*", select "*FEC type*" to view the configuration. There are in all 7 FEC modes for TMXP2 line side, which are respectively

G709FEC/SDFEC1/SDFEC2/SDFEC3/SDFEC1_Non-diff/SDFEC2_Non-diff/SDFEC3_Non-diff. SDFEC3 is the default mode, as shown in the figure below:

M6500-CH2U(10.32.130.120)	Port Management P	luggable Configuration			
B Slot1 TMXP5-4X40G-4X10G : norm	D-10-5-1-1-1				
Slot2 M6500-100G-TMXP2 : normal	Port Configuration				
Port1	Choose State	port			
- C Port2	Administrative State	Enabled	*	Operational State	Up
Port3				oportational oracio	
🕀 🖪 Slot3 M6500-NMU : normal	Availability State	Normal	v	Degrade Interval	2
Slot4 Empty : available					
Slot5 M6500-2UPSM : normal	Near End ALS	No	Ψ	Degrade Threshold	128459
Slot6 Empty : available	Loopback	NONE	~	FEC Type	SDFEC3
Slot7 M6500-2UPSM : normal	coopstant			120 ()p0	G709FEC SDFEC1
Slot8 Empty : available					SDFEC2 SDFEC3
Slot9 Empty : available	TIM Mode	NONE	Ŧ	Expected SAPI	SDFEC1 Non-diff SDFEC2 Non-diff
Slot10 M6500-2UFAN : normal	TIM AIS Insertion	False	*	Expected DAPI	SDFEC2_Non-diff SDFEC3_Non-diff
🖨 🛑 M6500-CH5U(10.32.130.220)					
🖨 🖀 Shelf01	Rx SAPI			Tx SAPI	Please input content
🕀 🖸 Slot1 M6500-NMU : normal					
🕀 🖸 Slot2 M6500-40G-TMXP2 : normal	Rx DAPI	&«uốølÔes⊒e⊒Hld		Tx DAPI	Please Input content
🕀 🗖 Slot3 M6500-MXP10 : absent	Rx Operator	èÝÙ[Î□ ∠ß+ĭ□□Ö□ëtÞè(àiñBvOμ;?×		Tx Operator	Please input content
🕀 🗖 Slot4 TMXP5-2X100G : absent					
B Slot5 TMXP5-2X100G : absent		DCN Apply			

Figure 5-51 FEC Configuration of M6500-TMXP2 Line Side Port

• Client Side 100G Port

Select NE-Slot 2, click on "*Port1*" and select" *Port Management*" on the right", and then select OTU4 as the port mode. In"*OTU4*" interface under" *Port Configuration*", select "*FEC type*" to view the configuration. There is only one default FEC mode for 100G client side, which is G709FEC, as shown in the figure below:

Port Configuration			
Choose State	OTU4 ODU4		
Administrative State	Enabled	Operational State	Up
Availability State	Normal	Degrade Interval	2
Near End ALS	No	Degrade Threshold	128459
Loopback	NONE	FEC Type	G709FEC *
TIM Mode	NONE	Expected SAPI	Please input content
TIM AIS Insertion	False	Expected DAPI	Please input content
Rx SAPI		Tx SAPI	Please input content
Rx DAPI	&«uõøiÔås⊡e⊡Xįd	Tx DAPI	Please input content
Rx Operator	âýŮ_Ĵ□ ¿&+ï□□Ô□ēlÛê(âêñBvOµ;?×	Tx Operator	Please input content
	DCN Apply		

Figure 5-52 FEC Configuration of M6500-TMXP2 Client Side 100G Port

• Client Side 40G Port

Select NE-Slot 2, click on "Port1" and select "Port Management" on the right, and then select OTU3 as the port mode. In "OTU3" interface under "Port Configuration", select "FEC type" to view the configuration. There are in all 4 FEC modes for the client side 40G, which are respectively No FEC/G709FEC/I.4EFEC/I.7EFEC. G709FEC is the default mode, the configuration is as shown in the figure below:

Port Configuration			
Choose State	OTU3 ODU3		
Administrative State	Enabled	Degrade Interval	2
Operational State	Up	Degrade Threshold	49424
Availability State	Normal	Near End ALS	No
Loopback	NONE	FEC Type	G709FEC V
			G709FEC
TIM Mode	NONE	Expected SAPI	1.4EFEC 1.7EFEC
TIM AIS Insertion	False	Expected DAPI	Please input content
Rx SAPI		T× SAPI	Please input content
Rx DAPI	⊡⊡eľv→′⊐q⊡°⊡ów¹	Tx DAPI	Please input content
Rx Operator	ÇαÑιασωιùiex *x64ÌyαDQiaaaó& gi	Tx Operator	Please input content
	DCN Apply		

Figure 5-53 FEC Configuration of M6500-TMXP2 Client Side 40G

5.4.3. M6500-TMXP5

M6500-TMXP5 port types are divided into 1 (port 1) 200G/100G line side interface (CFP2),

2 (ports 2-3) 100G client interface (QSFP28),

1 (port 3) 100G client interface (QSFP28)) and 2 (ports 5-6) 40G client-side interfaces (QSFP+),

1 (port 3) 100G client-side interfaces (QSFP28) and 3 (ports 4-6) 10G client-side interfaces (QSFP+),

4 (Ports 2-5) 40G client-side ports (QSFP+) and 1 (port 6) 10G client-side ports (QSFP+)

5 (ports 2-6) 10G client-side ports (QSFP+).

5.4.3.1. Service Type

• Line side port

Select the NE-Slot1, click on "*Port1*" and select "*Port Configuration*" on the right. The operation steps are shown in the figure below.

Global View	Port Management	Pluggable Configuration		
⊞ — — M6200-CH2U(10.32.130.110)				
B ■ M6200-CH2U-2(10.32.130.116)	BasicInfo			
Ф 🛑 М6500-СН2U(10.32.130.120)				
🗄 🚍 Shelf01	Administrative State	Disabled		
G Slot1 TMXP5-2X100G : normal	Operational State	Down		
Port1				
Port2	Availability	Empty		
Port3	Port Mode	OCh(OTUC2)	•	
🕀 🗖 Slot3 M6500-NMU : normal	Port Description	Please input content	(Can no	ot contain / : * ? " < > special characters)
Slot4 Empty : available				
Slot5 M6500-2UPSM : normal		Apply		

Figure 5-54 M6500-TMXP5 line side port information operation steps

Open the line side port management as below figure, and can choose the service type in port mode.

asicInfo			
Administrative State	Enabled		
Operational State	Up		
Availability	Normal		
Port Mode	OCh(OTUC2)	*	
Port Description	OCh(OTU4) OCh(OTUC2) Please input content	(C	tan not contain / : * ? " < > special characte

Figure 5-55 M6500-TMXP5 Line side port interface

• Client side port

M6500-TMXP5 client-side ports are divided into 100G, 40G, and 10G. According to different board modes, different client-side ports are displayed.

Select the NE-Slot 1, click on "*Slot 1*" and select "*Card Mode Configuration*" module on the right, the steps are shown in the figure below.

🖯 😵 Global View	Card Current Alarm		
 ➡ ■ M6200-CH2U(10.32.130.110) ➡ ■ M6200-CH2U-2(10.32.130.116) 	Card Current Alarm	View the current board alarm information	Check
🖨 🛑 M6500-CH2U(10.32.130.120)	Slot Reboot		
📋 🔚 Shelf01	51011105001		_
🛱 🗖 Slot1 TMXP5-2X100G : normal	Card WarmReboot	The board will restart and the board configuration will not be lost	Reboot
- Port1	Card ColdReboot	The board will restart and the board configuration will reset	Reboot
Port2		The board minitestant and the board configuration minitestor	
Port3	Card Mode Configuration		
B Slot2 M6500-40G-TMXP2 : normal			
🕀 🗖 Slot3 M6500-NMU : normal	Card Mode	TMXP5-2X100G	Ŧ
Slot4 Empty : available		Apply	
Slot5 M6500-2UPSM : normal	TP Multiplexing Structure		
Slot6 Empty : available	The manapioning officiare		
Slot7 M6500-2UPSM : normal	Port	1	*
Slot8 Empty : available		⊞- ≽ ODUC2(0)	
Slot9 Empty : available			
Slot10 M6500-2UFAN : normal		Clear All	

Figure 5-56 M6500-TMXP5 Board configuration operation steps

After selection, the card mode selection window appears.

The client side supports 100G and can choose TMXP5-2X100G, TMXP5-100G-10X10G, TMXP5-100G-2X40G;

The client side supports 40G and can choose TMXP5_4X40G-4X10G, TMXP5-100G-2X40G;

The client side supports 10G can choose TMXP5-20X10G, TMXP5-100G-10X10G, TMXP5_4X40G-4X10G.

Card Mode Configuration		
Card Mode	TMXP5-2X100G	Ŧ
	TMXP5-2X100G	
	TMXP5-20X10G	
	TMXP5-100G-10X10G	
	TMXP5-4X40G-4X10G	
TP Multiplexing Structure	TMXP5-100G-2X40G	

Figure 5-57 M6500-TMXP5 Card mode selection

Apply TMXP5_4X40G-4X10GMode.

Card Mode Configuration	Please make sure the cross connection or SNC configuration related to this card has been removed successfully, otherwise this
Card Mode	TMXPs operation will be failed.
	Apply Cancel

Figure 5-58 M6500-TMXP5 Board mode apply

After apply successfully, the board will be in initialization mode as shown below:

🖂 🚱 Global View
☐
🗐 📄 M6200-CH2U-2(10.32.130.116)
🖨 🛑 M6500-CH2U(10.32.130.120)
🗄 🗮 Shelf01
Slot1 TMXP5-2X100G : initializing

Figure 5-59 M6500-TMXP5 Board initialization

After a while, perform NE synchronization and synchronize the latest mode of the M6500-TMXP5 board. The operation steps are as follows: select the NE, click and select "*NE Management*" on the right, then click on "*synchronization*" button on the right side of the NE synchronization module, the interface is shown in the figure below.

Global View	NE View NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
■ ■ M6200-CH2U(10.32.130.110)						
🗄 🛑 M6200-CH2U-2(10.32.130.116)	Modify NE					
🛱 🗐 M6500-CH2U(10.32.130.120)	modify HE					
🕒 🚆 Shelf01	Parent Node	Global View				
Slot1 TMXP5-2X100G : initializing	Group Name	M6500-CH2U				
B Slot2 M6500-40G-TMXP2 : normal						
Slot3 M6500-NMU : normal	IP Address	10.32.130.120				
Slot4 Empty : available						
Slot5 M6500-2UPSM : normal	Subnet Mask	255.255.255.0				
Slot6 Empty : available		Apply Delete				
Slot7 M6500-2UPSM : normal						
Slot8 Empty : available	Synchronize NE					
Slot9 Empty : available	Synchronize NE	Synchronization				
Slot10 M6500-2UFAN : normal						
🖻 🗃 M6500-CH5U(10.32.130.220)	Synchronize Current Alarm	Synchronization				
B Shelf01						
🕀 🖪 Slot1 M6500-NMU : normal	Synchronize NE Histroy Alarm	Synchronization				
B Slot2 M6500-40G-TMXP2 : normal	Synchronize NE Event	Synchronization				

Figure 5-60 NE Synchronization

After the synchronization is successful, the TMXP5_4X40G-4X10G board card mode is successfully switched, as shown in the figure below.



Figure 5-61 The board mode switch successfully

• Client Side 100G

Select the NE-Slot 1, click on "*Port 3*" and select "*Port Configuration*" on the right. The operation steps are shown in the figure below.

Global View ■ ■ M6200-CH2U(10.32.130.110)	Port Management Plu	uggable Configuration	
 ■ ■ M6200-CH2U-2(10.32.130.116) □ M6500-CH2U(10.32.130.120) 	BasicInfo		
□ ■ Shelf01	Administrative State	Disabled	
GINT Slot1 TMXP5-2X100G : normal	Operational State	Down	
Port2	Availability	Empty	
Port3 Slot2 M6500-40G-TMXP2 : normal	Port Mode	HGE_GMP	
 Slot3 M6500-NMU : normal Slot4 Empty : available 	Port Description	Please input content	Can not contain /: *? " <> special characters)
Slot5 M6500-2UPSM : normal		Apply	

Figure 5-62 M6500-TMXP5 Client side 100G port information operation steps

Open the client-side port management interface as shown in the figure below, and you can select the service type in the port mode.

Port Management Plu	uggable Configuration		
BasicInfo			
Administrative State	Disabled		
Operational State	Down		
Availability	Empty		
Port Mode	HGE_GMP	•	
Port Description	OTU4 HGE_GMP HGE_GFPF		(Can not contain / ; * ? " < > special character
	Apply		

Figure 5-63 M6500-TMXP5 Client side 100G port interface

• Client side 40G port

First switch the card mode to the corresponding mode. Choose NE--Slot 1, click on "*Port 5*" and choose "*Port management*" on the right, as shown in below:

🖂 😵 Global View	Port Management P	luggable Configuration	
🕀 🛑 M6200-CH2U(10.32.130.110)	~		
🖽 🛑 м6200-CH2U-2(10.32.130.116)	BasicInfo		
🖶 🗃 M6500-CH2U(10.32.130.120)			
🗄 🗮 Shelf01	Administrative State	Disabled	Ŧ
Slot1 TMXP5-4X40G-4X10G : norm Port1	Operational State	Down	
Port2	Availability	Empty	
Port3	Port Mode	FGE_GMP OTU3	v
Port5	Port Description	FGE_GMP Frease input content	(Can not contain / : * ? " < > special characters)
Port6.2		Apply	

Image5-64 M6500-TMXP5 Client side 40G port interface

• Client side 10G port

First switch the card mode to the corresponding mode. Choose NE--Slot 1, click on "*Port 6.1*" choose "*Port management*", as shown in below:

 ☐ Global View ☐ M6200-CH2U(10.32.130.110) 	Port Management Plugga	able Configuration	
 ➡ ■ M6200-CH2U-2(10.32.130.116) ➡ ■ M6500-CH2U(10.32.130.120) 	BasicInfo		
Ġ- ≣ Shelf01	Administrative State	Disabled	
E Slot1 TMXP5-4X40G-4X10G : norm	Operational State	Down	
Port2	Availability	Empty	
Port3	Port Mode	XGE_BMP)
Port5	Port Description	XGE_GFPF XGE_GFPFextp STM64_AMP	(Can not contain <i>f</i>) * ? " < > special characters)
Port6.2		OC192_AMP OTU2 OTU2e STM64_BMP OC192_BMP	
	Port Configuration		

Figure 5-65 M6500-TMXP5 Client side 10G port interface

5.4.3.2. Time slot configuration

When the board is in the 2X100G mode, there is no need to configure the time slot, and the other board modes all need to configure the time slot.

Take TMXP5-4X40G-4X10G as an example

Select the NE-Slot1 and on the right side there is "*TP Multiplexing Structure*" module, the steps are shown in the figure below.

🖃 🚷 Globa	al View	Card Current Alarm		
	16200-CH2U(10.32.130.110) 16200-CH2U-2(10.32.130.116)	Card Current Alarm	View the current board alarm information	Check
	16500-CH2U(10.32.130.120)	Slot Reboot		_
E	Slot1 TMXP5-4X40G-4X10G norm	Card WarmReboot	The board will restart and the board configuration will not be lost	Reboot
	Dort1	Card ColdReboot	The board will restart and the board configuration will reset	Reboot
	Port2			
	Port3	Card Mode Configuration		
	Port4	1200120000		
	Port5	Card Mode	TMXP5-4X40G-4X10G	Ŧ
	Port6.1		Apply	
	Port6.2	TP Multiplexing Structure		
	Port6.3			
	Port6.4	Port	1	•
E	🗄 🖸 Slot2 M6500-40G-TMXP2 : normal		⊞ 🚡 ODUC2(0)	
E	🖹 🞑 Slot3 M6500-NMU : normal			
	MGMT1		Clear All	

Figure 5-66 M6500-TMXP5 TP Multiplexing operation steps

The interface after opening is as follows, select ODU4, it can be demultiplexed into ODU3 and ODU2/ODU2e.

Port	1
	🖃 🍃 ODUC2(0)
	- DU4(1)
	■ ODU4(2)

Figure 5-67 M6500-TMXP5 Demultiplexing configuration interface

Each ODU4 can be demultiplexed into 2 ODU3 in total, each ODU3 is configured with 31 time slots; and 2 ODU2/2e, each ODU2/2e is configured with 8 time slots.

ParentName	ODU4			
TP ID	1			
rs	✓TS(#1)	✓TS(#2)	✓TS(#3)	✓TS(#4)
	✓TS(#5)	✓TS(#6)	✓TS(#7)	✓TS(#8)
	✓TS(#9)	Image: State of the state o	✓TS(#11)	Image: TS(#12)
	✓TS(#13)	ITS(#14)	✓TS(#15)	☑TS(#16)
	TS(#17)	Image: State of the state o	✓TS(#19)	✓TS(#20)
	ITS(#21)	Image: State of the state o	☑ TS(#23)	✓TS(#24)
	Image: Image	Image: TS(#26)	Image: Image	☑TS(#28)
	INCENTIAL INTERNA INTERN	✓ TS(#30)	✓TS(#31)	TS(#32)
	TS(#33)	TS(#34)	TS(#35)	TS(#36)
	TS(#37)	TS(#38)	□TS(#39)	TS(#40)
	TS(#41)	TS(#42)	T S(#43)	TS(#44)
	TS(#45)	TS(#46)	TS (#47)	TS(#48)
	TS(#49)	TS(#50)	TS(#51)	TS(#52)
	TS(#53)	TS(#54)	TS(#55)	TS(#56)

Figure 5-68 M6500-TMXP5 Demultiplexing ODU3 time slot configuration

ParentName	ODU4			
TP ID	1			v
TS	✓TS(#1)	✓TS(#2)	✓TS(#3)	✓TS(#4)
	✓TS(#5)	Image: State of the state o	✓TS(#7)	Image: Image
	TS(#9)	TS(#10)	TS(#11)	TS(#12)
	TS(#13)	TS(#14)	TS(#15)	TS(#16)
	TS(#17)	TS(#18)	TS(#19)	TS(#20)
	TS(#21)	TS(#22)	TS(#23)	TS(#24)
	TS(#25)	TS(#26)	TS(#27)	TS(#28)
	TS(#29)	TS(#30)	TS(#31)	TS(#32)
	TS(#33)	TS(#34)	TS(#35)	TS(#36)
	TS(#37)	TS(#38)	TS(#39)	TS(#40)
	TS(#41)	TS(#42)	TS(#43)	TS(#44)
	TS(#45)	TS(#46)	TS(#47)	TS(#48)
	TS(#49)	TS(#50)	TS(#51)	TS(#52)
	TS(#53)	TS(#54)	TS(#55)	TS(#56)

Figure 5-69 M6500-TMXP5 Demultiplexing ODU2/2e time slot configuration

Fully configure 2 * ODU3 and 2*ODU2/2e is shown as below figure.

TP Multiplexing Structure		
Port	1	Ψ.
	🖃 🍃 ODUC2(0)	
	DDU4(1)	
		6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31)
		4,35,36,37,38,39)
	昌 ODU2e(1-3)(TS:40,41,4	2,43,44,45,46,47)
	—————————————————————————————————————	

Figure 5-70 M6500-TMXP5 demultiplexing 2*ODU3 and ODU2/2e configuration results

5.4.3.3. Cross configuration

Taking the establishment of 40G service as an example, the operation is as follows: select FGE_GMP on the client side and OCh (OTUC2) on the line side, corresponding to the establishment of ODU3 crossover, as shown in the following figure.

Label	1	
Туре	2WAY	v
Capacity	ODU3	v
A		
Shelf	1	v
Slot	1	v
Port	Port1	Ψ.
TP	ODU3(1-1)(TS:1,2,3,4,5,6,7,8,9,10,11,12,	13,14,15,16,17,18,19,20,21,22,2%,
z		
Shelf	1	v
Slot	1	v
Port	Port2	

Figure 5-71 M6500-TMXP5Two-way cross without protection

The cross establishment is successful as shown in the figure below.

Delete Protect
Delete

Figure 5-72 Two-way without protection cross established successfully

5.4.3.4. FEC Configuration

FEC only can be configured in OTU layer.

• Line side port

Select NE-Slot 1, click on "*Port1*" and select "*Port Management*" on the right, select OCh (OTUC2) or OCh (OTU4) as the port mode, select "*OTUC2*" or "*OTU4*" under "*Port Configuration*" and "*FEC Type*" option, check the configuration. When the line side is in 2*100G mode, there are a total of 6 FEC modes on the M6500-TMXP5 line side, which are

SDFEC1_8QAM/SDFEC2_8QAM/SDFEC3_8QAM/SDFEC1_16QAM/SDFEC2_16QAM/SDFEC3_16QAM, and when the line side is 7 in the default mode, SDFEC3_16QAM is the default mode. The FEC modes are G709FEC/SDFEC1/SDFEC2/SDFEC3/SDFEC1_Non_diff/SDFEC2_Non_diff/SDFEC3_Non_diff, and SDFEC3 is the

default mode. As shown below.

Port Management Plug	gable Configuration				
BasicInfo					
Administrative State	Enabled	×			
Operational State	Down				
Availability	Notinstalled				
Port Mode	OCh(OTUC2)	*			
Port Description	Please input content	(Can not conta	in / : * ? " < > special characters)		
	Apply				
Port Configuration					
Choose State	Interface				
Administrative State	Enabled		Operational State	Up	
Availability State	Normal	*	FEC Type	SDFEC3_16QAM SDFEC1_8QAM SDFEC2_8QAM	v
Loopback	NONE	•		SDFEC2_80AM SDFEC3_80AM SDFEC1_160AM SDFEC2_160AM	
	Apply			SDFEC3_16QAM	
Port Management P	luggable Configuration				
Port Configuration					
Choose State	• OTU4 ODU4				
Administrative State	Enabled	•	Operational State	Up	
Availability State	Normal		Degrade Interval	2	
Near End ALS	No	*	Degrade Threshold	128459	
Loopback	NONE	₹.	FEC Type	G709FEC G709FEC SDFEC1	· · · · ·
TIM Mode	NONE	*	Expected SAPI	SDFEC2 SDFEC3 SDFEC1_Non-diff	
TIM AIS Insertion	False		Expected DAPI	SDFEC2_Non-diff SDFEC3_Non-diff	
Rx SAPI			Tx SAPI	Please input content	
Rx DAPI	DÛ°ùÔDÆÀi≁Ð9D		Tx DAPI	Please input content	
Rx Operator	ή޻K%B£⊟{,≺a 2Fī⊡åçi4à/⇔ÿüĺė		Tx Operator	Please input content	
	DCN Apply				



• Client Side 100G port

Select the NE-Slot 1, click on "*Port1*" and select "*Port Management*" on the right, select OTU4 as the port mode, and select the "*FEC Type*" option on the "*OTU4*" interface under "*Port Configuration*" to view the configuration ,

There are 7 types of 100G on the client side, and the default FEC mode is G709 FEC. The configuration is shown below.

ort Configuration					
Choose State	OTU4 ODU4				
Administrative State	Enabled	▼ Operat	ional State	Up	
Availability State	Normal	▼ Degrad	le Interval	2	
Near End ALS	No	▼ Degrad	le Threshold	128459	
Loopback	NONE	▼ FEC T	rpe	G709FEC G709FEC	Ŧ
				SDFEC1 SDFEC2	
TIM Mode	NONE	▼ Expect	ed SAPI	SDFEC3 SDFEC1_Non-diff	
TIM AIS Insertion	False	Expect		SDFEC2_Non-diff SDFEC3_Non-diff	
TIM AIS Insertion	Faise	* Expect	ed DAPI	- Licase input content	
Rx SAPI		Tx SAF	21	Please input content	
Rx DAPI	□Û°ùÔ□ÆĂĩ+Đ9□	Tx DAP	p	Please input content	
Rx Operator	ή޻k′%B£□{,<`a 2Fī⊡åçi4à/⇔ÿülė	Tx Ope	erator	Please input content	

Figure5-74 M6500-TMXP5 Client side 100G Port FEC configuration

• Client side 40G port

Select the NE-Slot 1, click on "*Port 2*" and select "*Port Management*" on the right, select OTU3 for the port mode, select the "*FEC Type*" option on the "*OTU3*" interface under "*Port Configuration*", on the client side there are 4 FEC modes for 40G, namely no FEC/G709FEC/I.4EFEC/I.7EFEC, among which G709FEC is the default mode. The configuration is shown below.

t Configuration				
Choose State	OTU3 ODU3			
Administrative State	Enabled	Tegrade Inte	2	
Operational State	Up	Degrade Thr	49424	
Availability State	Normal	Near End AL	No	
Loopback	NONE	▼ FEC Type	G709FEC NOFEC	
TIM Mode	NONE	▼ Expected SA	G709FEC I.4EFEC I.7EFEC	
TIM AIS Insertion	False	▼ Expected DA	Please input content	
Rx SAPI		Tx SAPI	Please input content	
Rx DAPI	SWÊþ*ÅÞ□_□{íùxà	Tx DAPI	Please input content	
Rx Operator	□g_N(Ü.a□□□?rĐp*⊡·∾~~□ òA}Õ□uuÈÅ	Tx Operator	Please input content	

Figure 5-75 M6500-TMXP5 Client side 40G port FEC configuration

• Client side 10G Port

Select the NE-Slot 1, click on "*Port 6.1*" and select "*Port Management*" on the right, select OTU2 as the port mode, select the "*FEC Type*" option on the "*OTU2*" interface under "*Port Configuration*", on the client side There are 4

FEC modes for 10G, namely no FEC/G709FEC/I.4EFEC/I.7EFEC, among which G709FEC is the default mode. The configuration is shown below.

Shelf01	Port Management P	luggable Configuration			
Slot1 TMXP5-4X40G-4X10G : norm					
	Port Configuration				
Port2	Choose State	OTU2 ODU2			
Port3					
Port4	Administrative State	Enabled	Ŧ	Degrade Interval	2
Port5	Operational State	Up		Degrade Threshold	12304
Port6.1	operational state	ob		Degrade micanola	12004
Port6.2	Availability State	Normal	*	Near End ALS	No
Port6.3					
Port6.4	Loopback	NONE	Ŧ	FEC Type	G709FEC NoFEC
G Slot2 M6500-100G-TMXP2 : normal					G709FEC L4EFEC
🕒 🖸 Slot3 M6500-NMU : normal	TIM Mode	NONE	~	Expected SAPI	1.7EFEC
Slot4 Empty : available					
Slot5 M6500-2UPSM : normal	TIM AIS Insertion	False	Ψ.	Expected DAPI	Please input content
Slot6 Empty : available	Rx SAPI			Tx SAPI	Please Input content
Slot7 M6500-2UPSM : normal					
Slot8 Empty : available	Rx DAPI	DDDïêDDDFàDvp(g		Tx DAPI	Please input content
Slot9 Empty : available					
Slot10 M6500-2UFAN : normal	Rx Operator	wDDiY^D%DLizÔDDDD%soøD§DD9Dx+Dc		Tx Operator	Please input content
M6500-CH5U(10.32.130.220)		DON Apply			

Figure 5-76 M6500-TMXP5 Client side 40G Port FEC configuration

5.5. Configuration Example

5.5.1. Configuration Example of Ring Network Service

Here we take the ring network of Site A, Site B and Site C in M6500-TMXP2 board access 100G service as an example.

Configure the service type of the client side port1 as 100GE_GMP/GFPF, and the mode of the lien side port3 as OTU4 or OCh (OTU4).

Port Management	Pluggable Configuration	
BasicInfo		
Administrative State	Enabled	•
Operational State	Up	
Availability	Normal	
Port Mode	HGE_GMP	Ŧ
Port Description	Please input content	(Can not contain /: *? " <> [special characters)
	Αρρίγ	

Figure 5-77 Configure Client Side Signal Mode

sicInfo			
Administrative State	Enabled	Ŧ	
Operational State	Up		
Availability	Normal		
Port Mode	OCh(OTU4)	*	
Port Description	Please input content		(Can not contain / : * ? " < > special characte

Figure 5-78 Configure Line Side Signal Mode

Create cross-board two-way SNC cross-connection for ODU4 of the client side port1 to port3.

Add		×
* Label	3	
* Туре	2WAYPR	Ψ.
* Capacity	ODU4	v
A		
* Shelf	1	Ψ.
* Slot	3	v
* Port	1	Ψ.
* TP	ODU4(0)	•
z		
* Shelf	1	
* Slot	3	Ŧ
* Port	3	•
* TP	ODU4(0)	Ŧ

AFIOLECI	ion 🔵	
* Shelf	1	Ŧ
* Slot	1	Ŧ
* Port	1	v
* TP		Ŧ
Z Protect	ion 🖲	
* Shelf	1	Ŧ
	2	· · · · · · · · · · · · · · · · · · ·
* Shelf * Slot * Port		



Build the environment according to the following diagram.

Rote

- Respectively create the two-way SNC cross-connection with protection of port1 to port3 (primary)/port3 (standby) at Site A and Site C.
- Ensure that the client side service types including mapping methods of Site A and Site C are the same.
- Create two-way cross-connection for ODU4 of port3 to port3 at Site B. Site B acts as the transparent transmission site.

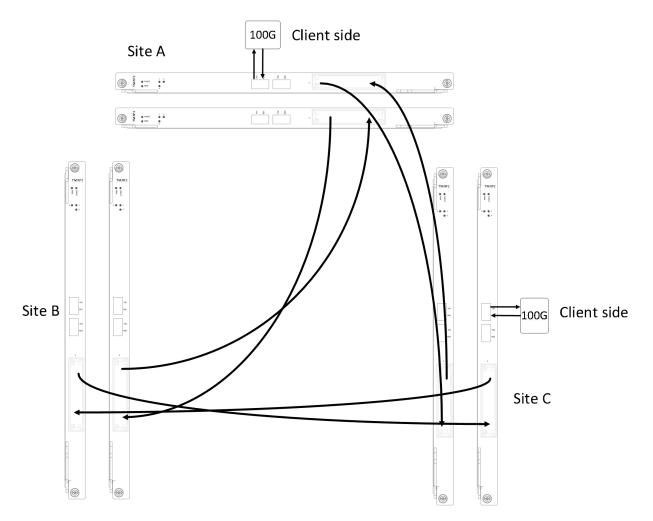


Figure 5-80 Site-to-Site Primary and Standby Protection Environment

6. Overhead Configuration

6.1. Configuration Rules

The G.709 standard defines the overhead function of the OTN frame structure and the network of each layer. M6500adopts a lot of overhead bytes, which provides great convenience for equipment maintenance.

M6500usually configures overhead such as SM, PM, TCMi (i = $1 \sim 6$)etc. This chapter describes in detail the configuration methods of various overhead, including: configuration rules, configuration steps and configuration examples.

6.1.1. SM, PM & TCMi Overhead Introduction

SM is the segment monitoring overhead byte of OTUk layer. By configuring the SM overhead, the performance and fault monitoring of the electrical regeneration segment can be carried out.

PM is the path monitoring overhead byte of ODUk layer. By configuring the PM overhead, the performance and failure of end-to-end wavelength service channel can be monitored.

The PM monitoring connection of the service should be established between the network elements of the service two ends. The SM monitoring connection of the service should be established between the service network element and the electrical relay network element or between the relay network element and the power. This product has no electrical relay applications, so SM planning and PM planning are usually the same.

6.1.2. Overhead Configuration Rules

SM and PM monitoring overhead can be configured on branch interface cards, line interface cardsand optical forwarding cards. The general principles are as follows (priority is determined in sequence):

1. SM must be terminated between the network elements at both ends of the power layer service, and the intermediate network elements can go through the optical layer without overhead monitoring.

2. For non-OTUk/ODUk services, when it is multiplexed or mapped to OTUk/ODUk services, the OTUk/ODUk services must establish PM connections, that is, PM connection enablement and monitoring enablement must be activated.

3. For OTUk services, the network elements connected with PM overhead need to be configured, but PM connection enablement must be prohibited. Monitoring enablement can be configured to "activate" or "inactivate" and it is suggested that it be set to activate. For ODUk services, PM monitoring enablement must be activated because there is no SM.

4. When OTUj / ODUj services are multiplexed and mapped to OTUk / ODUk (j < k) services, the location where configuration monitoring enable "activation" / "inactivation" includes the call port (such as the Client / Port port) and the call ODTUjk port.

6.1.3. TTI Configuration Rules

After configuring the connection enablement or monitoring enablement of SM and PM, TTI is also required to be configured. TTI is a path trace marker that exists in PM and SM overhead bytes to test whether the corresponding overhead is correctly connected.

TTI includes SAPI and DAPI. SAPI value and DAPI value sent by single card at the opposite end are required to be consistent with SAPI value and DAPI value expected to be received by single card at the local end, and SAPI value and DAPI value sent by single card single card at the local end are consistent with SAPI value and DAPI

value expected to be received at the opposite end. That is to say, the two network elements connected by the overhead should meet the rules as shown in table 6-1:

NE A		Set Relationship	NE B	
Send TTI	SAPI	=	SAPI	Receive TTI
	DAPI	=	DAPI	
Receive TTI	SAPI	=	SAPI	Send TTI
	DAPI	=	DAPI	

6.2. Configuration Steps

6.2.1. SM Configuration Steps

Here we take M6500-MXP10 board as an example to introduce the SM configuration steps:

• Activate the connection and monitoring enablement of SM overhead.

In M Series NMS, the service XGE_GFPF is configured for port 1 of the local end and opposite end of M6500-MXP10 board (Specific service is configured according to actual demand). OTU4 service is configured for port 11 of the local-end and opposite-end board (Specific service is configured according to actual demand). Demultiplex ODU4 to ODU2, configure service cross-connection, connect optical fiber and build the environment.

Configuration Steps

Click on port 11 at the local end to enter the port management interface of the local end. Click on and enter"*OTU4*" option interface, then set"*Path Trace Mismatch (TIM) Mode*" as"*Source & Destination Access Identifier*"(SAPI&DAPI), and set the status of"*Path Trace Mismatch (TIM) Affects Service*" as"*Yes*". The opposite-end SM overhead configuration method is the same as that of the local end, we will not go into much detail here.

		Monitor	Global	Configuration		X Maintain		4.32 root (
🕀 😵 Global View								
🕀 🛑 M6800-TSP16(10.32.130.111)	Port Management PI	luggable Configuration						
🖽 🛑 M6200-CH2U(10.32.130.110)								
■ ● M6200-CH2U-No.2(10.32.130.116)	BasicInfo							
■ ■ M6500-CH5U(10.32.130.220)	Administrative State	Enabled			w.			
🖽 🛑 M6500-CH2U(10.32.130.120)	Administrative State	Chabled						
🖨 🛑 M6500-CH2U-No.2(10.32.130.160)	Operational State	Up						
🖹 🗮 Shelf01								
🛱 🖸 Slot1 M6500-MXP10 : normal	Availability	Normal						
- Port1	Port Mode	OTU4			Ŧ			
- Port2	FOILWOUE	0104						
Port3	Port Description	Please input content				(Can not contain / : * 7 * < > special cf	varacters)	
Port4								
Port5		Apply						
- O Port6	Port Configuration							
- Port7		270222						
Port8	Choose State	● OTU4 ○ C	DU4					
Port9	Administrative State	Enabled				Operational State	Down	
Port10								
@ Port11	Availability State	Failed			*	Degrade Interval	2	

Figure6-1 Enter Port Management Interface

Pluggable Configuration		
Disabled	•	
Up		
Normal		
OTU4	T	
OCh(OTU4) Please input content	(Can not contain / ; * ? " < > spec	ial characters)
	Disabled Up Normal OTU4 OCh(OTU4)	Disabled Up Up Normal OTU4 COTU4 COTU4 COTUA C

Figure6-2 Select Port Service

		Monitor	(Siobal	Configuration	X Maintain
 Global View M6800-TSP16(10.32.130.111) M6200-CH2U(10.32.130.110) M6200-CH2U-No.2(10.32.130.116) 	Card Current Alarm Card Current Alarm Slot Reboot	View the current board ali	arm information	Ct	eck
M6500-CH5U(10.32.130.220) M6500-CH2U(10.32.130.120) M6500-CH2U-No.2(10.32.130.160) Shelf01	Card WarmReboot	The board will restart and The board will restart and			boot
Slot1 M6500-MXP10 : normal Port1 Port2 Port3 Port4 Port5	TP Multiplexing Structure	11 DDU4(0) Clear All			•

Figure6-3 Enter TP Multiplexing Interface

P Multiplexing Structu	re		
Port	11	•	
	⊞ /_ ODU4(0)		
	ODU2 ODU2e Clear All		

Figure6-4 TP Multiplexing Configuration Step 1

ODU4 To OD)U2			
ParentName	ODU4			
TP ID	2			v
TS	TS(#1)	TS(#2)	TS(#3)	TS(#4)
	TS(#5)	TS(#6)	TS(#7)	TS(#8)
	✓TS(#9)	✓TS(#10)	✓TS(#11)	✓TS(#12)
	TS(#13)	✓TS(#14)	✓TS(#15)	✓TS(#16)
	TS(#17)	TS(#18)	TS(#19)	TS(#20)
	TS(#21)	TS(#22)	TS(#23)	TS(#24)
	TS(#25)	TS(#26)	TS(#27)	TS(#28)
	TS(#29)	TS(#30)	TS(#31)	TS(#32)
	TS(#33)	TS(#34)	TS(#35)	TS(#36)
	TS(#37)	TS(#38)	TS(#39)	TS(#40)
	TS(#41)	TS(#42)	TS(#43)	TS(#44)
	TS(#45)	TS(#46)	TS(#47)	TS(#48)
	TS(#49)	TS(#50)	TS(#51)	TS(#52)
	TS(#53)	TS(#54)	TS(#55)	TS(#56)

Apply Close

Figure6-5 TP Multiplexing Configuration Step 2

Port Management Pl	uggable Configuration		
Port Configuration			
Choose State	○ port		
Administrative State	Enabled -	Operational State	Up
Availability State	Normal	Degrade Interval	2
Near End ALS	No	Degrade Threshold	128459
Loopback	NONE	FEC Type	G709FEC 💌
TIM Mode	NONE	Expected SAPI	Please input content
TIM AIS Insertion	False v	Expected DAPI	Please input content
Rx SAPI		Tx SAPI	Please input content
Rx DAPI	'Cé,qª¦åU□□4 1□	Tx DAPI	Please input content
Rx Operator	P}~i□[H□□];¿i□+«h□^×דMÆnE [−] *±])ôv	Tx Operator	Please input content
	DCN Apply		

Figure6-6 Click to Enter OTU4 Port Interface

Port Management	Pluggable Configuration		
Port Configuration			
Choose State	port		
Administrative State	Enabled	Operational State	Up
Availability State	Normal	Degrade Interval	2
Near End ALS	No	Degrade Threshold	128459
Loopback	NONE	FEC Туре	G709FEC 👻
		_	
TIM Mode	SAPI_DAPI	Expected SAPI	Please input content
TIM AIS Insertion	True	Expected DAPI	Please input content
Rx SAPI		Tx SAPI	Please input content
Rx DAPI	'Cé,qªåU□□4 1□	Tx DAPI	Please input content.
Rx Operator	P}~□[H□□]¿1□+«h□^^דM/EnE¯®±j)ôv	Tx Operator	Please input content
	DCN Apply		



• TTI Configuration

Enter"*OTU4*" interface of the local and opposite ends to configure"*Send TTI*" and "*Expect to Receive TTI*" of "*SM*" overhead for the corresponding port. The configuration rules are as shown in the table above. Configure the expected and sent source access point identifier (SAPI), the expected and sent destination access point identifier (DAPI). The opposite-end TII configuration method is the same as that of the local end.

Port Management	Pluggable Configuration		
Port Configuration			
Choose State	port OTU4 ODU4 ODU2e ODU2 ODU2e ODU2 ODU2 ODU2 ODU2 ODU2		
Administrative State	Enabled 💌	Operational State	Up
Availability State	Normal	Degrade Interval	2
Near End ALS	No	Degrade Threshold	128459
Loopback	NONE	FEC Type	G709FEC *
LUOPUALK	HOTE .	FEG type	STURIES *
TIM Mode	SAPI_DAPI -	Expected SAPI	A
TIM AIS Insertion	True	Expected DAPI	В
Rx SAPI		Tx SAPI	c
Rx DAPI	'Cé,q"¦åU□□4 1□	Tx DAPI	D
Rx Operator	P}~i□[H□□];j1□+«h□^~×"MÆnE [¯] °±])ôv	Tx Operator	Please input content.
			Construction of the second sec
	DCN Apply	All Diable Decented	

Figure 6-8 Configure Local-End TTI

Port Management F	Pluggable Configuration		
Port Configuration			
Choose State	◎ port		
Administrative State	Enabled	Operational State	Up
Availability State	Normal	Degrade Interval	2
Near End ALS	No	Degrade Threshold	128459
Loopback	NONE	FEC Type	G709FEC 💌
TIM Mode	SAPI_DAPI	Expected SAPI	D
TIM AIS Insertion	True	Expected DAPI	С
Rx SAPI		Tx SAPI	В
Rx DAPI	'Cé,qªåU⊡⊒4]1⊡	Tx DAPI	A
Rx Operator	$P_{I}(H_{I})_{I}(I_{I}) = P_{I}(I_{I})_{I}(I_{I}) = P_{I}(I_{I})_{I}(I_{I}) = P_{I}(I_{I})_{I}(I_{I})$	Tx Operator	Please input content
	DCN Apply		

Figure 6-9 Configure Opposite-End TTI

Attention

The Source Access Identifier and Destination Access Identifier values in the TTI overhead can be either default or arbitrary strings.

6.2.2. PM Configuration Steps

• Activate the connection and monitoring enablement of PM overhead.

In M Series NMS, the service XGE_BMP is configured for port 1 of the local end and opposite end of M6500-MXP10 board (Specific service is configured according to actual demand). OTU4 service is configured for port 11 of the local-end and opposite-end board (Specific service is configured according to actual demand).

Demultiplex ODU4 to ODU2e, configure service cross-connection, connect optical fiber and build the environment.

For line side Port 11: If the status of ODU layer is "unterminated", then only expected TTI can be set, but sent TTI cannot be set. It is used as a monitoring function, which checks whether the signal received on the line side is correct.

For client side Port 1: If the status of ODU layer is "client side signal terminated", then both expected TTI and sent TTI can be set. They are used to test the signal, which tests whether the client side signal sending source and receiving source are correct. The PM overhead configuration of the opposite end is the same as that of the local end. We will not go into too much detail.

🗄 😵 Global View	Port Management	Pluggable Configuration		
■ ■ M6800-TSP16(10.32.130.111)	BasicInfo			
🖽 💼 M6200-CH2U(10.32.130.110)	Dasicilio			
⊞ @ M6200-CH2U-No.2(10.32.130.116)	Administrative State	Enabled	Ŧ	
🕀 🗊 M6500-CH5U(10.32.130.220)	Operational State			
🖽 🛑 M6500-CH2U(10.32.130.120)	Operational State	Up		
🕀 🗃 M6500-CH2U-No.2(10.32.130.160)	Availability	Normal		
🖨 🗮 Shelf01				
🖯 🗖 Slot1 M6500-MXP10 : normal	Port Mode	OTU4	Ψ.	
- 🖸 Port1	Port Description	Please input content	(Can not contain /: *? * <> special characters)	
Port2	Port Description	FIGLIC INPA CONCIN		
Port3		Apply		
Port4				
Port5	Port Configuration			
Port6	Choose State	OTU4 ODU4		
Port7	Administrative State	Enabled	Operational State Down	
Port8	Automistrative state	LINDEG	· Operational state	
Port9	Availability State	Failed	Degrade Interval 2	
- Port10				
- C Port11	Near End ALS	No	▼ Degrade Threshold 128459	



Configuration			
hoose State	© port ⊚ 0TU4 ⊚ 0	ODU2e	
Please input content		Search	
ODU2e		Operational State	
1	Enabled	Up	Management
2	Enabled	Up	Management
3	Enabled	Up	Management
4	Enabled	Up	Management
5	Enabled	Up	Management
6	Enabled	Up	Management
7	Enabled	Up	Management
8	Enabled	Up	Management
9	Enabled	Up	Management
10	Enabled	Up	Management

Figure6-11 Enter Line Side ODU2e Management Interface

Management ODU2e		×
Administrative State	Enabled	•
OPU State	Intact	
Operational State	Up	
Rx PT		
Availability State	Normal	Ŧ
Tx PT		
PLM AIS Insertion		•
Expected PT		
Degrade Interval	2	
Degrade Threshold	12748	
NIM	Enabled	•

TIM Mode	SAPI_DAPI	
Expected SAPI	Please input content	
TIM AIS Insertion	True	
Expected DAPI	Please input content	
Rx SAPI	уууууууууууууу	
Tx SAPI		
Rx DAPI	ууууууууууууу	
Tx DAPI		
Rx Operator	<u>ŶŶŷŶŷŶŷŶŷŶŷŶŷŶŷŶŷŶŷŶŷŷŷŷŷŷŷŷŷŷŷŷŷŷŷ</u>	
Tx Operator		



🗄 😵 Global View				
🗐 🛑 M6800-TSP16(10.32.130.111)	Port Management	Pluggable Configuration		
🕀 📄 M6200-CH2U(10.32.130.110)				
🕀 🛑 M6200-CH2U-No.2(10.32.130.116)	BasicInfo			
□ ■ M6500-CH5U(10.32.130.220)	Administrative State	Disabled	*	
☐ ■ M6500-CH2U(10.32.130.120)				
🕒 📄 M6500-CH2U-No.2(10.32.130.160)	Operational State	Down		
🖻 🗮 Shelf01				
🖯 🗖 Slot1 M6500-MXP10 : normal	Availability	Empty		
- @ Port1	Port Mode	XGE_BMP	*	
Port2				
Port3	Port Description	Please input content	(Can not contain / : * ? " <> special characters)	
Port4				
🔂 Port5		Apply		

Figure6-13 Enter Client Side Port Management Interface

hoose State	OTU2e	ODU2e		
Please input co	ontent		Search	
ODU2e	↑ Administrative State		↑ Operational State	↑ Operation
0	Enabled		Up	Management

Management ODU2e \times Administrative State Enabled Ŧ OPU State Client Operational State Up Rx PT 0×97 Availability State NotConnected 0×3 Tx PT True PLM AIS Insertion Ŧ Expected PT 0x3 Degrade Interval 2 Degrade Threshold 12748

Figure6-14 Enter Client Side ODU2 Management Interface

TIM Mode	SAPI_DAPI	*
Expected SAPI	Please input content.	
TIM AIS Insertion	False	
Expected DAPI	Please input content	
Rx SAPI		
Tx SAPI	Please input content	
Rx DAPI	4RÜ8\⊭⊡°⊐Q?ê«⊐î	
TX DAPI	Please input content	
Rx Operator	=ê□z²e;â>åþ<Éēå¼üwV¾⊘D+□mE-[Áét	
Tx Operator	Please input content	

Figure6-15 Set Client Side PM Overhead

• TTI Configuration

Enter"ODU2"/"ODU2e"interface of line side local and opposite ends to configure "Expected Receiving TTI" of "PM" overhead for the corresponding port and to monitor whether the line side receiving signal is correct. Configure the expected source access point identifier (SAPI) and expected destination access point identifier (DAPI) (Here ODU2/ODU2e is prohibited to set sent SAPI and DAPI).

Enter"ODU2"/"ODU2e"interface of the client side local and opposite ends to configure "expected receiving TTI" and "sending TTI" of "PM" overhead for the corresponding port. Configure the expected source access point identifier and sent source access point identifier (SAPI), as well as expected destination access point identifier and sent destination access point identifier (DAPI). The TTI configuration steps of the opposite end are the same as those of the local end. Here we will not go into too much detail.

Management ODU2e		
Administrative State	Enabled	v
OPU State	Intact	
Operational State	Up	
Rx PT		
Availability State	Normal	¥
Tx PT		
PLM AIS Insertion		v
Expected PT		
Degrade Interval	2	
Degrade Threshold	12748	
NIM	Enabled	*

TIM Mode	e Expected SAPI/DAPI	*
Expected SAPI	Please input content	
TIM AIS Insertion	False	Ŧ
Expected DAPI	Please input content	
Rx SAPI	уууууууууууууу	
Tx SAPI		
Rx DAPI	<u>yyyyyyyyyyyyyyy</u>	
Tx DAPI		
Rx Operator	<u> </u>	
Tx Operator		
DCN Apply	Close	



Apply

Close

Management ODU2e		×
Administrative State	Enabled	Ŧ
OPU State	Client	
Operational State	Up	
Rx PT	0×97	
Availability State	NotConnected	
Tx PT	0×3	
PLM AIS Insertion	True	¥
Expected PT	0x3	
Degrade Interval	2	
Degrade Threshold	12748	
TIM Mode	SAPI_DAPI	Ŧ
Expected SAPI	A	
TIM AIS Insertion	True	*
Expected DAPI	В	
Rx SAPI	<i>ӯӯӯӯӯӯӯӯӯӯӯӯӯӯӯӯ</i> ӯӯӯ	
Tx SAPI	С	
Rx DAPI	<u> </u>	
Tx DAPI	D	
Rx Operator	<u>ŶŸŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶ</u>	
Tx Operator	Please input content	

Figure6-17 Configure Client Side Local End Port TTI

Management ODU2e		
Administrative State	Enabled	v
DPU State	Client	
Operational State	Up	
Rx PT	0x97	
Availability State	NotConnected	Ŧ
Tx PT	0×3	
PLM AIS Insertion	True	v
Expected PT	0x3	
Degrade Interval	2	
Degrade Threshold	12748	
TIM Mode	SAPI_DAPI	~
Expected SAPI	C	
TIM AIS Insertion	True	
Expected DAPI	D	
Rx SAPI		
Tx SAPI	A	
Rx DAPI	4RÜ8\¥⊡²⊡Q?ē«⊡î	
Tx DAPI	В	
Tx DAPI	B =ê⊡z²e;â>åþ<Éēå¼üwV%/ØD+⊡mE-{Áét	

Figure6-18 Configure Client Side Opposite End Port TTI

🕜 Hint

The Source Access Identifier and Destination Access Identifier values in the TTI overhead can be either default or arbitrary strings.

6.3. Configuration Examples

Application Environment :

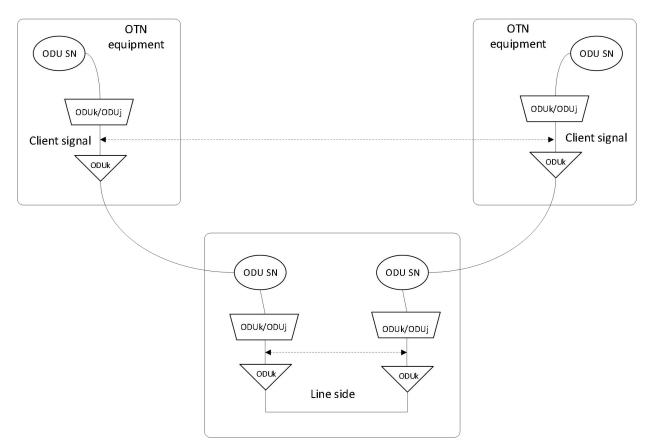


Figure6-19 Application Environment of SM/PM Overhead Configuration

Configuration analysis: The network elements of the local-end and opposite-end client side signals should be configured with the same service, such as XGE_GFPF service (Specific configuration needs to be made according to actual needs). The capacity of the local-end and opposite-end client side signals is ODU2. The OTU2 service is configured on both ends of the line side (configure according to the service type of the client side), and both ends are demultiplexed to ODU2.

According to the SM overhead configuration rules described in 6.1.2, the SM overhead is planned as follows:

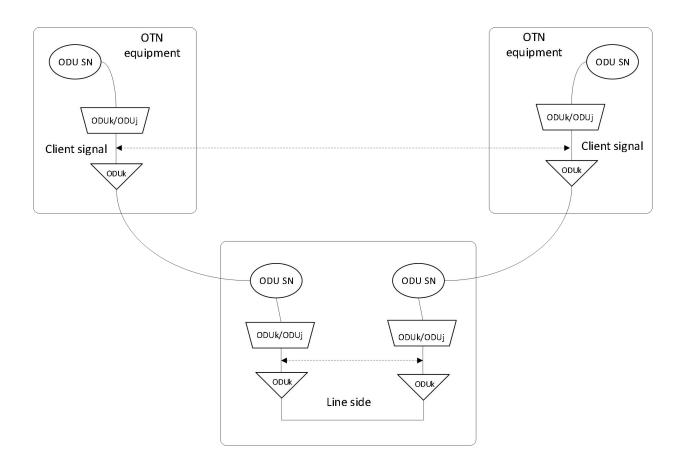
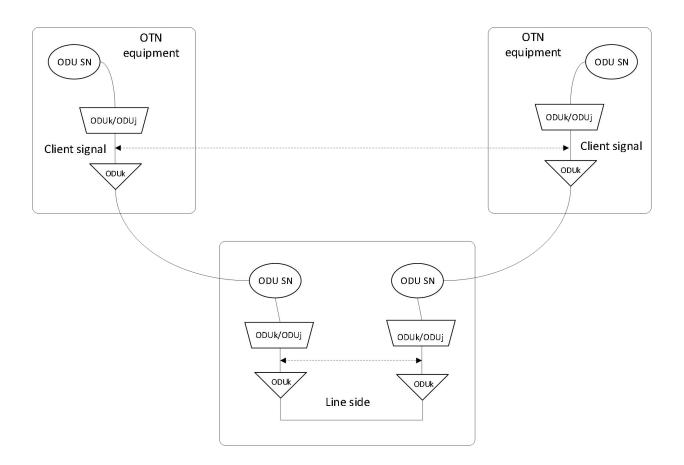
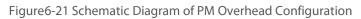


Figure6-20 Schematic Diagram of SM Overhead Configuration

The line side NE of the two ends is OTU2 service (configured according to the service type of the client side). Enable the monitoring function of SM overhead on the OTU2 layer at both ends, and then set the values of sending TTI and expected TTI. For detailed configuration, please see the detailed steps described in 6.2.1. If the values of sending TTI and receiving TTI at both ends conform to the overhead establishment rules listed in Table 6-1, then the line Configuration is correct and the service can be received and dispatched normally.

According to the PM overhead configuration rules described in 6.2.2, the PM overhead is planned as follows:





The line side of the NE at the two ends is OTU2 service (configured according to the service type of the client side). After being demultiplexed to ODU2, enable the monitoring function of PM overhead on ODU2 layer at the two ends. Here the status of ODU2 layer is "unterminated", the value of expected TTI can be set. For detailed configuration, please see detailed steps described in 6.1.3. If the values of expected TTI and receiving TTI of the two ends are the same, then the line configuration is correct and the signal source is correct.

The client side of NE at both ends is XGE_GFPF service (Specific service needs to be configured according to actual demand). Enable the monitoring function of PM overhead of client side port at both ends on ODU2 layer. Here the status of ODU2 layer is "client end signal terminated". Set the values of sending TTI and expected TTI. For detailed configuration, please see the detailed steps described in 6.1.3. If the values of the sending TTI and receiving TTI of the two ends conform to the overhead establishment rules in Table 6-1, then the line configuration is correct and the service can be normally sent and received.

After the configuration is completed, when fault occurs to the service of the monitoring segment corresponding to SM and PM, the NMS system will report the alarm and performance instructions corresponding to SM and PM, such as TIM, BDI, AIS and SD etc. The fault can be quickly and accurately located according to these alarms and performances.

7. SNC Protection Configuration

7.1. Introduction of SNC Protection

SNC protection is also called subnet connection protection. Its function is when the signal on the client side fails in the working channel (signal failure, signal degradation), the service can automatically switch to the protection channel and continue to work normally.

The following figure shows the service environment of SNC protection. SNC protection service is configured for the devices at both ends. One is the working channel and the other is the protection channel. When the signal of the working channel is deteriorated or the signal is invalid, the protection channel is working normally at the same time. The service will switch automatically from the working channel to the protection channel. The switch time is less than 50ms, so the service interruption can not be perceived and the service can run normally.

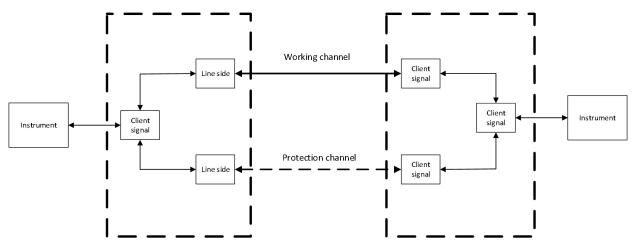


Figure 7-1 Schematic Diagram of SNC Protection Service Environment

7.2. Configuration Steps

Configuration Prerequisite: After the normal start-up of the equipment board, arrange the optical module and optical fiber, connect the instrument and build the service environment.

Table7-1 SNC Configuration Process	
------------------------------------	--

Stage	Configuration Method	
Configure Service Type	Select client side service and line side type	
	Enable client side port	
	Enable line side port	
	Line side signal is demultiplexed to low order ODU layer so as to match line side rate and client side rate.	
Configure Service Cross-Connection with Protection	Select SNC cross-connection type—bidirectional with protection or unidirectional with protection	
	Select the service capacity, that is, the corresponding ODU time slot.	
	Select SNC protection mode—Site A protection or Site Z protection.	

	Create SNC cross-connection with protection.
	Select SNC protection typeSNC/I or SNC/N.
Reply Wait Settings	Set reply mode—Reply Mode or Non-reply Mode.
	If it is set as "non-reply mode", it indicates that after the service is reversed to the secondary channel, even if the primary channel recovers to normal, the service will still work on the secondary channel until failure occurs to the secondary channel.
	If it is set as "reply mode", it needs to simultaneously set the reply waiting time. It indicates that after the service is reversed to the secondary channel, if the primary channel recovers to normal, the service will immediately return to the primary channel or recover to the primary channel after the reply waiting time.
	The settings for the two ends of the protection equipment should keep consistent.
Protection Switching Command Settings	Manually select the issuing external command.
Delete Protection Settings	Manually delete the protection channel/working channel.

7.3. Configuration Example

The SNC service types supported by various Shelf and boards are listed in the following table.

Table7-2 Supported SNC Service Type Table

Shelf Type	Board Type	Supported SNC Service Type
M6500-CH5U	M6500_MXP10	10G service board SNC protection 10G service cross board SNC protection
	M6500-100G-TMXP2	100G service cross board SNC protection
	M6500-40G-TMXP2	40G service cross board SNC protection
M6500-CH2U	M6500_MXP10	10G service board SNC protection 10G service cross board SNC protection
	M6500-100G-TMXP2	100G service cross board SNC protection

The demultiplexing capacity corresponding to the service type is shown in the following table:

Table7-3 TP Multiplexing Capacity Table of SNC Service

Service Rate	Service Type	Capacity Type
1.25G Service	GE_TTT	
	FE_CBR	ODU0
	STM1_GMP/OC3_GMP	0000
	STM4_GMP/OC12_GMP	
2.5G Service	STM16_AMP/OC48_AMP	ODU1

	STM16_BMP/OC48_BMP	
10G Service	XGE_BMP	ODU2e
	XGE_GFPF	
	XGE_GFPFextp	
	STM64_AMP/OC48_AMP	ODU2
	STM64_BMP/OC48_BMP	
	OTU2	
	OTU2e	ODU2e
40G Service	FGE_GMP	ODU3
	OTU3	0003
100G Service	HGE_GMP	
	HGE_GFPF	ODU4
	OTU4	

Here we take the 10G service cross board protection of M6500-MXP10 board as an example to introduce the configuration process of SNC services.

1. Insert a M6500-MXP10 board in M6500 and open the NMS interface to add the NE after the normal start-up of the board.

Global View	Group view Group (Configration
 ➡ M6200-CH2U-No.2(10.32.130.116) ➡ M6800-TSP16(10.32.130.112) 	* Group Name	M6500-MXP10
□ □ M6200-CH5U(10.32.130.180)	Describe Info	Please input content
	Add NE	
	Parent Node	M6500-CH2U
	* Display Name	M6500-MXP10
	* IP Address	10.32.130.120
	* Subnet Mask	255.255.255.0
	* Trap Name	trap
	* Trap Host	10.32.130.32
		Apply

Figure7-2 Add NE

Select a client side port (Port 1-10), (here we take Port 1 of Slot 1 as the client side signal port), then click on the port and select "*Port Management*" on the right.

		Monitor	Giobal	Configuration	X Maintain	
Global View M6800-TSP16(10.32.130.111) M6200-CH2U(10.32.130.110)	Port Management	Pluggable Configuration				
🕀 💼 M6200-CH2U-No.2(10.32.130.116)	BasicInfo					
 ☐	Administrative State	Disabled			×	
 ➡ M6500-CH2U-No.2(10.32.130.160) ➡ ■ Shelf01 	Operational State	Down				
Slot1 M6500-MXP10 : normal	Availability	Empty				
Port1	Port Mode	XGE_BMP			•	
Port3	Port Description	Please input content			(Can not contain / : *	? " < > special characters)
Port4		Apply				

Figure7-3 Select Client Side Port

Select the service type you need and enable the port, then click on "Apply".

Port Management	Pluggable Configuration	
BasicInfo		
Administrative State	Enabled	
Operational State	Down	
Availability	NotInstalled	
Port Mode	XGE_BMP	×
Port Description	XGE_BMP XGE_GFPF XGE_GFPFextp STM64_AMP OC192_AMP OTU2 OTU2e STM64_BMP OC192_BMP	(Can not contain / : * ? * <> special characters
	OC192_BMP	

Figure7-4 Configure Client Side Service

2. Here we take Port 11 of Slot 1 and Port 11 of pair Slot 17 as the line side port.Click on the port and select "*Port Management*" on the right. Then select the needed service type according to the optical module type of the line side, enable the port and click on "*Apply*".

isicInfo			
Administrative State	Enabled	*	
Operational State	Up		
Availability	Normal		
Port Mode	OCh(OTU4) OTU4 OCh(OTU4)	~	
Port Description	Please input content	(Can not contain / : * ? " < > spe	cial characters

Figure7-5 Configure Line Side Service

3. Click on the service board and select"*TP Multiplexing Structure*".

🚱 Global View			
🕀 🗃 M6800-TSP16(10.32.130.111)	Card Current Alarm		
■ ■ M6200-CH2U(10.32.130.110)	Card Current Alarm	View the current board alarm information	Check
🕀 🛑 M6200-CH2U-No.2(10.32.130.116)			
🖽 🗊 M6500-CH5U(10.32.130.220)	Slot Reboot		
■ M6500-CH2U(10.32.130.120)	Card WarmReboot	The board will restart and the board configuration will not be lost	Reboot
🖻 🛑 M6500-CH2U-No.2(10.32.130.160)	Curd Marmitebook	The board will restart and the board configuration will not be lost	
🗄 🚆 Shelf01	Card ColdReboot	The board will restart and the board configuration will reset	Reboot
🖯 🗖 Slot1 M6500-MXP10 : normal			
- Dert1	TP Multiplexing Structure		
Port2	Port	11	*
Port3			
Port4		■ ODU4(0)	
Port5		Clear All	
Ba is			

Figure 7-6 TP Multiplexing Structure

Select the appropriate time slot to demultiplex to the low order ODU layer, so as to make the line side rate and the client side rate match.

Card Current Alarm	View the curren	ParentName	ODU4				
lot Reboot		TP ID	3				
Card WarmReboot	The board will r	TS	TS(#1)	TS(#2)	TS(#3)	TS(#4)	
Card ColdReboot	The board will r		TS(#5)	TS(#6)	TS(#7)	TS(#8)	
			TS(#9)	TS(#10)	TS(#11)	TS(#12)	
P Multiplexing Structure			TS(#13)	TS(#14)	TS(#15)	TS(#16)	
Port	11		✓TS(#17)	✓TS(#18)	✓TS(#19)	✓TS(#20)	
	⊕- / > ODU4(I		✓TS(#21)	✓TS(#22)	✓TS(#23)	✓TS(#24)	
			TS(#25)	TS(#26)	TS(#27)	TS(#28)	
	ODU2		TS(#29)	TS(#30)	TS(#31)	TS(#32)	
			TS(#33)	TS(#34)	TS(#35)	TS(#36)	
			TS(#37)	TS(#38)	TS(#39)	TS(#40)	
			TS(#41)	TS(#42)	TS(#43)	TS(#44)	
			TS(#45)	TS(#46)	TS(#47)	TS(#48)	
			TS(#49)	TS(#50)	TS(#51)	TS(#52)	
			TS(#53)	TS(#54)	TS(#55)	TS(#56)	

Figure7-7 Select Time Slot Demultiplexing

4. Select SNC cross-connection type--"bidirectional with protection" or "unidirectional with protection".

Add		
* Label	Please input content	
* Туре	2WAYPR	v
* Capacity	2WAY 1WAY 2WAYPR	
	1WAYPR	
A		
* Shelf	1	*
* Slot	2	
* Port	1	*
* TP		v
z		
* Shelf	1	v
* Slot	2	
* Port	1	Ŧ

Figure7-8 Select Cross-Connection Type

5. Select the service capacity, that is, the corresponding ODU time slot.

Add		>
* Label	Please input content	
* Туре	2WAYPR	v
* Capacity	ODU2e ODU0	•
A	ODU0 ODU1 ODU2 ODU2e	
* Shelf	ODU3 ODU4	
* Slot	2	Ŧ
* Port	1	Ŧ
* TP	ODU2e(0)	
z		
* Shelf	1	v
* Slot	2	v
* Port	1	v
	0010 10	
Add	Close	

Figure7-9 Select Service Capacity

6. Select SNC protection mode—Site A protection or Site Z protection.

Add		×
* Label	2	
* Type	2WAYPR	
* Capacity	ODU2e	•
A		
* Shelf	1	v
* Slot	2	v
* Port	1	•
* TP	ODU2e(0)	•
z		
* Shelf	1	Ŧ
* Slot	2	v
* Port	11	
* TP	ODU2e(1)(TS:1,2,3,4,5,6,7,8)	*

A Protection O

* Shelf	1	•
* Slot	2	•
* Port	1	•
* TP		*
Z Protecti	ion	
* Shelf	1	•
* Slot	3	•
* Port	11	•
* TP	ODU2e(1)(TS:1,2,3,4,5,6,7,8)	•
Add	Close	



7. Select client side port number and line side port number. The tag name can be empty. Create the

cross-connection of SNC protection service, then click on "*PPG*" option of the created SNC cross-connection with protection.

If View	Shelf Inform	ation	Slot Information	Card Information S	C1+1 Configuration	Business Configuration			
Configura	ation								
Please inpl	ut content			Search					
Add	Delete								
		пс Туре		+ Src TpID	↑ Des TpID		D		

Figure7-11 Click Protection Group

Select the protection type--"SNC/I" or "SNC/N".

Availability State	Working	
Protection Type	SNC/N) v
Working TpID	Slot2-port11-ODU2e(1)	
Protecting TpID	Slot3-port11-ODU2e(1)	
Switch Type	Uni-directional	v
Wait to Restore(s)	300	
Revertive Mode	Non Revertive	

Figure7-12 Select Protection Type

8. Reply wait settings—select"*Revertive*" or"*Non Revertive*". If"*Revertive*" mode is selected, the reply waiting time needs to be entered.

Augustability Otata	Wedies	
Availability State	Working	
Protection Type	SNC/N	~
Working TpID	Slot2-port11-ODU2e(1)	
Protecting TpID	Slot3-port11-ODU2e(1)	
Switch Type	Uni-directional	-
Wait to Restore(s)	300	
Revertive Mode	Non Revertive Non Revertive	

Figure7-13 Reply Wait Settings

9. Click on *"Switch"* option of the created SNC protection cross-connection.

Configuration Please input content Ad Detete +ID +SncType +Circuit ID +SrcTeID +Des TpID +SrcProt TpID +SrcProt TpID +Des TpID +SrcProt Tp	
Add Delete	
+ ID + Snc Type + Circuit ID + Src TpID + Des TpID + Src TpID + DesProt TpID + DesProt TpID	
1 2WAYFR 1 Slot2-port1-ODU2e(0) Slot2-port11-ODU2e(1) Slot3-port11-ODU2e(1)	Delete Unprotect PPG
al: 1 records	10 V Previous

Figure7-14 Protection Switching Settings

Manually select to issue protection switching command. The command priority is clear>lock protection switching>force switch to working channel>force switch to protection channel>manually switch to working channel>practice.

Switch		>
Current Request	No Request	
External Command	Forced Switch_Working	v
	Clear Lockout for Protection	
Apply (Forced Switch_Working	
	Forced Switch_Protection Manual Switch_Working Manual Switch_Protection Exercise	

Figure7-15 Select Protection Switching Command

10. Click on "Unprotect" option of the created SNC protection cross-connection.

					Configuration	Business Configuration	
Config	uration						
Please i	nput content			Search			
	_						
Add	Del	lete					
Add		lete					
Add	↑ ID	+ Snc Type	+ Circuit ID		↑ Des TpID		
Add			↑ Circuit ID				

Figure8-16 Delete Protection

You can manually select to delete the working channel or the protection channel.

UnProtect		>
Туре	2WAY	*
Point to Delete	Working	v
Apply	Working Protecting Close	

Figure7-17 Delete Working Channel or Protection Channel

8. Alarm Management

8.1. Alarm Management Introduction

The alarm management function is a functional group that manages the faults of various network devices managed by the NMS system during the operation of the system. The managed fault is commonly called alarm.

The NMS alarm management function manages two types and four levels of failures. The two types are equipment alarm and communication alarm. The four levels are emergency, primary, secondary and warning.

8.2. Main Interface of Alarm Management

After logging in the NMS system, click on "*Maintain*" on the navigation bar – left click on the "*Alarm Management*" menu -- the alarm management sub-menu appears, which includes: current alarm, history alarm, alarm configuration, alarm notification configuration, alarm mailbox server configuration and enable sound.

🕜 Hint

In the upper right corner of the NMS main interface, alarm statistics are displayed, including the total number of alarms and the number of alarms at all levels.

			Monitor	() Global	Configuration	X Maintain	
] Log Management	Current Alarm	History Alarm Element Event					
Alarm Management Performance Current Info	Current Alarm						
Performance History Info	IP	All	•	Slot	All		•
Data Maintenance	Port	All	*	Raised Time From	Please Select		
	Raised Time To	Please Select	Ē	Cleared Time From	Please Select		Ē
	Cleared Time To	Please Select	III	Search	Please enter the search content		
	Severity	Major Minor Warning Critical		Acknowledge State	Ack Unack	Auto Refresh	Query
	Ack	Linack					

Figure8-1 Alarm Management

8.2.1. Current Alarm

Click on"*Current Alarm*" in the sub-menu to enter the current alarm page, as shown in the figure below:

ent Alarm											
	All		Ŧ	Slot	AI		Ψ.	Port	I	*	
aised Time om	Please 5	Select		Raised Time To	Please Select			Cleared Time From	Please Select		
eared Time	Please S	Select		Search	Please enter the search content			Severity	Major 📄 Minor 📄 Warning	Critical	
cknowledge tate Ack	Ack Unack	Unack Auto Refresh	Query								
ID	Severity	NE	Alarm Source		Alarm Name	Alarm Type	State	Raised Time	Acknowledge State	Acknowledge User	Acknowledge Time
1	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_TX_0	DLP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:39	Unacknowledge	-	-
2	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_RX_0	ХLР	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:35	Unacknowledge		2
3	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_T1_C	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:35	Unacknowledge	-	-
4	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_R1_0	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:39	Unacknowledge	-	-
5	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_T2_C	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:35	Unacknowledge		=
6	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_R2_0	DLP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:39	Unacknowledge	-	-
7	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot8_TX_0	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:36:51	Unacknowledge	-	-
8	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot8_RX_0	ЖР	Optical_Below_Threshold	Communication	Set	2020/09/22 11:36:51	Unacknowledge	-	-
9	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot8_T1_C	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:36:51	Unacknowledge	-	-
			Location_Shelf1_Slot8_R1_0		Optical_Below_Threshold	Communication	Set	2020/09/22 11:36:51	Unacknowledge	-	2

Figure8-2 Current Alarm

The lower right corner of the alarm interface can filter the number of alarms displayed on the current page, and the number of displayed alarms per page can be adjusted to 10, 20, 50 and 100 (as shown below).



Figure8-3 Show Number of Current Alarms

The upper part of the alarm interface is the "Query" part and the "Auto Refresh" button , the area under the

"*Query*" section is the "*Ack*", "*Unack*". The functions of these buttons are:

The function of "Ack" button is to confirm the selected alarm. By ticking the check box on the left of the alarm to be confirmed and clicking the "Ack" button, the selected alarms are all in the confirmation state. The confirmation status of the confirmed alarm is "confirmed" and the "confirmation" icon becomes green with specific confirmation person and confirmation time. The specific operation is: select the alarm to be confirmed → click the "Ack" button → click on "apply" → confirm the alarm.



Because the current page will refresh once in 10 seconds, the selected alarm will become unchecked after refreshing if it is not confirmed in time.

	ID	Severity	NE	Alarm Source	Are you sure to perform this operation?	Alarm Type
•	1	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2		Communication
•	2	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3	Apply Cancel	Communication
•	3	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2_Pluggable	Pluggable_Missing	Equipment
	4	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_Pluggable	Pluggable_Missing	Equipment
	5	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port1_Pluggable	Pluggable_Missing	Equipment

Figure8-4 Select to Confirm Current Alarm

	ID	Severity	NE	Alarm Source	Are you sure to perform this operation?	Alarm Type	Stat
•	1	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Sionort2		Communication	Set
•	2	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3	Apply Cancel	Communication	Set
•	3	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2_Pluggable	Pluggable_Missing	Equipment	Set
•	4	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_Pluggable	Pluggable_Missing	Equipment	Set
	5	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port1_Pluggable	Pluggable_Missing	Equipment	Set
	6	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port5_ODU4(0)	ODU_AIS	Communication	Set

Figure8-5 Carry Out Confirmation of Current Alarm

Ack	Unack							
D ID	Severity	NE	Alarm Source	Alarm Name	Alarm Type	State	Raised Time	Acknowledge State
1	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2_ODU4(0)	ODU_AIS	Communication	Set	2020/09/21 14:30:25	Acknowledge
2	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_ODU4(0)	ODU_AIS	Communication	Set	2020/09/21 14:30:25	Acknowledge
3	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:09:39	Acknowledge
4	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:09:38	Acknowledge
5	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port1_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:08:41	Unacknowledge

Figure8-6 Complete Confirmation of Current Alarm

• The function of "Unack" button is to cancel confirmed alarms and return them to unconfirmed state. The operation method is similar like that to confirm alarm: select the alarm to be canceled confirmation \rightarrow click the "Unack" button \rightarrow click on "Apply" \rightarrow The alarm is not confirmed.

🕜 Hint

Because the current page will refresh once in 10 seconds, the selected alarm will become unchecked after refreshing if it is not confirmed in time.

	ID	Severity	NE	Alarm Source Are	you sure to perform this operation?	Alarm Type	State	Raised Time	Acknowledge State
•	1	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2		Communication	Set	2020/09/21 14:30:25	Acknowledge
•	2	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3	Apply Cancel	Communication	Set	2020/09/21 14:30:25	Acknowledge
•	3	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:09:39	Acknowledge
•	4	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:09:38	Acknowledge

Figure9-7 Cancel Confirmation of Current Alarm

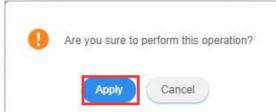


Figure8-8 Cancel Confirmation

A	ck	Unack							
	ID	Severity	NE	Alarm Source	Alarm Name	Alarm Type	State	Raised Time	Acknowledge State
	1	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2_ODU4(0)	ODU_AIS	Communication	Set	2020/09/21 14:30:25	Unacknowledge
	2	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_ODU4(0)	ODU_AIS	Communication	Set	2020/09/21 14:30:25	Unacknowledge
	3	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:09:39	Unacknowledge
	4	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:09:38	Unacknowledge
	5	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port1_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:08:41	Unacknowledge

Figure8-9 Complete Confirmation Cancellation of Current Alarm

• The function of "Query" button is to use the known conditions to view and operate the specified alarm. The filter conditions include: NE IP, specified slot of specified IP, specified port of specified slot; alarm creation and termination time (i.e. alarm generation period), the beginning and ending time of alarm clearance; alarm level and alarm confirmation status. A single filter condition or a combination of several filter conditions can be used to filter out the alarms required, as shown in the figure below.

rent Alarm					
P	10.32.130.160	-	Slot	All	Ŧ
	All				
Port	10.32.130.160 10.32.130.120		Raised Time	Please Select	1000 A
	10.32.130.116		From		
aised Time	10.32.130.111 10.32.130.110		Cleared Time		
0	10.32.130.110		From	Please Select	1
	10.32.130.220				
Cleared Time	Please Select	(****)	Search	Please enter the search content	

Figure8-10 IP Filter Current Alarm

Current Alarm	History Alarm Element Event					
Current Alarm						
IP	10.32.130.160	•	Slot	All		•
Port	All	•	Raised Time From	All 1 2 3		
Raised Time To	Please Select		Cleared Time From	4 5 6 7		
Cleared Time To	Please Select		Search	/ 8 9 10		
Severity	Major Minor Warning Critical		Acknowledge State	Ack Unack	Auto Refresh	Query

Figure 8-11 Filter Current Alarm for Slots & Ports

			27 - W	2	والمحادث	1.5		
Cleared Time	+	3	Septe	ember	2020)	+	-
From	Su	Mo	Tu	We	Th	Fr	Sa	
2000	30	31	1	2	3	4	5	
Search	6	7	8	9	10	11	12	
Acknowledge	13	14	15	16	17	18	19	
State	20	21	22	23	24	25	26	uto Refresh
	27	28	29	30	1	2	3	
	4	5	6	7	8	9	10	
				Today	/			Alarm Type Stat
	Fi	aure8	-12 (Create	Time	e to F	ilter	Current Alarm

Figure8-12 Filter Current Alarm According to Alarm Level & Confirmation Status

🕜 Hint

Severi

The method to filter IP, slot and port is: $IP \rightarrow Slot \rightarrow Port$ or $IP \rightarrow Slot$ or IP. It is not allowed to select slot or port separately.

• *"Auto Refresh"* button is a button which can move right and left (It can switch from refresh to close or from close to refresh by clicking the button.) The current page is refreshed every 10 seconds when it is in Refresh state and the current page is not refreshed when it is in Close state.

The middle right part of the alarm interface is the search area: By entering specified content, it can get all the alarms that contain that content, as shown in the following figure.

Cleared Ti To	me Please S	Select	Search	Equi			
Severity	Major	Minor Warning C	itical Acknowledg	Je Ack Unack A	Auto Refresh	Query	
Ack	Unack						
D ID	Severity	NE	Alarm Source	Alarm Name	Alarm Type	State	Raised Time
1	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port2_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:0
2	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:0
3	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port1_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:0
4	Major	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot6	EQPT_Power_Supply_Issue	Equipment	Set	2020/09/18 16:0
5	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port4_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/18 16:0
6	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port5_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/18 16:0
7	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port10_Pluggable	Pluggable_Missing	Equipment	Set	2020/09/18 16:0

Total: 7 records filtered from 10 total entries

Figure8-13 Search Current Alarm

Alarm Details		×	*		
NE	10.32.130.111_M6800-TSP16	Ē	1		
larm Source	Location_Shelf1_Slot1_Port2_Pluggable				
Alarm Name	Pluggable_Missing		<u>a</u>		
Probable Cause	Pluggable_Missing				
Recommend Measures	Document Links	Quer			
larm Type	Equipment				
Severity	Critical				
state	Set	knowledge State	Acknowledge User	Acknowledge Time	Operation
being of Time of					
kaised time	2020/09/21 10:09:39	acknowledge	<u>22</u> 3	1 <u>10</u>	Details Ack
	2020/09/21 10:09:39	acknowledge acknowledge	-	-	Details Ack Details Ack
Cleared Time				-	
Cleared Time Acknowledge State		acknowledge	-	-	Details Ack
cknowledge State cknowledge User	 Unacknowledge	acknowledge acknowledge	-	-	Details Ack Details Ack
Raised Time Cleared Time Acknowledge State Acknowledge User Acknowledge Time Submit	 Unacknowledge 	acknowledge acknowledge acknowledge		-	Details Ack Details Ack Details Ack

Figure8-14 Alarm Details

1E	10.32.130.111_M6800-TSP16
Alarm Source	Location_Shelf1_Slot1_Port2_Pluggable
Alarm Name	Pluggable_Missing
Probable Cause	Pluggable_Missing
Recommend Measures	Document Links
Alarm Type	Equipment
Severity	Critical
State	Set
Raised Time	2020/09/21 10:09:39
Cleared Time	(22)
Acknowledge State	Unacknowledge
Acknowledge User	(22)
Acknowledge Time	

Figure8-15 Alarm Document Link

The lower middle area is the display section of the current alarm. From left to right in turn, the table header is: check box, serial number, alarm level, NE, alarm source, alarm name, alarm type, status, generation time, clearance time, confirmation status, confirmer and confirmation time, operation.

- Check box is used to check or cancel a specified alarm, or the first check box can be used to select all the alarms on the page.
- The serial number is the number of the alarms, sequentially increasing from 1.
- There are four alarm levels, marked by different colors: emergency level (red), main level (orange), secondary level (blue), warning level (cyan).
- Network element is the IP of network equipment that generates alarm.
- The alarm source is the specific slot or port information of NE which generates alarm.
- Alarm name, alarm type, status, generation time, clearance time, confirmation status, confirmer and confirmation time are relatively simple, we will not go into much detail here.

8.2.2. History Alarm

Click on "*History Alarm*" in the submenu to enter the history alarm page, as shown in the figure below:

urrent Alarr	n Hk	tory Alarm Element Event								
story Alarr	n									
IP	10.32.13	0.111	•	Raised Time From	se Select					
Raised Tin To	Please	select		Cleared Time From	se Select					
Cleared Ti To	Please	select		Severity 🔲 Maj	or Minor Critical	Warning				
Acknowled State	lge 🔲 Ack	Unack Query								
Delete	Delete	ALL Export								
	Severity	NE	Alarm Source	Alarm Name	Alarm Type	State	Raised Time	Cleared Time	Acknowledge State	Ackr
1	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LOSYNC	Communication	Auto clear	2020/09/21 16:17:15	2020/09/21 16:17:15	Acknowledge	Auto
2	Major	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LF	Communication	Auto clear	2020/09/21 16:17:13	2020/09/21 16:17:13	Acknowledge	Auto
3										
3	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LOSYNC	Communication	Auto clear	2020/09/21 16:17:13	2020/09/21 16:17:13	Acknowledge	Auto
	Critical Major	10.32.130.220_TMXP5-1 10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn Shelf1_Slot3_Port1_ETYn	ETY_LOSYNC ETY_LF	Communication	Auto clear Auto clear	2020/09/21 16:17:13 2020/09/21 16:17:11	2020/09/21 16:17:13 2020/09/21 16:17:11	Acknowledge	
										Auto Auto Auto
. 4	Major	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LF	Communication	Auto clear	2020/09/21 16:17:11	2020/09/21 16:17:11	Acknowledge	Auto
45	Major Critical	10.32.130.220_TMXP5-1 10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn Shelf1_Slot3_Port1_ETYn	ETY_LF ETY_LOSYNC	Communication	Auto clear Auto clear	2020/09/21 16:17:11 2020/09/21 16:17:11	2020/09/21 16:17:11 2020/09/21 16:17:11	Acknowledge Acknowledge	Auto Auto Auto
4 5 6 7	Major Critical Major	10.32.130.220_TMXP5-1 10.32.130.220_TMXP5-1 10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn Shelf1_Slot3_Port1_ETYn Shelf1_Slot3_Port1_ETYn	ETY_LF ETY_LOSYNC ETY_LF	Communication Communication Communication	Auto clear Auto clear Auto clear	2020/09/21 16:17:11 2020/09/21 16:17:11 2020/09/21 16:17:05	2020/09/21 16:17:11 2020/09/21 16:17:11 2020/09/21 16:17:05	Acknowledge Acknowledge Acknowledge	Auto Auto Auto Auto
 4 5 6 7 	Major Critical Major Critical	10.32.130.220_TMXP5-1 10.32.130.220_TMXP5-1 10.32.130.220_TMXP5-1 10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn Shelf1_Slot3_Port1_ETYn Shelf1_Slot3_Port1_ETYn Shelf1_Slot3_Port1_ETYn	ETY_LF ETY_LOSYNC ETY_LF ETY_LOSYNC	Communication Communication Communication Communication	Auto clear Auto clear Auto clear Auto clear	2020/09/21 16:17:11 2020/09/21 16:17:11 2020/09/21 16:17:05 2020/09/21 16:17:04	2020/09/21 16:17:11 2020/09/21 16:17:11 2020/09/21 16:17:05 2020/09/21 16:17:04	Acknowledge Acknowledge Acknowledge Acknowledge	Auto Auto

Figure8-16 History Alarm

The lower right corner of the history alarm interface can filter the number of alarms displayed on the current page, and the number of displayed alarms per page can be adjusted to 10, 20, 50 and 100.

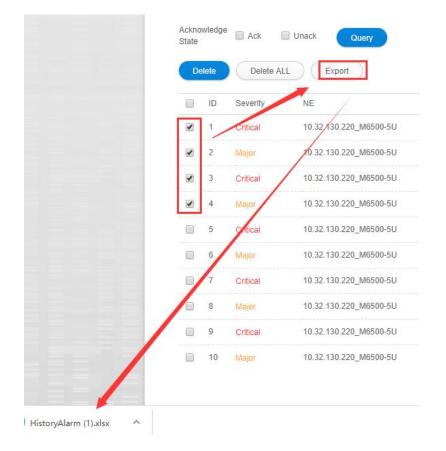
The Filter, All, Delete, Delete All, Export buttons are shown in the right area of the navigation bar.

- Functions of "Query" buttons are the same as the functions of those buttons in the current alarm.
- The function of "*Delete*" button is to delete the selected history alarm, as shown in the following figure.

De	elete	Delete Al	LL Export					
•	ID	Severity	NE	Cross Pource	. Do you want to del	ete these data?		State
	1	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	Apply C	Cancel	ion	Auto cle
	2	Major	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	EIT_LF	Communic	ation	Auto cle
	3	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LOSYNC	Communic	ation	Auto clea
	4	Major	10.32.130.220_TMXP5-1	Sheif1_Slot3_Port1_ETYn	ETY_LF	Communic	ation	Auto clea
	5	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LOSYNC	Communic	ation	Auto clea

Figure8-17 Delete History Alarm

- The function of "*Delete All*" button is to delete all the history alarms.
- The function of *"Export"* button is to export all the history alarms. A dialog box pops up after clicking the Export button. Enter the name of the file you want to save in the dialog box. After saving, it will prompt to save the path. The exported data is saved in Excel format.





🕜 Hint

The path to save the data is: NMS Installation Root Directory→report_out Folder→HistoryAlarm Folder→File Name.xls.

The lower area of the navigation bar is the display section of the history alarm. From left to right in turn, the table header is: Serial Number, NE, Alarm Source, Alarm Name, Alarm Type, Severity, status, Raised Time, Cleared

Time, Acknowledge State, Acknowledge User, Acknowledge Time. (The functions are the same as that in the current alarm. Here we will not go into much detail.)



In history alarm details, there is no recommended measure and linked document. There are three types of alarm clearance states, which are automatic clearance, manual clearance and synchronous clearance.For the confirmation state, it can only be"confirmation" state.There are two types of confirmer, which are automatic confirmation and current login user confirmation, such as root.

8.3. Alarm Configuration

8.3.1. Alarm Configuration

Click on "*Configuration*" and click on "*Alarm Configuration*" in the submenu to enter the alarm configuration page, as shown in the figure below:

		Monitor	(in the second s	Configuration	X Maintain		
Alarm Configuration	Alarm Configuration Alarm Notification Configuration	Alarm Mailbox Server Configura	tion				
A User Management	Alarm Configuration						
Subser Group Management	Please enter the search content	Search					
L OLP Route	Apply Refresh						
Data Store Config		Alarm Sev	erity Configuration			Alarm Sh	ielding Conf
Set Screen Lock Time	TCA_UAS	Major	*			No	*
	TCA_SES	Major	¥			No	¥
	TCA_ES	Major	•			No	v
	TCA_BBE	Major	•			No	Ŧ
	SWITCH_PortDown	Major	•			No	•
	SW_STORAGE_FULL	Major	Y			No	¥
	SW_MISMATCH	Major	•			No	*
	SW_MIB_MISMATCH	Major	•			No	Ŧ
	SW_MIB_FAIL	Major	•			No	Ŧ
	SW_DOWNLOAD_FAIL	Major	¥			No	*



The lower right corner of the alarm configuration interface can filter the number of alarms displayed on the current page, and the number of displayed alarms per page can be adjusted to 10, 20, 50 and 100.

10 🔻	Pre
10	
20	
50	
50 100	

Figure8-17 Number of Alarms Displayed in Alarm Configuration

The upper area of the alarm configuration shows the searching function. By entering the specified content, it can get the alarms which contain that content, as shown in the following figure.

TCA	Search
Apply Refresh	
↑ Alarm Name	Alarm Severity Configuration
TCA_UAS	Major 🔻
TCA_SES	Major 🔻
TCA_ES	Major 🔻
	Major 🔻

Total: 4 records filtered from 201 total entries

Figure8-18 Searching Function in Alarm Configuration

The middle area of the alarm configuration is the main content of alarm configuration. The table headers are: alarm name, alarm level configuration and alarm shielding configuration.

- Alarm Name: All the alarms on NE are contained in alarm name.
- Alarm Level Configuration: The specified alarm level can be set for the specified alarm. There are four optional levels: emergency, primary, secondary warning. (The alarm level before configuring is the default level.)
- Alarm Shielding Configuration: It can shield the specified alarm. After the alarm is shielded, if the alarm is generated on NE, it will not be displayed on the NMS system. (By default, all the alarms are not shielded.)

8.3.2. Alarm Notification Configuration

Click on *"Alarm Notification Configuration"* in the submenu to enter the alarm notification configuration page, as shown in the figure below:



			Monitor	Global	Configuration	X Maintain
Alarm Configuration	Alarm Configuration	Alarm Notification Configuration	Alarm Mailb	ox Server Configuratio	n	
Performance Monitoring User Management	Alarm Sound Configur	ration				
User Group Management	* Sound on / off					
UP Route	Choose Sound	Custom				
Data Store Config						
Set Screen Lock Time	Alarm Notification Cor	nfiguration				
	🕀 📃 Critical					
	🕀 🗌 Major					
	H- Minor					
	H Warning					



🕜 Hint

The alarm notification configuration is an alarm configuration for alarm mail notifications, and by default only the alarm at the emergency level is checked (that is, the mail receives only the alarm notification at the emergency level).

After expanding the Emergency Level Alarm Tree, you can find that by default all the Emergency Level Alarms are selected. The designated alarms or all the alarms can be checked or the check can be canceled. In application, it will only receive the generation and elimination information of the selected alarm in the mail system.

8.3.3. Alarm Mailbox Server Configuration

Click on "*Alarm Mailbox Server Configuration*" in the submenu to enter the alarm mailbox server configuration page, as shown in the figure below:

			Monitor	() Global	Configuration	X Maintain	
Alarm Configuration	Alarm Configuration	Alarm Notification Configuration	Alarm Mailbo	x Server Configuration]		
Performance Monitoring			114	Ň			
A User Management	Alarm Mailbox Server	Configuration					
Subser Group Management	* Send Name	Please input content					
L OLP Route	* Send User	Please input content					
Data Store Config	* Email						
Set Screen Lock Time	Authorization Code	Please input content					
	* Value Smtp	Please input content					
	* Value Smtp Port	25					
	SSL						
		Apply					

Figure 8-20 Alarm Mailbox Server Configuration

The function of the alarm mailbox server configuration is to configure a mailbox as a server mailbox, and then click on the navigation bar \rightarrow Configuration.

Configuration \rightarrow User Management \rightarrow (Specify User Bar) Modify Information \rightarrow Fill in a mailbox address for receiving alarm notifications. In this way, the alarm generated on the NE (after the configuration in the previous section) is sent to the specified mailbox by the mailbox server, and the alarm mail can be received.

🕜 Hint

For different types of mailboxes, SMTP addresses and port numbers are different.Before setting the server mailbox, please check to confirm the server mailbox type and the SMTP information to be used.

8.3.4. Enable the Alarm Sound

Enable sound function means when there is an alarm on the NMS system, the NMS server will continue to issue an alarm sound after enabling this function, so as to indicate that there is an alarm on the NMS system. Currently, the NMS system only has function to enable or disable the sound.

🕜 Hint

There are four kinds of alarm sounds, which correspond to emergency alarm, main alarm, secondary alarm and warning alarm respectively, but when the NMS system enables the sound, only the highest level alarm sound is prompted. When the alarm level changes, the alarm sounds also change (for example, the current alarm level is emergency and main, it will prompt the highest level alarm sound which is emergency alarm sound. If at that time the alarm at the emergency level disappears, then it will turn to the main alarm sound).

8.3.5. Custom Alarm Sound

Custom alarm sound mean that customers can set different alarm tones for different types of alarms according to their own needs.

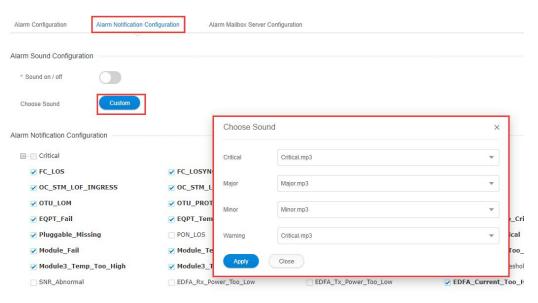


Figure8-21 Custom Alarm Sound

9. Performance Management

The first step of performance management is to enable the performance monitoring point to be monitored in the performance monitoring point management interface.

9.1. Performance Management Introduction

9.1.1. Filter Box

Click on "*Configuration*" on the top menu bar and select"*Performance Monitoring*", as shown in the figure below:

			Monitor		ð obal	Configuration	% Maintain	
Alarm Configuration	Performance M	onitoring						
Performance Monitoring	NE	Please Select		Slot	Please Select			w
A User Management	PM Granularity	15min	•	PMP Status	ALL			*
⊗ User Group Management								
L OLP Route	Search	Please enter the search content		Query				
Data Store Config	Enable PM	AP Disable PMP						
Set Screen Lock Time	🗐 🛧 Na	me				PMP State	IS	

Figure9-1 Performance Monitoring Point Management Interface

Check the status of the corresponding monitoring point through the above filter box. The filter conditions include network element, slot, port, PM monitoring cycle, performance monitoring status. (There are three kinds of monitoring status: enable, disable and all. The three kinds of monitoring status can be viewed separately.) For all filter conditions, when any of them is selected, you can get the corresponding information by clicking "Query" in the middle part, as shown in the figure below.

formance M	Ionitoring								
IE	10.32.130.111	×	Slot	1		•	Port	1	•
°M Granularity	15min	•	PMP Status	ALL		¥			
earch	Please enter the search content		Query						
Enable PM					PMP Status				Operate
10.32	2.130.111_Slot1_Port1_OCh_Ingress_NearEnd				Disabled PMP				Enable PMP
	2.130.111_Slot1_Port1_Optical_Ingress_NearEnd				Enabled PMP				Disable PMP
10.32	2.130.111_Slot1_Port1_Optical_Egress_NearEnd				Enabled PMP				Disable PMP
	2.130.111_Slot1_Port1_OTU_Ingress_NearEnd				Disabled PMP				Enable PMP
10.32	2.130.111_Slot1_Port1_OTU_Ingress_FarEnd				Disabled PMP				Enable PMP
- 10.35	3 430 444 Claff Darff OTU FEC Instant MaarEnd				Dissilied DMD				Esoble DUD



9.1.2. Performance Monitoring Point Introduction

- The performance monitoring point is determined by monitoring point ID, monitoring point location, monitoring point direction and monitoring cycle.
- Performance monitoring point location: far end and near end (for OTUk and ODUk).
- Near-end monitoring point: according to received BIP8.

- Far-end monitoring point: according to received BEI.
- The direction of performance monitoring points: ingress and egress.
- Monitoring Cycle: 15 minutes, 24 hours.

9.1.3. Enable Performance Monitoring Point

When the current 15-minute performance monitoring point is enabled, all the performance monitoring parameters of the performance monitoring point are enabled at the same time, so when the performance monitoring point is enabled, the relevant data of the current performance statistics can be viewed. The 24-hour performance monitoring operation is the same as the 15-minute operation, as shown in the figure below:

Er	able PMP Disable PMP		
	↑ Name	PMP Status	Operate
	10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	Enabled PMP	Disable PMP
	10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	Enabled PMP	Disable PMP
	10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	Enabled PMP	Disable PMP
	10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd	Enabled PMP	Disable PMP
-	ANALIAN ALL BLA ATT L P.P.J	PCLU PAIR	PLE-LLE PARM

Figure9-1 Enable Monitoring Points

Since the enablement of performance monitoring point will affect the NE performance, currently up to 500 performance monitoring points (including 15 minutes and 24 hours) for a single network element are supported. However, if there are more than 500 points, then the system will prompt the operation failure, as shown in the figure below:

En	able PMP Disable PMP	
	↑ Name	PMP Status
	10.32.130.111_Slot1_Port1_OCh_ingress_NearEnd	Enabled PMP
	10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	Enabled PMP
	10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	Not Modified! bled PMP
	10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd	bled PMP
	10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	Apply
	10.32.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	Enabled PMP

Figure9-2 Operation Failure

Each performance monitoring point can be enabled individually by modifying the status with the button behind it (Disable PMP→ Enable PMP), as shown in the figure below:

	↑ Name		PMP Status
	10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd		Enabled PMP
	10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd		Enabled PMP
	10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd		Enabled PMP
	10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd	Success	Enabled PMP
	10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd		Enabled PMP
	10.32.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd		Enabled PMP
I)	10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_NearEnd		Enabled PMP
	10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_FarEnd		Enabled PMP
	10.32.130.111_Slot1_Port1_ODU4(2)_Ingress_NearEnd		Enabled PMP
	10.32 130 111 Slot1 Port1 ODU4(2) Ingress FarEnd		Enabled PMP

Figure9-3 Enable A Single Monitoring Point

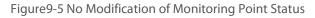
To realize batch enabling operations on multiple pieces of data, you can select the previous multiple checkboxes, then click the button on the table (Enable PMP) to enable the monitoring of selected performance, as shown in the figure below:

1	↑ Name	PMP Status
•	10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	Enabled PMF
•	10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	
	10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	Are you sure you want to operate these data?
	10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd	Apply Cancel
	10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	Apply Cancel
•	10.32.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	Enabled PMP
•	10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_NearEnd	Enabled PMP
•	10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_FarEnd	Enabled PMP
•	10.32.130.111_Slot1_Port1_ODU4(2)_Ingress_NearEnd	Disabled PMF
1	10.32.130.111_Slot1_Port1_ODU4(2)_Ingress_FarEnd	Enabled PMP

Figure 9-4 Batch Enabling Monitoring Point

Select multiple enabled performance monitoring, then select"Enable PMP"button, click on "Apply", it will display"Not Modified", as shown in the figure below.

↑ Name	PMP Status
10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	Enabled PMP
10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	Engbled PMP
10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	Not Modified! bled PMP
10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd	bled PMP



9.1.4. Disable Performance Monitoring Point

When the current 15-minute performance monitoring point is disabled, the 24-hour performance monitoring will be automatically disabled by default, and all the performance monitoring parameters of the performance monitoring point will be disabled at the same time. Therefore, when the performance monitoring point is disabled, the relevant data of the current performance statistics can not be viewed, as shown in the figure below:

Enable PMP (Disable PMP)		
	PMP Status	Oper
10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	Disabled PMP	Enab
10.32.130.111_Slot1_Port1_Optical_ingress_NearEnd		Disat
10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	Are you sure you want to operate these data?	Disal
10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd		Disat
10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	Apply Cancel	Disat
10.33.130.111 Slott Bodt OTH EEC Ingross NovEnd	Easting DMD	Dirah

Figure9-6 Disable Monitoring Point

Each monitoring point can be disabled by modifying the status of the monitoring point with the button behind

it (Enable PMP - >Disable PMP), as shown in the figure below:

		PMP Status	Operate
10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd		Enabled PMP	Disable PMP
10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	Q	Enabled PMP	Disable PMP
10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd		Enabled PMP	Disable PMP
10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd		Enabled PMP	Disable PMP
10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd		Enabled PMP	Disable PMP

Figure9-7 Disable A Single Monitoring Point

To realize batch disabling operations on multiple pieces of data, you can select the previous multiple checkboxes, then click the button on the table (Disable PMP) to disable the monitoring of selected performance, as shown in the figure below:

En	able PMP		
	↑ Name	PMP Status	Opera
	10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	Disabled PMP	Enab
	10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd		Disat
	10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	Are you sure you want to operate these data?	Disab
	10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd		Disab
	10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	Cancel	Disab

Figure 9-8 Disable Batch Monitoring Points

Select multiple disabled performance monitoring, then select "Disable PMP" button, click on "Apply", it will display "Not Modified", as shown in the figure below.

Enable PMP Disable PMP		
□ ↑Name	PMP Status	Operate
10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	Disabled PMP	Enable PMP
10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	Enabled PMP	Disable PMP
10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	Not Modified! bled PMP	Disable PMP
I0.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd	Apply abled PMP	Enable PMP
10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	bled PMP	Disable PMP
	PLL-2 PAIR	20.01.200

Figure9-11 No Modification of Monitoring Point Status

9.1.5. Attentions for Monitoring Performance

- When monitoring points are enabled, they will be disabled in several cases:
 - (1) Manually disable a single monitoring point or batch monitoring points.
 - (2) After the board mode is switched, all the 15-minute and 24-hour monitoring points of the port are automatically disabled.
 - (3) When the port changes the mode, only the monitoring point of the optical power among all the 15-minute and 24-hour monitoring points of the port will not be disabled, and all other performance monitoring points will be automatically disabled.
 - (4) When the 15-minute performance monitoring point is disabled, the corresponding 24-hour performance monitoring point will be automatically disabled.
- When the user disable the performance monitoring point:
 - (1) The current performance data cannot be acquired.
 - (2) The history performance data which has been saved can be viewed by the NMS system and the user.
 - (3) When the user issues the disable command, the monitoring data that has been counted during that time period (do not reach a full 15-minute or 24-hour monitoring cycle) will not be saved to history performance data.
 - (4) When the port mode is switched or the port mode is set as empty, all the performance monitoring points under this port mode will be automatically deleted. (Previously stored history performance data are still retained.)
 - (5) When the TP such as OCh, OTUk, ODUk, Ethernet and SDH/SONET corresponding to the port or the monitoring point is administrative down, all the performance monitoring points of the TP will be automatically disabled. (Previously stored history performance data are still retained.)

9.2. Current Performance Statistics

Click on "*Maintenance*" in the top menu bar, and select "*Performance Current Info*" in the left navigation bar, as shown in the figure. you can find current performance statistics of optical power, FEC, OTU/ODU, SDH regeneration segment and Ethernet at the right side, as shown in the figure below:

			Monitor			Configuration	X Maintain			(
Optical Performance C	urrent Info	OCh Performance current info	FEC Performance	e Current Info	0)TUK/ODUk Performance Current Info	SDF	H Sonet Performance Current Info	Ethern	et Performance Current Info
			•	Slot		Please Select		•	Port	Please Select
Granularity	nin		¥	Search		Please enter the search content.			Query	Refresh
☐ ↑Name		1	MaxPower	∱ Ma	xPower	Stamp	↑ MinPower	+ Min	Power Stamp	
								No datas		
	Optical Performance NE Pier PM Granulanty 15rr Reset	PM Granularity 15min Reset	Optical Performance Current Info NE Please Select PM Granularity 15min Recet	Optical Performance Current Info OCh Performance FEC Performance Optical Performance Current Info NE Piease Select ▼ FM Granularity 15min ▼ ▼	Montor Other Optical Performance Current Info OCh Parlamente Current Info Optical Performance Current Info FEC Performance Current Info NE Please Select PM Granularity 15min Reset Search	Monitor Clickal Optical Performance Current Info OCh Performance Current Info Optical Performance Current Info C NE Please Select PM Granularity 15min Reset Search	Monitor Citobal Configuration Optical Performance Current Info OCth Parlamener current Info FEC Performance Current Info Optical Performance Current Info OCth Parlamener current Info OTUK/ODUR Performance Current Info NE Please Select Stot PM Granularity 15min Search Please enter the search content	Montor Circle Configuration Mantain Optical Performance Current Info OCh Budance current Info FEC Performance Current Info OTUk/ODUk Performance Current Info SDI Optical Performance Current Info NE Please Select Image: Select Image: Select Image: Select PM Granularity 15min Image: Select Image: Select Image: Select Image: Select	Monther Clothad Configuration Maintain Optical Performance Current Info OCh Pauborance current Info FEC Performance Current Info OTUk/ODUk Performance Current Info SDH Sonet Performance Current Info Optical Performance Current Info Maintain Visit Presse Select Visit Please Select Visit Performance Current Info NE Please Select Visit Please Select Visit Please Select Visit Presse enter the search content PM Granularity 15min Visit Please Select Visit Please enter the search content	Monthor Global Configuration Maintain Optical Performance Current Info OCh. Badismuse outrieffit Info FEC Performance Current Info OTUV/ODUk Performance Current Info SDH Sonet Performance Current Info Ethern Optical Performance Current Info Info FEC Performance Current Info SDH SDH Sonet Performance Current Info Port NE Piesse Select Info Stat Piesse Belect Port Manual registry 15min Search Piesse enter the search content Current Recet Info + Max/Power + Max/Power Stamp + Min/Power + Min/Power Stamp



9.2.1. Monitoring of Optical Power

9.2.1.1. Introduction of Optical Power Monitoring Parameters

The monitoring parameters of optical power monitoring point include maximum optical power, maximum optical power time stamp, minimum optical power, minimum optical power time stamp, average optical power, suspicious interval marker, running time and reset operation. The performance parameters of optical power will be enabled or disabled at the same time.

Optical Performan		h Performance Current Info FEC Perform	nance Current Info	OTUk/ODUk Performance Curr	rent Info SDH Sonet Performance	e Current Info Ether	net Performance Current Info		
Optical Performa	nce Current Info								
NE	Please Select	·	Slot	Please Select		▼ Port	Please Select		Ŧ
PM Granularity	15min		Search	Please enter the search conte	ent	Query	Refresh		
Reset									
A Name		+ MaxPower	+ MaxP	ower Stamp	+ MinPower	+ MinPower Stamp	+ AvgPower	3	+ Suspect Interval Flag
					-				
					No data~				
Total: 0 records								10 🔻	Previous Next



9.2.1.2. View Optical Power Monitoring Information

Select the appropriate network elements, slots, ports and monitoring cycle through the selection box above the menu, the optical power value of a certain network element/slot/port will be displayed. Optical power includes two monitoring points for near-end transmission and near-end reception. Optical module is inserted into the monitoring port. Data of the maximum and minimum optical power and of the corresponding generation time stamp which are currently read will be displayed. After the 15-minute monitoring port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 900 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 15-minute data automatically becomes the history data.

NE	10.32.130.111	*	Slot	1			Port	1		
PM Granularity	15min	•	Search	Please enter the search content			Query	Refresh		
Reset	e	+ MaxPower	↑ MaxPo	ower Stamp		÷ N	linPower Stamp		+ AvgPower	+ Suspect Interval Fla
☐ ↑ Nam	ie 130.111_Slot1_Port1_Optical_Ingress_NearEnd	↑ MaxPower	∱ MaxPo		+ MinPower		linPower Stamp		+ AvgPower	

Figure9-14 15-Minute Monitoring Point Data of Optical Power

When the 24-hour monitoring port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 86400 seconds, the suspicious interval marker will become trustworthy. The running time counts again from 0. The last 24-hour data automatically becomes the history data.

10.32.130.111	•	Slot	1	v	Port	1	
M 24hours	Ŧ	Search	Please enter the search content		Query	Refresh	
Reset							
		↑ MaxPov	wer Stamp		↑ MinPower Stamp		
			wer Stamp				
j • Name							
↑ Name							
↑ Name							



9.2.1.3. Reset Optical Power Monitoring Data

When the current optical power monitoring point needs to be reset and to restart the monitoring, the 15-minute and 24-hour operation steps are the same. Taking 15-minute operation as an example, you can click on Reset behind each piece of monitoring record to perform resetting of a single piece of monitoring record, or you can select the first box to do batch resetting, as shown in the figure below.

	* MaxPower			+ MinPower Stamp		+ Suspect Interval Flag
10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	-	anafarfar as'as'ar	-	neered produces and produces	-	False
10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	-	Are you sure you want to operate these data?			-	False
		Apply Cancel				

Figure9-16 Batch Resetting of Optical Power

Then click on *Apply* button, as shown in the figure, it will show that the operation is successful. After that, click on "*Refresh*" button to refresh the whole page. At this time, the suspicious interval marker will become from untrustworthy to trustworthy and the running time counts again from 0. The maximum optical power time stamp and the minimum optical power time stamp are updated to the latest time to read the optical power, and the value of the maximum and minimum optical power are updated to the data read at the latest time.

Reset						
The Ame	+ MaxPower		↑ MinPower		+ AvgPower	+ Suspect Interval Fla
10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	0.0	1970/01/01 08:00:00	0.0	1970/01/01 08:00:00	0.0	False
10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	0.0	1970/01/	0.0	1970/01/01 08:00:00	0.0	False
Total: 2 records		Success			10	Previous

Figure9-17 Successful Reset Operation

9.2.1.4. Optical Power Monitoring Data Shown As"-"

Here are the situations when the monitoring data of optical power for the port is shown as NA:

- (1) When optical module is not inserted into the port, the optical module is not in position but the port is enabled.
- (2) Optical module is inserted into the port but it is mismatched and the port is enabled.

At this time, both the maximum and minimum optical power will be shown as -. The time stamp of the maximum and minimum optical power will be shown as ----/--/--:---. The suspicious interval marker is untrustworthy. The running time is normal and counts from 0, as shown in the figure below:

	10.32.130.111	*	Slot	1		Port 2	
nularity	15min	×	Search	Please enter the search con	lent	Query	Refresh
-							
	e	↑ MaxPower	↑MaxPo	ower Stamp	↑ MinPower	↑MinPower Stamp	↑ AvgPower
	e 130.111_Sixt1_Port2_Optical_Ingress_NearEnd	↑ MaxPower	↑ MaxPo	2	↑ MinPower	↑ MinPower Stamp	↑ AvgPower

Figure 9-18 Optical Module of Optical Power Not in Position

Here are the situations when the monitoring data of optical power for the board is shown as -:

(1) When the board is not in position or is pre-configured with an empty slot and the port for the board is enabled, the maximum and minimum optical power will be shown as -. The time stamp of the maximum and minimum optical power will be shown as - /-:--. The suspicious interval is marked as untrustworthy, and the running time is always 0 without any change, as shown in the figure below.

	10.32.130.111	¥	Slot	1		▼ Port	1		
l anularity	15min		Search	Please enter the search content			uery Refresh		
Reset									
Reset	2		↑ MaxPo	wer Stamp	+ MinPower	↑ MinPower S	tamp	↑ AvgPower	+ Suspect Int
] ↑Name	a 30.111_Slot1_Port1_Optical_Ingress_NearEnd	↑ MaxPower 0.0		wer Stamp /01 08:00:00	∻ MinPower 0.0	+ MinPower S			

Figure9-19 Optical Power Monitoring Data

When the board is mismatched and the port for the board is enabled, the maximum and minimum optical power will be shown as -. The time stamp of the maximum and minimum optical power will be shown as ----/--/--:--:--. The suspicious interval is marked as untrustworthy, and the running time counts from 0, as shown in the figure below:

Optical Perform	ance Current Info								
NE	10.32.130.111	*	Slot	1		▼ Po	rt 1		
PM Granularity	15min	•	Search	Please enter the search content	ł		Query	Refresh	
Reset									
Reset	Ĩ.		+ MaxPo	wer Stamp	+ MinPower	↑ MinPowe	r Stamp	↑ AvgPower	
☐ ↑ Nam	30.111_Slot1_Port1_Optical_Ingress_NearEnd	+ MaxPower		wer Stamp 01 08:00:00	+ MinPower 0.0	↑ MinPowe 1970/01/01		+ AvgPower 0.0	+ Suspect Interval False
+ Nam			1970/01/				08:00:00		
+ Nam	30.111_Slot1_Port1_Optical_Ingress_NearEnd	0.0	1970/01/	01 08:00:00	0.0	1970/01/01	08:00:00	0.0	False



9.2.2. OCh Current Performance Statistics

9.2.2.1. OCh Monitoring Parameters Introduction

Monitoring parameters of OCh monitoring points include maximum differential group delay (DGD), maximum differential group delay (DGD) time stamp, minimum differential group delay (DGD), minimum differential group delay (DGD) time stamp, average differential group delay (DGD), maximum chromatic dispersion (CD), maximum chromatic dispersion (CD) time stamp, minimum chromatic dispersion (CD), minimum chromatic dispersion (CD) times tamp, average chromatic dispersion (CD), maximum optical signal-to-noise ratio (OSNR) time stamp, minimum optical signal-to-noise ratio (OSNR), minimum optical signal-to-noise ratio (OSNR) time stamp, average optical signal-to-noise ratio (OSNR), suspicious interval marker, running time and reset operation. The performance parameters of OCh will be enabled or disabled at the same time.

* *	Slot Search	Please Select Please enter the search content		•	Port	Please Select	×
•	Search	Please enter the search content			Query	Refresh	
+ MaxDGD							+ MaxCD
	≁ MaxDGD	→ MaxDGD	MaxDGD				



9.2.2.2. View OCh Monitoring Information

Only when WDM optical module is inserted can OCh monitoring point and related data exist. Select the appropriate network elements, slots, ports and monitoring cycle through the selection box above the menu, the OCh value of a certain network element/slot/port will be displayed. OCh includes only one monitoring point which is entrance-near end. WDM module is inserted into the monitoring port. OCh data and corresponding generation time which are currently read will be displayed. After the port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 900 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 15-minute data automatically becomes the history data.

n Performan	ice Current Info									
NE	10.32.130.160	w.	Slot	1	•	Port 1				v
PM Granularity	15min	•	Search	Please enter the search content		Query	Refresh			
Reset										
	↑ Name	↑ MaxDGD			↑ MinDGD	+ MinDGD Stamp		+ AvgDGD		↑ MaxCD
	10.32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	4		2020/09/22 12:21:05	1	2020/09/22 12:16:18		2		-586

Figure9-22 15-Minute OCh Monitoring Data

WDM module is inserted into the monitoring port. OCh data and corresponding generation time stamp which are currently read will be displayed. After the 24-hour performance monitoring port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 86400 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 24-hour data automatically becomes the history data, as shown in the figure below:

OCh Performan	ce Current Info							
NE	10.32.130.160	▼ S	Slot	1	Ŧ	Port 1		*
PM Granularity	24hours	▼ S	Search	Please enter the search content		Query Refresh		
Reset								
	↑ Name				↑ MinDGD	+ MinDGD Stamp	↑ AvgDGD	↑ MaxCD
					4			
					No c	lata~		

Figure9-23 24-Hour OCh Monitoring Data

9.2.2.3. Reset OCh Monitoring Data

When the current OCh monitoring data needs to be reset and to restart the monitoring, the 15-minute and 24-hour operation steps are the same. Taking 15-minute operation as an example, you can click on Reset behind each piece of monitoring record to perform resetting of a single piece of monitoring record, or you can select the first box to do batch resetting, as shown in the figure below.

10.32.130.160_Slot1_Port1_OCh_ingress_NearEnd	
	//::
Are you sure you want to operate these data?	

Figure9-24 Reset OCh Data

Then click on *Apply* button, as shown in the figure, it will show that the operation is successful. After that, click on *Refresh* button to refresh the whole page. At this time, the suspicious interval marker will become from untrustworthy to trustworthy and the running time counts again from 0. All the time stamps are updated to the latest time to read the value, and other data will be updated to that read at the latest time.

	↑ Name	↑ MaxDGD	MaxDGD Stamp		
	10.32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	0	1070/01/01 08-00-00	0	
otal: 1 re	cords		V 1		

Figure 9-25 Successful Resetting of OCh

9.2.2.4. OCh Monitoring Data Shown As"-"

Here are the situations when the OCh monitoring data for the port is shown as -:

(1) When optical module is not inserted into the port, the optical module is not in position but the port is enabled.

(2) Optical module is inserted into the port but it is mismatched and the port is enabled.

(3) Optical module is inserted into the port but there is los, that is, no light is received.

At this time, both the maximum and minimum data will be shown as -. The times tamp of the maximum and minimum data will be shown as ----/--/--:---. The suspicious interval marker is untrustworthy. The running time is normal and counts from 0, as shown in the figure below:

OCh Performar	nce Current Info								
NE	10.32.130.112	*	Slot	1	*	Port	1		*
PM Granularity	15min	¥	Search	Please enter the search content		Query	Refresh		
Reset									
	↑Name	↑ MaxDGD			+ MinDGD	↑ MinDGD Stamp	D	↑ AvgDGD	↑ MaxCD
	10.32.130.112_Slot1_Port1_OCh_Ingress_NearEnd	<u>11</u> 3			-			-	

Figure9-26 Optical Module of OCh Not In Position

Here are the situations when the monitoring data for the board is shown as NA:

(1) When the board is not in position or is pre-configured with an empty slot and the port for the board is enabled, the maximum and minimum data will be shown as NA.The time stamp of the maximum and minimum data will be shown as - /-:--.The suspicious interval is marked as untrustworthy, and the running time is always 0 without any change, as shown in the figure below.

ce Current Info								
10.32.130.112	*	Slot	1	-	Port	1		•
15min	*	Search	Please enter the search content		Query	Refresh		
↑ Name	↑ MaxDGD		↑ MaxDGD Stamp	↑ MinDGD	↑ MinDGD Stam	P	↑ AvgDGD	↑ MaxCD
10.32.130.112_Slot1_Port1_OCh_Ingress_NearEnd								
	10.32.130.112 15min	10.32.130.112 • 15min • *Name + MaxDGD	10.32.130.112 • Stot 15min • Search * Name + MaxDGD	10.32.130.112 • Stot 1 15min • Search Please enter the search content * Name + MaxDGD + MaxDGD Stamp	10.32.130.112 v Slot 1 v 15min v Search Please enter the search content *Name + MaxDGO + MaxDGO Stamp + MinDGD 10.32.130.112_Stot1_Port1_OCh_Ingress_NearEnd /	10.32.130.112 v Slot 1 v Part 15min v Search Please enter the search content Query *Name * MaxOGD * MaxOGD Stamp + MinOGO + MinOGO Stam 10.32.130.112_Stot1_Port1_OCh_Ingress_NearEnd / /	Instruction Stort Instruction Port Instruction 15min • MaxDGD Stamp • MaxDGD Stamp • MaxDGD Stamp • MinDGD Stamp 10.32.130.112_Stort_Port1_OCh_Ingress_NearEnd - • • • • •	10.32.130.112 Stot 1 Port 1 15min

Figure9-27 OCh Monitoring Data

(2) When the board is mismatched and the port for the board is enabled, the maximum and minimum data will be shown as -. The time stamp of the maximum and minimum data will be shown as ----/--/--:--. The suspicious interval is marked as untrustworthy, and the running time counts from 0, as shown in the figure below:

OCh Performan	ce Current Info								
NE	10.32.130.112	Ŧ	Slot	1	*	Port	1		•
PM Granularity	15min	Ŧ	Search	Please enter the search content		Query	Refresh		
Reset									
	↑ Name	↑ MaxDGD						↑ AvgDGD	
	10.32.130.112_Slot1_Port1_OCh_Ingress_NearEnd	223			-				122

Figure9-28 OCh Monitoring Data When Mismatched

9.2.3. FEC Current Performance Statistics

9.2.3.1. FEC Monitoring Parameters Introduction

As shown in the figure, the monitoring parameters of FEC monitoring points include maximum error correction rate, maximum error correction rate time stamp, average error correction rate, suspicious interval marker, running time and reset operation. The performance parameters of FEC will be enabled or disabled at the same time.

Optical Performa		OCh Performance Current Info	FEC Performance	e Current Info	OTUk/ODUk Performance Current Info	SDH Sonet Performance Cur	rrent Info Ether	net Performance Current Info	
NE PM Granularity	Please Select		*	Slot Search	Please Select Please enter the search content	¥	Port	Please Select Refresh	
Reset	ne			↑ PreFECBER	♦ Max Correcte	ad BER		R Stamp	+ Avg Corrected BER

Figure 9-29 FEC Monitoring Parameters

9.2.3.2. View FEC Monitoring Information

As shown in the figure, select the appropriate network elements, slots, ports and monitoring cycle through the selection box above the menu, the FEC value of a certain network element/slot/port will be displayed. There is only one entrance-near end monitoring point for FEC. Optical module is inserted into the monitoring port. FEC data and corresponding generation time stamp which are currently read will be displayed. After the port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 900 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 15-minute data automatically becomes the history data.

	10.32.130.111	•	Slot	1	Port	1	
nularity	15min	•	Search	Please enter the search content	Query	Refresh	
Reset	me				Max Corrected BER S	News	↑ Avg Corre

Figure 9-30 15-Minute Monitoring Data of FEC

Optical module is inserted into the monitoring port. FEC data and corresponding generation time stamp which are currently read will be displayed. After the 24-hour performance monitoring port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 86400 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 24-hour data automatically becomes the history data, as shown in the figure below:

Performance Current Info				
10.32.130.111	▼ Slot 1		▼ Port 1	
nularity 24hours	▼ Search Please er	ter the search content	Query Refresh	
Reset				
] ^Name				+ Avg Corrected BER

Figure9-31 24-Hour Monitoring Data of FEC

9.2.3.3. Reset FEC Monitoring Data

When the current FEC monitoring data needs to be reset and to restart the monitoring, the 15-minute and 24-hour operation steps are the same. Taking 15-minute operation as an example, you can click on Reset behind each piece of monitoring record to perform resetting of a single piece of monitoring record, or you can select the first box to reset, as shown in the figure below.

EC Performa	nce Current Info					
NE	10.32.130.111	*	Slot	1	*	Po
PM Granularity	15min	•	Search	Please enter the search content		
Reset	ame		+ PreFECBER	+ Max Corrected BER		↑ Max Cor
✓ 10.3	2.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd		-	-		/:
Total: 1 recor	ds		🚺 Are you	sure you want to operate these data?		

Figure9-32 FEC Reset

Then click on Apply button, as shown in the figure, it will show that the operation is successful. After that, click on Refresh button to refresh the whole page. At this time, the suspicious interval marker will become from untrustworthy to trustworthy and the running time counts again from 0. All the time stamps are updated to the latest time to read the value, and other data will be updated to that read at the latest time.

Name * Name	↑ PreFECBER	Max Corrected BER
10.32.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	-	-
otal: 1 records	· · · · · · · · · · · · · · · · · · ·	
	Succes	s



9.2.3.4. FEC Monitoring Data Shown As"-"

Here are the situations when the FEC monitoring data for the port is shown as -:

(1) When optical module is not inserted into the port, the optical module is not in position but the port is enabled.

(2) Optical module is inserted into the port but it is mismatched and the port is enabled.

At this time, all the non-time stamp data will be shown as -, and all the time stamps will be shown as ----/--/--:--:--. The suspicious interval marker is untrustworthy. The running time is normal and counts from 0, as shown in the figure below:

C Performar	ace Current Info						
NE	10.32.130.111	*	Slot	1 -	Port	1	
PM Granularity	15min	Ŧ	Search	Please enter the search content	Query	Refresh	
Reset			↑ PreFECBER	+ Max Corrected BER	↑ Max Corrected BE	-D Stems	
						erc otamp	
10.3	2.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd						-

Figure 9-34 Optical Module of FEC Not In Position

Here are the situations when the monitoring data for the board is shown as -:

(1) When the board is not in position or is pre-configured with an empty slot and the port for the board is enabled, all the non-time stamp data will be shown as -, and all the time stamps will be shown as - /-:--.The suspicious interval is marked as untrustworthy, and the running time is always 0 without any change, as shown in the figure below.

	10.32.130.111	*	Slot	1	*	Port	1	
ularity	15min	•	Search	Please enter the search content		Query	Refresh	
eset								
Reset	10		↑ PreFECBER		4	Max Corrected BER	Stamp	Avg Corrected BER

Figure9-35 FEC Monitoring Data

(2) When the board is mismatched and the port for the board is enabled, all the non-time stamp data will be shown as - and all the time stamps will be shown as ----/--/--:--. The suspicious interval is marked as untrustworthy, and the running time counts from 0, as shown in the figure below:

NE 10.32.130.111 Image: Slot 1 Pot 1 PM Granularity 15min Image: Search Please enter the search content Cuery Refree the	C Performa	ance Current Info									
PM Granularity 15min Search Please enter the search contant Query Refresh Reset	NE	10.32.130.111	-	Slot	1		Port	1			v
_		15min	Ŧ	Search	Please enter the search content			Refresh			
Anne + PreFECBER + Max Corrected BER Stamp + Avg Corrected BER	Reset										
a 10.32.130.111_Stott_Port1_OTU-FEC_Ingress_NearEnd	_	ame		↑ PreFECBER		↑ Max C	Corrected BER	t Stamp	9	Avg Corrected BER	

Figure 9-36 FEC Monitoring Data When Mismatched

9.2.4. OTUk/ODUk Current Performance Statistics

9.2.4.1. OTUk/ODUk Monitoring Parameters Introduction

As shown in the figure, the monitoring parameters of OTUk/ODUk monitoring points include background error block (BBE), error second (ES), serious error second (SES), unavailable second (UAS), suspicious interval marker,

runtime (S) and reset operation. The performance parameters of OTUk / ODUk will be enabled or disabled at the same time.

Optical Performa	ance Current Info	OCh Performance Current Info	FEC Performance	Current Info	OTUk/ODUk Performance Current Info	SDH Sonet Performance Curren	t Info Ethernet Performan	ce Current Info	
TUK/ODUK Pe	erformance Current	Info							
NE	Please Select		•	Slot	Please Select	Ŧ	Port Please Se	lect	
PM Granularity	15min		•	Search	Please enter the search content		Query Refre	sh	
Reset									
☐ ↑Name		↑ Bi	BE	≁ES	↑ SES	↑UAS			



9.2.4.2. View OTUk/ODUk Monitoring Information

As shown in the figure, select the appropriate network elements, slots, ports and monitoring cycle through the selection box above the menu, the OTUk/ODUk value of a certain network element/slot/port will be displayed. The monitoring points of OTUk/ODUk include near end and far end, and the monitoring directions include entrance and exit. (Generally, the client port which is not OTU is corresponding to exit of ODU. The monitoring direction of OTU and ODU for OTU port is entrance. Non-OTU means that the services of the port are not OTU2/OTU2e.)

Optical module is inserted into the monitoring port. OTUk/ODUk monitoring data which is currently read will be displayed. After the port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 900 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 15-minute data automatically becomes the history data.

	10.32.130.111	*	Slot			Port 1		
l anularity	15min	Ψ.	Search	Please enter the search content		Query Refre	sh	
Reset								
↑ Name		↑ BBE	+ ES	+ SES	↑ UAS			
	30.111_Slot1_Port1_OTU_Ingress_FarEnd	↑BBE 0	↑ES 0	+ SES 0	⊕ UAS 0		↑ Elapsed Time 337	
10.32.1								
10.32.1	30.111_Slot1_Port1_OTU_Ingress_FarEnd	0	0	0	0	True	337	Reset

Figure9-38 15-Minute OTUk/ODUk Monitoring Data

Optical module is insertedw: into the monitoring port. OTUk/ODUk data which is currently read will be displayed. After the 24-hour performance monitoring port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 86400 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 24-hour data automatically becomes the history data, as shown in the figure belo



Figure9-39 24-Hour OTUk/ODUk Monitoring Data

9.2.4.3. Error Generation Conditions for Monitoring Parameters

SES counts are generated when the following alarms are generated at the near end, and continuous 10S of SES becomes a UAS. If the alarm persists, the ES and SES stops counting, but the UAS counts all the time, as shown in the figure.

- Equipment Missing
- Equipment Mismatch
- Equipment Failure
- OTUk defects: OTU-LOS, OTU-LOF, OTU-LOM, OTU-AIS and OTU-TIM.
- ODUk defects: alarms of the Server layer (e.g. LOS, LOF, LOM), ODU-AIS, ODU-LCK, ODU-TIM, ODU-OCI and ODU-PLM.
- When alarms are generated at the far end, SES counts generate.
- BDI.
- When low-rate bit error is inserted by the meter, BBE and ES generate.
- ES and SES are generated when high-rate bit error is inserted by the meter. The continuous 10S of SES will become a UAS. If the high-rate bit error of the meter keeps, then ES and SES stops counting but UAS will count all the time.

1	0.32.130.111	-	Slot 1			▼ Port 1		
1 anularity	5min	٣	Search	base enter the search content		Query Refre	sh	
Reset								
]		↑ BBE	↑ ES	↑ SES	↑UAS			
	11_Slot1_Port1_OTU_Ingress_FarEnd	⊕ BBE	rt ES 0	↑ SES	↑ UAS 0			
] 10.32.130.11	11_Slot1_Port1_OTU_Ingress_FarEnd 11_Slot1_Port1_ODU4(1)_Ingress_NearEnd			↑ SES 0 0		1		
] 10.32.130.11] 10.32.130.11		0	0	+ SES 0 0 0	0	True	482	Reset

Figure 9-40 UAS Always Counts

9.2.4.4. OTUk/ODUk Monitoring Data Reset

When the current OTUk/ODUk monitoring data needs to be reset and to restart the monitoring, the 15-minute and 24-hour operation steps are the same. Taking 15-minute operation as an example, you can click on Reset behind each piece of monitoring record to perform resetting of a single piece of monitoring record, or you can select the first box to do batch resetting, as shown in the figure below.

Reset							
+ Name	↑ BBE	ΦES	↑ SES	+ UAS			
10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	0	0	0	0	True	482	Reset
10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	Are you sure yo	u want to operate these data?	482	True	482	Reset
10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	_		0	True	482	Reset
10.32.130.111_Slot1_Port1_ODU4(2)_Ingress_FarEnd	0	Apply	Cancel	0	True	482	Reset



Then click on *Apply* button, as shown in the figure, it will show that the operation is successful. After that, click on *Refresh* button to refresh the whole page. At this time, the suspicious interval marker will become from

untrustworthy to trustworthy and the running time counts again from 0. All the details updated to the latest time to read the value.

Reset							
+Name	↑BBE	↑ ES	↑ SES	+ UAS		+ Elapsed Time	
10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	0	0	-	0	False	0	Reset
10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0		581	True	581	Reset
10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	0	V	0	True	581	Reset
10.32.130.111_Slot1_Port1_ODU4(2)_Ingress_FarEnd	0	0	Success	0	True	581	Reset

Figure9-42 OTUk/ODUk Successfully Reset

9.2.4.5. OTUk/ODUk Monitoring Data Shown As"-"

Here are the situations when the OTUk/ODUk monitoring data for the port is shown as -:

(1) When optical module is not inserted into the port, the optical module is not in position but the port is enabled.

(2) The port and the module are normal and the port is enabled.

(3) Optical module is inserted into the port but it is mismatched and the port is enabled.

At this time, all the data will be shown as -. The suspicious interval marker is trustworthy or untrustworthy (after 900/86400 seconds). The running time is normal and counts from 0, as shown in the figure below:

	erformance Current Info							
4E	10.32.130.111		Slot			▼ Port 2		
PM Branularity	15min	Ŧ	Search	Please enter the search content		Query	tefresh	
Reset		↑BBE	+ES	↑ SES	† UAS		↑ Elapsed Time	
☐ ↑Name	30.111_Slot1_Port2_ODU4(0)_Egress_NearEnd	◆BBE	↑ES -	+SES -	+UAS	+ Suspect Interval Flag	↑ Elapsed Time 0	

Figure9-43 Optical Module of OTUk/ODUk Not In Position

Here are the situations when the monitoring data for the board is shown as -:

(1) When the board is not in position or is pre-configured with an empty slot and the port for the board is enabled, all the data will be shown as -. The suspicious interval is marked as untrustworthy, and the running time is always 0 without any change, as shown in the figure below.

					[.					
10.32.130.111			Ŧ	Slot	1		Ŧ	Port 2		
inularity 15min			Ŧ	Search	Please enter the search content			Query Re	fresh	
Reset										
		↑BBE		↑ES	+ SES	+ UAS		+ Suspect Interval Flag		↑ Reset Operate
Reset	J4(0)_Egress_NearEnd	↑ BBE		+ES	↑ SES -	≁UAS		+ Suspect Interval Flag	↑ Elapsed Time 0	↑ Reset Operate

Figure9-44 OTUk/ODUk Monitoring Data

(2) When the board is mismatched and the port for the board is enabled, all the data will be shown as -. The suspicious interval is marked as untrustworthy, and the running time counts from 0 without any change, as shown in the figure below:

TUK/ODUK Pe	rformance Current Info							
NE	10.32.130.111	Ŧ	Slot	1	Ψ.	Port 2		•
PM Granularity	15min	*	Search	Please enter the search content		Query Refre	sh	
Reset								
		↑ BBE	↑ES	+ SES	↑UAS	+ Suspect Interval Flag		+ Reset Operate
10.32.13	0.111_Slot1_Port2_ODU4(0)_Egress_NearEnd	100				~	0	Reset

Figure9-45 OTUk/ODUk Monitoring Data When Mismatched

9.2.5. Current Performance Statistics of SDH Regeneration Segment

9.2.5.1. Monitoring Parameters Introduction of SDH Regeneration Segment

Monitoring parameters of SDH monitoring points include background error block (BBE), error second (ES), serious error second (SES), unavailable second (UAS), suspicious interval marker, runtime (S) and reset operation. Performance parameters of SDH will be enabled or disabled at the same time.

				Monitor	Globa	Configuration	X Maintain				Inspect	Lock	root
Log Management	Optical Performan	ce Current Info	OCh Performance Current Info	FEC Performance	Current Info	OTUK/ODUk Performance Current In	nfo SDH S	Sonet Performance Current Info	o Etherne	t Performance Curren	t Info		
Alarm Management Performance Current Info	SDH Sonet Perf	rmance Current In	fo										
Performance History Info	NE	Please Select		*	Slot	Please Select		*	Port	Please Select			Ŧ
III Data Maintenance	PM Granularity	15min		v	Search	Please enter the search content			Query	Refresh			
	Reset												
	☐ ↑Name		† 1	BE	+ ES	↑ SES	+	UAS 1	Suspect Interval	Flag 🗠	Elapsed Time		te

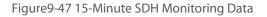
Figure9-46 Monitoring Parameters of SDH Regeneration Segment

9.2.5.2. View Monitoring Information of SDH Regeneration Segment

As shown in the figure, select the appropriate network elements, slots, ports and monitoring cycle through the selection box above the menu, the SDH value of a certain network element/slot/port will be displayed. The monitoring point of SDH only includes the near end, and the monitoring direction only includes entrance. (Generally, the client port which is not OTU is corresponding to exit of ODU. The monitoring direction of OTU and ODU for OTU port is entrance. Non-OTU means that the services of the port are not OTU2/OTU2e.)

Optical module is inserted into the monitoring port. SDH monitoring data which is currently read will be displayed. After the port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 900 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 15-minute data automatically becomes the history data.

al Performan	ance Current Info OCh Performance Current I	nfo FEC Performance	e Current Info	OTUK/ODUk Performance Current Info	SDH Sonet Performance C	urrent info	Ethernet Performan	nce Current Info	
	formance Current Info								
	10.32.130.220	Ŧ	Slot	3		▼ Po	ort1		
	15min	v	Search	Please enter the search content			Query Refr	resh	
anularity	15min	*	Search	Please enter the search content			Query Refr	resh	
A anularity Reset			Search + ES	Please enter the search content	≁UAS	+ Susp	Query Refr	resh ↑ Elapsed Time	



Optical module is inserted into the monitoring port. SDH data which is currently read will be displayed. After the 24-hour performance monitoring port is enabled, the suspicious interval marker should be untrustworthy. The

running time counts from 0. After 86400 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 24-hour data automatically becomes the history data, as shown in the figure below:

		Ψ	3	Slot	Ŧ	10.32.130.220
	Query Refresh		Please enter the search content	Search	•	24hours
						set
perate	ect Interval Flag	↑ UAS ↑ St	↑ SES	+ ES	↑ BBE	r Name

Figure 9-48 24-Hour SDH Monitoring Data

9.2.5.3. SDH Regeneration Segment Monitoring Data Reset

When the current SDH monitoring data needs to be reset and to restart the monitoring, the 15-minute and 24-hour operation steps are the same. Taking 15-minute operation as an example, you can click on Reset behind each piece of monitoring record to perform resetting of a single piece of monitoring record, or you can select the first box to do batch resetting, as shown in the figure below.

Sonet Per	rformance Current Info							
E	10.32.130.220	*	Slot	3	*	Port 1		
M ranularity	15min	*	Search	Please enter the search content		Query Refre	ish	
Reset								
🔲 🛧 Name		↑BBE	↑ES	+ SES	+ UAS			
	30.220_Slot3_Port1_SDH-RS_Ingress_NearEnd	0	Are you	sure you want to operate these data?	0	False	1	Reset
10.32.13								

Figure9-49 SDH Regeneration Segment Reset

Then click on *Apply* button, as shown in the figure, it will show that the operation is successful. After that, click on *Refresh* button to refresh the whole page. At this time, the suspicious interval marker will become from untrustworthy to trustworthy and the running time counts again from 0. All the data is updated to the latest time to read the value.

Sonet Performance C	urrent Info							
10.32.130.	220	•	Slot	3	Ŧ	Port 1		
						and the second se		
nularity 15min		Ŧ	Search	Please enter the search content		Query Refre	esh	
		*	Search	Please enter the search content		Query Refre	rsh	
nularity 15min		• BBE	Search +ES	Please enter the search content	+UAS	Query Refre	nsh) ↑ Elapsed Time	* Reset Operate

Figure9-50 SDH Regeneration Segment Successfully Reset

9.2.5.4. Monitoring Data of SDH Regeneration Segment Shown As NA

Here are the situations when the monitoring data of the SDH regeneration segment for the port is shown as NA:

(1) When optical module is not inserted into the port, the optical module is not in position but the port is enabled.

(2) The port and the module are normal and the port is enabled.

(3) Optical module is inserted into the port but it is mismatched and the port is enabled.

At this time, all the data will be shown as NA. The suspicious interval marker is trustworthy (after 900/86400 seconds) or untrustworthy. The running time is normal and counts from 0, as shown in the figure below:

Sonet Perfe	formance Current Info							
E	10.32.130.220	*	Slot	3	*	Port 1		
M ranularity	15min	v	Search	Please enter the search content		Query	Refresh	
unununy								
Reset		↑BBE	↑ES	↑ SE3	≁UAS			

Figure9-51 Optical Module of SDH Regeneration Segment Not In Position

Here are the situations when the monitoring data for the board is shown as NA:

(1) When the board is not in position or is pre-configured with an empty slot and the port for the board is enabled, all the data will be shown as NA.The suspicious interval is marked as untrustworthy, and the running time is always 0 without any change, as shown in Figure 2.5-7:

Sonet Performance Current Info							
10.32.130.220	•	Slot	3		Port 1		
nularity 15min	*	Search	Please enter the search content		Query Refre	ish	
Reset							
Reset	↑ BBE	↑ES	+ SES	≁UAS	+ Suspect Interval Flag	+ Elapsed Time	

Figure9-52 SDH Regeneration Segment Monitoring Data

(2) When the board is mismatched and the port for the board is enabled, all the data will be shown as NA. The suspicious interval is marked as untrustworthy, and the running time counts from 0 without any change, as shown in Figure 2.5-8:

Optical Performa	nce Current Info OCh Performance	Current Info FEC Performan	ce Current Info	OTUk/ODUk Performance Current Info	SDH Sonet Performance Current	Info Ethernet Performa	ance Current Info				
SDH Sonet Per	ormance Current Info										
NE	10.32.130.220	*	Slot	3		Port 1					•
PM Granularity	15min	•	Search	Please enter the search content		Query Re	fresh				
Reset											
☐ ↑ Name		↑BBE	+ ES	↑ SES	↑ UAS	+ Suspect Interval Flag	+ Elapsed Time			te	
10.32.13	0.220_Slot3_Port1_SDH-RS_Ingress_NearE	nd N/A	N/A	N/A	N/A	False	0		Reset		
Total: 1 records								10 💌	Previous	1	Next

Figure9-53 Monitoring Data of SDH Regeneration Segment When Mismatched

9.2.6. Current Performance Statistics of Ethernet

9.2.6.1. Ethernet Monitoring Parameters Introduction

Monitoring parameters of Ethernet monitoring points include normal frame number, unicast frame number, multicast frame number, broadcast frame number, CRC error frame, alignment error frame number, ultra-long frame number (Frame Too Long), ultra-long Jabber frame number (CRC error), ultra-short frame number (CRC error), discarded frame number, ultra-short frame number (CRC normal), 64-byte frame number. 65-127 byte frame number, 128-255 byte frame number, 256-511 byte frame number, 512-1023 byte frame number, 1024-1518 byte frame number, 1519-maximum byte frame number, ultra-long frame number (CRC normal), normal pause frame number (Pause), total frame number, suspicious interval marker, running time (S) and reset operation. The performance parameters of Ethernet will be enabled or disabled at the same time.

		Monitor Global	Configuration		inspect Lock root c
 Log Management Alarm Management Performance Current Info 	Optical Performance Current Info OCh Performance Current	Info FEC Performance Current Info OTU	Jk/ODUk Performance Current Info	SDH Sonet Performance Current Info	et Performance Current Info
Performance Current into Performance History Info Data Maintenance	NE Please Select PM 15min		ease enter the search content	Port Query	Please Select
	Granularity Taliini			ducy	(Number)
	Mame * Name		+ Unicast Frame		ame + CRC Error Frame + Alignment Error Frame
			No data-		

Figure9-54 Ethernet Monitoring Parameters

9.2.6.2. View Ethernet Monitoring Information

As shown in the figure, select the appropriate network elements, slots, ports and monitoring cycle through the selection box above the menu, the Ethernet value of a certain network element/slot/port will be displayed. The monitoring point of Ethernet only includes the near end, and currently the monitoring directions include entrance and exit. (Generally, the client port which is not OTU is corresponding to exit of ODU. The monitoring direction of OTU and ODU for OTU port is entrance. Non-OTU means that the services of the port are not OTU2/OTU2e.)

Optical module is inserted into the monitoring port. Ethernet monitoring data which is currently read will be displayed. After the port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 900 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 15-minute data automatically becomes the history data.

ernet Perforr	mance Current Info									
NE	10.32.130.111		Slot	.1		•	Port	2		
PM Granularity	15min	Ŧ	Search	Please e	nter the search content		Query	Refresh		
Reset										
		↑ G00	d Frame					ne	↑ CRC Error Frame	↑ Alignment Error Frame
0	+Name 10.32.130.111_Slot1_Port2_Ethernet_Ingress_NearEnd	∱ Goo N/A	d Frame		↑ Unicast Frame N/A			ne		

Figure9-55 15-Minute Ethernet Monitoring Data

Optical module is inserted into the monitoring port. Ethernet data which is currently read will be displayed. After the 24-hour performance monitoring port is enabled, the suspicious interval marker should be untrustworthy. The running time counts from 0. After 86400 seconds, the suspicious interval marker will become trustworthy and the running time counts again from 0. The last 24-hour data automatically becomes the history data, as shown in the figure below:

5	10.32.130.111	Ψ	Slot	1	τ.	Port 2		
nularity	24hours	•	Search	Please enter the search content		Query Refres	h	
Reset								
1	↑ Name	∱ G¢	od Frame		+ Multicast Frame			+ Alignment Error Frame

Figure9-56 24-Hour Ethernet Monitoring Data

9.2.6.3. Ethernet Monitoring Data Reset

When the current Ethernet monitoring data needs to be reset and to restart the monitoring, the 15-minute and 24-hour operation steps are the same. Taking 15-minute operation as an example, you can click on Reset behind each piece of monitoring record to perform resetting of a single piece of monitoring record, or you can select the first box to do batch resetting, as shown in the figure below:

	↑ Name					+ CRC Error Frame	+ Alignment Er
	10.32.130.111_Slot1_Port2_Ethernet_Ingress_NearEnd	N/A	N/A	N/A	N/A	N/A	N/A
0	10.32.130.111_Slot1_Port2_Ethernet_Egress_NearEnd	N/A 🌔 Are you su	re you want to operate these data?	N/A	N/A	N/A	N/A
			pply Cancel				

Figure9-57 Ethernet Reset

Then click on *Apply* button, as shown in the figure, it will show that the operation is successful. After that, click on *Refresh* button to refresh the whole page. At this time, the suspicious interval marker will become from untrustworthy to trustworthy and the running time counts again from 0. All the data is updated to the latest time to read the value.

Reset)						
	↑ Name				+ Broadcast Frame	+ CRC Error Frame	+ Alignment Error Frame
	10.32.130.111_Slot1_Port2_Ethernet_Ingress_NearEnd	0	0	0	0	0	0
	10.32.130.111_Slot1_Port2_Ethernet_Egress_NearEnd	N/A		N/A	N/A	N/A	N/A
			V				
Total: 2 rec	ords		Success			10	✓ Previous 1

Figure 9-58 Ethernet Successfully Reset

9.2.6.4. Ethernet Monitoring Data Shown As NA

Here are the situations when the Ethernet for the port is shown as NA:

(1) When optical module is not inserted into the port, the optical module is not in position but the port is enabled.

- (2) The port and the module are normal and the port is enabled.
- (3) Optical module is inserted into the port but it is mismatched and the port is enabled.

At this time, all the data will be shown as NA. The suspicious interval marker is trustworthy (after 900/86400 seconds) or untrustworthy. The running time is normal and counts from 0, as shown in the figure below:

	10.32.130.111	*	Slot	1		*	Port 2		
iularity	15min		Search	Please enter the search conten			Query	Refresh	
eset	∧ Name	↑G	ood Frame	⊕ Unicast Frame	+ Multicast Frame		+ Broadcast Frame	+ CRC Error Frame	
eset	+Name 10.32/130.111_Stot1_Port2_Ethernet_Ingress_NearEnd	+ G 0	ood Frame	 ◆ Unicast Frame 0 	 Multicast Frame 		 	+ CRC Error Frame	+ Alignment Error Frame

Figure9-59 Optical Module of Ethernet Not In Position

Here are the situations when the monitoring data for the board is shown as NA:

(1) When the board is not in position or is pre-configured with an empty slot and the port for the board is enabled, all the data will be shown as NA. The suspicious interval is marked as untrustworthy, and the running time is always 0 without any change, as shown in figure below:

			0		0		0	(False	0		Reset
3 Byte Frame		1024-1518 Byte Frame	↑ 1519-Maximun Frame		↑ Oversize Frame				Total Frame			↑ Elapsed Tir	no	↑ Operate
	10.32.130.11	11_Slot1_Port2_Ethernet_Egress_N	VearEnd	N/A		N/A		N/A		N/A		N/A	N/A	
	10.32.130.11	11_Slot1_Port2_Ethernet_Ingress_I	NearEnd	0		0		0		0		0	0	
				+ Good F	rame	+ Unicast	Frame		rame	+ Broadcas	t Frame	+ CRC Error Frame	+ Alignment	Error Fram
anularity Reset	15min		Ŧ		Search Please	enter the se	arch content			Query	Refresh			
	10.32.130.111		×		Slot 1				*	Port	2			

Figure9-60 Ethernet Monitoring Data

(2) When the board is mismatched and the port for the board is enabled, all the data will be shown as NA. The suspicious interval is marked as untrustworthy, and the running time counts from 0 without any change, as shown in the figure below:

PM Granularity	15min	▼ Search	Please enter the search content		Query Refresh		
Reset	↑ Name						
	10.32.130.111_Slot1_Port3_Ethernet_Ingress_NearEnd	N/A	N/A	N/A	N/A	N/A	N/A
	10.32.130.111_Slot1_Port3_Ethernet_Egress_NearEnd	N/A	N/A	N/A	N/A	N/A	N/A

Figure9-61 Ethernet Monitoring Data When Mismatched

9.3. History Performance Statistics

9.3.1. History Performance Statistics of Optical Power

9.3.1.1. History Monitoring Parameters Introduction of Optical Power

The monitoring parameter of the history monitoring point for optical power includes time interval, which is a shortcut to choose the time. There are three options--one day, three days and a week for you to choose.

Duration: You can choose a specific day or a period of time according to your needs.

Performance Monitoring Point: entrance-near end, exit-near end.

Performance Monitoring Parameters: maximum optical power, minimum optical power, average optical power.

Optical Performa	ance History Info					
Statistical Method	Chart Chart Table					
NE	10.32.130.160	•	Slot	1	*	
Port	1	•	PM Granularity	15min	~	
Time Interval	Last Three Days	•	Time Duration	2020/09/20 - 2020/09/22		
PM Point	Optical_Ingress_NearEnd	*	PM Parameter	MaxPower; MinPower; AvgPower;	•	Query

Figure 9-62 History Performance Parameters of Optical Power

9.3.1.2. View History Monitoring Information of Optical Power

15minutes and 24hours of optical power history data operation and display are the same form. Here we take 15-minute optical power history monitoring point as an example. Choose the appropriate network elements, slots, ports and monitoring cycles through the screening box above the menu, and then select the time interval, performance monitoring point and parameters which need to be monitored in the right menu. The maximum optical power, minimum optical power and average optical power can be all selected or only select one or two of them to check.After that, click Apply button on the lower right corner. From the graph, we can see the trend of the refraction chart of the maximum, minimum and average optical power. The ordinate represents the value of the optical power, and the abscissa represents the time. Data which has been read for more than 15 minutes will be automatically transferred from current statistics to history statistics.

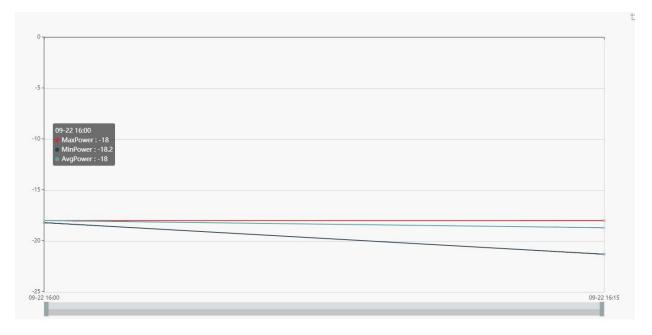


Figure 9-63 15-Minute Chart Data of Optical Power

History performance statistics of optical power also show history data in tabular form. Click on the table, the interface as shown in the figure below appears:

Oplical Periorna	ance history into							
Statistical Method	Chart Table							
NE	10.32.130.160	•	Slot	1	v			
Port	1	•	PM Granularity	15min	Ŧ			
Time Interval	Last Three Days		Time Duration	2020/09/20 - 2020/09/22	Ē			
Search	Please enter the search content		Query					
Export								
◆ Name		+ MaxPower	↑ MaxPower Star	mp	+ MinPower Stamp	+ AvgPower		↑ Time Stamp
10.32.130.16	0_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 15:45:0	01 -4.0	2020/09/22 15:45:02	-3.9	True	2020/09/22 16:00:00
10.32.130.16	0_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 16:00:0	01 -4.0	2020/09/22 16:00:02	-3.9	True	2020/09/22 16:15:00
10.32.130.16	0_Slot1_Port1_Optical_Ingress_NearEnd	-18.0	2020/09/22 15:45:0	D1 -18.2	2020/09/22 15:59:50	-18.0	True	2020/09/22 16:00:00
10.32.130.16	0_Slot1_Port1_Optical_Ingress_NearEnd	-18.0	2020/09/22 16:00:3	31 -21.3	2020/09/22 16:14:28	-18.7	True	2020/09/22 16:15:00

Figure9-64 15-Minute Tabular Interface of Optical Power

Click the time interval shortcut in the right menu or select the required time interval in Duration, and then click on Apply button in the lower right corner, the history data of all the optical power records on this port will be displayed, as shown in the figure below:

Optical Performa	ance History Info					
Statistical Method	Chart					
NE	10.32.130.160	•	Slot	1	*	
Port	1	*	PM Granularity	24hours	Ŧ	
Time Interval	Last Three Days		Time Duration	2020/09/20 - 2020/09/22		
Search	Please enter the search content		Query			
Export						
Name		+ MaxPower		mp + MinPower		
				:1		
				No data-		

Figure9-65 15-Minute Tabular History Data of Optical Power

9.3.1.3. Export History Monitoring Information of Optical Power

To save the history data, you can click on the upper Export button, and an interface will pop up, as shown in the figure below:

Optical Perform	ance History Info		
Statistical Method	Chart		
NE	10.32.130.160	×	Slot
Port	1	•	PM Granularity
Time Interval	Last Three Days		Time Duration
Search	Please enter the search content		Query
Export			
↓ Name			↑ MaxPower
10.32.130.10	60_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 15:
10.32.130.10	60_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 16:
10.32.130.16	60_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 16:
10.32.130.16	60_Slot1_Port1_Optical_Ingress_NearEnd	-18.0	2020/09/22 15:
10.32.130.16	60_Slot1_Port1_Optical_Ingress_NearEnd	-18.0	2020/09/22 16:

Figure 9-66 Export History Data of Optical Power

Any character such as English, Chinese, alphabet or number can be entered as the file name, and then click on Apply button, it will prompt that the export is successful, as shown in the figure below:

↓ Name	 MaxPower 	 MaxPower Stamp 		 MinPower Stamp 	AvgPower		
10.32.130.160_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 15:45:01	-4.0	2020/09/22 15:45:02	-3.9	True	2020/09/22 16:00:00
10.32.130.160_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 16:00:01	-4.0	2020/09/22 16:00:02	-3.9	True	2020/09/22 16:15:00
10.32.130.160_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 16:15:03	-4.0	2020/09/22 16:15:01	-3.9	True	2020/09/22 16:30:00
10.32.130.160_Slot1_Port1_Optical_Ingress_NearEnd	-18.0	2020/09/22 15:45:01	-18.2	2020/09/22 15:59:50	-18.0	True	2020/09/22 16:00:00
10.32.130.160_Slot1_Port1_Optical_Ingress_NearEnd	-18.0	2020/09/22 16:00:31	-21.3	2020/09/22 16:14:28	-18.7	True	2020/09/22 16:15:00
10.32.130.160_Slot1_Port1_Optical_Ingress_NearEnd	-20.9	2020/09/22 16:15:50	-21.3	2020/09/22 16:15:36	-21.0	True	2020/09/22 16:30:00
Total: 6 records						10	▼ Previous 1
			apyright © 2020 by FS.COM A				

HistoryOpticalPm....xls

Figure9-67 Successfully Export Data of Optical Power

9.3.2. OCh History Performance Statistics

9.3.2.1. OCh History Monitoring Parameters Introduction

The monitoring parameter of the history monitoring point for OCh includes time interval, which is a shortcut to choose the time. There are three options--one day, three days and a week for you to choose.

Duration: You can choose a specific day or a period of time according to your needs.

Performance Monitoring Point: entrance-near end.

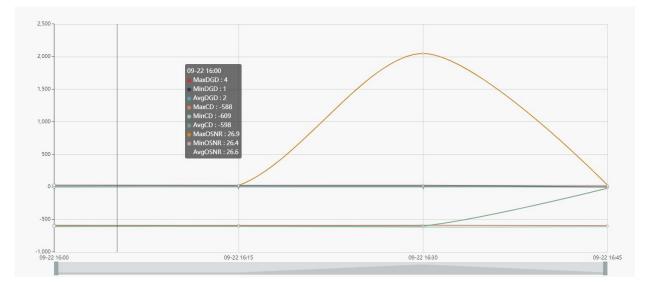
Performance Monitoring Parameters: maximum differential group delay (DGD), minimum differential group delay (DGD), average differential group delay (DGD), maximum chromatic dispersion (CD), minimum chromatic dispersion (CD), average chromatic dispersion (CD), maximum optical signal-to-noise ratio (OSNR), minimum optical signal-to-noise ratio (OSNR), average optical signal-to-noise ratio (OSNR).

Optical Performar	nce History Info	OCh Performance History Info	FEC Performance F	listory Info	OTUk/ODUk Performance History Info	SDH Sonet Performance History Info	Ethernet Performance History Info
OCh Performand	ce History Info						
Statistical Method	Chart I Ta	ble					
NE	Please Select		*	Slot	Please Select	•	
Port	Please Select		•	PM Granularity	15min	•	
Time Interval	Please Select		•	Time Duration	Please Select		
PM Point			*	PM Parameter		*	Query



9.3.2.2. View OCh History Monitoring Information

15minutes and 24hours of OCh history data operation and display are the same form. Here we take 15-minute OCh history monitoring point as an example. Choose the appropriate network elements, slots, ports and monitoring cycles through the screening box above the menu, and then select the time interval, performance monitoring point and parameters which need to be monitored in the right menu.Parameters to be monitored can be all selected or only select one or two of them to check.After that, click Apply button on the lower right corner. From the graph, we can see the trend of the refraction chart of the monitoring parameters. The ordinate represents the value of the monitoring data, and the abscissa represents the time. Data which has been read for more than 15 minutes will be automatically transferred from current statistics to history statistics.





History performance statistics of OCh also show history data in tabular form. Click on the table, the interface as shown in the figure below appears:

Ch Performan	ce History Info					
Statistical Method	Chart Table					
NE	10.32.130.160	•	Slot	1	*	
Port	1	*	PM Granularity	15min	*	
Time Interval	Last Three Days		Time Duration	2020/09/20 - 2020/09/22		
Search	Please enter the search content		Query			
Export						
↓ Name		↑ Max	DGD		↑ MinDGD	MinDGD Stamp
10.32.130.16	0_Slot1_Port1_OCh_Ingress_NearEnd	4		2020/09/22 15:51:48	1	2020/09/22 15:47:15
10.32.130.16	0_Slot1_Port1_OCh_Ingress_NearEnd	4		2020/09/22 16:14:09	2	2020/09/22 16:14:23
10.32.130.16	0_Slot1_Port1_OCh_Ingress_NearEnd	5		2020/09/22 16:23:09	2	2020/09/22 16:15:04
10.32.130.16	60_Slot1_Port1_OCh_Ingress_NearEnd	4		2020/09/22 16:45:00	1	2020/09/22 16:44:38

Figure 9-70 15-Minute Tabular Interface of OCh

Click the time interval shortcut in the right menu or select the required time interval in Duration, and then click on Apply button in the lower right corner, the history data of all the OCh records on this port will be displayed, as shown in the figure below:

atistical O Chart I Table athod				
10.32.130.160	▼ 5	Slot 1	Ŧ	
đ. 1		PM 15min Granularity	*	
ne Interval Last Week		Time 2020/09/16 - 2020/09/22		
Please enter the search content		Query		
arch Please enter the search content Export		Query		
Export	↑ MaxDGD	_	↑ MinDGD	+ MinDGD Stamp
Export	+ MaxDGD	_		+ MinDGD Stamp 202069822 15-47-15
Eigent Name 0.32.130.160_Slot1_Port1_OCh_Ingress_NewEnd)		
		0 + MaxDGD Stamp 2020/09/22 15 51:48	1	2020/09/22 15:47:15

Figure 9-71 15-Minute Tabular History Data of OCh

9.3.2.3. Export OCh History Monitoring Information

To save the history data, you can click on the

 MaxDGD Stamp 2020/09/22 15:51:48 	↑ MinDGD	
2020/09/22 15:51:48	1	2020/00/22 15:47:15
		2020/08/22 13.47.13
2020/09/22 16:14:09	2	2020/09/22 16:14:23
2020/09/22 16:23:09	2	2020/09/22 16:15:04
2020/09/22 16:45:00	1	2020/09/22 16:44:38
	2020/09/22 16:23:09 2020/09/22 16:45:00	2020/09/22 16 23:09 2

er Export button, and an interface will pop up, as shown in the figure below:

Figure 9-72 Export History Data of OCh

Any character such as English, Chinese, alphabet or number can be entered as the file name, and then click on Apply button, it will prompt that the export is successful, as shown in the figure below:

		MaxDGD Stamp		
10.32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	4	2020/09/22 15:51:48	1	2020/09/22 15:47:15
10.32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	4	2020/09/22 16:14:09	2	2020/09/22 16:14:23
10.32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	5	2020/09/22 16:23:09	2	2020/09/22 16:15:04
10.32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	4	2020/09/22 16:45:00	1	2020/09/22 16:44:38
Total: 4 records				10 T Previous 1

Figure9-73 Successfully Export Data of OCh

9.3.3. FEC History Performance Statistics

9.3.3.1. FEC History Monitoring Parameters Introduction

The monitoring parameter of the history monitoring point for FEC includes time interval, which is a shortcut to choose the time. There are three options--one day, three days and a week for you to choose.

Duration: You can choose a specific day or a period of time according to your needs.

Performance Monitoring Point: entrance-near end.

Performance Monitoring Parameters: maximum error correction rate and average error correction rate.

	Chart Table					
IE	Please Select	•	Slot	Please Select	•	
Port	Please Select	v	PM Granularity	15min	v	
îme Interval	Please Select	*	Time Duration	Please Select	Ē	
PM Point		*	PM Parameter		~	Que

Figure9-74 FEC History Performance Parameters

9.3.3.2. View FEC History Monitoring Information

15minutes and 24hours of FEC history data operation and display are the same form. Here we take 15-minute FEC history monitoring point as an example. Choose the appropriate network elements, slots, ports and monitoring cycles through the screening box above the menu, and then select the time interval, performance monitoring point and parameters which need to be monitored in the right menu.Parameters to be monitored can be all selected or only select one or two of them to check.After that, click Apply button on the lower right corner. From the graph, we can see the trend of the refraction chart of the monitoring parameters. The ordinate represents the value of the monitoring data, and the abscissa represents the time. Data which has been read for more than 15 minutes will be automatically transferred from current statistics to history statistics.

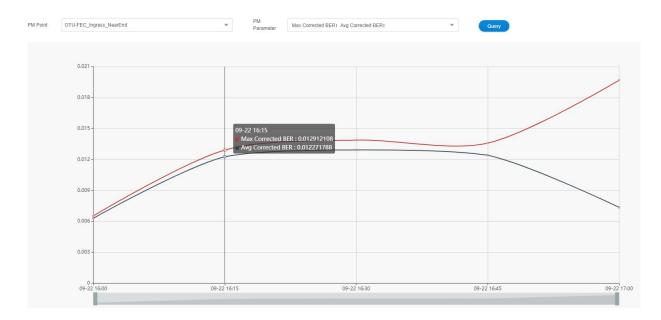


Figure 9-75 15-Minute Chart Data of FEC

History performance statistics of FEC also show history data in tabular form. Click on the table, the interface as shown in the figure below appears:

10.32.130.160	Slot	1	.		
10.02.100.100	UNIT				
1 *	PM Granularity	15min	7		
Last Three Days	Time Duration	2020/09/20 - 2020/09/22			
Please enter the search content	Query				
Max Corrected BER	↑ Max	Corrected BER Stamp			↑ Time Stamp
0_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.0065304474	2020/09/	22 15:47:28	0.0063019455	True	2020/09/22 16:00:00
0_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.012912108	2020/09/	22 16:12:35	0.012271788	False	2020/09/22 16:15:00
0_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.012912108 0_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.013881688		22 16:12:35 22 16:22:48	0.012271788	False True	2020/09/22 16:15:00 2020/09/22 16:30:00
	2020/09/				
	1 Last Three Days Please enter the search content Aux Corrected BER	1 PM Granularity Last Three Days Time Duration Please enter the search content	1 Smin Granularity Stanuarity Sta	1 PM Granularity ISmin Last Three Days Time Duration 2020/09/22 - 2020/09/22 Please enter the search content Curry	1 Image: Max Corrected BER * Max Corrected BER * Max Corrected BER

Figure 9-76 15-Minute Tabular Interface of FEC

Click the time interval shortcut in the right menu or select the required time interval in Duration, and then click on Apply button in the lower right corner, the history data of all FEC monitoring points on this port will be displayed, as shown in the figure below:

ethod	Chart Table								
	10.32.130.160		Slot	1		*			
ırt	1	*	PM Granularity	15min		*			
ne Interval	Last Three Days	*	Time Duration	2020/09/20 - 2020/09/22					
Export	Please enter the search content		Query						
Export Name	Please enter the search content + Max Corrected BE 0. Stott_Port1_OTU-FEC_Ingress_NearEnd 0.0085304474	R	↑ Max (Corrected BER Stamp 22 15:47:28	 Avg Corrected BER 0.0063019455 		Suspect Interval Flag True	↑ Time Stamp 2020/09/22 16:00:00	
Export Name 0.32.130.160	+ Max Corrected BE	R	↑ Max (2020/09/2						
Export Name 0.32.130.160	+ Max Corrected B5 0_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.0065304474	R	 Max (2020/09/2 2020/09/7 	22 15:47:28	0.0063019455		True	2020/09/22 16:00:00	
Export Name 0.32.130.160 0.32.130.160 0.32.130.160	Max Corrected BE	R	 Max 0 2020/09/2 2020/09/2 2020/09/2 	22 15:47:28 22 16:12:35	0.0063019455		True False	2020/09/22 16:00:00 2020/09/22 16:15:00	

Figure 9-77 15-Minute Tabular History Data of FEC

9.3.3.3. Export FEC History Monitoring Information

To save the history data, you can click on the upper Export button, and an interface will pop up, as shown in the figure below:

Export		—		
↓Name	+ Max Corrected BER	↑ Max Corrected BER Stamp	Avg Corrected BER	
10.32.130.160_Slot1_Port1_OTU	J-FEC_Ingress_NearEnd 0.0065304474	2020/09/22 15:47:28	0.0063019455	True
	J-FEC_Ingress_NearEnd 0.012912108	2020/09/22 16:12:35	0.012271788	False
10.32.130.160_Slot1_Port1_OTU	J-FEC_Ingress_NearEnd 0.013881688	2020/09/22 16:22:48	0.012929441	True

Figure 9-78 Export History Data of FEC

Any character such as English, Chinese, alphabet or number can be entered as the file name, and then click on Apply button, it will prompt that the export is successful, as shown in the figure below:

↓ Name	 Max Corrected BER 	+ Max Corrected BER Stamp	 Avg Corrected BER 	+ Suspect Interval Flag	Time Stamp
10.32.130.160_Slot1_Port1_OTU-F	C_Ingress_NearEnd 0.0065304474	2020/09/22 15:47:28	0.0063019455	True	2020/09/22 16:00:00
10.32.130.160_Slot1_Port1_OTU-F	C_Ingress_NearEnd 0.012912108	2020/09/22 16:12:35	0.012271788	False	2020/09/22 16:15:00
10.32.130.160_Slot1_Port1_OTU-F	C_Ingress_NearEnd 0.013881688	2020/09/22 16:22:48	0.012929441	True	2020/09/22 16:30:00
10.32.130.160_Slot1_Port1_OTU-F	C_Ingress_NearEnd 0.013589366	2020/09/22 16:36:03	0.012420523	False	2020/09/22 16:45:00
10.32.130.160_Slot1_Port1_OTU-F	C_Ingress_NearEnd 0.019693151	2020/09/22 16:58:22	0.0073621697	False	2020/09/22 17:00:00
Total: 5 records					10 v Prev
		Copyright @ 2020 by FS	COM All Rights Reserved.		

Figure 9-79 Successfully Export Data of FEC

9.3.4. OTUk/ODUk History Performance Statistics

9.3.4.1. OTUk/ODUk History Monitoring Parameters Introduction

The monitoring parameter of the history monitoring point for OTUk/ODUk includes time interval, which is a shortcut to choose the time. There are three options--one day, three days and a week for you to choose.

Duration: You can choose a specific day or a period of time according to your needs.

Performance Monitoring Point: There are near end and far end, as well as entrance and exit for OTUk/ODUk monitoring points.

Performance Monitoring Parameters: background error code block (BBE), bit error seconds (ES), serious bit error seconds (SES) and unavailable seconds.

TUK/ODUK Pe	rformance History Info					
Statistical Method	Chart Table					
NE	Please Select	•	Slot	Please Select	*	
Port	Please Select	¥	PM Granularity	15min	•	
Time Interval	Please Select	•	Time Duration	Please Select		
PM Point		•	PM Parameter		*	Query

Figure9-80 OTUk/ODUk History Performance Parameters

9.3.4.2. View OTUk/ODUk History Monitoring Information

15 minutes and 24 hours of OTUk/ODUk history data operation and display are the same form. Here we take 15-minute OTUk/ODUk history monitoring point as an example. Choose the appropriate network elements, slots, ports and monitoring cycles through the screening box above the menu, and then select the time interval, performance monitoring point and parameters which need to be monitored in the right menu. Parameters to be monitored can be all selected or only select one or two of them to check. After that, click Apply button on the lower right corner. From the graph, we can see the trend of the refraction chart of the monitoring parameters. The ordinate represents the value of the monitoring data, and the abscissa represents the time. Data which has been read for more than 15 minutes will be automatically transferred from current statistics to history statistics.

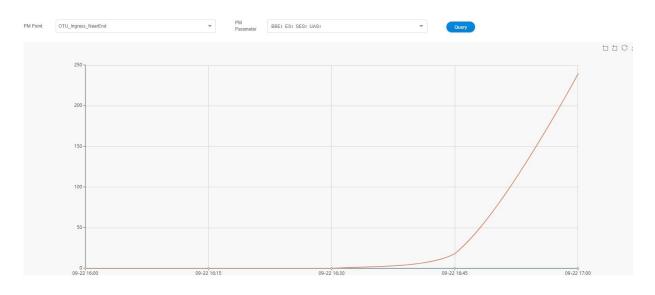


Figure9-81 15-Minute Chart Data of OTUk/ODUk

History performance statistics of OTUk/ODUk also show history data in tabular form. Click on the table, the interface as shown in the figure below appears:

istical hod	Chart Table							
	10.32.130.160	w.	Slot	1	w			
	1	•	PM Granularity	15min	Ψ.			
e Interval	Last Three Days	*	Time Duration	2020/09/20 - 2020/09/22				
rch	Please enter the search content		Query					
oxport								
Name			+ BBE	+ ES	+ SES	+ UAS	Suspect Interval Flag	Time Stamp
32.130.160	Slot1_Port1_ODU4(1)_Ingress_FarEnd		0	0	0	0	True	2020/09/22 16:00:00
32.130.160	Slot1_Port1_ODU4(1)_Ingress_FarEnd		0	0	0	0	True	2020/09/22 16:15:00
32.130.160	Slot1_Port1_ODU4(1)_Ingress_FarEnd		2473	1	0	0	True	2020/09/22 16:30:00
32.130.160	Slot1_Port1_ODU4(1)_Ingress_FarEnd		8	1	0	0	True	2020/09/22 16:45:00
32.130.160	Slot1_Port1_ODU4(1)_Ingress_FarEnd		1	1	0	o	True	2020/09/22 17:00:00
32.130.160	Slot1_Port1_ODU4(1)_Ingress_FarEnd		686	6	0	10	True	2020/09/22 17:15:00
32.130.160	Slot1_Port1_ODU4(1)_Ingress_NearEnd		0	0	0	0	True	2020/09/22 16:00:00
32.130.160	_Slot1_Port1_ODU4(1)_Ingress_NearEnd		0	0	0	0	True	2020/09/22 16:15:00
32.130.160	_Slot1_Port1_ODU4(1)_Ingress_NearEnd		1	1	0	0	True	2020/09/22 16:30:00
32.130.160	_Slot1_Port1_ODU4(1)_Ingress_NearEnd		0	0	0	18	True	2020/09/22 16:45:00

Figure 9-82 15-Minute Tabular Interface of OTUk/ODUk

Click the time interval shortcut in the right menu or select the required time interval in Duration, and then click on Apply button in the lower right corner, the history data of all OTUk/ODUk monitoring points on this port will be displayed, as shown in the figure below:

latistical ethod	Chart							
E	10.32.130.160	•	Slot	1	×			
ort	1	¥	PM Granularity	15min	¥			
me Interval	Last Three Days	*	Time Duration	2020/09/20 - 2020/09/22				
earch	Please enter the search content		Query					
Export								
Name			+ BBE	+ ES	+ SES	+ UAS	+ Suspect Interval Flag	+ Time Stamp
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd		0	0	0	0	True	2020/09/22 16:00:00
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd		0	0	0	0	True	2020/09/22 16:15:00
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd		2473	1	0	0	True	2020/09/22 16:30:00
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd		8	1	0	0	True	2020/09/22 16:45:00
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd		1	1	0	0	True	2020/09/22 17:00:00
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd		686	6	0	10	True	2020/09/22 17:15:00
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd		0	0	0	0	True	2020/09/22 16:00:00
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd		0	0	0	0	True	2020/09/22 16:15:00
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd		1	1	0	0	True	2020/09/22 16:30:00
0.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd		0	0	0	18	True	2020/09/22 16:45:00

Figure 9-83 15-Minute Tabular History Data of OTUk/ODUk

9.3.4.3. Export OTUk/ODUk History Monitoring Information

To save the history data, you can click on the upper Export button, and an interface will pop up, as shown in the figure below:

OTUk/ODUk Pe	rformance History Info						
Statistical Method	Chart						
NE	10.32.130.160	▼ Slot	1	*			
Port	1	♥ PM Gran	lanity 15min	•			
Time Interval	Last Three Days	▼ Time Durat	lon 2020/09/20 - 2020/09/22				
Search	Please enter the search content		uery				
Export							
1 Marmo		÷ BE	E	* PEP	a 110E	 Europet Interval Flag 	a Timo Stamo

Figure 9-84 Export History Data of OTUk/ODUk

Any character such as English, Chinese, alphabet or number can be entered as the file name, and then click on Apply button, it will prompt that the export is successful, as shown in the figure below:

10.22 103 108_05trl / Port_OCOLVIL layers_Factod 0 0 0 0 True 202000 10.32 103 108_05trl / Port_OCOLVIL layers_Factod 2673 1 0 0 True 202000 10.32 103 108_05trl / Port_OCOLVIL layers_Factod 6 1 0 0 True 202000 10.32 103 108_05trl / Port_OCOLVIL layers_Factod 6 1 0 0 True 202000 10.32 103 108_05trl / Port_OCOLVIL layers_Factod 66 0 0 0 202000 10.32 103 108_05trl / Port_OCOLVIL layers_Factod 66 0 0 7000 202000 10.32 103 108_05trl / Port_OCOLVIL layers_Handred 66 0 0 7000 202000 10.32 103 108_05trl / Port_OCOLVIL layers_Handred 66 0 0 7000 202000 10.32 103 108_05trl / Port_OCOLVIL layers_Handred 0 0 0 7000 202000	19.32: 103: 169_Starl_Port_GOUV(1) Joyees_FatEdd 0 0 0 0 True 20200022 16 1500 19.32: 103: 169_Starl_Port_GOUV(1) Joyees_FatEdd 2473 1 0 0 True 20200022 16 1500 19.32: 103: 169_Starl_Port_GOUV(1) Joyees_FatEdd 8 1 0 0 True 20200022 16 1500 19.32: 103: 169_Starl_Port_GOUV(1) Joyees_FatEdd 8 1 0 0 True 20200022 17 000 19.32: 104: 169_Starl_Port_GOUV(1) Joyees_FatEdd 66 6 0 True 20200022 17 000 19.32: 104: 169_Starl_Port_GOUV(1) Joyees_FatEdd 64 6 0 True 20200022 17 000 19.32: 104: 169_Starl_Port_GOUV(1) Joyees_FatEdd 64 6 0 True 20200022 17 000 19.32: 104: 169_Starl_Port_GOUV(1) Joyees_FatEdd 64 6 0 True 20200022 15 000 19.32: 104: 169_Starl_Port_GOUV(1) Joyees_FatEdd 6 6 True 20200022 15 000 19.32: 104: 169_Starl_Port_GOUV(1) Joyees_FatEdd 6 6 True 20200022 15 000 19.32	♦ Name	+ BBE	+ ES	+ SES	+ UAS	 Suspect Interval Flag 	+ Time Stamp
No.2110 No.5Mt Port COCULI Junges Factod 2473 1 0 0 True 200000 10.2110 No.5Mt Port COCULI Junges Factod 6 1 0 0 True 200000 10.2110 No.5Mt Port COCULI Junges Factod 1 1 0 0 True 200000 10.2110 No.5Mt Port COCULI Junges Factod 1 1 0 0 True 200000 10.2110 No.5Mt Port COCULI Junges Factod 666 6 0 10 True 200000 10.2110 No.5Mt Port COCULI Junges Factod 0 0 0 True 200000 10.2110 No.5Mt Port COCULI Junges Factod 0 0 0 True 200000 10.2110 No.5Mt Port COCULI Junges Factod 0 0 0 True 200000 10.2110 No.5Mt Port COCULI Junges Factod 0 0 0 0 True 200000	19.32.103.106_0_Bit/LPerL_0004(1)_loges_FlatEdd 2473 1 0 0 True 20200022.19.00 19.32.103.106_0_Bit/LPerL_0004(1)_loges_FlatEdd 0 0 0 True 20200022.19.00 19.32.103.106_0_Bit/LPerL_0004(1)_loges_FlatEdd 1 0 0 True 20200022.19.00 19.32.103.106_0_Bit/LPerL_0004(1)_loges_FlatEdd 0 0 0 True 20200022.17.90 19.32.103.106_0_Bit/LPerL_0004(1)_loges_FlatEdd 0 0 0 True 20200022.17.90 19.32.103.106_0_Bit/LPerL_0004(1)_loges_FlatEdd 0 0 0 True 20200022.17.90 19.32.103.106_0_Bit/LPerL_0004(1)_loges_FlatEdd 0 0 0 True 20200022.19.00 19.32.103.106_0_Bit/LPerL_0004(1)_loges_FlatEdd <td>10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>True</td> <td>2020/09/22 16:00:00</td>	10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	0	0	0	True	2020/09/22 16:00:00
N3.2.133.146_Skit_Port_ODU4()_hypes_Facted 8 1 0 0 Twa 200060 10.3.2.133.146_Skit_Port_ODU4()_hypes_Facted 1 1 0 0 Twa 200060 10.3.2.133.146_Skit_Port_ODU4()_hypes_Facted 668 6 0 10 Twa 200060 10.3.2.133.146_Skit_Port_ODU4()_hypes_Facted 668 6 0 10 True 202060 10.3.2.133.146_Skit_Port_ODU4()_hypes_Facted 0 0 0 True 202060 10.3.2.133.146_Skit_Port_ODU4()_hypes_Facted 0 0 0 True 202060	10.2.110.106_Set1_Per1_0004(1_lugves_plextd) 8 1 0 0 True 20200022144.50 10.2.110.106_Set1_Per1_0004(1_lugves_plextd) 1 1 0 0 True 20200022144.50 10.2.110.106_Set1_Per1_0004(1_lugves_plextd) 68 6 0 10 True 2020002214.50 10.2.110.106_Set1_Per1_0004(1_lugves_plextd) 60 0 0 0 7rue 2020002214.50 10.2.110.106_Set1_Per1_0004(1_lugves_plextd) 0 0 0 0 True 2020002214.50 10.2.110.106_Set1_Per1_0004(1_lugves_plextd) 0 0 0 7rue 2020002214.50 10.2.110.106_Set1_Per1_0004(1_lugves_plextd) 0 0 0 7rue 2020002214.50 10.2.110.106_Set1_Per1_0004(1_lugves_plextd) 0 0 0 True 2020002214.50 10.2.110.106_Set1_Per1_0004(1_lugves_plextd) 0 0 0 True 2020002214.50 10.2.1106_Set1_Per1_0004(1_lugves_plextd) 0 0 0 True 2020002214.50	10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	0	0	0	True	2020/09/22 16:15:00
10.22 103 (INg_Staft_Port[_OOU4(]_]hegress_Facted 1 1 0 0 True 202080 10.32 103 (INg_Staft_Port[_OOU4(]_]hegress_Facted 666 6 10 True 202080 10.32 103 (INg_Staft_Port[_OOU4(]_]hegress_Facted 0 0 0 0 10 True 202080 10.32 103 (INg_Staft_Port[_OOU4(]_]hegress_FlexEdd 0 0 0 0 True 202080 10.32 103 (INg_Staft_Port[_OOU4(]_]hegress_FlexEdd 0 0 0 True 202080	10.32.103.106_Stdt_Port_OOU4(1)_wyres_/FeEd 1 1 0 0 Twar 20200022170000 10.32.103.106_Stdt_Port_OOU4(1)_wyres_/FeEd 668 6 0 10 Twar 20200022170500 10.32.103.106_Stdt_Port_OOU4(1)_wyres_/FeEd 0 0 0 0 70xe 20200022170500 10.32.103.106_Stdt_Port_OOU4(1)_wyres_/Head 0 0 0 0 Twar 20200022170500 10.32.103.106_Stdt_Port_OOU4(1)_wyres_/Head 0 0 0 Twar 20200022170500 10.32.103.106_Stdt_Port_OOU4(1)_wyres_/Head 0 0 0 Twar 202000221705000 10.32.103.106_Stdt_Port_OOU4(1)_wyres_/Head 0 0 0 10 Twar 202000221705000	10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd	2473	1	0	0	True	2020/09/22 16:30:00
10.32.150.100_SMLPortLODUk[Lingwes_Field 668 6 0 10 True 202000 10.32.150.100_SMLPortLODUk[Lingwes_Field 0 0 0 0 True 202000 10.32.150.100_SMLPortLODUk[Lingwes_Field 0 0 0 0 True 202000 10.32.150.100_SMLPortLODUk[Lingwes_Field 0 0 0 0 True 202000	10.32.130 140_5Mt_Port_OOU4(1_lowers_FarEnd 668 6 0 10 Twa 20200922 17.500 13.22.130 140_5Mt_Port_OOU4(1_lowers_FarEnd 0 0 0 0 7.000 20209622 17.500 13.22.130 140_5Mt_Port_OOU4(1_lowers_HarEnd 0 0 0 0 7.000 20209622 17.500 13.22.130 140_5Mt_Port_OOU4(1_lowers_HarEnd 0 0 0 7.000 20209622 16.500 13.2.130 140_5Mt_Port_OOU4(1_lowers_HarEnd 1 1 0 0 7.000 20209622 16.500 13.2.130 140_5Mt_Port_OOU4(1_lowers_HarEnd 0 0 0 100 20209622 16.500 13.2.130 140_5Mt_Port_OOU4(1_lowers_HarEnd 0 0 0 100 2020962 16.500	10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd	8	1	0	0	True	2020/09/22 16:45:00
10.32:100.100_Skit_PortLOOU(1)_Ingress_HeadEnd 0 0 0 0 True 202009 10.32:100.100_Skit_PortLOOU(1)_Ingress_HeadEnd 0 0 0 0 True 202009 10.32:100.100_Skit_PortLOOU(1)_Ingress_HeadEnd 0 0 0 True 202009	No.21.103.108_USet/Pert_OOU4(1)Ingress_HeadEnd 0 0 0 0 Toe 2020082216500 No.21.103.108_USet/Pert_OOU4(1)Ingress_HeadEnd 0 0 0 0 Toe 2020082216500 No.21.103.108_USet/Pert_OOU4(1)Ingress_HeadEnd 1 0 0 Toe 2020082216500 No.21.103.108_USet/Pert_OOU4(1)Ingress_HeadEnd 1 0 0 Toe 2020082216500 No.21.103.108_USet/Pert_OOU4(1)Ingress_HeadEnd 0 0 0 Toe 2020082216500	10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd	1	1	0	0	True	2020/09/22 17:00:00
10.32.130.160_Set1_Port_COD4(1_brgress_HearEnd 0 0 0 0 True 202009	10.32.13.146_36t1_Pdr1_0004(1_)hypes_Jkeefind 0 0 0 Toe 2020/09/22 16 500 10.32.13.146_36t1_Pdr1_0004(1_)hypes_Jkeefind 1 0 0 Toe 2020/09/22 16 500 10.32.13.146_36t1_Pdr1_0004(1_)hypes_Jkeefind 0 0 0 Toe 2020/09/22 16 500 10.32.13.146_36t1_Pdr1_0004(1_)hypes_Jkeefind 0 0 0 Toe 2020/09/22 16 500	10.32_130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd	686	6	0	10	True	2020/09/22 17:15:00
	10.32.130.106_Start_Port_OCUV(1)_Ingress_HeadEnd 1 1 0 0 True 20200822.16.30 kf 10.32.130.106_Start_Port_OCUV(1)_Ingress_HeadEnd 0 0 0 10 10 10 20200822.16.40 kf	10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	0	Тгие	2020/09/22 16:00:00
10.32.130.160_Stoft_Portf_0004(1)_Impres_MearInd 1 1 0 0 True 202089	10.32 130 140_Stat_Part_COU41()_pagess_HeadEnd 0 0 0 13 True 2020092214.6 0	10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	0	True	2020/09/22 16:15:00
		10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_NearEnd	1	1	0	0	True	2020/09/22 16:30:00
18.32.13.160_5lat_Port_OOU(1_)_Ingress_HearEnd 0 0 0 13 True 222069		10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	18	True	2020/09/22 16:45:00

Figure 9-85 Successfully Export Data of OTUk/ODUk

9.3.5. History Performance Statistics of SDH Regeneration Segment

9.3.5.1. History Monitoring Parameters Introduction of SDH Regeneration Segment

The monitoring parameter of the history monitoring point for SDH regeneration segment includes time interval, which is a shortcut to choose the time. There are three options--one day, three days and a week for you to choose.

Duration: You can choose a specific day or a period of time according to your needs.

Performance Monitoring Point: entrance-near end.

Performance Monitoring Parameters: background error code block (BBE), bit error seconds (ES), serious bit error seconds (SES) and unavailable seconds.

				Monitor	Global	Configuration	* Maintain		
 Log Management Alarm Management 	Optical Performance Hist	tory Info OCth Performance History Info	FEC Performan	nce History Info	OTUK/ODUk P	erformance History Info	SDH Sonet Performance	e History Info	Ethernet Performance History Info
Performance Current Info Performance History Info	Method	rt 🔍 Table							
n Data Maintenance		s Select	•	Slot PM Granularity	Please Select		v.		
	Time Interval Please PM Point	a Select	*	Time Duration PM Parameter	Please Select		•	Query	
		1							
		0.8							
		0.6-							
		0.4							

Figure 9-86 SDH Regeneration Segment History Performance Parameters

9.3.5.2. View SDH Regeneration Segment History Monitoring Information

15minutes and 24hours of SDH regeneration segment history data operation and display are the same form. Here we take 15-minute history monitoring point for the SDH regeneration segment as an example. Choose the appropriate network elements, slots, ports and monitoring cycles through the screening box above the menu, and then select the time interval, performance monitoring point and parameters which need to be monitored in the right menu.Parameters to be monitored can be all selected or only select one or two of them to check.After that, click Apply button on the lower right corner. From the graph, we can see the trend of the refraction chart of the monitoring parameters. The ordinate represents the value of the monitoring data, and the abscissa represents the time. Data which has been read for more than 15 minutes will be automatically transferred from current statistics to history statistics.

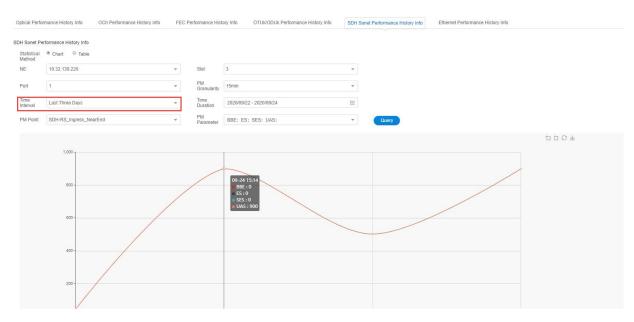


Figure9-87 15-Minute Chart Data of SDH Regeneration Segment

History performance statistics of SDH regeneration segment also show history data in tabular form. Click on the table, the interface as shown in the figure below appears:

Optical Perform	nance History Info OCh Performance History Info	D FEC	Performance Hist	ory Info OTUK/ODUk	Performance History Info	SDH Sonet	Performance History Info	Ethernet Performance History Info		
DH Sonet Per	formance History Info									
Statistical Method	Chart Table									
NE	10.32.130.220	٣	Slot	3		w.				
Port	1	*	PM Granularity	15min		*				
Time Interval	Please Select	w.	Time Duration	Please Select						
Search	Please enter the search content		Query							
Export										
◆Name	+ BBE	* ES		* SES	* UAS		* Suspect Interval Flag		 Time Stamp 	
					No	data~				
Total: 0 reco										10 - Provinus

Figure 9-88 15-Minute Tabular Interface of SDH Regeneration Segment

Click the time interval shortcut in the right menu or select the required time interval in Duration, and then click on Apply button in the lower right corner, the history data of all SDH regeneration segment monitoring points on this port will be displayed, as shown in the figure below:

	erformance History Info								
Itatistical Nethod	Chart Table								
E	10.32.130.220			Slot	3		*		
ort	1		*	PM Granularity	15min		*		
me terval	Last Three Days		*	Time Duration	2020/09/22 - 2020/09/24				
earch	Please enter the sear	ch content		Query					
Export									
•Name		+ BBE	* ES		* SES	+ UAS		* Suspect Interval Flag	 Time Stamp
10.32.130 RS_Ingre	0.220_Slot3_Port1_SDH- ss_NearEnd	0	0		0	43		False	2020/09/24 14:59:59
10.32.130 RS_Ingre	0.220_Slot3_Port1_SDH- ss_NearEnd	0	0		0	900		True	2020/09/24 15:14:59
10.32.130	0.220_Slot3_Port1_SDH- ss_NearEnd	0	0		0	502		False	2020/09/24 15:29:59
No_ingle	0.220_Slot3_Port1_SDH- ss_NearEnd	0	0		0	900		True	2020/09/24 15:44:59

Figure 9-89 15-Minute Tabular History Data of SDH Regeneration Segment

9.3.5.3. Export SDH Regeneration Segment History Monitoring Information

To save the history data, you can click on the Export button, and an interface will pop up, as shown in the figure below:

Optical Perfor	rmance History Info	OCh Performance History Info	FEC P	erformance Histo	ory Info OTUk/ODUk Perfo	mance History Info	SDH Sonet	Performance History Info	Ethernet Performance History Info		
SDH Sonet Pe	rformance History Info										
Statistical Method	Chart Table										
NE	10.32.130.220		*	Slot	3		*				
Port	1		Ŧ	PM Granularity	15min						
Time Interval	Last Three Days		Ŧ	Time Duration	2020/09/22 - 2020/09/24		53				
Search	Please enter the sear	ch content		Query							
Export											
*Name		↑ BBE	+ ES		* SES	+ UAS		* Suspect Interval Flag		 Time Stamp 	
10.32.130 RS_Ingres	.220_Slot3_Port1_SDH- ss_NearEnd	0	0		0	43		False		2020/09/24 14:59:59	
10.32.130 RS_Ingres	.220_Slot3_Port1_SDH- ss_NearEnd	0	0		0	900		True		2020/09/24 15:14:59	
10.32.130 RS_Ingres	.220_Slot3_Port1_SDH- ss_NearEnd	0	0		0	502		False		2020/09/24 15:29:59	
10.32.130 RS_Ingres	.220_Slot3_Port1_SDH- ss_NearEnd	0	0		0	900		True		2020/09/24 15:44:59	
Total: 4 reco	ords									10 -	Previous 1 Next

Figure9-90 Export History Data of SDH Regeneration Segment

After click on export, the download file default name is HistorySdhPm.xls as shown in the figure below:

.og Management	Optical Perfor	mance History Info OCh Performance Histor	y Info FEC Perf	ormance Hist	ory Info OTUK/ODU	k Performance History Info	SDH Sonet I	Performance History Info	Ethernet Performance History Info	
Narm Management Performance Current Info	SDH Sonet Per	formance History Info								
Performance History Info	Statistical Method	Chart Table								
	NE	10.32.130.220	*	Slot	3		*			
Data Maintenance				PM						
	Port	1	Ŧ	Granularity	15min		Ŧ			
	Time Interval	Last Three Days	*	Time Duration	2020/09/22 - 2020/09/24		(III)			
	Search	Please enter the search content		Query						
	Export									
	◆ Name	↑ BBE	* ES		+ SES	+ UAS		 Suspect Interval Flag 		 Time Stamp
	10.32.130. RS_Ingres	220_Slot3_Port1_SDH- os_NearEnd	0		0	43		False		2020/09/24 14:59:59
/	10.32.130. RS_Ingres	220_Slot3_Port1_SDH- os_NearEnd	0		0	900		True		2020/09/24 15:14:59
/	10.32.130. RS_Ingres	.220_Slot3_Port1_SDH- os_NearEnd 0	0		0	502		False		2020/09/24 15:29:59
/	10.32.130 RS_Ingres	220_Slot3_Port1_SDH- os_NearEnd	0		0	900		True		2020/09/24 15:44:59
	Total: 4 reco	urde								10
1						Copyright @ 2020 by FS.C	OM All Rights Re	leserved.		
HistorySdhPm.xls 5.0/5.0 KB	^									

Figure9-91 Successfully Export Data of SDH Regeneration Segment

9.3.6. History Performance Statistics of Ethernet

9.3.6.1. Ethernet History Monitoring Parameters Introduction

The monitoring parameter of the history monitoring point for Ethernet includes time interval, which is a shortcut to choose the time. There are three options--one day, three days and a week for you to choose.

Duration: You can choose a specific day or a period of time according to your needs.

Performance Monitoring Point: entrance-near end, exit-near end.

Performance Monitoring Parameters: The monitoring parameters of Ethernet monitoring point include normal frame number, unicast frame number, multicast frame number, broadcast frame number, CRC error frame, alignment error frame number, ultra long frame number (Frame Too Long), ultra long Jabber frame number (CRC error), ultra short frame number (CRC error), discarded frame number, ultra short frame number (CRC normal), 64-byte frame number, 65-127-byte frame number, 128-255-byte frame number, 256-511-byte frame number, 512-1023-byte frame number, 1024-1518-byte frame number.

ernet Perform	nance History Info					
Statistical Method	Chart Chart Table					
NE	Please Select	*	Slot	Please Select	*	
Port	Please Select	•	PM Granularity	15min	*	
îme Interval	Please Select	*	Time Duration	Please Select		
PM Point		*	PM Parameter		Ŧ	Query



9.3.6.2. View Ethernet History Monitoring Information

15minutes and 24hours of Ethernet history data operation and display are the same form. Here we take 15-minute Ethernet history monitoring point as an example. Choose the appropriate network elements, slots, ports and monitoring cycles through the screening box above the menu, and then select the time interval, performance monitoring point and parameters which need to be monitored in the right menu.Parameters to be monitored can be all selected or only select one or two of them to check.After that, click Apply button on the lower right corner. From the graph, we can see the trend of the refraction chart of the monitoring parameters. The ordinate represents the value of the monitoring data, and the abscissa represents the time. Data which has been read for more than 15 minutes will be automatically transferred from current statistics to history statistics.

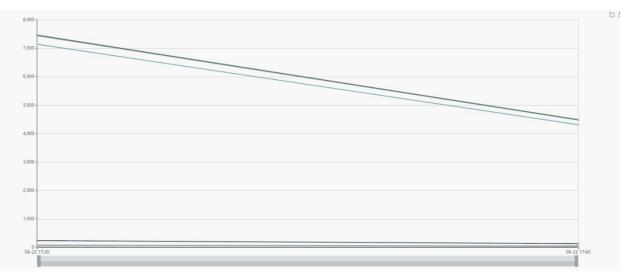


Figure9-93 15-Minute Chart Data of Ethernet

History performance statistics of Ethernet also show history data in tabular form. Click on the table, the interface as shown in the figure below appears:

Statistical Method	Chart				
NE	Please Select	Ψ.	Slot	Please Select	
Port	Please Select	*	PM Granularity	15min	
Time Interval	Please Select	•	Time Duration	Please Select	1
Search	Please enter the search content		Query		

Figure9-94 15-Minute Tabular Interface of Ethernet

Click the time interval shortcut in the right menu or select the required time interval in Duration, and then click on Apply button in the lower right corner, the history data of all Ethernet monitoring points on this port will be displayed, as shown in the figure below:

Statistical Method	Chart							
IE	10.32.130.120	٣	Slot	1	v			
ort	1 PM Granularity 15min		15min	•				
ime Interval	Last Three Days	*	Time Duration	2020/09/20 - 2020/09/22				
Search	Please enter the search content		Query					
Export	Please enter the search content		Query					
Export	Please enter the search content			d Frame	+ Unicast Frame	+ Multicast Frame	+ Broadcast Frame	CRC Err
Export Name	Please enter the search content Please enter the search content 20_Std1_Port1_Ethernel_Egiess_MearEnd			d Frame	 Unicast Frame 0 	 Muticast Frame 0 	 Broadcast Frame 0 	+ CRC Err
Export Name 10.32.130.12			+ Goo	d Frame				
 Name 10.32.130.12 10.32.130.12 	10_Sld1_Pot1_Ethernel_Egress_NearEnd		+ Goo	d Frame	0		0	-

Figure 9-95 15-Minute Tabular History Data of Ethernet

9.3.6.3. Export Ethernet History Monitoring Information

To save the history data, you can click on the upper Export button, and an interface will pop up, as shown in the figure below:

Statistical Method	Chart				
E	10.32.130.120	Ŧ	Slot	1	Ŧ
ort	1	Ŧ	PM Granularity	15min	Ŧ
me Interval	Last Three Days	-	Time Duration	2020/09/20 - 2020/09/22	
earch	Please enter the search content		Query		

Figure 9-96 Export History Data of Ethernet

Any character such as English, Chinese, alphabet or number can be entered as the file name, and then click on Apply button, it will prompt that the export is successful, as shown in the figure below:

4 Name	Good Frame	Unicast Frame	Multicast Frame	Broadcast Frame	 CRC Erro
10.32.130.120_Slot1_Port1_Ethernet_Egress_NearEnd	0	0	0	0	-
10.32.130.120_Slot1_Port1_Ethernet_Egress_NearEnd	0	0	0	0	
10.32.130.120_Slot1_Port1_Ethernet_Ingress_NearEnd	0	0	0	0	24
10.32.130.120_Slot1_Port1_Ethernet_Ingress_NearEnd	0	0	0	0	15

Figure 9-97 Successfully Export Data of Ethernet

10. Abbreviation

Abbreviation	Description
AIS	Alarm Indication Signal
АМР	Asynchronous Mapping Procedure
BDI	Backward Defect Indication
BEI	Backward Error Indication
BER	Bit Error Ratio
BIP	Bit Interleaved Parity
ВМР	Bit-synchronous Mapping Procedure
BSP	Board Support Package
DAPI	Destination Access Point Identifier
DCM	Dispersion Compensation Module
DCN	Data Communication Network
DWDM	Dense Wavelength Division Multiplexing
EDFA	Erbium-Doped Fiber Amplifier
FEC	Forward Error Correction
GCC	General Communication Channel
GE	Gigabit Ethernet
GFP	Generic Framing Procedure
GMP	Generic Mapping Procedure
IP	Internet Protocol
NE	Network Element
NTP	Network Time Protocol
ОА	Optical Amplifier
OCh	Optical Channel
ODU	Optical Demultiplexer Unit
OLA	Optical Line Amplifier
OLP	Optical Line Protection
ОМИ	Optical Multiplexer Unit
ОРА	Optical Pre-Amplifier

OPU	Optical Channel Payload Unit
OSC	Optical Supervisory Channel
OSNR	Optical Signal-to-Noise Ratio
OSPF	Optical Signal-to-Noise Ratio
ΟΤΝ	Optical Transport Network
ΟΤυ	Optical Transponder Unit
РМ	Path Monitoring
PT	Payload Type
SM	Section Monitoring
SNMP	Simple Network Management Protocol
тті	Trail Trace Identifier