M6800 Series

NE Configuration Manual



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Preface

Overview

Chapter	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 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 Alarm Management	This chapter introduces the current alarms and history alarms of NE and NMS system.
Chapter 7 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
M Series NMS-M6800 Series	R6.3.31

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
\bigwedge	Special attention should be paid to the content. If the operation is improper, it may cause serious injury to the person.
	It reminds the matters for attention. Improper operation may cause loss of data or damage to the device.
P	It represents the operation or information that requires special attention to ensure the success of the operation or the normal work of the device.
0	A skill or a knack which helps to solve a problem and save time.
	The necessary supplement and explanation for the description of the text.

- 1. It is not allowed to make modification if the input box or the drop-down box is grayed out.
- 2. The add, delete, modify and refresh buttons are all on the toolbar.
- 3. One and only one data in the table must be selected first while doing the modification operation.
- 4. At least one data in the table must be selected while doing the deletion operation.
- 5. The refresh button is used to refresh the table and the form. There are two refresh operations on the toolbar. When it shows

"Refresh Table" on 📿 icon, it will refresh the table. When it shows "Refresh Form" on 🥰 icon, it will refresh the form.

1. Preparation Before Configuration

1.1. Configuration Process

When configuring M6800-TSP16 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 Figure 1-1 to complete the operation. If the project has been created, only the configuration of one NE or single disk needs to be changed, please perform the operation according to relevant content of chapters in Figure 1-1.



Figure 1-1 M6800-TSP16 Service Configuration Process

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

It is recommended that the configurations of M Series NMS equipment be completed according to the sequence of operation in the flowchart (Figure 1-1).

1.2. Connect NMS System & NE

For different network connection components, there are multiple connection modes between M Series NMS network management computer and M6800-TSP16 network elements. The connection mode of "directly connected network line+HUB+directly connected network line" is the most commonly used. You can also directly connect M Series NMS network management computer with M6800-TSP16 network elements by using cross network cable or directly connected network cable.



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 "directly connected network cable+HUB+directly connected network cable" 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 End Program



Double click on "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:

NMS			<u> </u>		\times
Options Edit Help					
Pr & & 9					
Start NMS Server Starts the NMS Server	t NMS Server	Shutdown NMS Server		Reinitialize N	VMS
Start NMS Server					
Process : NmsSAServerFE [Started]					
Process : EventFE [Started]					-
Process : MapFE [Started]					
Process : PolicyFE [Started]					
Process : AlertFE [Started]					
Process : UserConfigProcessFE [Starte	d]				
Process : ConfigFE [Started]					
Process : NmsMainFE [Started]					
Process : WebNMSMgmtFEProcess [Sta	arted]				
Verifying connection with web server verified					
NMS modules started successfully at Oct 08,2018 0	2:44:50 PM				
Please connect your client to the web server on port	9090				13

Figure 1-3 Start NMS Server

Note: In log of "Start NMS Server", when it shows "NMS module has successfully started at XXXX, please start the client application.

The port of web server is 9090", it indicates that the NMS server has successfully started.

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 disk 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 M6800-TSP16 in each step, and only the sections of the reference book will be provided for the common configuration steps for each device. M Series NM-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;
- Management of NE IP;
- 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 Create Flow Chart of Network Topology

2.2. Login NMS Interface

Prerequisite

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

Steps

Open the Google Chrome browser and enter localhost:9090 in the address bar (If you log on to the NMS host, you can use this

address.) or xxx.xxx.xxx.xxx:9090 (for remote NMS host). Enter your user name and password to login. The user name is root, and the

password is public.



Figure 2-2 Login NMS System

2.3. Create Node

Click on "Global View", and then click on "Global Configuration". Enter node name and description information. The description

information can be blank. After that, click on "Apply".

Global View	Global View Glob	al Configuration
H M6800-ISP16(10.32.130.111)	L	
🖨 🚟 Shelf01	Add Group	
🕀 🖸 Slot1 M6800-TSP16 : normal	500 S 20 S 20 S 20 S	
Slot2 DCI_PWR_AC_1U : normal	Parent Node	Global View
Slot3 DCI_FAN_1U : normal	* Group Name	Please input content
Slot4 DCI_FAN_1U : normal		
Slot5 DCI_FAN_1U : normal	Describe Info	Please input content
Slot6 DCI_PWR_AC_1U : normal		
E 🗐 10G(10.32.130.110)		Apply
🖹 🗮 Shelf01	Add NE	

Figure 2-3 Add Node

Global View	Global Configuration
Add Group	
Parent Node	Global View
* Group Name	test
Describe Info	test
	Apply
	Figure 2-4 Add Node Info

2.4. Add NE

2.4.1. Add NE

Click on the node which has been added, then click on "*Group Configuration*". Enter the NE name, NE IP address, subnet mask, Trap host name, Trap host IP address, and click on "*Apply*".

a 222			
🍃 test	* Group Name	Please input content	
	Describe Info	Please input content	
	-	Арру	
	Add NE		
	Parent 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	
		АррАу	
	test	Circup Name	 Croup Name Please input content Describe info Please input content Approve Add NE Parent Node Vest Display Name Please input content IP Address Please input content Subnet Mask Please input content Trap Name Please input content Trap Hosi Please input content Trap Hosi

Figure 2-5 Add NE

2.4.2. Modify NE

Click on the NE which has been added, then click "NE Management". Here you can only modify the displayed name of the NE.



NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
Modify NE						
Parent Node		Global View				
Group Name		M6800-TSP16				
IP Address		10.32.130.111				
Subnet Mask		255.255.255.0				
	[Apply Delete				
			Figure 2-6 Modify N	E Name		

2.4.3. Delete NE

Click on the NE which has been added, then click "NE Management", and click on "Delete".

NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
Modify NE						
Parent Node		Global View				
Group Name		M6800-TSP16				
IP Address		10.32.130.111				
Subnet Mask		255.255.255.0				
		Apply Delete				

Figure 2-7 Delete NE

2.5. Manage NE IP

There are three types of IP addresses of NE:

- Node IP address: in-band management IP address which is suitable for DCN transmission.
- IP1/IP2 address: out-band management IP address which can be modified by the client.
- Local NMS IP address: It is the default IP address which is 192.168.126.2.

DCN purpose: 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

Click on the NE which has been added, then click on"MGMT IP Configuration" on the top.

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)		
* Node IP		192.168.155.111		(1.1.1)		

Figure 2-8 MGMT IP Configuration

Input the IP address of the node, and then click on" Apply".

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NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
MGMT IP Cont	figuration					
* Node IP		192.168.155.111		(1.1.1.1)		
NMS IP1						
* IP Address		10.32.130.111		(1.1.1.1)		
* Subnet Mas	sk	255.255.255.0		(1.1.1.1)		
* OSPF		Enable		*		
LCT IP						
IP Address		192.168.126.1				
Subnet Mas	k	255.255.255.252				
* Gateway		0.0.0.0		(1.1.1.1)		
* Default rout	e re-distribution	Disable		•		
		Apply				

Figure 2-9 MGMT IP Configuration

2.5.2. NMS IP1 Configuration

Click on the NE which has been added \rightarrow Click on "MGMT IP Configuration" on the top. Input the IP address, and then click on "Apply".

* IP Address	10.32.130.111	(1.1.1.1)
* Subnet Mask	255.255.255.0	(1.1.1.1)
* OSPE	Disable	•

Figure 2-10 NMS IP1 Configuration

2.5.3. Local NMS IP Configuration

The default IP address of local NMS is 192.168.126.1, and the default subnet mask is 255.255.255.252.

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 2-11 Local NMS IP Configuration

2.5.4. Gateway Configuration

Click on the NE which has been added→Click on "MGMT IP Configuration". Input gateway IP address, and click on "Apply".

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 2-12 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

Click on the NE which has been added \rightarrow Click on "Server Configuration" on the top, and input the IP address of the FTP server, then click on "Apply".

Current Value	10.32.130.8	
* Set Value	Please input content	

Figure 2-13 Configure FTP Server

2.7. SNMP Configuration

Click on the NE which has been added \rightarrow Click on "Server Configuration" on the top \rightarrow Click "Add". Enter SNMP Trap configuration interface, click on "Apply".

SNMP 1	rap (Configuration	Add SNMP T	rap Configuration ×		
Ple	ase ir	put content	* Name	Please input content		
A	dd	Refresh Delete	* Trap Host	Please input content		
	ID	↑ Name		(1.1.1.1)	Storage Type	
	1	1	* Trap Port	16222 (Value greater than or equal to 1)	IonVolatile	Active
	2	33		(runs groute and a other or i)	IonVolatile	Active
	3	FS	Apply	Close	IonVolatile	Active
	4	OTN	10.32.130.1	16222	NonVolatile	Active
	5	Тгар	10.32.130.44	16222	NonVolatile	Active
	6	Trap1	10.32.130.8	16222	NonVolatile	Active
	7	internal0	127.0.0.1	162	ReadOnly	Active
	8	internal1	127.0.0.1	162	ReadOnly	Active
	9	trap	192.168.126.2	16222	NonVolatile	Active

Figure 2-14 SNMP Configuration

Click on "*Apply*" button in the pop-up window to add trap address. The default port number of trap is 16222. It is not recommended to modify this port number.

Name	Please input content	
Trap Host	Please input content	
		(1.1.1.1)
Trap Port	16222	
		(Value greater than or equal to 1)



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 top.

ease input con	ent		Search
Basic Info	Add Refresh	Delete	

Figure 2-16 NTP Configuration

Input the IP address of NTP server, and click on "Apply", the configuration succeeds.

	5	Trap	Add NTP Configuration	×	IonVolatile
	6	Trap1			IonVolatile
	7	internal0	* Server IP Please input content		leadOnly
	8	internal1		(1.1.1.1)	leadOnly
	9	trap	Apply Close		IonVolatile
Cor	ifigu	uration			
⊃ Cor	nfigu	uration			
² Cor Plea	nfigu se in	nput content	Search		
Plea	nfigu se in	nput content	h Delete		
Plea	nfigu se in ∱S	uration nput content Info Add Refree Server IP	h Delete	↑ Server Stat	us

Figure 2-17 Configure NTP Server

2.8.2. Configure NE Time

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the top menu.



NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Soft
NE Basic Info					
System Loca	tion	ш)			
Contact Info					
Device Identi	ifier	M Series NMS 200G			
System Up T	ïme	1 day, 4 hours, 26 minutes, 1	9 seconds.		
Serial Numbe	er	302D16HRS20050037			
Hardware Ve	rsion	3.0			
Software Ver	sion	R6.3.31_v9116_release			
System Nam	e	Please input content			
System Desc	cription	Please input content			

Figure 2-18 NE Time Configuration

Configure the current time of NE , and click on "Apply".

Time Zone	(GMT)	
NE Current Time	2020-09-28 02:55:25	
	Refresh Apply	



2.9. Upgrade NE

Upgrade NE:

- NE Software Upgrade: When the NE software is not the latest version but it needs to support the new function, you need to upgrade the NE software.
- BSP Upgrade of SC Card: When the NE BSP is not the latest version but it needs to support the new BSP function, you need to upgrade the NE BSP.

2.9.1. NE Software Upgrade

Click on the NE which has been added \rightarrow Click on "Software Update" on the top.

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NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
Software Lingra	10					
Soltware opgrad	ue -					
Software Upgra	ade	Please select a file		Select File		
Last status		NoAction		*		
		Apply				
SC Bsp Upgrade	2					
SC Bsp Upgrad	de	Please select a file		Select File		
		Apply				
NE Reboot						
NE WarmRebo	ot	The NE will restart. Please save advance	the NE configuration information i	Reboot		
NE ColdReboo	t	The NE will restart. Please save advance	the NE configuration information i	Reboot		

Figure 2-20 NE Software Upgrade

Select the NE load which needs to be upgraded, and click on "Apply" to upgrade the NE.

Software Upgrade	Please select a file	Select File
oonnalo opgrado	1 Marco solest a lite	Ocida File
Last status	NoAction	v
	Арріу	

Figure 2-21 Select NE File Name

Note: The software upgrade file and MD5 validating file should be placed in the following directory at the same time: server

installation root NMS --->TFTP---> software. Please do not change the file name and release the file by using the official name.

After upgrading the NE, you need to cold start and hot start the NE to make the upgraded load be effective.

Cold Start of NE: It will reboot the NE after cold start of NE, and the service which is being tested will be interrupted. After successful reboot of the NE, the service will recover to normal.

Hot Start of NE: It will reboot the NE after hot start of NE. However, the service will not be interrupted in the reboot process.

2.9.2. BSP Upgrade of SC Card (NMU Module)

Click on the NE which has been added \rightarrow Click on "Software Update" on the top.

Select the BSP file which needs to be upgraded and click on "Apply", you can upgrade BSP of NMU card.

sp Upgrade	Please select a file	Select File
------------	----------------------	-------------

Figure 2-22 Select BSP File Name

Note: BSP upgrade file and MD5 verification file need to be simultaneously placed in the following directory: server installation root NMS --->TFTP---> bsp (firmware_update upgrade tool is simultaneously placed in this root directory). Users can locally modify the upgrade file name and MD5 verification file name. The names of the two files must be the same (except for the suffix), and Chinese or special characters are not allowed for the file names.

2.10. Configure NE Data

Configure NE Data:

- Save NE Configuration: Abnormal power failure of the network element may cause configuration loss and affect the service. The configuration data of M6800-TSP16 network elements will be saved automatically at a certain time interval (1-3 minutes). In this option, it manually triggers the saving of configuration. With this function, the NE configuration will be saved immediately.
- 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.

2.10.1. Save NE Configuration

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the top.

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NE View NE Management	NE Configuration MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
System Name	Please input content			
System Description	Please input content			
	Refresh Apply			
NE Time Configuration				
Time Zone	(GMT)	~		
NE Current Time	2020-09-28 03:18:02			
	Refresh Apply			
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 an restarted	nd Recovery		
Configuration Data Upload	The NE Configuration will be uploaded from the NE to the NMS serv	rer Upload		
Configuration Data Download		• Download		

Figure 2-23 Save NE Configuration

2.10.2. Upload NE Configuration

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the top.

NE View	NE Management	NE Configuration	MGMT IP Configuration	Server (Configuration	Software Update	OSPF Information
System Nam	10	Please input content					
System Des	cription	Please input content					
		Refresh Apply					
NE Time Confi	iguration						
Time Zone		(GMT)		•			
NE Current 1	lime	2020-09-28 03:18:02					
		Refresh Apply					
NE Configurat	ion Management						
NE Log Uplo	ad	The NE log will be uploaded fr	om the ne to the NMS server		Upload		
Configuratio	n Data Save	The NE configuration will be sa	aved to the flash of the device		Save		
Default Conf Restore	iguration Data	The existing configuration will restarted	be lost, and the NE will be restored ar	ıd	Recovery		
Configuratio	n Data Upload	The NE Configuration will be u	ploaded from the NE to the NMS serv	er	Upload		
Configuration	n Data Download			•	Download		
		Fi	igure 2-24 Upload NE Con	figurati	on		
Enter the na	ame of the confi	guration file which ne	eds to be uploaded, and o	lick on	"Upload".		
Configur	ation Data Uploa	d The NE Co	nfiguration will be uploaded	from the	e NE to the NMS	server	Upload
		Figure	e 2-25 Enter NE Configura	tion File	Name		

The path to upload network element configuration is: the NMS installation directory --->TFTP--->config folder.

2.10.3. Download NE Configuration

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the top.

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	٣	Download

Figure 2-26 Download NE Configuration

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



Figure 2-27 Select Configuration File To Be Downloaded

2.10.4. Restore NE Default Configuration

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the top.

NE View	NE Management	NE Configuration	MGMT IP Configuration	Server	Configuration	Software Update	OSPF Information
System Nan	ne	Please input content					
System Des	cription	Please input content					
		Refresh Apply					
NE Time Conf	iguration						
Time Zone		(GMT)		*			
NE Current	Time	2020-09-28 03:18:02					
		Refresh Apply					
NE Configurat	tion Management						
NE Log Uplo	oad	The NE log will be uploaded fro	m the ne to the NMS server		Upload		
Configuratio	on Data Save	The NE configuration will be sa	ved to the flash of the device		Save	-	
Default Cont Restore	figuration Data	The existing configuration will b restarted	e lost, and the NE will be restored and	ł	Recovery		
Configuratio	n Data Upload	The NE Configuration will be up	oloaded from the NE to the NMS serve	r	Upload		
Configuratio	on Data Download			•	Download		

Figure 2-28 Restore NE Default Configuration

2.11. Upload NE Log

2.11.1. Upload NE Log

Click on the NE which has been added \rightarrow Click on "*NE Configuration*" on the top.

NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
System Na	ime	Please input content				
System De	scription	Please input content				
		Refresh Apply				
NE Time Cor	figuration					
Time Zone		(GMT)		T		
NE Curren	t Time	2020-09-28 03:18:02				
		Refresh Apply				
NE Configura	ation Management					
NE Log Up	load	The NE log will be uploaded fr	om the ne to the NMS server	Upload]	
Configurati	ion Data Save	The NE configuration will be s	aved to the flash of the device	Save		
Default Co Restore	nfiguration Data	The existing configuration will restarted	be lost, and the NE will be restored a	Recovery		
Configurati	ion Data Upload	The NE Configuration will be u	iploaded from the NE to the NMS ser	ver Upload		
Configurati	ion Data Download			Download		
			Figure 2-29 Upload NE	Log		
Enter the file	e name of the log	which needs to be up	ploaded, and click on " Ap	oply".		
NE Lo	g Upload	The NE log	will be uploaded from the n	e to the NMS server		Upload

Figure 2-30 Enter File Name of NE Log

The path to upload network element configuration is: the NMS installation directory --->TFTP--->log folder.

2.12. Reboot NE

Reboot NE:

- Hot Reboot of NE: During the hot reboot of NE, the service will not be interrupted.
- Cold Reboot of NE: During the cold reboot of NE, the service will be interrupted. The service will be recovered to normal after the start of the equipment is completed.

2.12.1. NE Hot Reboot

Click on the NE which has been added \rightarrow Click on "Software Update" on the top.



NE View NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information
NE Reboot					
NE WarmReboot	The NE value	will restart. Please	save the NE configura	ation information in	Reboot
NE ColdReboot	The NE v advance	will restart. Please	save the NE configura	ation information in	Reboot
ou are sure to make hot reb	Fig bot of NE, then click on"C	jure 2-31 NE Hot Re DK".	boot		
	The NE will restart	and the unsaved c	onfiguration will be lo	ost. If	
У	ou want to save the confi	guration, please ex	ecute the command	to	
S	ave the configuration data	a before restarting	the NE. Do you want	to	
re	start the NE?				
		Apply Cano	el		
	Figure	e 2-32 Confirm Hot	Reboot		
2.2. NE Cold Reb	Figure DOT	e 2-32 Confirm Hot	Reboot		
2.2. NE Cold Reb ek on the NE which has beer	Figure >ot added→Click on" <i>Softwo</i>	e 2-32 Confirm Hot are Update"on the t	Reboot op.		
A.2. NE Cold Reb k on the NE which has been NE View NE Management	Figure >ot added→Click on" <i>Softwo</i> NE Configuration	e 2-32 Confirm Hot are Update" on the t	Reboot op. Server Configuration	Software Update	OSPF Information
A con the NE which has been NE View NE Management	Figure >ot added→Click on" <i>Softwo</i> NE Configuration	e 2-32 Confirm Hot are Update" on the t	Reboot op. Server Configuration	Software Update	OSPF Information
A 2.2. NE Cold Reber k on the NE which has been NE View NE Management	Figure Dot added→Click on" <i>Softwo</i> NE Configuration	e 2-32 Confirm Hot are Update" on the t	Reboot op. Server Configuration	Software Update	OSPF Information
A 2.2. NE Cold Rebo k on the NE which has been NE View NE Management NE Reboot	Figure Dot added→Click on" <i>Softwo</i> NE Configuration	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration	Reboot op. Server Configuration	Software Update	OSPF Information
A 2.2. NE Cold Rebo k on the NE which has been NE View NE Management NE Reboot NE WarmReboot	Figure Pot added→Click on"Softwo NE Configuration The NE Madvance	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s	Reboot op. Server Configuration	Software Update	OSPF Information
A Conthe NE which has been NE View NE Management NE Reboot NE WarmReboot	Figure Pot added→Click on"Softwo NE Configuration The NE v advance	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s	Reboot op. Server Configuration	Software Update	OSPF Information
A Cold Reboot	Figure Pot added→Click on"Softwo NE Configuration The NE v advance The NE v advance	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s	Reboot op. Server Configuration	Software Update ation information in ation information in	OSPF Information Reboot Reboot
A Cold Reboot	Figure Pot added→Click on"Softwo NE Configuration The NE M advance The NE M advance	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s will restart. Please s	Reboot op. Server Configuration	Software Update ation information in ation information in	OSPF Information Reboot Reboot
A Cold Reboot	Figure added→Click on "Softwo NE Configuration The NE v advance The NE v advance Figure Figure	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s will restart. Please s ure 2-33 NE Cold Re	Reboot op. Server Configuration	Software Update ation information in ation information in	OSPF Information Reboot Reboot
A Cold Reboot	Figure Poot added→Click on"Softwo NE Configuration The NE v advance The NE v advance Figure poot of NE, then click on"	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s will restart. Please s ure 2-33 NE Cold Re <i>OK</i> ".	Reboot op. Server Configuration	Software Update	OSPF Information Reboot Reboot
A Cold Reboot	Figure Poot added→Click on"Softwo NE Configuration The NE v advance The NE v advance Figure poot of NE, then click on"	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s will restart. Please s ure 2-33 NE Cold Re <i>OK</i> ".	Reboot op. Server Configuration	Software Update	OSPF Information Reboot Reboot
A Cold Reboot NE Reboot NE ColdReboot NE ColdReboot NE coldReboot	Figure Added→Click on "Softwo NE Configuration The NE v advance Figure toot of NE, then click on " The NE will restart a	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s will restart. Please s ure 2-33 NE Cold Re OK".	Reboot op. Server Configuration save the NE configura save the NE configura eboot	Software Update ation information in ation information in e lost. If	OSPF Information Reboot Reboot
A Cold Reboot NE WarmReboot NE Cold Reboot NE Cold Reboot NE Cold Reboot NE Cold Reboot	Figure added→Click on <i>"Softwo</i> NE Configuration The NE v advance The NE v advance Figure poot of NE, then click on <i>"</i>	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s will restart. Please s ure 2-33 NE Cold Re <i>OK</i> ".	Reboot op. Server Configuration save the NE configura save the NE configura save the NE configura source the Configuration will b xecute the comma	Software Update ation information in ation information in e lost. If and to	OSPF Information Reboot Reboot
A Cold Reboot NE View NE Management NE Reboot NE ColdReboot NE ColdReboot NE coldReboot NE sure to make cold relation Sure sure to make cold relation NE coldReboot	Figure added→Click on <i>"Softwa</i> NE Configuration The NE v advance The NE v advance Figure coot of NE, then click on <i>"</i> The NE will restart a ant to save the configuration data	e 2-32 Confirm Hot are Update" on the t MGMT IP Configuration will restart. Please s will restart. Please s ure 2-33 NE Cold Re <i>OK</i> ".	Reboot op. Server Configuration save the NE configura save the NE configura save the NE configura source the NE configura eboot configuration will b xecute the comma the NE. Do you w	Software Update ation information in ation information in ation information in we lost. If and to rant to	OSPF Information Reboot Reboot



2.13. Display and Operate Device Panel

2.13.1. 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 2-35 Adjust NE Layout

2.13.2. Create Connection between NEs

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



Figure 2-36 Click"Connect"Button

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

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	FC
0	12

NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	
de					
ade	Please select a file		Select File		
	NoAction		w.		
Global Configu	uration				
_	Create Li	ink		×	
Q Q <mark>%</mark>	Name				
	Source				
	* Network	Please Select		•	
	* Shelf	1		•	
	* Slot			•	
	* Port			×	
	Dest				
	* Network	Please Select		• 5	
	* Shelf	1		•	
	* Slot			•	
	* Port			•	
	Apply	Close			
	NE Management	NE Management NE Configuration de ade Please select a file NoAction Create L Name Source Name Network Sold Port Sold Port Sold Network Sold Network Sold Network Sold Network Networ	NE Management NE Configuration MGMT IP Configuration de ade Please select a file NoAction Global Configuration Global Configur	NE Management NE Configuration MGMT IP Configuration Server Configuration	NE Management NE Configuration MGMT IP Configuration Sever Configuration Software Update

Figure 2-37 Create Connection between NEs

2.13.3. Display Panel Diagram

Click on the NE which has been added, then click on"NE View".

NE View	NE Management	NE Configuration	MGMT IP Configuration	Server Configuration	Software Update	OSPF Information	
0 Q	Q %		ase input content Q Search				System Time: 2020-09-28 11:40:25
		Recent		10	.32.130.111		

Figure 2-38 NE View

2.13.4. Save Layout

Click on "Save" button in the global view.

Figure 2-39 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

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 MGMT1 port of the device. Add the IP of 192.168.126.1 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 OCh (OTU4)/OCh (OTUC2).

🖯 😵 Global View	Port Management Pl	uggable Configuration	
🗐 💼 M6200-CH2U(10.32.130.110)			
■ ■ M6200-CH2U-2(10.32.130.116)	BasicInfo		
➡			
🖽 🛑 M6500-CH5U(10.32.130.220)	Administrative State	Enabled	•
🛱 🛑 M6800-TSP16(10.32.130.111)	Operational State	Down	
🖻 🚆 Shelf01			
🖨 🗖 Slot1 M6800-TSP16 : normal	Availability	NotInstalled	
Dort1			
Port2	Port Mode	OCh(OTUC2)	•
		OCh(OTU4)	
Port3	Port Description	OCh(OTUC2)	(Can
Port4			
Port5		Apply	
- Port6			

Figure 3-3 Enable OCh (OTU4) Port

-

Port Management	Pluggable Configuration	
BasicInfo		
Administrative State	Enabled	Ψ.
Operational State	Up	
Availability	Normal	
Port Mode	OCh(OTUC2)	v
Port Description	OCh(OTUC2) Please input content	

Figure 3-4 Enable OCh (OTUC2) Port

Click on OTU4.

Port Management Pl	uggable Configuration		
Availability	Notinstalled		
Port Mode	OCh(OTU4)	v	
Port Description	Please input content	(Can not contain / ; * ? * < > special characters)	
	Apply		
Port Configuration			
Choose State	O port O ODU4		
Administrative State	Enabled	▼ Operational State	Up
Availability State	Normal	▼ Degrade Interval	2
Near End ALS	No	▼ Degrade Threshold	128459
Loopback	NONE	▼ FEC Type	SDFEC3
TIM Mode	NONE	T Expected SAPI	Please input content
TIM AIS Insertion	False	▼ Expected DAPI	Please input content
Rx SAPI	2000000000000	Tx SAPI	Please Input content
Rx DAPI	000000000000	Tx DAPI	Please input content
Rx Operator		Tx Operator	Please input content
	DCN Apply		

Figure 3-5 Preparation before Opening GCC Channel of OCh (OTU4)

2					
Port Mode	OCh(OTUC2)	*			
Port Description	Please input content	(Can not contain / : *	? " < > (special characters)		
	Apply				
Port Configuration					
Choose State	O Interface OTUC2 ODU4				
Administrative State	Enabled	Ψ	Operational State	Up	
Availability State	Normal	Ŧ	Degrade Interval	2	
FEC Type	SDFEC3_16QAM	Ŧ	Degrade Threshold	258054	
Loopback	NONE				

Figure 3-6 Preparation before Opening GCC Channel of OCh (OTUC2)

Then click on DCN in the lower right corner to enter DCN configuration interface. Select GCC type (The GCC type of ODU4 layer is

Port Mode	OCh	ODU4DCN		×	
Port Description	Plea	GCC Type	Disabled	v	
		lfindex	Disabled GCC1 GCC1+2		
ort Configuration		PPP Status	Offline		
Choose State	int	Apply Close			
Please input conte	ent		Search		
÷	ODU4	+ Administrative State			+ Operation
0	1	Enabled		Up	DCN
0	2	Enabled		Up	DCN

GCC1 and GCC1+2), as shown in the figure below:

Figure 3-7 Open GCC Channel of ODU4 Layer

It needs to set the same GCC types of the occupied ports for adjacent NE.

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

"MGMT IP Configuration".

GFS

NE View N	E Management	NE Configuration	MGMT IP Configuration	Server C	onfiguration	Softwa
MGMT IP Configura	tion					
* Node IP		192.168.155.111			(1.1.1.1)	
NMS IP1						
* IP Address		10.32.130.111			(1.1.1.1)	
* Subnet Mask		255.255.255.0			(1.1.1.1)	
* OSPF	I	Disable		•		
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-d	istribution	Disable		•		
		Apply				
T ID Configuration		Figure 3-8 Select NE ar	nd MGMT IP Configuration	ı		
TIP Conliguration	ſ					
lode IP		192.168.155.111				(1.1.1
IS IP1						
^o Address		10.32.21.111				(1.1.1
ubnet Mask		255.255.255.0				(1.1.1
	C					

Figure 3-9 Open MGMT IP Configuration Interface

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.
MGMT 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	~

Figure 3-10 Configure Gateway NE IP

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.

Node IP	192.168.155.112	(1.1.1.1
NMS IP1		
IP Address	10.32.22.112	(1.1.1.1
Subnot Mack	255.255.255.0	(1.1.1.1
Sublict Mask		

Step 3:

192.

Configure the route on the computer to run CMD as an administrator and enter the following two routes: route add 192.168.155.111 mask 255.255.255.255.255 192.168.21.111 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 3-12 Add Local Route
Check the input route through route print command.

3	3
4	4
10.	10.
100.	100.
2.	2.
172	172
111	111
21.	21.
168.	168.
192.	192.
255	255
255.	255.
255.	255.
255.	255.
111	112
155.	155.
168.	168.

Figure 3-13 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 Configurat
IGMT IP Conf	iguration			
* Node IP		192.168.155.111		(1.1.1.1)
NMS IP1				
* IP Address		10.32.21.111		(1.1.1.1)
* Subnet Mas	sk	255.255.255.0		(1.1.1.1)
* OSPF		Enable		Ŧ
LCT IP				
IP Address		192.168.126.1		
Subnet Mask	¢	255.255.255.252		
* Gateway		0.0.0.0		(1.1.1.1)

Figure 3-14 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	(1.1.1.3
* Default route re-distribution	Disable	~
	Apply Figure 3-15 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 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 "Shelf 01", then select "Shelf Information" to open the Shelf information interface. Information such as Shelf type and temperature is displayed in this interface, as shown in Figure 4-1:



Figure 4-1 Operation Steps to View Shelf Information

4.1.1. M6800-TSP16 Shelf Information

M6800-TSP6 3.0 60:E6:BC:06:64:7C 60% False			
M6800-TSP6 3.0 60:E6:BC:06:64:7C 60% False)
M6800-TSP6 3.0 60:E6:BC:06:64:7C 60% False			
3.0 60:E6:BC:06:64:7C 60% False			
60:E6:BC:06:64:7C 60% False			
60% False			
False			
20.010.5243			
302D16HRS20050037			
1			
24			
Please input content			Can not contain / : * ? " < > special
True		*	
	302D16HRS20050037 1 24 Please input content True Apply LampTest	302D16HRS20050037 1 24 Please input content True Apply LampTest	302D16HRS20050037 1 24 Please input content True Apply LampTest

Figure 4-2 M6800-TSP16 Shelf Information

4.2. Indicator Light Information

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

4.2.1. NMU Module

		M6800-TSP16
NMU Control System	SYS	Green Light Slow Flash: The system has successfully started.
Indicator Light		Green Light Always Off: The system has not started.
(NMU Board, Service Board		
Integration)		
	ALM	Red Light Quick Flash: There is Critical alarm.
		Red Light Slow Flash: There is Major alarm of the device.
		Red Light Always ON: There is Minor alarm of the device.
		Red Light Off: There is no alarm of the device.

Table 4-1 Indicator Light Status of Integrated NMU Module

4.2.2. Fan Tray Indicator Light

Table 4-2 Fan Tray Indicator Light Status

		M6800-TSP16
Fan Tray Indicator Light	FAN	Green Light Always ON: There is no alarm of the fan.
	(Two Colors)	Red Light Always ON: There is alarm of the fan.

4.2.3. Port Indicator Light of Service Board

Table 4-3 Port	Indicator Ligh	t Status of	Service Board

		M6800-TSP16
Service Board Port	Bi-Color Indicator Light	Always OFF: The port is disabled.
Indicator Light		Red Light Quick Flash: There is mismatch alarm of the port.
		Red Light Always On: There is los alarm of the port.
		Green Light Always On: There is no los and mismatch alarm of the port.

4.2.4. Power Tray Indicator Light

Table 4-4 Power	Trav	Indicator	Light Status
Tuble I II offer		marcator	Eight Status

		M6800-TSP16
Power Tray Indicator Light	PWR (Bi-Color Indicator Light)	Red Light Always ON: The power tray is not powered or there is failure of the power tray. Green Light Always ON: Normal power supply and there is no alarm of the power tray.

4.3. View Single Board Information

Select NE and click on "Shelf 01", and then select "Card Information".



Figure 4-3 View Single Card Information

After selecting "Card Information", the interface as shown in the figure below pops up. Information such as board type, hardware

version, software version, Kernel version, Uboot version, central temperature and outlet temperature of each slot can be checked in

this interface.

Please input cor	itent	Search			
Slot ID	Туре	SN	PN	HW Version	SW Version
1	M6800-TSP16	302D16HRS20050037	20.010.5243	20.010.5243	R6.3.31_v10388_r
2	M6800-1UPSM	U1A-K10400-DRB	ASPOWER_1.1SA1	ASPOWER_1.1SA1	
3	M6800-1UFAN	112DF16RS20050014	20.010.5245	20.010.5245	-
4	M6800-1UFAN	112DF16RS20050002	20.010.5245	20.010.5245	-
5	M6800-1UFAN	112DF16RS20050086	20.010.5245	20.010.5245	-
6	M6800-1UPSM	U1A-K10400-DRB	ASPOWER 1.1SA1	ASPOWER 1.1SA1	-



4.4. View Slot Information

Select NE and click on "Shelf 01", and then select "Slot Information".



Figure 4-5 View Slot Information

After selecting "Slot Information", the interface as shown in the figure below pops up. Information of every slot, pre-configured board, actual board, board status and board description can be checked in this interface.

Shelf View	Shelf Information	Slot Information	Card Information Busines	ss Configuration		
Slot Info						
Please input	content		Search			
Modify						
			Require Card Type	Actual Card Type	Card State	
	1		M6800-TSP16	M6800-TSP16	normal	
	2		M6800-1UPSM	M6800-1UPSM	normal	
	3		M6800-1UFAN	M6800-1UFAN	normal	
	4		M6800-1UFAN	M6800-1UFAN	normal	
	5		M6800-1UFAN	M6800-1UFAN	normal	
	6		M6800-1UPSM	M6800-1UPSM	normal	
Total: 6 records						10 TPrevious 1 Next

Figure 4-6 Slot Information Interface

4.5. Port Configuration

Select NE-Slot 1, Cick on "Port 1", as shown in the figure below:



Figure 4-7 View Port Configuration Information

4.5.1. Basic Information

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

The client side port type supports: HGE_GMP.

The line side (system side) port type supports: OCh (OTU4), OCh (OTUC2).

Select NE-Slot 1, click on "*Port 3*", and select"*Port Configuration*", the interface as shown in the figure below pops up. The configuration status, port mode and port description can be modified in basic information.

asicInfo		
Administrative State	Disabled	•
Operational State		
Availability		
Port Mode	HGE_GMP	Ψ.
Port Description	Please input content	(Ca

Figure 4-8 Port Management Interface

4.5.1.1. Interface Configuration

Select NE-Slot 1, click on "Port 3" and select "Port Management", the port management interface pops up.

hoose State	Interface ODU4	
dministrative State	Disabled	Ŧ
Operational State	Down	
Availability State	Normal	Ψ.
oopBack	NONE	T
lear End ALS	No	
Client Shutdown (CSD) by Alarm	No	v
EC Type	NoFEC	•

Figure 4-9 Port Management-Interface Information

4.5.1.2. OTU4 Configuration

Select NE-Slot 1, click on "*Port 1*" and select "*Port Management*", 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.

Port Configuration			
Choose State	◎ port		
Administrative State		Operational State	Down
Availability State	Normal	Degrade Interval	0
Near End ALS	No	Degrade Threshold	0
Loopback	NONE	FEC Type	T
TIM Mode	NONE	Expected SAPI	Please input content
TIM AIS Insertion	True	Expected DAPI	Please input content
Rx SAPI		TX SAPI	Please input content
Rx DAPI		TX DAPI	Please input content
Rx Operator		Tx Operator	Please input content
	DCN Apply		

Figure 4-10 OTU4 Toolbar Interface

4.5.1.3. ODU4 Configuration

Select NE-Slot 1, click on "*Port 3*" and select "*Port Management*" (here we take ODU4 corresponding to HE_GMP port mode as an example), the port management interface pops up. Click on ODU4 option from "*Port Configuration*" in this interface, as shown in the figure below. It shows ODU4 toolbar interface.

Port Configuration				
Choose State	Interface ODU4			
Administrative State	Enabled	-	Opu State	Client
Operational State	Down		Degrade Interval	2
Availability State	Failed	*	Degrade Threshold	128459
PLM AIS Insertion	True	•	Expected PT	0x7
Rx PT	N/A		Tx PT	0x7
TIM Mode	NONE	Ŧ	Expected SAPI	Please input content
TIM AIS Insertion	False	*	Expected DAPI	Please input content
Rx SAPI	kkkkkkkkkkkkkkk		Tx SAPI	Please input content
Rx DAPI	lektelaktelaktelaktelaktelaktelaktelakte		Tx DAPI	Please input content
Rx Operator	kkikkickikkikkikkikkikkikkikkikkikkikkik		Tx Operator	Please input content
	Amele			

Figure 4-11 ODU4 Toolbar Interface

4.5.1.4. OTUC2 Configuration

Select NE-Slot 1, click on "*Port 1*" and select "*Port Management*", the port management interface pops 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.

dministrative State	Enabled	¥
perational State	Down	
Availability	Notinstalled	
Port Mode	OCh(OTUC2)	v
Port Description	Please input content	

4.5.1.5. ODUC2 Configuration

Select NE-Slot 1, click on "Port 1" and select "Port Management", the port management interface pops up (here we take ODUC2

corresponding to OCh (OTUC2) port mode as an example) . Click on ODUC2 option from "Port Configuration" in this interface, as

shown in the figure below. It shows ODUC2 toolbar interface.

Port Configuration				
Choose State	Interface Interface OTUC2 ODU4			
Administrative State	Enabled	*	Operational State	Up
Availability State	Normal	*	Degrade Interval	2
FEC Type	SDFEC3_16QAM	•	Degrade Threshold	258054
Loopback	NONE	•		
	Apply			
	Figure 4	I-13 OD	UC2 Toolbar Interface	

4.5.2. Parameter Description

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



Figure 4-14 M6800-TSP16 Port Mode

Table 4-5 M6800-TSP16 Parameter Description

ltem	Description
Maximum Capacity	1.6Tbit/s
Client Side Interface	16x QSFP28-based 100G interfaces



System Side Interface	8x CFP2-based 200G interfaces
Encryption Algorithm	AES-256 (In Developing)
Management Interface	2xRJ45 Ethernet port, 1 mini USB serial port
Management	Supports WEB/SNMP v2
In-band Management	Supports GCC0/1/2.

4.6. Configuration of Optical Module Information

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

Select NE-Slot, click on "Port 1"->"Pluggable Configuration", and select "Pluggable BasicInfo", as shown in the figure below:

🛛 🐨 Global View	Port Management	Pluggable Configuration
🖽 🛑 M6200-CH2U(10.32.130.110)	. or manugamon	
🖽 🗃 M6500-CH2U-2(10.32.130.116)	Pluggable BasicInfo	
🗄 🛑 M6500-CH2U(10.32.130.120)	33	
🖽 🗃 M6500-CH5U(10.32.130.220)	Туре	Unknown
🗎 🗃 M6800-TSP16(10.32.130.111)	Present or Absent	Absent
🗄 👹 Shelf01	Vendor SN	
Slot1 M6800-TSP16 : normal	Vendor PN	-
Port1	Vendor OUI	
Port2	Application Code	0
Port3	CLEI	~
Port4	LaneNum	0
Port5	Firmware	-
Port6	Tunable	False
Port7	Wavelength(nm)	0
- C Port8		
Port9	Optics Paramete	
Port10		
- Port11	Please input content	

Figure 4-15 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.

4.6.1. QSFP28 Optical Module Information

Port Management	Pluggable Configuration
Pluggable BasicInfo	
Туре	QSFP28
Present or Absent	Alarm
Vendor SN	F1908012321
Vendor PN	QSFP28-LR4-100G
Vendor OUI	
Application Code	100GBASE_LR4
CLEI	-
LaneNum	4
Firmware	-
Wavelength(nm)	1310

Figure 4-16 Basic Information of QSFP28 Optical Module

Please input conter	it	Search			
↓Lane ID		+ Lane RxPower(dBm)	↑ Laser Temperature(°C)	+ Laser Bias(mA)	+Laser Vcc(V)
1	1.80	-40.00	24.0	38	3.33
2	2.20	-40.00	24.0	36	3.33
3	1.60	-40.00	24.0	36	3.33
4	1.30	-40.00	24.0	39	3.33



4.6.2. CFP2 Optical Module Information

Configure the port mode as Och (OTUC2), insert a wavelength division CFP2 optical module, select the interface, and configure the working wavelength and transmit optical power of the optical module, as shown in the following figure.

Port Management Pluggabl	e Configuration				
ort Configuration					
Choose State	● port	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	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			High Value(Supported)	-40000
High Value(Setting)					



Port Management Pluggable	e Configuration		
Port Configuration			
Choose State	● port		
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)			
	Apply		



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-connect. 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-connect without protection: one-way cross-connect, that is, the service is transmitted from site A--->site Z without line protection.
- Bidirectional cross-connect without protection: bidirectional cross-connect, that is, the service is transmitted from site A--->site Z and from site Z--->site A without line protection.
- Unidirectional cross-connect with protection: one-way cross-connect, 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-connect with protection: bidirectional cross-connect, 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').

Our company's M6800-TSP16 equipment temporarily does not support the protection function, so we only need to know unidirectional cross-connect without protection and bidirectional cross-connect without protection. Since the TP multiplexing structure and cross-connect of our M6800-TSP16 equipment are generated by fixed default, and by default it is bidirectional cross-connect without protection, there is no need to configure OTN electric cross-connect.

Configuration Steps

Select NE, click on "Shelf 01" and select "Business Configuration", the operation steps are as shown in the figure below:

	Shelf View	Shelf In	formation Slot Inform	mation Card Information	Business Configuration		
П M6200-CH2U(10.32.130.110)	CNC Confi	auration					
M6500-CH2U(10.32.130.120)	SNC Conti	guration					
🗃 M6500-CH5U(10.32.130.220)	Please	input content		Search			
M6800-TSP16(10.32.130.111)							
🗄 🗮 Shelf01		↓ ID	+ Snc Type	+ Circuit ID	+ Src TpID		
🖨 🖸 Slot1 M6800-TSP16 : normal		1001	2WAY		Slot1-port1-ODU4(0)	Slot1-port2-ODU4(0)	
Port1		1003	2WAY		Slot1-port4-ODU4(1)	Slot1-port5-ODU4(0)	
- 🔂 Port2		1004	2WAY		Slot1-port4-ODU4(2)	Slot1-port6-ODU4(0)	
Port3		1005	2WAY		Slot1-port7-ODU4(1)	Slot1-port8-ODU4(0)	
Dort4							
Port5		1006	2WAY		Slot1-port7-ODU4(2)	Slot1-port9-ODU4(0)	
- 🙆 Port6		1007	2WAY		Slot1-port10-ODU4(1)	Slot1-port11-ODU4(0)	
Port7		1008	2WAY		Slot1-port10-ODU4(2)	Slot1-port12-ODU4(0)	
- Port8		1009	2WAY		Slot1-port13-ODU4(1)	Slot1-port14-ODU4(0)	
Port9		1010	2WAY		Slot1-port13-ODU4(2)	Slot1-nort15-ODU4(0)	
- 🔂 Port10	_						
Port11		1011	2WAY		SIOT-port16-ODU4(1)	Slot1-port17-ODU4(0)	
Port12	Total: 15	records					10 - Previous 1 2
D Port13	Total. To						Tierious I 2

Figure 5-1 Operation Steps of Service Configuration

5.1.1. Bidirectional Cross-Connect without Protection

Please i	input content		Searc	h		
	↓ID		+ Circuit ID	+ Src TpID	↑ Des TpID	
	1001	2WAY		Slot1-port1-ODU4(0)	Slot1-port2-ODU4(0)	
	1003	2WAY		Slot1-port4-ODU4(1)	Slot1-port5-ODU4(0)	
	1004	2WAY		Slot1-port4-ODU4(2)	Slot1-port6-ODU4(0)	
	1005	2WAY		Slot1-port7-ODU4(1)	Slot1-port8-ODU4(0)	
	1006	2WAY		Slot1-port7-ODU4(2)	Slot1-port9-ODU4(0)	
	1007	2WAY		Slot1-port10-ODU4(1)	Slot1-port11-ODU4(0)	
	1008	2WAY		Slot1-port10-ODU4(2)	Slot1-port12-ODU4(0)	
	1009	2WAY		Slot1-port13-ODU4(1)	Slot1-port14-ODU4(0)	
	1010	2WAY		Slot1-port13-ODU4(2)	Slot1-port15-ODU4(0)	
	1011	2WAY		Slot1-port16-ODU4(1)	Slot1-port17-ODU4(0)	

Figure 5-2 Configuration Result of Bidirectional Cross-Connect without Protection

5.2. Service Type

5.2.1. Service Type

Select NE-Slot 1, click on "Port 2" and select "Port Management", as shown in the figure below:

Port Management	Pluggable Configuration	
3asicInfo		
Administrative State	Enabled	
Operational State	Down	
Availability	Notinstalled	
Port Mode	HGE_GMP	•
Port Description	Please input content	(Can not contain / : * ?
	Apply	

Figure 5-3 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	Pluggable Configuration	
BasicInfo		
Administrative State	Enabled	•
Operational State	Down	
Availability	NotInstalled	
Port Mode	HGE_GMP	•
Port Description	Please input content	(Car
	Apply	

Figure 5-4 Port Mode Type Interface

5.3. Service Configuration Process



Figure 5-7 Service Configuration Process

5.4. Configuration Instructions

5.4.1. M6800-TSP16

M6800-TSP16 port type includes 1 (port 1)*200G/100G line side interface (CFP2) and 2 (port 2/3)*100G client side interfaces

(QSFP28).

5.4.1.1. Service Type

Line Side Port

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



Figure 5-8 Operation Steps of M6800-TSP16 Line Side Port Information

The line side port management interface is as shown in the figure below. You can select the service type in port mode.

Administrative State	Enabled	v
Operational State	Down	
Availability	NotInstalled	
Port Mode	OCh(OTU4)	*
	OCh(OTU4) OCh(OTUC2)	
Port Description	Please input content	

Figure 5-9 M6800-TSP16 Line Side Port Interface

Client Side 100G Port

Select NE-Slot 1, click on "Port 2" and select "Port Management", the operation steps are as shown in the figure below:

	Port Management PI	uggable Configuration	
M6200-CH2U(10.32.130.110)			
M6500-CH2U-2(10.32.130.116)	BasicInfo		
M6500-CH2U(10.32.130.120)			
M6500-CH5U(10.32.130.220)	Administrative State	Enabled	*
M6800-TSP16(10.32.130.111)	Operational State	Down	
🗄 🚆 Shelf01			
🗐 📮 Slot1 M6800-TSP16 : normal	Availability	Notinstalled	
- Dort1			
Port2	Port Mode	HGE_GMP	Ŧ
Port3	Port Description	Please input content	(Can not contain / ; * ? * <> special characters
Dort4			
Port5		Apply	
Port7	Port Configuration		
Port8	Choose State	Interface ODU4	
Port9		-	

Figure 5-10 Operation Steps of M6800-TSP16 Client Side 100G Port Information

The client side port management interface is as shown in the figure below. You can select the service type in port mode.

Port Management	Pluggable Configuration	
BasicInfo		
Administrative State	Enabled	•
Operational State	Down	
Availability	NotInstalled	
Port Mode	HGE_GMP	×
Port Description	Please input content	(0
	Apply	

Figure 5-11 M6800-TSP16 Client Side 100G Port Interface

5.4.1.2. FEC Configuration

FEC is configurable only on OTU layer.

Line Side Port

Select NE-Slot 1, click on "*Port 1*" and select "*Port Management*" to open the port management interface and select OCh (OTU4) as the port mode. Select "*FEC Type*" option in "*OTU4*" interface of "*Port Configuration*" to check the configuration. There are in all 4 FEC modes for the line side, which are respectively G709FEC/SDFEC1/SDFEC2/SDFEC3. SDFEC3 is the default mode. The configuration is as shown in the figure below:

Port Configuration				
Choose State	o port			
Administrative State	Enabled	*	Operational State	Up
Availability State	Normal	Ŧ	Degrade Interval	2
Near End ALS	No	*	Degrade Threshold	128459
Loopback	NONE		FEC Type	SDFEC3
				G709FEC SDFEC1 SDFEC2
TIM Mode	NONE	*	Expected SAPI	SDFEC3
TIM AIS Insertion	False		Expected DAPI	Please input content
Rx SAPI	000000000000000000000000000000000000000		Tx SAPI	Please input content
Rx DAPI	0000000000000		Tx DAPI	Please input content
Rx Operator	000000000000000000000000000000000000000		Tx Operator	Please input content
	DCN Apply			

Figure 5-12 FEC Configuration of M6800-TSP16 Line Side Port OTU4

Select NE-Slot 1, click on "*Port 1*" and select "*Port Management*" to open the port management interface and select OCh (OTUC2) as the port mode. Select "*FEC Type*" option in "*OTUC2*" interface of "*Port Configuration*" to check the configuration. There are in all 6 FEC modes for the line side, which are respectively

SDFEC1_8QAM/SDFEC2_8QAM/SDFEC3_8QAM/SDFEC1_16QAM/SDFEC2_16QAM/SDFEC3_16QAM. SDFEC3_16QAM is the default mode. The configuration is as shown in the figure below:

	Appty			
Port Configuration				
Choose State	Interface OTUC2 ODU4			
Administrative State	Enabled		Operational State	Up
Availability State	Normal	*	Degrade Interval	2
FEC Type	SDFEC3_16QAM	v	Degrade Threshold	258054
Loopback	SDFEC1_80AM SDFEC3_80AM SDFEC3_80AM SDFEC2_160AM SDFEC2_160AM SDFEC2_160AM			
	Apply			

Figure 5-13 FEC Configuration of M6800-TSP16 Line Side Port OTUC2

Client Side 100G Port

Select NE-Slot 1, click on "*Port 2*" and select "*Port Management*" to open the port management interface and select HE_GMP as the port mode. Select "*FEC Type*" option in "*Interface*" interface of "*Port Configuration*" to check the configuration. There are in all 2 FEC modes for the client side, which are respectively No-FEC and RS_FEC. No-FEC is the default mode. The configuration is as shown in the figure below:

Choose State	Interface ODU4	
Administrative State	Enabled	*
Operational State	Up	
Availability State	Normal	Ŧ
LoopBack	NONE	~
Near End ALS	No	3
Client Shutdown (CSD) by Alarm	No	
FEC Type	NoFEC	v

Figure 5-14 FEC Configuration of M6800-TSP16 Client Side 100G Port

Note: When SR4 or CWDM4 optical modules are used at the client side, it needs to enable the RS_FEC function of the port according to actual requirements.

5.5. Configuration Example

5.5.1. Configuration Example of Service Transparent Transmission

Here we take site-to-site transmission between Site A and Site B of LR4 100GE service as an example.

Configure the service type of the client side port2-port3 as HGE_GMP, and configure the mode of the line side port1 as OCh

(OTUC2), and then enable the ports at the client side and the line side.

Administrative State	Enabled	v
Operational State	Down	
Availability	Notinstalled	
Port Mode	HGE_GMP	•
Port Description	Please input content	(Can r

Figure 5-15 Configure Client Side Signal Mode

Administrative State	Enabled	*
Operational State	Down	
Availability	NotInstalled	
Port Mode	OCh(OTUC2)	•
Port Description	Please input content	(Can not contain /

Figure 5-16 Configure Line Side Signal Mode

Build the environment according to the following diagram.



Figure 5-17 Site-to-Site Transmission Environment

Note:

- Ensure that the client side service types including mapping methods of Site A and Site B are the same.
- Ensure that the line side FEC types of Site A and Site B are the same.

6. Alarm Management

6.1. 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 several types and four levels of failures. It includes types such as equipment alarm,

communication alarm, service quality alarm, environment alarm and error processing alarm. The four levels are emergency, primary, secondary and warning.

6.2. Main Interface of Alarm Management

After logging in the NMS system, click "Maintain" on the top bar -> click on the "Alarm Management" menu -- the alarm

management sub-menu appears, which includes: current alarm, history alarm and Ethernet events.

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.

FS M Series NMS			Monitor	Global	Configuration	* Maintain	
Log Management C Alarm Management Performance Current Info	Current Alarm	History Alarm Element Event					
Performance History Info	IP	All	v	Slot	All	Ŧ	
<u>III.</u> Data Maintenance	Port	All	*	Raised Time From	Please Select		
	Raised Time To	Please Select		Cleared Time From	Please Select		
	Cleared Time To	Please Select		Search	Please enter the search content		
	Severity	Major Minor Warning Critical		Acknowledge State	🗌 Ack 🔲 Unack Au	ito Refresh 🚺 Query	
	Ack	Unack					

Figure 6-1 Alarm Management

6.2.1. Current Alarm

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

Current Alarm	History Ala	rm Element Event									
urrent Alarm											
IP	All			Slot	All			Port			r
Raised Time From	Please Select			Raised Time To	Please Select			Cleared Time Pi From	ease Select	6	a
Cleared Time To	Please Select		Ħ	Search	Please enter the search content			Severity 🔲 N	fajor 🗐 Minor 🗐 Warning	Critical	
Acknowledge State	🛛 Ack 🔲 U	nack Auto Refresh	Query								
Ack	Unack										
🗉 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_C	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:39	Unacknowledge	-	-
2	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_RX_C	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:39	Unacknowledge	10	2
3	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_T1_O	JP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:39	Unacknowledge	-	-
□ 4	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_R1_C	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_O	JP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:39	Unacknowledge	17	7
6	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot6_R2_G	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:37:39	Unacknowledge	-	-
□ 7	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot8_TX_C	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	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:36:51	Unacknowledge		-
9	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot8_T1_O	JP.	Optical_Below_Threshold	Communication	Set	2020/09/22 11:36:51	Unacknowledge	-	-
🔲 10	Critical	10.32.130.116_FMX-10G	Location_Shelf1_Slot8_R1_C	LP	Optical_Below_Threshold	Communication	Set	2020/09/22 11:36:51	Unacknowledge		-
Total: 46 reco	rds									10 🐨 Previo	us 1 2 3 4 5 Next

Figure 6-2 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).

10	
10	
20	
50	
100	

Figure 6-3 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 "Confirm" button, the selected alarms are all in the confirmation state. The confirmation status of the confirmed alarm is "Ack" and the "confirmation" icon becomes green with specific confirmation person and confirmation time. The specific operation is: select the alarm to be confirmed \rightarrow click the "Ack" button \rightarrow click on "apply" \rightarrow confirm the alarm.

Because the current page will refresh once every 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

Figure 6-4 Select to Confirm Current Alarm



A	ck	Unack					
	ID	Severity	NE	Alarm Source	Are you sure to perform this operation?	Alarm Type	State
	1	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Storrart2		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_Pluggab	e Pluggable_Missing	Equipment	Set
	4	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_Pluggab	e Pluggable_Missing	Equipment	Set
	5	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port1_Pluggab	e Pluggable_Missing	Equipment	Set
	6	Warning	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port5_ODU4(0)) ODU_AIS	Communication	Set

Figure 6-5 Confirm Current Alarm

Ack	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	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

Figure 6-6 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.

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

Ac	k	Unack							
	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
-	5	Critical	10.32.130.111_M6800-TSP16	Location Shelf1 Slot1 Port1 Pluggable	Pluadable Missina	Fauinment	Set	2020/09/21 10:08:41	Unacknowledge

Figure 6-7 Cancel Confirmation of Current Alarm





Ack	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

Figure 6-9 Complete Cancellation Confirmation 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 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.

1	10.32.130.111	T	Slot	All	v
	All	1			
+	10.32.130.116		Raised Time	Plance Palact	1000
11	10.32.130.111		From	Flease Select	
aised Time	10.32.130.160		Cleared Time		
	10.32.130.110		From	Please Select	
ieared Time)	Please Select		Search	Please enter the search content	
everity	Major Minor Warning Critical		Acknowledge State	🗐 Ack 🔲 Unack Auto Refresh 🧲	Query

Figure 6-10 IP Filter Current Alarm

Slot	All
	All
Raised Time	
From	2 3
Cleared Time	4
From	5 6
Search	Please enter the search content
Acknowledge State	🖾 Ack 🖾 Unack Auto Refresh 🚺 Query



Cleared Time	+	1	Septe	ember	2020)	+		202
From	Su	Mo	Tu	We	Th	Fr	Sa		
	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	Quer
	27	28	29	30	1	2	3		
	4	5	6	7	8	9	10		
				Today	1			Alarm Type	Stat
		Fig	gure 6	5-12 Cr	eate T	ime to	o Filte	r Current Alarm	

Figure 6-13 Filter Current Alarm According to Alarm Level & Confirmation Status

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.

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.

Se

Cleared Time To	Please Sele	ect	Ē	Search	i			
Severity	Major	Minor Warning C	itical	Acknowledge 📄 Ac State	k 🗌 Unack Al	uto 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:
2	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port3_	Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:
3	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port1_	Pluggable	Pluggable_Missing	Equipment	Set	2020/09/21 10:
4	Major	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot6		EQPT_Power_Supply_Issue	Equipment	Set	2020/09/18 16:
5	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port4_	Pluggable	Pluggable_Missing	Equipment	Set	2020/09/18 16:
6	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port5_	Pluggable	Pluggable_Missing	Equipment	Set	2020/09/18 16:
7	Critical	10.32.130.111_M6800-TSP16	Location_Shelf1_Slot1_Port10	Pluggable	Pluggable_Missing	Equipment	Set	2020/09/18 16:

Total: 7 records filtered from 10 total entries

Figure 6-14 Search Current Alarm

Alarm Details		×	×		
NE	10.32.130.111_M6800-TSP16	Ē			
Alarm Source	Location_Shelf1_Slot1_Port2_Pluggable	-	=		
Alarm Name	Pluggable_Missing				
Probable Cause	Pluggable_Missing				
Recommend Measures	Document Links				
Alarm Type	Equipment	Guler	y J		
Severity	Critical				
State	Set	cnowledge State	Acknowledge User	Acknowledge Time	Operation
Raised Time	2020/09/21 10:09:39	acknowledge		22 2	Details Ack
Cleared Time		acknowledge	-	-	Details Ack
Acknowledge State	Unacknowledge	acknowledge	-1	-	Details Ack
Acknowledge User		acknowledge			Details Ack
Acknowledge Time		acknowledge		: <u></u>	Details Ack
Submit		acknowledge			Details Ack
Equipment	Set 2020/09/18 16:08:12	Unacknowledge	-		Details Ack

Figure 6-15 Alarm Details

×

Alarm Details

NE	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	
Acknowledge State	Unacknowledge
Acknowledge User	
A descude data Tinan	

http://localhost:9090/alarm/alarmdetail.html Figure 6-16 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, confirmation status, confirmer, confirmation time and 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, confirmation status, confirmer and confirmation time are relatively simple,

we will not go into much detail here.

6.2.2. History Alarm

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

Current Ala	arm	History	Alarm Element Event									
History Ala	arm											
IP		10.32.130.11	Ē.	*	Raised Time From	Please Select						
Raised To	Time	Please Selec	ž		Cleared Time From	Please Select						
Cleared To	l Time	Please Selec	1	1000 1000 1000	Severity	Major Mir	ior 🔲 Critical	Warning				
Acknow State	ledge	🗌 Ack 📃	Unack Query									
Dele	ete	Delete ALL	. Export									
	ID	Severity	NE	Alarm Source	Alarm Na	ame	Alarm Type	State	Raised Time	Cleared Time	Acknowledge State	Ackno
	1	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LO	SYNC	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	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LO	SYNC	Communication	Auto clear	2020/09/21 16:17:13	2020/09/21 16:17:13	Acknowledge	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 /
	5	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_L0	SYNC	Communication	Auto clear	2020/09/21 16:17:11	2020/09/21 16:17:11	Acknowledge	Auto /
	6	Major	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LF		Communication	Auto clear	2020/09/21 16:17:05	2020/09/21 16:17:05	Acknowledge	Auto /
	7	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_L0	SYNC	Communication	Auto clear	2020/09/21 16:17:04	2020/09/21 16:17:04	Acknowledge	Auto /
	8	Major	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LF		Communication	Auto clear	2020/09/21 16:16:44	2020/09/21 16:16:44	Acknowledge	Auto /
	9	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot4_Port1_ETYn	ETY_LO	SYNC	Communication	Auto clear	2020/09/21 16:16:58	2020/09/21 16:16:58	Acknowledge	Auto /
	10	Major	10.32.130.220_TMXP5-1	Shelf1_Slot4_Port1_ETYn	ETY_LF		Communication	Auto clear	2020/09/21 16:16:58	2020/09/21 16:16:58	Acknowledge	Auto /
-												

Figure 6-17 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.

Ackno State	owledg	e 🔲 Ack	Unack Query				
	elete	Delete A	LL Export				
	D	Severity	NE	Puolini Cource	Do you want to del	ete these data?	State
X	1	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	Apply	Cancel	Auto clea
	2	Major	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	EIT_LF	Communication	Auto clea
	3	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LOSYNC	Communication	Auto clea
	4	Major	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LF	Communication	Auto clea
	5	Critical	10.32.130.220_TMXP5-1	Shelf1_Slot3_Port1_ETYn	ETY_LOSYNC	Communication	Auto clea

Figure 6-18 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 the file, it will prompt to save the path. The exported data is saved in Excel format.

	Ackno State	wledge	🔲 Ack	Unack Query
	De	lete	Delete	ALL
		ID	Severity	NE
		1	Critical	10.32 130.220_M6500-5U
		2	Major	10.32.130.220_M6500-5U
		3	Critical	10.32.130.220_M6500-5U
		4	Major	10.32.130.220_M6500-5U
		5	Citical	10.32.130.220_M6500-5U
		6	Major	10.32.130.220_M6500-5U
		7	Critical	10.32.130.220_M6500-5U
	6	8	Major	10.32.130.220_M6500-5U
		9	Critical	10.32.130.220_M6500-5U
		10	Major	10.32.130.220_M6500-5U
HistoryAlarm (1).xlsx				

Figure 6-19 Export History Alarm

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.

6.3. Alarm Configuration

6.3.1. Alarm Configuration

Click on"Alarm Configuration" in the sub-menu to enter the alarm configuration page, as shown in the figure below:

		Monitor	(S) Global	Configuration	X Maintain		
Alarm Configuration	Alarm Configuration Alarm Notification Configuration	Alarm Mailbox Server Configuratio	n				
R User Management	Alarm Configuration	Coarab					
User Group Management	Apply Refresh	Search					
Data Store Config	↑ Alarm Name	Alarm Severi	y Configuration			Alarm Sh	ielding Conf
Set Screen Lock Time	TCA_UAS	Major	•			No	٣
	TCA_SES	Major	r			No	v
	TCA_ES	Major				No	v
	TCA_BBE	Major	-			No	•
	SWITCH_PortDown	Major	,			No	٣
김희 동송자 왕	SW_STORAGE_FULL	Major	<u>-</u>			No	*
	SW_MISMATCH	Major	n			No	•
e se	SW_MIB_MISMATCH	Major	•			No	•
	SW_MIB_FAIL	Major	,			No	٣
	SW_DOWNLOAD_FAIL	Major	r 			No	*

Figure 6-20 Alarm Configuration

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	
100	

Figure 6-21 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 🔻
, , , , , , , , , , , , , , , , , , ,	

Total: 4 records filtered from 201 total entries

Figure 6-22 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 and 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.)

6.3.2. Alarm Notification Configuration

Click on "Alarm Notification Configuration" in the sub-menu to enter the alarm notification configuration page, as shown in the figure

below:

Alarm Configuration	Alarm Notification Configuration	Alarm Mailbox Server Configuration
Alarm Sound Configura	ition	
* Sound on / off		
Choose Sound	Custom	
Alarm Notification Confi	iguration	
⊞ Critical	1	
H Major		

H Minor	
⊞ <mark></mark> Warning	

Figure 6-23 Alarm Notification Configuration

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 cancelled. In application, it will only receive the generation and elimination information of the selected alarm in the mail system.

6.3.3. 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:
Alarm Configuration

Alarm Notification Configuration

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 Security 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.

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.

6.3.4. 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.

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).

6.3.5. Custom Alarm Sound

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

Alarm Configuration Alarm Notifical	tion Configuration Al	arm Mailbox Serv	er Configuration	
Alarm Sound Configuration				
* Sound on / off				
Choose Sound Custom				
Alarm Notification Configuration		Choose Sc	und	×
Critical		Critical	Critical.mp3	
FC_LOS	FC_LOSYN	Marina	Mainama	
✓ OC_STM_LOF_INGRESS	OC_STM_L	Major	Major.mp3	
✓ OTU_LOM	V OTU_PROT	Minor	Minor.mp3	_
✓ EQPT_Fail	☑ EQPT_Tem			<u>u</u>
Pluggable_Missing	PON_LOS	Warning	Critical.mp3	👻 ici
✓ Module_Fail	🔽 Module_Te			Го
✓ Module3_Temp_Too_High	☑ Module3_T	Apply	Close	esi
SNR_Abnormal	EDFA_RX_Po	wer_Too_Low	EDFA_Tx_Power_Too_Low	✓ EDFA_Current_Too

Figure 6-25 Custom Alarm Sound

7. 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.

7.1. Performance Management Introduction

7.1.1. Filter Box

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

			Monitor	Gio) obal	Configuration	X Maintain	
Alarm Configuration	Performance M	onitoring						
Performance Monitoring	NE	Please Select		Slot	Please Select			*
A User Management	PM Granularity	15min	•	PMP Status	ALL			
Ser Group Management								
LI OLP Route	Search	Please enter the search content		Query				
Data Store Config	Enable PM	IP Disable PMP						
Set Screen Lock Time	n That	me				PMP Statu	s	
							5	

Figure 7-1 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.

NE	10.32.130.111	*	Slot	i	Ŧ	Port	1	~
PM Granularity	15min	*	PMP Status	ALL	¥			
Search	Please enter the search content		Query					
Enable PM	P Disable PMP							
🗐 🕆 Nan	e .			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			Enabled PMP				Disable PMP
10.32	130.111_Slot1_Port1_OTU_Ingress_NearEnd			Disabled PMP				Enable PMP
10.32	130.111_Slot1_Port1_OTU_Ingress_FarEnd			Disabled PMP				Enable PMP
- 10.22	130 511 Pield David OTU EEO Jaaraan ManyEnd			Disability DMD				Canadia OMO

Figure 7-2 Show Monitoring Management Information

7.1.2. 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.

7.1.3. 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:

		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
-	28 19 244 242 PLU PLU PLU PLU PLPL3	PLACER	Pillipie Pare

Figure 7-3 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:

	Ane Pine Pine Pine Pine Pine Pine Pine Pi		PMP Status
2	10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	1	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	Арру	bled PMP
	10.32.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	1	Enabled PMP

Figure 7-4 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
D,	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) Incress FarEnd		Enabled PMP

Figure 7-5 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:

-		PMP Status
•	10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	Enabled PMF
	10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	F
•	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	
	10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	Appy Caricer
•	10.32.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	Enabled PMF
•	10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_NearEnd	Enabled PMF
•	10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_FarEnd	Enabled PMF
~	10.32.130.111_Slot1_Port1_ODU4(2)_Ingress_NearEnd	Disabled PMF

Figure 7-6 Batch Enabling Monitoring Points

Select multiple enabled performance monitoring, then 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! Ibled PMP
	10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd	bled PMP
3	10.32.130.111_Siot1_Port1_OTU_Ingress_FarEnd	bled PMP
	10.32.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	Enabled PMP

Figure 7-7 No Modification of Monitoring Point Status

7.1.4. 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 cannot be viewed, as shown in the figure below:

Enable PMP Disable PMP		
+ Name	PMP Status	Operat
I0.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	Disabled PMP	Enable
I0.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd		Disable
0.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	4. Are you sure you want to operate these data?	Disable
I0.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd		Disable
0.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	Approve Cancer	Disable

Figure 7-8 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:

↑ 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	Success	Enabled PMP	Disable PMP
10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd		Enabled PMP	Disable PMP

Figure 7-9 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	ble PMP Disable PMP		
	+ Name	PMP Status	Opera
	10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	Disabled PMP	Enabl
	10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	P-ULU DIST	Disabl
	10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	Are you sure you want to operate these data?	Disabi
	10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd		Disab
	10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	Cancer	Disabi

Figure 7-10 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.

Er	able PMP Disable PMP			
	↑Name	F	PMP Status	Operate
	10.32.130.111_Slot1_Port1_OCh_Ingress_NearEnd	C	Disabled PMP	Enable PMP
	10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	5	Enabled PMP	Disable PMP
	10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	Not Modified!	bled PMP	Disable PMP
	10.32.130.111_Slot1_Port1_OTU_Ingress_NearEnd	Apply	abled PMP	Enable PMP
	10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd		bled PMP	Disable PMP

Figure 7-11 No Modification of Monitoring Point Status

7.1.5. 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, but 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 disables 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.)

7.2. Current Performance Info

Click "*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	Giot) pal	Configuration	X Maintain		
Log Management Ø Alarm Management	Optical Performa	nce Current Info	Och Performance ourrent Info	FEC Performance	Current Info	OTUK/O	DUk Performance Current	Info SDH	Sonet Performance Current Info Ethe	rnet Performance Current Info
Performance Current Info Performance History Info Data Maintenance	Optical Perform NE PM Granularity	Please Select		* *	Slot Search	Please	Select enter the search content		▼ Port	Please Select Refresh
	Reset		Ť	MaxPower	↑ Maxi	Power Stamp			↑ MinPower Stamp	↑ AvgPower
									di la	
									No data~	

Figure 7-12 Current Performance Info Directory

7.2.1. Monitoring of Optical Power

7.2.1.1. Introduction of Optical Power Monitoring Parameters

The monitoring parameters of optical power monitoring point include maximum optical power, maximum optical power

timestamp, minimum optical power, minimum optical power timestamp, 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	ce Current Info	OCh Performance Current Info	FEC Performance	Current Info	OTUk/ODUk Performance Current In	fo SDH Sonet Performance Curr	ent Info Ethern	et Performance Current I	nfo			
Optical Performa	nce Current Info											
NE	Please Select		•	Slot	Please Select	*	Port	Please Select				*
PM Granularity	15min		•	Search	Please enter the search content		Query	Refresh				
Reset												
A Name		+ Max	Power	+ MaxPo	wer Stamp	+ MinPower	+ MinPower Stamp	<i>↑ F</i>	wgPower		+ Suspect Interv	al Flag
						No data~						
Total: 0 records											Braulous	Mout
Total. U records										10 🖤	Previous	rvext



7.2.1.2. 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 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.

otical Performa	nance Current Info								
NE	10.32.130.111		Slot	1		▼ Port	1		Ŧ
PM Granularity	A anularity 15min *			Please enter the search	h content		Query Re	fresh	
Reset	e	MaxPower	+ MaxPe	ower Stamp	+ MinPower	+ MinPower	Stamp		+ Suspect Interval Flag
Reset • Name • 10.32.13	e 130.111_Skot1_Port1_Optical_Ingress_NearEnd	+ MaxPower	+ MaxPo	ower Stamp	+ MinPower	+ MinPower	Stamp	+ AvgPower	+ Suspect Interval Flag False

Figure 7-14 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.

Optical Performa	nce Current Info								
NE	10.32.130.111	•	Slot	1		•	Port	1	•
PM Granularity	24hours		Search	Please enter the search	h content		Query	Refresh	
Reset									
Name + Name				ower Stamp		Ť.	MinPower Stamp		
					1				
					No d	ata~			

Figure 7-15 24-Hour Monitoring Point Data of Optical Power

7.2.1.3. 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.

Reset						
🕑 🛧 Name		+ MaxPower Stamp		+ MinPower Stamp	+ AvgPower	+ Suspect Interval Flag
10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	-	annafarfan arijanjar	-	{;;;;;;;;-	-	False
10.32.130.111_Slot1_Port1_Optical_Egress_NearEnd	-	Are you sure you want to operate these data?			-	False
Total: 2 records		Apply Cancel			10	Previous 1 Ne

Figure 7-16 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						
+ Name	+ MaxPower		+ MinPower		+ AvgPower	+ Suspect Interval Fi
10.32.130.111_Slot1_Port1_Optical_Ingress_NearEnd	0.0	1970/01/04-08-00-00	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 1

Figure 7-17 Successful Reset Operation

7.2.1.4. Optical Power Monitoring Data Show

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, that is to say, 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	,	Slo	ot	1			Port	2
ularity	arity 15min 💌		Sea	earch	Please enter the search cor	tent		Query	Refresh
rset ↑ Name	3	↑ MaxPower		↑ MaxPov	wer Stamp	☆ MinPower	ΦŇ	linPower Stamp	↑ AvgF
set) 30.111_Slot1_Port2_Optical_Ingress_NearEnd	+ MaxPower		↑ MaxPov	wer Stamp	+ MinPower	↑ N	tinPower Stamp	+ AvgF

Figure 7-18 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 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 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	▼ S	lot 1	▼ Port	1	Ŧ	
15min	* S	earch Please enter the search content		Refresh		
Reset	↑ MaxPower	+ MaxPower Stamp	+ MinPower	♦ MinPower Stamp	⊕ AvgPower	+ Suspect Interval
Reset Name 0.32.130.111_Slot1_Pont1_Optical_ingress_NearEnd	+ MaxPower	+ MaxPower Stamp	+ MinPower	♦ MinPower Stamp	AvgPower 	



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:

10.32.130.111	Ŧ	Slot 1	▼ Po	rt 1	Ŧ]
15min	-	Search Please enter the search conte	int	Query		
Reset						
eset		↑ MaxPower Stamp		+ MinPower Stamp		Suspect Interval
Name Na.2.130.111_Stot1_Port1_Optical_Ingress_NearEnd	+ MaxPower	+ MaxPower Stamp	+ MinPower _		⇔ AvgPower	+ Suspect Interval

Figure 7-20 Optical Power Monitoring Data When Mismatched

7.2.2. OCh Current Performance Statistics

7.2.2.1. 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), minimum chromatic dispersion (CD), maximum chromatic dispersion (CD), maximum chromatic dispersion (CD), maximum optical signal-to-noise ratio (OSNR), maximum optical signal-to-noise ratio (OSNR), 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.

ice current mio							
Please Select		▼ Slot	Please Select		▼ Port	Please Select	
15min		- Search	Please enter the search content		Query	Refresh	
↑ Name	-↑ MaxI	OGD			1 MinDGD Stam	p + AvgDGD	+ MaxCD
					No data~		
			_				
			+ MinCD Stamp	+ AvgCD	↑ MaxOSNR		↑ MinOSNR
ID	MayOSND Stamp	D	MinOSNP Stamp	* AVOCSNP	* Sugnect Interval Elan	e Elancad Time	+ Onerate
			- winoorar otamp	Augoona	- disport interval hag	TElepsed Time	1 Operate
	Please Select Tsmin + Name + MaxCD R	Prease Select 15min + Name + MaxC + MaxCD + MaxCD Stamp R + MaxCSNR Stamp + MinOSN	Please Select Slot tismin Search * Name * MaxCD * MaxCD Stamp * MinCD R * MaxOSNR Stamp * MinOSNR R * MaxOSNR Stamp * MinOSNR <!--</td--><td>Please Select Please Select Isiot Please Select Pl</td><td>Please Select Slot Please Select tSmin Slot Please Select Please Select Please enter the search content + Name MaxDGD MaxDGD Stamp MinDGD + MaxCD MaxCD Stamp MinCD Stamp MinCD Stamp </td><td>Please Select Stot: Please Select </td><td>ex contentione Peace Select For Fort Faces Select Search Peace center the search content Fort Coury Faces Faces *MaxCDC Stamp *MaxCD Stamp *</td>	Please Select Please Select Isiot Please Select Pl	Please Select Slot Please Select tSmin Slot Please Select Please Select Please enter the search content + Name MaxDGD MaxDGD Stamp MinDGD + MaxCD MaxCD Stamp MinCD Stamp MinCD Stamp 	Please Select Stot: Please Select 	ex contentione Peace Select For Fort Faces Select Search Peace center the search content Fort Coury Faces Faces *MaxCDC Stamp *MaxCD Stamp *

Figure 7-21 OCh Monitoring Parameters

7.2.2.2. 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.

OCh Performa	nce Current Info											
NE	10.32.130.160	*	Slot	1		Port 1						
PM Granularity	15min	×	Search	Please enter the search content		Query Refresh						
Reset												
				+ MaxDGD Stamp		+ MinDGD Stamp	↑ AvgD0	3D			↑ Max0	D:
	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	
Total: 1 recor	ts							10	*	Previous	1	Next

Figure 7-22 15-Minute OCh Monitoring Data

WDM module is inserted into the monitoring port. OCh data and corresponding generation timestamp 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	¥	Slot	1	*	Port	1		*
PM Granularity	24hours	¥	Search	Please enter the search content		Query	Refresh		
Reset									
	↑ Name	↑ MaxDGD			↑ MinDGD	↑ MinDGD Stamp		↑ AvgDGD	↑ MaxCD
					e e				
					No c	lata~			

Figure 7-23 24-Hour OCh Monitoring Data

7.2.2.3. 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.

Reset					
	↑ Name	↑ MaxDGD		↑ MinDGD	↑ MinDGD Stamp
	10.32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	-		-	//::
Total: 1 records			Are you sure you want to operate these data?		

Figure 7-24 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.

		↑ MaxDGD		↑ MinDGD	ΦM
	10.32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	0	1070/01/01 08:00:00	0	197
iotal: 1 re	ecords		V 1		
			Success		

Figure 7-25 Successful Resetting of OCh

7.2.2.4. OCh Monitoring Data Show

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 time stamp 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:

· · · · · · · · · · · · · · · · · · ·	Slot Search	1 Please enter the search content	*	Port	1 Refresh	¥
×	Search	Please enter the search content		Query	Refresh	
↑ MaxDG	D		↑ MinDGD		. ↑ AvgDG	D TMaxCD
lot1_Port1_OCh_Ingress_NearEnd			14		_	
	+ MaxDG	+ MaxDGD Slot1_Port1_OCh_Ingress_NearEnd	+ MaxDGD + MaxDGD Stamp Stot1_Port1_OCh_Ingress_NearEnd	+ MaxDGD + MaxDGD Stamp + MinDGD Stot1_Pot1_OCh_Ingress_NearEnd	+ MaxDGD + MaxDGD Stamp + MinDGD + MinDGD Stamp Stot1_Port1_OCh_Ingress_NearEnd -	· MaxDGD · MaxDGD Stamp · MinDGD · MinDGD Stamp · AwpDG Stot1_Pot1_OCh_Ingress_NearEnd

Figure 7-26 Optical Module of OCh 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, 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 is always 0 without any change, as shown in the figure

below.

Ch Performan	ce 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)	↑ AvgDGD	 ↑ MaxCD
	10.32.130.112_Slot1_Port1_OCh_ingress_NearEnd			//;	12	//;;;		-	

Figure 7-27 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	*	Slot	1	*	Port	1		*
PM Granularity	15min	*	Search	Please enter the search content		Query	Refresh		
Reset									
	↑Name	↑ MaxDGD			↑ MinDGD	↑ MinDGD Stamp	0	↑ AvgDGD	 MaxCD
	10.32.130.112_Slot1_Port1_OCh_ingress_NearEnd				12			-	

Figure 7-28 OCh Monitoring Data When Mismatched

7.2.3. FEC Current Performance Statistics

7.2.3.1. 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	ance Current Info	OCh Performance Current Info	FEC Performance	Current Info	OTUk/ODUk Performance Current Info	SDH Sonet Performance Cu	rrent Info Ethe	rnet Performance Current Info		
FEC Performan	ice Current Info									
NE	Please Select		Ŧ	Slot	Please Select	*	Port	Please Select		Ŧ
PM Granularity	15min		•	Search	Please enter the search content		Query	Refresh		
Reset										
🔲 🛧 Nar	me			+ PreFECBER		ted BER		ER Stamp	+ Avg Corrected BER	

Figure 7-29 FEC Monitoring Parameters

7.2.3.2. 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.

GFS

EC Performanc	e Current Info							
NE	10.32.130.111	•	Slot	1	•	Port	1	Y
PM Granularity	15min	×	Search	Please enter the search content		Query	Refresh	
Reset								
🗐 🕆 Nam	e				ŕ	Max Corrected BER	Stamp	+ Avg Corrected BER
10.32.	130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd		-			-//:::		=

Figure 7-30 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:

e Current Info						
10.32.130.111	*	Slot	1	Port	1	
24hours	•	Search	Please enter the search content	Query	Refresh	
le		↑ PreFECBER		↑ Max Corrected BER	Stamp	+ Avg Corrected BER
				1	No data~	
	e Current Info 10.32.130.111 24hours e	e Current Info 10.32:130:111 24hours e	e Current Info 10.32.130.111 Cathours e PreFECBER	e Current Info 10.32.130.111 Stot Flease enter the search content e • PreFECBER • Max Corrected BER	e Current Info 10.32.130.111 Stot Floase enter the search content e • PreFECBER • Max Corrected BER • Max Corrected BER	e Current Info 10.32.130.111 Sici Search Please enter the search content Person of t Retresh Retre

Figure 7-31 24-Hour Monitoring Data of FEC

7.2.3.3. 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.

30.111_Slot1_Port1_OTU-FEC_ingress_NearEnd		-	-		//
			+ Max Corrected BER		↑ Max Co
19000	•	Sedicit			
15min	-	Search			
10.32.130.111	*	Slot	1	•	P
	10. 32. 130. 111 15min 30. 111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	10.32.130.111 15min 30.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	10.32.130.111 Slot 15min FreFECBER 30.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	10.32.130.111 Image: Solution of the search content Please enter the search content 15min Image: Search Please enter the search content Image: Search Image: PreFECBER Image: Max Corrected BER 30.111_Stot1_Port1_OTU-FEC_Ingress_NearEnd - -	10.32.130.111 Slot Search Please enter the search content Please enter the search content Please enter the search content Please enter the search content Please enter the search content Please enter the search content Please enter the search content

Figure 7-32 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 trustworthy to untrustworthy 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.

		↑ Max Corrected BEF
10.32.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	-	-
	O	
tal: 1 records	· · · · · · · · · · · · · · · · · · ·	

Figure 7-33 FEC Successfully Reset

7.2.3.4. FEC Monitoring Data Show

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:

NE	10.32.130.111	♥ Slot	1	Port	1	
PM Granularity	15min	r Search	Please enter the search content	Query	Refresh	
Reset						
Image: Image	ame		+ Max Corrected BER	+ Max Corrected BER	Stamp	
10.3	82.130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd	-	-	//::		-

Figure 7-34 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 times tamps 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.

C Performanc	e Current Info							
NE	10.32.130.111	Ŧ	Slot	1	•	Port 1		
PM Granularity	15min	•	Search	Please enter the search content		Query	Refresh	
Reset								
	e		↑ PreFECBER	+ Max Corrected BER	ŕ	Max Corrected BER Stamp)	
10.32.	130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd			88	-	[]		-

Figure 7-35 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:

EC Performance	ce Current Info								
NE	10.32.130.111	Ŧ	Slot	1	Ŧ	Port	1		
PM Granularity	15min	•	Search	Please enter the search content		Query	Refresh		
Reset									
🗐 🕆 Nam	10		↑ PreFECBER		BER	↑ Max Corrected BER	Stamp	+ Avg Corrected BER	
10.32.	130.111_Slot1_Port1_OTU-FEC_Ingress_NearEnd		-	-		//]]		-	

Figure 7-36 FEC Monitoring Data When Mismatched

7.2.4. OTUk/ODUk Current Performance Statistics

7.2.4.1. 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.

otical Performan	ce Current Info	OCh Performance Current Info	FEC Performance	Current Info	OTUk/ODUk Performance Current Info	SDH Sonet Performance Curren	nt Info Ethernet Pe	rformance Current Info	
Uk/ODUk Per	formance Currer	t Info							
NE	Please Select		*	Slot	Please Select	Ŧ	Port	lease Select	
PM Granularity	15min		•	Search	Please enter the search content		Query	Refresh	
Reset									
☐ ↑Name		ΦE	BBE		↑ SES	+ UAS			

Figure 7-37 OTUk/ODUk Monitoring Parameters

7.2.4.2. 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.

E 10.32.130.111	*	Slot	1	¥	Port 1		
vi anularity	•	Search	Please enter the search content		Query Refre	sh	
Reset							
↑ Name		+ ES	∱ SES	↑ UAS		+ Elapsed Time	
					Terre	337	Deset
10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	0	0	0	U	Inde	35,	Reset
10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd 10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	337	True	337	Reset
10.32.130.111_Slof1_Port1_OTU_Ingress_FarEnd 10.32.130.111_Slof1_Port1_ODU4(1)_Ingress_NearEnd 10.32.130.111_Slof1_Port1_ODU4(1)_Ingress_FarEnd	0 0 0	0 0 0	0	337 0	True True	337 337	Reset

Figure 7-38 15-Minute OTUk/ODUk Monitoring Data

Optical module is inserted 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 below: Optical module is inserted 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 below:

OTUK/ODUK Pe	erformance Current Info							
NE	10.32.130.111	•	Slot	1	v	Port 1		v
PM Granularity	24hours	•	Search	Please enter the search content		Query Refresh		
Reset								
Name *		↑ BBE	↑ES	↑ SES	↑ UAS	+ Suspect Interval Flag	+ Elapsed Time	
				No data~				

Figure 7-39 24-Hour OTUk/ODUk Monitoring Data

7.2.4.3. 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, 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.

OTUK/ODUk Pe	formance Current Info								
NE	10.32.130.111	*	Slot	1		▼ Port 1			
PM Granularity	ularity 15min 💌			Please enter the search content		Query Refres	Query Refresh		
Reset									
Name + Name		↑ BBE	↑ES	↑ SES	↑ UAS		+ Elapsed Time	+ Reset Operate	
10.32.13	0.111_Slot1_Port1_OTU_Ingress_FarEnd	0	0	0	0	True	482	Reset	
10.32.13	0.111_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	482	True	482	Reset	
10.32.13	0.111_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	0	0	0	True	482	Reset	
10.32.13	0.111 Slot1 Port1 ODU4(2) Ingress FarEnd	0	0	0	0	True	482	Reset	

Figure 7-40 UAS Always Counts

7.2.4.4. 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							
	+ BBE	ΦES	+ SES	+ UAS	+ Suspect Interval Flag		
I0.32.130.111_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

Figure 7-41 OTUk/ODUk 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 trustworthy to untrustworthy and the running

time counts again from 0. All the data is updated to the latest time to read the value.

Reset							
	↑ BBE	÷ΕS	↑ SES	+ UAS	+ Suspect Interval Flag	+ Elapsed Time	
10.32.130.111_Slot1_Port1_OTU_Ingress_FarEnd	0	0	9	0	False	0	Reset
10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	581	True	581	Reset
10.32.130.111_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	0	•	0	True	581	Reset
10.32.130.111_Slot1_Port1_ODU4(2)_Ingress_FarEnd	0	0	Success	0	True	581	Reset

Figure 7-42 OTUk/ODUk Successfully Reset

7.2.4.5. OTUk/ODUk Monitoring Data Show

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 (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		r Slot 1			▼ Port 2		
ularity 15min	15min 👻		ise enter the search content		Query Refr	esh	
eset							
nset ↑ Name	↑BBE	≁ES	↑ SES	† UAS		↑ Elapsed Time	
* Name 10.32.130.111_Slot1_Port2_ODU4(0)_Egress_NearEnd	↑BBE	+ES -	+SES -	+UAS -		↑ Elapsed Time 0	

Figure 7-43 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.

NE	10.32.130.111		▼ Slot	1		▼ Port	2		
PM Granularity	ty 15min 👻		▼ Search	Please enter the search content		Query	Refresh		
Reset		◆ BBE	+F8	# SES	±UAS	+ Suspect Interv	al Flag	◆Flansed Time	
Reset	0.111_Siot1_Port2_ODU4(0)_Egress_NearEnd	↑BBE	≁ES -	≁SES -	≁UAS	+ Suspect Interv	al Flag	↑ Elapsed Time 0	

Figure 7-44 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:

	ionnance current mio							
NE	10.32.130.111		Slot			▼ Port 2		
PM Granularity	15min 👻		Search	Please enter the search content		Query	efresh	
Reset			- 50	- 050	-1140	- Ourseast Internal Film	· Flenned Time ·	- Darret Owards
Reset		↑BBE	↑ES	+ SES	↑UAS		↑ Elapsed Time	
Reset).111_Slot1_Port2_ODU4(0)_Egress_NearEnd	◆BBE	↑ES -	≁SES -	†UAS -		↑ Elapsed Time 0	

Figure 7-45 OTUk/ODUk Monitoring Data When Mismatched

7.2.5. Current Performance Statistics of Ethernet

7.2.5.1. 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.

thernet Perforr	nance Current Into							
NE	10.32.130.111	▼ Slot	ot	1	*	Port	2	•
PM Granularity	15min	▼ Sea	earch	Please enter the search content		Query	Refresh	



7.2.5.2. 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.

Ethernet Perform	nance Current Info						
NE	10.32.130.111	▼ Slot	1		Port 2		•
PM Granularity	15min	▼ Search	Please enter the search content		Query Refres	h	
Reset	↑ Name						
	10.32.130.111_Slot1_Port2_Ethernet_Ingress_NearEnd	N/A	N/A	N/A	N/A	N/A	N/A.
	10.32.130.111_Slot1_Port2_Ethernet_Egress_NearEnd	N/A	N/A	N/A	N/A	N/A	N/A

Figure 7-47 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:

Ethernet Perform	nance Current Info					
NE	10.32.130.111	▼ Slot	1	 Port 2		•
PM Granularity	24hours	▼ Search	Please enter the search content	Query Re	fresh	
Reset						
						+ Alignment Error Frame
			No data~			

Figure 7-48 24-Hour Ethernet Monitoring Data

7.2.5.3. 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.

Reset							
						↑ CRC Error Frame	+ Alignment Erro
	10.32.130.111_Slot1_Port2_Ethernet_Ingress_NearEnd	N/A	N/A	N/A	N/A	N/A	N/A
	10.32.130.111_Slot1_Port2_Ethernet_Egress_NearEnd	N/A 🌔 Are you sure	you want to operate these data?	N/A	N/A	N/A	N/A
Total: 2 records		A	Cancel			10	Previous

Figure 7-49 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 trustworthy to untrustworthy and the running

time counts again from 0. All the data is updated to the latest time to read the value.

Reset							
	+ Name			+ Multicast Frame	+ Broadcast Frame	+ CRC Error Frame	+ Alignment Error Frame
	10.32.130.111_Slot1_Port2_Ethernet_Ingress_NearEnd	0		0	0	0	0
	10.32.130.111_Slot1_Port2_Ethernet_Egress_NearEnd	N/A		N/A	N/A	N/A	N/A
			•				
Total: 2 records			Success			10	✓ Previous 1

Figure 7-50 Ethernet Successfully Reset

7.2.5.4. Ethernet Monitoring Data Show

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:

Ethernet Perform	nance Current Info									
NE	10.32.130.111	*	Slot	1		*	Port	2		*
PM Granularity	15min		Search	Please	enter the search content		Query	Refresh		
Reset										
		+ G00	d Frame			+ Multicast Frame	+ Broadcast Fr	ame	+ 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	N/A

Figure 7-51 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:

NE	10.32.130.111	Ŧ	Slot	1	*	Port 2		
PM Granularity	15min		Search	Please enter the search content		Query Refres	sh	
	+ Name	- 1	+ Good Frame	⊕ Unicast Frame	↑ Multicast Frame	⊕ Broadcast Frame ○		
0	10.32.130.111_Slot1_Port2_Ethernet_Egre	ss_NearEnd	N/A	N/A	N/A	N/A	N/A	N/A
1023 Byte Frame	+ 1024-1518 Byte Frame	+ 1519-Maximun Frame		ame 🕆 Good Pause I	Frame 🔷 Total Frame	+ Suspect Interva	al Flag	Time ↑ Operate
			0	٥	0	False	0	Reset
	0	0	0	0				

Figure 7-52 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							
	1 Name		+ Unicast Frame	+ Multicast Frame	+ Broadcast Frame		+ Alignment Error Frame
	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

Figure 7-53 Ethernet Monitoring Data When Mismatched

7.3. History Performance Statistics

7.3.1. History Performance Statistics of Optical Power

7.3.1.1. 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.

tical Performa	ance History Info					
Statistical Method	Chart G Table					
NE	10.32.130.160	*	Slot	1	٣	
°ort	1	T	PM Granularity	15min		
me Interval	Last Three Days	•	Time Duration	2020/09/20 - 2020/09/22		
PM Point	Optical_Ingress_NearEnd	*	PM Parameter	MaxPower; MinPower; AvgPower;	•	Query

Figure 7-54 History Performance Parameters of Optical Power

7.3.1.2. View History Monitoring Information of Optical Power

15 minutes and 24 hours 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 7-55 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:

Optical Performance History Info

Optical Performa	ance History Info							
Statistical Method	Chart Table							
NE	10.32.130.160	*	Slot	1	7			
Port	1	*	PM Granularity	15min	7			
Time Interval	Last Three Days	•	Time Duration	2020/09/20 - 2020/09/22	Terr Terr Terr			
Search	Please enter the search content.		Query					
Export								
◆Name		↑ MaxPower		np 🛧 MinPower	+ MinPower Stamp	↑ AvgPower		↑ Time Stamp
10.32.130.160	0_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 15:45:0	-4.0	2020/09/22 15:45:02	-3.9	True	2020/09/22 16:00:00
10.32.130.160	0_Slot1_Port1_Optical_Egress_NearEnd	-3.9	2020/09/22 16:00:0	11 -4.0	2020/09/22 16:00:02	-3.9	True	2020/09/22 16:15:00
10.32.130.160	0_Slot1_Port1_Optical_Ingress_NearEnd	-18.0	2020/09/22 15:45:0	11 -18.2	2020/09/22 15:59:50	-18.0	True	2020/09/22 16:00:00
10.32.130.160	0_Slot1_Port1_Optical_Ingress_NearEnd	-18.0	2020/09/22 16:00:3	1 -21.3	2020/09/22 16:14:28	-18.7	True	2020/09/22 16:15:00

Figure 7-56 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:

◆Name		↑ MaxPower	+ MaxPower Sta	Imp	↑ MinPower Stamp	+ AvgPower	↑ Time Stamp
Export							
Search	Please enter the search content		Query				
Time Interval	Last Three Days		Time Duration	2020/09/20 - 2020/09/22			
Port	1	~	PM Granularity	24hours		-	
NE	10.32.130.160	×	Slot	1		*	
Statistical Method	Chart Table						

No data~

Figure 7-57 15-Minute Tabular History Data of Optical Power

Show all

7.3.1.3. 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:

Method	Chart	Table						
NE	10.32.130	.160				v	Slot	
Port	1					v	PM Granu	ılarity
Time Interval	Last Three	e Days				Ŧ	Time Durati	on
Search	Please er	nter the sea	rch content					uery
Export					MaxPower			ower
10.32.130.16)_Slot1_Poi	rt1_Optical_	Egress_NearE	nd	-3.9	2020/09/2	2 15:	
10.32.130.16)_Slot1_Poi	t1_Optical_	Egress_NearE	nd	-3.9		2020/09/2	2 16:
10.32.130.16	_Slot1_Poi	rt1_Optical_	Egress_NearE	nd	-3.9		2020/09/2	2 16:
10.00 100 100)_Slot1_Poi	t1_Optical_	Ingress_NearE	nd	-18.0		2020/09/2	2 15:
10.32.130.16		rt1_Optical_	Ingress_NearE	nd	-18.0		2020/09/2	2 16:
10.32.130.16)_Slot1_Poi			-				
10.32.130.160)_Slot1_Pol	Figure 7-5	8 Export Histo	ory Data of	f Optical Power			
10.32.130.160)_Slot1_Poi	Figure 7-5	* MaxPower Stamp	MinPower	f Optical Power	↑ AvgPower		↑ Time S
10.32.130.160	D_SIOT1_POI	Figure 7-5	8 Export Histo + MaxPower Stamp 2020/09/22 15:45:01	MinPower -4.0	f Optical Power // MinPower Stamp 2020/09/22 15:45:02 2020/09/22 15:45:02	 AvgPower -3.9 		↑ Time S 2020/09/22
10.32.130.160	D_SIOT1_POI	Figure 7-5	KaxPower Stamp 2020/99/22 15:45:01 2020/99/22 15:45:01 2020/99/22 16:00:01 2020/99/22 16:00:01	MInPower -4.0 -4.0 -4.0	+ MmPower Stamp 2020/09/22 15:45:02 2020/09/22 16:46:02 2020/09/22 16:46:44	 AvgPower -3.9 -3.9 -3.9 		↑ Time 5 2020/09/2 2020/09/2 2020/09/2
10.32.130.161	D_SIOT1_POI	Figure 7-5	* MaxPower Stamp 2020/09/22 15:45:01 2020/09/22 16:06:01 2020/09/22 16:15:03 2020/09/22 15:45:01	* MinPower -4.0 -4.0 -18.2	+ MinPower Stamp 2020/09/22 15:45:02 2020/09/22 16:05:01 2020/09/22 15:59:50	 AvgPower -3.9 -3.9 -3.9 -18.0 	Suspect Interval Flag True True True True True	 ↑ Time 5 2020/09/2 2020/09/2 2020/09/2 2020/09/2 2020/09/2
10.32.130.161 10.32.130.161 Exect A Name 10.32.130.60_Bet[Pert_0 10.2130.60_Bet[Pert_0 1	D_SIOt1_POI	Figure 7-5	* MaxPower Stamp 20200922 15:45:01 20200922 15:45:01 20200922 15:45:01 20200922 15:45:01 20200922 15:45:01 20200922 15:45:01	* MinPower -4.0 -4.0 -4.0 -4.0 -18.2 -21.3	+ MinPower Stamp 2020/09/22 15:45:02 2020/09/22 15:45:01 2020/09/22 15:55:50 2020/09/22 16:14:28	 AvgPower -3.9 -3.9 -3.9 -18.0 -18.7 	+ Suspect Interval Flag True True True True True	 Time 8 2020/09/2 2020/09/2 2020/09/2 2020/09/2 2020/09/2 2020/09/2 2020/09/2

HistoryOpticalPm....xls 6.0/6.0 K8

Figure 7-59 Successfully Export Data of Optical Power

7.3.2. OCh History Performance Statistics

7.3.2.1. 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.

- (1) Duration: You can choose a specific day or a period of time according to your needs.
- (2) Performance Monitoring Point: entrance-near end.

(3) 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 Performation	nce History Info	OCh Performance History Info	FEC Performance Hi	story Info	OTUk/ODUk Performance History Info	SDH Sonet Performance History Info	Ethernet Performance History Info
OCh Performan	ce History Info						
Statistical	Chart O Tab	le					
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

Figure 7-60 OCh History Performance Parameters

7.3.2.2. View OCh History Monitoring Information

15 minutes and 24 hours 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.



Figure 7-61 15-Minute Chart Data of OCh

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:

Periormance History Into				
tistical Chart Table thod				
10.32.130.160	▼ Slot 1			
1	▼ PM Granularity 1	5min	¥.	
e Interval Last Three Days	Time Duration	2020/09/20 - 2020/09/22	THE OWNER OF THE OWNER OWNER OF THE OWNER OWNE	
rch Please enter the search content	Query			
Export				
Name	↑ MaxDGD		↑ MinDGD	
32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	4	2020/09/22 15:51:48	1	2020/09/22 15:47:15
32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	4	2020/09/22 16:14:09	2	2020/09/22 16:14:23
32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	5	2020/09/22 16:23:09	2	2020/09/22 16:15:04
32.130.160_Slot1_Port1_OCh_Ingress_NearEnd	4	2020/00/22 16:45:00	1	2020/00/22 46:44:20
	4	2020103122 10.40.00		2020/09/22 16:44:38

Figure 7-62 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:

OCH Periornano	e History Into				
Statistical Method	Chart				
NE	10.32.130.160	▼ Slot	1	7	
Port	1	▼ PM Granul	anity 15min	•	
Time Interval	Last Week	Time Duration	n 2020/09/16 - 2020/09/22	1	
Search	Please enter the search content	Qu	ery		
Export					
↓Name		↑ MaxDGD	MaxDGD Stamp	↑ 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	0_Slot1_Port1_OCh_Ingress_NearEnd	4	2020/09/22 16:45:00	1	2020/09/22 16:44:38

Figure 7-63 15-Minute Tabular History Data of OCh

7.3.2.3. Export OCh 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	MaxDGD	+ MaxDGD Stamp	↑ MinDGD	
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

Figure 7-64 Export History Data of OCh

	Export				
	◆ Name		+ MaxDGD Stamp	↑ MinDGD	MinDGD 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 • Previous 1 Next
			Copyright © 2020 by FS.COM All Rights Reserved.		
HistoryOCHPm.xls					Show all

Figure 7-65 Successfully Export Data of OCh

7.3.3. FEC History Performance Statistics

7.3.3.1. 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.

- (1) Duration: You can choose a specific day or a period of time according to your needs.
- (2) Performance Monitoring Point: entrance-near end.
- (3) Performance Monitoring Parameters: maximum error correction rate and average error correction rate.

C Performan	ce History Info					
Statistical Method	Chart O Table					
NE	Please Select	•	Slot	Please Select	*	
Port	Please Select	w.	PM Granularity	15min	*	
Time Interval	Please Select	×	Time Duration	Please Select		
PM Point			PM Parameter		*	Query

Figure 7-66 FEC History Performance Parameters

7.3.3.2. View FEC History Monitoring Information

15 minutes and 24 hours 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.





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

be	low	ар	pe	ars:
----	-----	----	----	------

C Performan Statistical	Ce History Info							
Method NE	10.32.130.160		Slot	1		•		
Port	1	*	PM Granularity	15min		*		
Time Interval	Last Three Days	v	Time Duration	2020/09/20 - 2020/09/22				
Search	Please enter the search content		Query					
Export								
◆Name	 Max Corrected BER 		↑ Max	Corrected BER Stamp	+ Avg Corrected BER		nterval Flag	+ Time Stamp
10.32.130.16	0_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.0065304474		2020/09/	22 15:47:28	0.0063019455	True		2020/09/22 16:00:00
10.32.130.16	50_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.012912108		2020/09/	22 16:12:35	0.012271788	False		2020/09/22 16:15:00
10.32.130.16	50_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.013881688		2020/09/	22 16:22:48	0.012929441	True		2020/09/22 16:30:00
10.32.130.16	50_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.013589366		2020/09/	22 16:36:03	0.012420523	False		2020/09/22 16:45:00
10.32.130.16	30_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.019693151		2020/09/	22 16:58:22	0.0073621697	False		2020/09/22 17:00:00
Total: 5 record:	s							10 Trevious 1 Ne

Figure 7-68 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:

Statistical	Chart Table							
VE	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 Corrected BEI	۲.	↑ Max	Corrected BER Stamp	+ Avg Corrected BER		+ Suspect Interval Flag	+ Time Stamp
10.32.130.16	50_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.0065304474		2020/09	22 15:47:28	0.0063019455		True	2020/09/22 16:00:00
10.32.130.16	50_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.012912108		2020/09	22 16:12:35	0.012271788		False	2020/09/22 16:15:00
10.32.130.16	50_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.013881688		2020/09	22 16:22:48	0.012929441		True	2020/09/22 16:30:00
10.32.130.16	50_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.013589366		2020/09	22 16:36:03	0.012420523		False	2020/09/22 16:45:00
10.32.130.16	50_Slot1_Port1_OTU-FEC_Ingress_NearEnd 0.019693151		2020/09	22 16:58:22	0.0073621697		False	2020/09/22 17:00:00
Total: 5 records	ŝ							10 v Previous 1 Ne

Figure 7-69 15-Minute Tabular History Data of FEC

7.3.3.3. 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			Avg Corrected BER	
10.32.130.160_Slot1_Port1_OTU-F	EC_Ingress_NearEnd 0.0065304474	2020/09/22 15:47:28	0.0063019455	True
10.32.130.160_Slot1_Port1_OTU-F	EC_Ingress_NearEnd 0.012912108	2020/09/22 16:12:35	0.012271788	False
10.32.130.160_Slot1_Port1_OTU-F	EC_Ingress_NearEnd 0.013881688	2020/09/22 16:22:48	0.012929441	True

Figure 7-70 Export History Data of FEC

	Export					
	↓Name		+ Max Corrected BER Stamp			↑ Time Stamp
	10.32.130.160_Slot1_Port1_OTU-F	EC_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	EC_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	EC_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	EC_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	EC_ingress_NearEnd 0.019693151	2020/09/22 16:58:22	0.0073621697	False	2020/09/22 17:00:00
	Total: 5 records		Copyright © 2020 by FS	COM All Rights Reserved.		10 v Previo
HistoryFecPm.xls						

Figure 7-71 Successfully Export Data of FEC

7.3.4. OTUk/ODUk History Performance Statistics

7.3.4.1. 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.

- (1) Duration: You can choose a specific day or a period of time according to your needs.
- (2) Performance Monitoring Point: There are near end and far end, as well as entrance and exit for OTUk/ODUk monitoring points.
- (3) Performance Monitoring Parameters: background error code block (BBE), bit error seconds (ES), serious bit error

seconds (SES) and unavailable seconds (UAS).

Statistical Nethod	Chart Table					
NE	Please Select	•	Slot	Please Select	*	
Port	Please Select	٣	PM Granularity	15min	•	
ime Interval	Please Select		Time Duration	Please Select		
PM Point		•	PM Parameter		•	Query

Figure 7-72 OTUk/ODUk History Performance Parameters

7.3.4.2. 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.

GFS



Figure 7-73 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:

	former a lifetare lefe						
OTUK/ODUK Pe	normance History Into						
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		+ BBE	+ ES	+ SES	+ UAS	Suspect Interval Flag	
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	0	0	0	True	2020/09/22 16:00:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	0	0	0	True	2020/09/22 16:15:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	2473	1	0	0	True	2020/09/22 16:30:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	8	1	0	0	True	2020/09/22 16:45:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	1	1	0	0	True	2020/09/22 17:00:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	686	6	0	10	True	2020/09/22 17:15:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	0	True	2020/09/22 16:00:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	0	True	2020/09/22 16:15:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd	1	1	0	0	True	2020/09/22 16:30:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	18	True	2020/09/22 16:45:00
Total: 48 record	Is					10 *	Previous 1 2 3 4 5 Next

Figure 7-74 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:

JTUK/UDUK Pe	normance History Into						
Statistical Method	Chart						
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		+ BBE	+ ES	+ SES	+ UAS	+ Suspect Interval Flag	+ Time Stamp
10,32,130,16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	0	0	0	True	2020/09/22 16:00:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	0	0	0	0	True	2020/09/22 16:15:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	2473	1	0	0	True	2020/09/22 16:30:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	8	1	0	0	True	2020/09/22 16:45:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_FarEnd	1	1	0	0	True	2020/09/22 17:00:00
10.32.130.16	10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd		6	0	10	True	2020/09/22 17:15:00
10.32.130.16	10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_NearEnd		0	0	0	True	2020/09/22 16:00:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	0	True	2020/09/22 16:15:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd	1	1	0	0	True	2020/09/22 16:30:00
10.32.130.16	0_Slot1_Port1_ODU4(1)_Ingress_NearEnd	0	0	0	18	True	2020/09/22 16:45:00
Total: 48 record	Is					10 👻	Previous 1 2 3 4 5 Next

Figure 7-75 15-Minute Tabular History Data of OTUk/ODUk

7.3.4.3. 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:

160 * 160 * 160 * 160 * 160 * 160 * 160 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 * 1700 *	Slot PM PM Pm Duration Comy enc Figure	1 15min 2020/09/20 - 2020 • BBE • BBE •	onne22 ■ ee port History = E5 0	The set of ot use of the set of t	<pre>c/ODUk </pre>	 Prosented Enforced Suspect Interval Plag True 	Else - Tess Elseen
660 • Days • Days • Const • # Itane • 132:05 106 (Staff Part)_COUV(1)_byeas_FaEch • 132:21 108 (Staff Part)_COUV(1)_byeas_FaEch • 132:21 108 (Staff Part)_COUV(1)_byeas_FaEch •	Slot PM Granularity Time Duration Query Figure	1 15min 2020/09/20 - 2024 e 7-76 Exp + 886 0	annez port History	The set of OTUK	* UAS 0	 Pressent failured Suspect Interval Flag True 	Else - Tusi Plasen - Tins Sanp - Vanan - 16 6 6
	 PM Granularity Time Duration Query 	15min 2020/09/20 - 2020 e 7-76 Exp • ese •	annez port History	The set of OTUK	* UAS 0	 Pressured fastered Suspect Interval Flag True 	Shar - Theo Shares
Days ter the search content ter the search content ter the search content ter the search content ter ter search content ter ter search content ter ter search content ter	Time Duration Courty exc Figure	2020/09/20 - 2024 e 7-76 Exp * 886 0	ausazz port History → E5 9	Data of OTUk	<pre>c mas c/ODUk</pre>	 Proceed falses of Suspect Interval Plag The 	Else • Yess Proces
er the search content Form Name 19.22:103:106_2041_boytes_FarEnd 19.22:103:106_2041_boytes_FarEnd 19.22:103:106_2041_boytes_FarEnd 19.22:103:106_2041_boytes_FarEnd	- eee Figure	е 7-76 Ехр • вес •	port History	Data of OTUk	* UAS	 Present fatured Suspect Interval Flag True 	Elva • Yana Pirana + Time Stanp
Cost Hate 1922 108 106_541 [Pott_COUH(1]_bytes_FacEnd 1922 108 106_541 [Pott_COUH(1]_bytes_FacEnd 19.22 108 106_541 [Pott_COUH(1]_bytes_FacEnd 19.22 108 106_541 [Pott_COUH(1]_bytes_FacEnd	Figure	e 7-76 Exp	port History	Data of OTUk	+ UAS 0	 Promod falsered Suspect Interval Flag True 	Ein - Tens Finnen
Exent +1ame 19.32: 130.180_2841_Port_00U4(1]_https:st_FatExt 19.32: 130.180_2841_Port_00U4(1]_https:st_FatExt 19.32: 130.180_2841_Port_00U4(1]_https:st_FatExt	Figure	e 7-76 Exp	port History	Data of OTUk	+ UAS		Else = Time Stamp + Time Stamp
Esser + Name 1932 103 106 _SMI _Pol1_0004(1]_bryws_FwEet 19.32 103 106 _SMI _Pol1_0004(1]_bryws_FwEet 19.32 108 106 _SMI _Pol1_0004(1]_bryws_FwEet	Figure	e 7-76 Exp	port History	Data of OTUk	* UAS	Suspect Interval Flag True	+ Time Stamp
10.32.130.160_SkH_Port1_ODU4(1)_Ingress_FarEnd 10.32.130.160_SkH_Port1_ODU4(1)_Ingress_FarEnd 10.32.130.160_SkH_Port1_ODU4(1)_Ingress_FarEnd		0	0	0	0	True	2020/00/22 16:00:00
10.32.130.160_Skitl_Port1_ODU4(1)_Ingress_FarEnd 10.32.130.160_Skitl_Port1_ODU4(1)_Ingress_FarEnd 10.32.130.160_Skitl_Port1_ODU4(1)_Ingress_FarEnd		0	0	0	0	True	2020/00/22 16:00:00
10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd 10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd		0					2020/03/22 10:00:00
10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd			0	0	0	True	2020/09/22 16:15:00
		2473	1	0	0	True	2020/09/22 16:30:00
10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd		8	1	0	0	True	2020/09/22 16:45:00
10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd		1	4	0	0	Тгие	2020/09/22 17:00:00
10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_FarEnd		686	6	0	10	True	2020/09/22 17:15:00
10.32.130.160_Slot1_Port1_ODU4(1)_Ingress_NearEnd		0	0	0	0	True	2020/09/22 16:00:00
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
10.32.130.160_Slof1_Port1_ODU4(1)_Ingress_NearEnd		0	0	0	18	True	2020/09/22 16:45:00
			Copyright @ 20	20 by FS.COM All Rights Reserved.			
	16 32 130 140, 541 [Jwt1, 004(1, Jwpres, Jwt6nd 19 32 130 140, 541 [Jwt1, 004(1, Jwpres, Jwt6nd	18 32 130 180_5ket [Port]_0004(1).bgress_factor 19 32 130 180_5ket [Port]_0004(1).bgress_factor 19 32 130 180_5ket [Port]_0004(1).bgress_factor 19 32 130 180_5ket]_Port]_0004(1).bgress_factor 18 32 130 180_5ket]_Port]_0004(1).bgress_factor	16 32 130 140_541_Pert_0004(1).bytes_field 65 10 32 130 140_541_Pert_0004(1).bytes_field64 10 32 130 140_541_Pert_0004(1).bytes_field64 10 32 130 140_541_Pert_0004(1).bytes_field64 10 32 130 140_541_Pert_0004(1).bytes_field64 0	10.22.130.140_Skit_PertLOOU(1).byres_Failud 656 6 10.22.130.140_Skit_PertLOOU(1).byres_Mediad 0 0	10.21.10.10.00.4(1).jogress./self.nd 666 6 0 10.21.10.10.00.4(1).jogress./self.nd 0 0 0	162.2130 146_541_Pert_0004(1_byres_Failed 656 6 0 10 162.2130 146_541_Pert_0004(1_byres_Failed 0 0 0 0 162.2130 146_541_Pert_0004(1_byres_Failed 0 0 0 0 162.2130 146_541_Pert_0004(1_byres_Failed 1 1 0 0 0 162.2130 146_541_Pert_0004(1_byres_Failed 0 0 0 0 0	163.2130 160_Stat_Part_CODU-{Lippera_Partant 66 6 0 10 Tote 163.2130 160_Stat_Part_CODU-{Lippera_Partant 6 0 0 0 Tote 163.2130 160_Stat_Part_CODU-{Lippera_Partant 0 0 0 0 Tote 163.2130 160_Stat_Part_CODU-{Lippera_Partant 0 0 0 Tote 163.2130 160_Stat_Part_CODU-{Lippera_Partant 0 0 0 Tote 153.130 160_Stat_Part_CODU-{Lippera_Partant 0 0 0 Tote

Figure 7-77 Successfully Export Data of OTUk/ODUk

7.3.5. History Performance Statistics of Ethernet

7.3.5.1. 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.

- (1) Duration: You can choose a specific day or a period of time according to your needs.
- (2) Performance Monitoring Point: entrance-near end, exit-near end.

(3) 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.

rnet Perform	nance History Info					
tatistical lethod	Chart O Table					
E	Please Select	*	Slot	Please Select	*	
ort	Please Select	*	PM Granularity	15min	*	
ie Interval	Please Select	•	Time Duration	Please Select	int ex	
M Point		*	PM Parameter		• Qu	iery

Figure 7-78 Ethernet History Performance Parameters

7.3.5.2. View Ethernet History Monitoring Information

15 minutes and 24 hours 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.



Figure 7-79 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	Ŧ
Port	Please Select	*	PM Granularity	15min	Ţ
Time Interval	Please Select	•	Time Duration	Please Select	iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
Search	Please enter the search content		Query		

Figure 7-80 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:

Ethernet Perfor	mance History Info						
Statistical Method	Chart						
NE	10.32.130.120	Slot	1	Ŧ			
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		+ Goo	d Frame	Unicast Frame	Multicast Frame	Broadcast Frame	CRC Error
10.32.130.12	10.32.130.120_Slot1_Port1_Ethernel_Egress_NearEnd 0			0	0	0	
10.32.130.120_Slot1_Port1_Elhernet_Egress_NearEnd 0			0	0	0	-	
10.32.130.120_Slot1_Port1_Ethernel_Ingress_NearEnd 0				0	0	0	24
10.32.130.120_Slot1_Port1_Elhernel_Ingress_NearEnd 0				0	0	0	15



7.3.5.3. 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: Ethernet Performance History Info

Statistical Method	Chart I Table							
NE Port	10.32.130.120	▼ Si	Dt 1		Ŧ			
		▼ PM Gr	/ 15min					
Time Interval	Last Three Days		me 2020/09/20 - 2020/09	9/22				
Search	Please enter the search content		Query					
Export	Figure 7-82 Export History Data of Etherpet							
	tigure 7-62		xport History Data of Ethernet					
	Export							
	Export + Name	Good Frame	Unicast Frame	+ Multicast Frame	Broadcast Frame	+ CRC E		
	Root 4 Name 10.22.100.120_Stoft_Portf_EBwareLEgrees_JwarEnd	+ Good Frame 0	+ Unicast Frame 0	 Multicast Frame 	 Broadcast Frame 0 	+ CRC 		
	Form • Name 19.32 150 120_5841_Fort1_Ethernel_Eryses_HearEnd 19.21 151 120_5841_Fort1_Ethernel_Eryses_HearEnd	+ Good Frame 0 0	+ Unicet Frame 0 0	 Multicat Frame 0 0 	Broadcast Frame 0 0	+ CRC E - -		
	Equal + Name 10.221 (3) 10.10_5 Not [_Point]_Epison]_Equation 10.321 (3) 10.10_5 Not [_Point]_Ethinois_Epison_HeadTed 10.321 (3) 10.25_Not [_Point]_Ethinois_Epison_HeadTed	+ Good Frame 0 0 0	+ Unicast Prane 0 0 0	 Multicast Frame 0 0 0 	 Broadcast Frame 0 0 0 	+ CRC E - - 24		
	Equal + Name 10.23:103.103.103.12.041.284met_Egyess_JearEnd 10.23:103.103.5041.2441.284met_Egyess_JearEnd 10.23:103.103.5041.2441.284met_Egyess_JearEnd 10.23:103.102.5041.2441.284met_Egyess_JearEnd	 Good Frame 0 0 0 0 0 	- Uticad Frame 0 0 0 0	 Multicast Frame 0 0 0 	+ Breadcast Frame 0 0 0	+ CRC E - 24 15		
	Food * Name 10.21 Stol 10.25, Stol L, Port L, Ethernet, Egners, Jacobia 10.21 Stol 10.25, Stol L, Port L, Ethernet, Jacobia 10.21 Stol 10.25, Stol L, Port L, Ethernet, Jacobia 10.21 Stol 10.25, Stol L, Port L, Ethernet, Jacobia Total 4 records	Good Frame O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O O	- Uticad Frame 0 0 0 0	 Multical Frame 0 0 0 	 Breadcail Frame 0 0 0 10 10 	+ CRC E 24 15 •		
	Form • Name 19.23 100 102, Shift, Port J, Ehnmel, Egnes, Java End 19.23 103 102, Shift, Port J, Ehnmel, Egnes, Java End 19.23 103 102, Shift, Port J, Ehnmel, Jagese, Java End 19.23 103 102, Shift, Port J, Ehnmel, Jagese, Java End 19.23 103 102, Shift, Port J, Ehnmel, Jagese, Java End	- Good Frame 0 0 0 0	← Ubical Frame 0 0 0 0 0	+ Multical Pame 0 0 0 0	Brasdcarl Frame B B B B B B	+ CRC +		
	Ford • Name 10:2534 (2)-561 (2)-561 (2)-561 (2)-562 (2)-562 (2) 10:2534 (2)-561 (2)-561 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)-562 (2)	+ Good Prame 0 0 0 0 0	- Unical Prans 0 0 0 0	 Multicast Frame 0 0 0 0 	Broadcart Frame 0 0 0 1 10 10	+ CRC 8 - - 24 15 * *		
	Form * Anne * Anne * A 2000 * A	© Good Frame 0 0 0 0	- Ubicat Frame 0 0 0 0	 Multicas Frame 0 0 0 	Breadcad Frame 0 0 0 0 10	+ CRC + 24. 15 •) Previous 1 Inter		
	Ford * Anne 19.23 19.03 Sulf Jord Elbornel, Egress, Josef Sul 19.23 19.13 20.54 El Jord Elbornel, Egress, Josef Sul 20.23 20.13 20.54 El Jord Elbornel, Joges, Josef Sul 20.23 20.12 20.54 Elbornel, Joges, Josef Sul Total 4 records	+ Good Frame 0 0 0	Utical Fam 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	 Multical Frame 0 0 0 0 	Breadcail Frame 0 0 0 0 1	+ CRC E - - 24 15 • •		



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

GFS

ΟΑ	Optical Amplifier
OCh	Optical Channel
ODU	Optical Demultiplexer Unit
OLA	Optical Line Amplifier
OLP	Optical Line Protection
ОМИ	Optical Multiplexer Unit
ΟΡΑ	Optical Pre-Amplifier
OPU	Optical Channel Payload Unit
OSC	Optical Supervisory Channel
OSNR	Optical Signal-to-Noise Ratio
ΟΤΝ	Optical Transport Network
ΟΤυ	Optical Transponder Unit
РМ	Path Monitoring
РТ	Payload Type
SM	Section Monitoring
SNMP	Simple Network Management Protocol
πι	Trail Trace Identifier