



OPCOM3100 CONFIGURATION GUIDE

SOFTWARE VERSION: 2.1.5

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1 Overview

1.1 Audience

This guide is for experienced network administrators who are responsible for configuring and maintaining OPCOM3100. And it describes the device function as well as how to configure.

1.2 Organization

There are mainly 10 chapters in this guide:

Chapter 2: **INTRODUCTION**

Describe the main features of OPCOM3100

Chapter 3: **HOW TO USE COMMAND-LINE**

Describe how to configure OPCOM3100 through command-line and application features.

Chapter 4: **CONFIGURING SYSTEM COMMANDS**

Describe system command function of OPCOM3100 and how to configure.

Chapter 5: **CONFIGURING NETWORK PROTOCOLS**

Describe network protocol function of OPCOM3100 and how to configure.

Chapter 6: **CONFIGURING ETHERNET INTERFACES**

Describe Ethernet interface function of OPCOM3100 and how to configure

Chapter 7: **CONFIGURING E1 INTERFACES**

Describe E1 interface function of OPCOM3100 and how to configure

Chapter 8: **CONFIGURING CROSS CONNECT**

Describe cross connect function of OPCOM3100 and how to configure

Chapter 9: **NETWORKING**

Describe how to establish network by OPCOM3100

Chapter 10: **NETWORK TOPOLOGY OF INCONTINUOUS DCC**

Describe how to configure incontinuous DCC

Chapter 11: **CONFIGURATION APPLICATIONS**

1.3 Definitions

Describe the definitions of professional terminologies and the original words of the alphabet abbreviations

Appendix A

1.4 References

OPCOM3100 device commands notebook

2 Introduction

OPCOM3100 is an SDH access device which supports both Ethernet services and E1 services, and is developed as an edge access device for the purpose of full use of the resource of SDH networks. OPCOM3100 can aggregate the user data flows and multiplex them to STM-1 data. You can access OPCOM3100 via the device's serial port RS232 or network management interface: Telnet and it also provides standard SNMP management interface and can be field upgraded.

3 How to use command-line

3.1 Requirements of software and hardware

Operation environment of hardware: platform of OPCOM3100

Computer serial interface;

Operation environment of software: WIN98/WIN2000/WINDOWS XP

3.2 Getting help

command	Function description
help	Getting a brief description from help system
abbreviated-command-entry?	Obtaining a list of commands that begin with a particular character sequence (<i>abbreviated-command-entry</i>) For example: OPCOM3100#en ? english enable
abbreviated-command-entry<Tab>	Supplementing an unfinished command. For example: OPCOM3100# show mac <TAB> OPCOM3100# show mac-address-table
?	Listing all the commands in this mode For example: OPCOM3100#?
command?	Listing all the key words, options and brief help information of a command. OPCOM3100#show ?

3.3 Use history commands

There are 20 history commands in the memory of the device system by default. User can configure the number of history commands that system can save by the command-line:

OPCOM3100> terminal history <0-20>

Use **history** to show commands that has been entered.

3.4 Editing properties

up arrow:	last entered command
down arrow:	next entered command
left arrow:	move a character left
right arrow:	move a character right
backspace:	delete a character in front of the cursor
Ctrl+d:	delete a character at the cursor

- Ctrl+a: move the cursor to the beginning of the command line
- Ctrl+e: move the cursor to the end of the command line
- Ctrl+k: delete all the characters on the right side the cursor
- Ctrl+w: delete all the characters on the left side of the cursor
- Ctrl+u: delete the row all
- Ctrl+z: exit from other modes to privileged mode

Modes of command-line

Mode	Mode description	Access	Prompt
User EXEC	Configuring the basic information and show the parameters and etc.	Login the device and enter the user name and password	OPCOM3100>
Privileged EXEC(enable)	Configuring the basic information such as system time and show the parameters but not the running information of OPCOM3100	Form user EXEC mode, enter enable command and password	OPCOM3100#
Global configuration	Configuring all the running parameters of OPCOM3100	From privileged EXEC mode, enter config command	OPCOM3100(config)#
Interface configuration	Configuring parameters of Ethernet network management interface, Ethernet service interfaces, E1 interfaces, SDH interfaces and DCC interfaces.	In global configuration mode, enter interface command. [eth/dcc /sdh/e1/snmp]	OPCOM3100 (config-xxx/n)# xxx refers to eth/dcc/sdh/e1/snmp n refers to number of the interface

4 Configuring system commands

Basic system configuration and user management.

4.1 Basic system commands and configuration

chinese	show help information of the command in Chinese
english	show help information of the command in English
clear	clear the information on the screen
list	show the list of all the commands in one mode
settime	change the system time

4.2 Managing configuration files and startup files

4.2.1 Configuration files

- The present reserved configuration file name is *startup_config.conf* by default.
- Use **write** command to write the configuration file into the flash file system, when the system resets next time, the reserved configuration information will be configured again.
- Use **erase** command to delete that file
- The reserved configuration information file *startup_config.conf* can be uploaded to the server by commands *upload* and *download* through the FTP protocol or TFTP protocol, or downloaded to system to replace the old configuration information.
- Use **show startup-config** command to show the reserved configuration information.
- Use **show running-config** command to show the present configuration information.
-

4.2.2 Startup file

- Same as program file, and the file name must begin with OPCOM3100, present program file name is: OPCOM3100-040109.Z;
- The program file can be uploaded to the server by commands *upload* and *download* through the FTP protocol or TFTP protocol, or downloaded to system.
- Use **show version** to check the version information.

4.2.3 Upgrade the program file from bootrom

There are two ways to upgrade the program file, one is using the serial port through Xmodem protocol, and the other is using network through FTP protocol, the specific operations are as follows:

Upgrade the program file by the serial port

A: The user who has management privilege can login and enter the privileged EXEC by the serial port;

B: Enter **reboot** command;

C: Press the **space** key to enter the [raisecom] interface, enter? to show the command list.

```

?          show this list
h          show this list
e          erase Flash
i          modify network manage port ip address
c          choose default image file
s          show network manage interface information
u          update your system
m          update microcode
r          reboot system
    
```

D: Enter **u** to upgrade program file, the interface is as follows:
choose mode for updating core file.

```

-----
-      1.  |      serial      -
-----
-      2.  |      network    -
-----
    
```

please input mode choose..

E: Enter **1** to choose the serial port for downloading, the interface is as follows:
choose serial baud rate for updating core file.

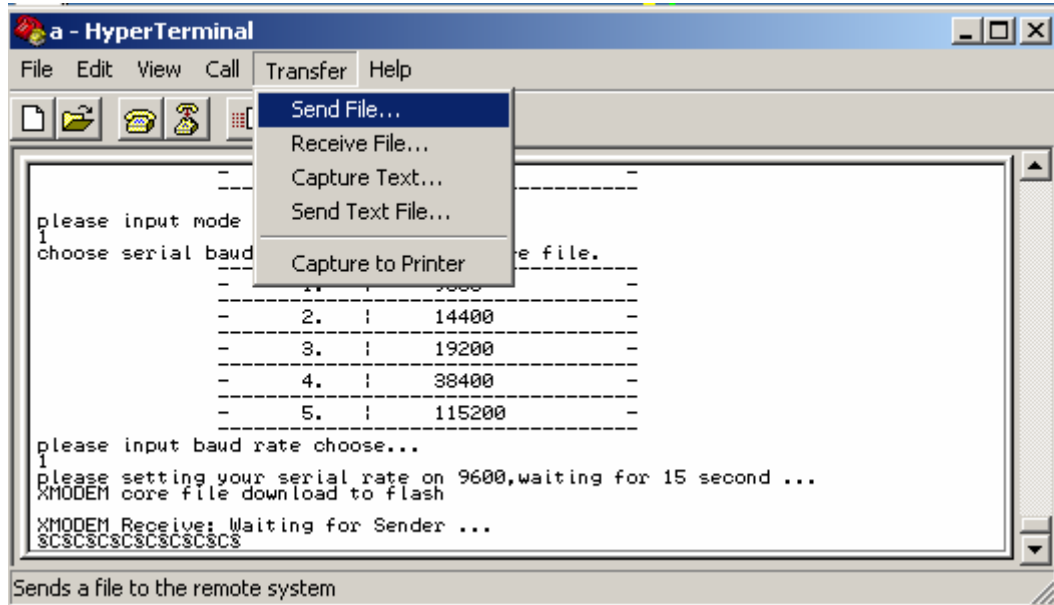
```

-----
-      1.  |      9600       -
-----
-      2.  |      14400      -
-----
-      3.  |      19200      -
-----
-      4.  |      38400      -
-----
-      5.  |      115200     -
-----
    
```

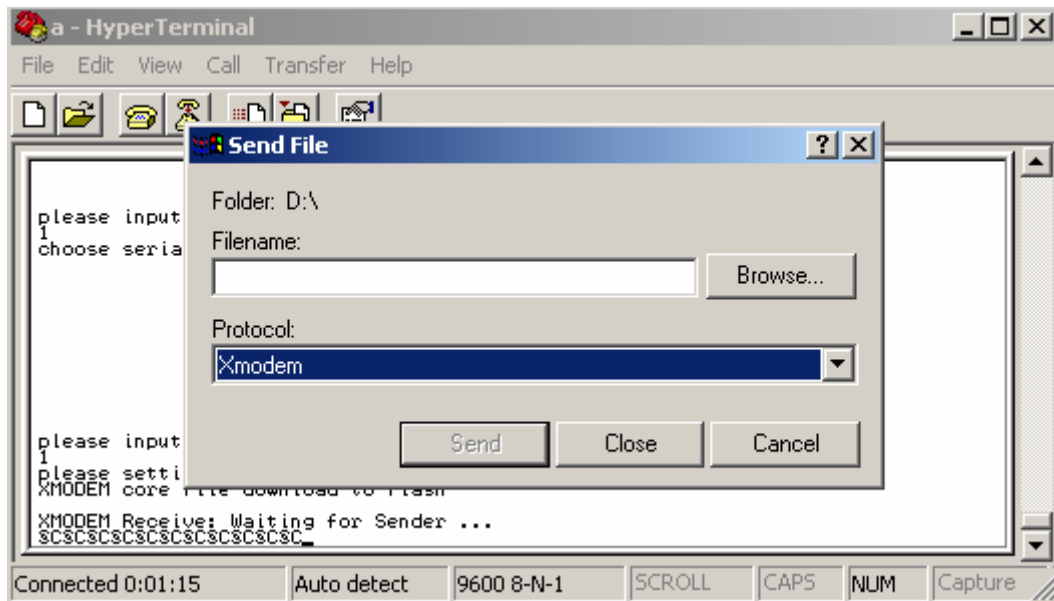
please input baud rate choose...

F: After entering the chosen baud rate, the system is waiting to transmit upgrade file

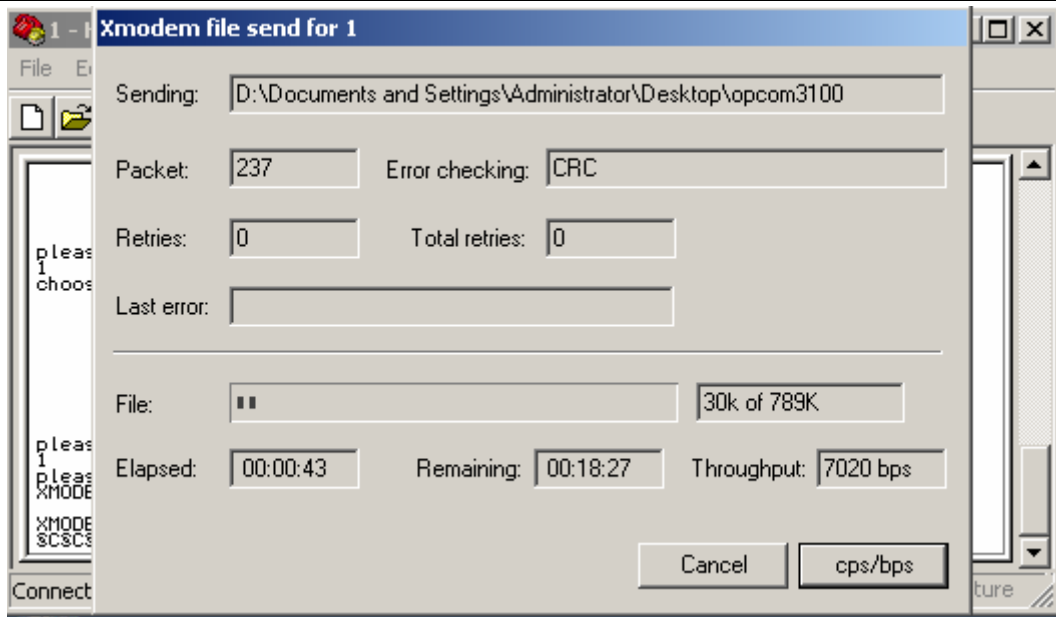
through the serial port, now press the [Transfer] option in the serial port as follows:



Choose the file to transmit:



Press [Browse] option to choose the program file to be downloaded, press [Send] then there will be the following interface:



After downloading there will be the command-line:

Do you want to update core code? <Y/N>y

Choose **y** and then finish the program upgrading.

Use network to upgrade the program file through FTP protocol:

A: The user who owns the management privilege can login and enter the privileges EXEC mode by the serial port;

B: Enter **reboot** command;

C: Press the **space** key to enter the [raisecom] interface, enter **?** to show the command list.

- ? show this list
- h show this list
- e erase Flash
- i modify network manage port ip address
- c choose default image file
- s show network manage interface information
- u update your system
- m update microcode
- r reboot system

D: Enter **u** to upgrade program file, the interface is as follows:

choose mode for updating core file.

```

-----
- 1. | serial -
-----
- 2. | network -
-----
    
```

please input mode choose...

E: Enter 2 to choose network for downloading, the interface is as follows:

starting config network infor ...

```

host ip address: 192.168.2.225
filename: OPCOM3100-040109.z
usr: wrs
passwd: wrs
    
```

Enter host IP address, file name, user name and password of FTP in turn, and then get into the interface as follows:

starting connect host, please waiting...
 choose flash disk for updating core file.

```

-----
-      1.  |   flash:      -
-----
-      2.  |   CORE:      -
-----
-      3.  |   cancel:    -
-----
    
```

please input disk choose...

Put the new program file in **flash** zone or **CORE** zone, after confirming there will be the following information:

start update core, please wait some minutes.....
 success

Now the program upgrade has been finished.

4.3 User management

The system has a default username **raisecom** and the password **raisecom**;
 Add a new user, the steps are as follows:

steps	Command	Description
1	user USERNAME password { no-encryption md5 } PASSWORD	<ul style="list-style-type: none"> ● USERNAME user name; ● Password password; ● { no-encryption md5} password not enciphered or enciphered by MD5;

		<ul style="list-style-type: none"> ● PASSWORD password information;
2	user USERNAME privilege <i>[ADMINISTRANT NORMAL LIMITED]</i>	<ul style="list-style-type: none"> ● USERNAME user name; ● Privilege key word for privilege ● <i>[ADMINISTRANT NORMAL LIMITED]</i> user privilege
3	write	Save the configuration information
4	show user	Show the user information

5 Configuring network protocols

This chapter includes the following sections:

Configure the mapping from IP address to physical address

Configure IP address of SNMP interface

Configure a static routing

Configure COMMUNITY table of SNMP

Configure SNMP trap server host

5.1 Configure the mapping from IP address to physical

address

Command	Description
config	Enter global configuration mode
arp add <i>A.B.C.D</i> <i>MACADDRESS</i>	Add a mapping from one IP address to physical address. <i>A.B.C.D</i> the IP address of the interface; <i>MACADDRESS:</i> <AA.BB.CC.DD.EE.FF>, the port's physical address for mapping
exit	Exit from global configuration mode to privileged mode
show arp	Show ARP table

Using the global configuration command `arp delete A.B.C.D` to delete a mapping from an IP address to a physical address.

For example: Add a mapping of a IP address 192.168.1.119 to a physical address 00:50:8d:46:fb:3

```
OPCOM3100# config
```

Configuration mode, one command input per times. End with CTRL-Z.

```
OPCOM3100(config)# arp add 192.168.2.11 00:50:8d:46:fb:3
```

Successfully add an entry from ARP table

```
OPCOM3100(config)# exit
```

```
OPCOM3100# show arp
```

```
LINK LEVEL ARP TABLE
```

<i>destination</i>	<i>gateway</i>	<i>flags</i>	<i>Refcnt</i>	<i>Use</i>	<i>Interface</i>
192.168.2.11	00:50:8d:46:fb:3	c05	0	0	hw0

5.2 Configure IP address of SNMP interface

There is the possibility to change the IP address of network management, in this

case **ip address** is available.

Command	Description
config	Enter global configuration mode
interface snmp	Enter SNMP interface configuration mode
ip address <i>A.B.C.D</i> { <i>A .B.C.D</i> }	Configure IP address of network management <i>A.B.C.D</i> IP address of network management in decimal with dot. { <i>A .B.C.D</i> } subnet mask of network management IP address in decimal with dot.

For example: configure IP address of network management as 192.168.2.20, subnet mask as 255.255.255.0 and serial number of network management interface as 1.

OPCOM3100# config

Configuration mode, one command input per times. End with CTRL-Z.

OPCOM3100(config)#interface snmp

OPCOM3100(config-snmp)#ip address 192.168.2.20 255.255.255.0

OPCOM3100(config-snmp)# show interface snmp

Interface:snmp Status :up

5.3 Configure IP routing

Command	Description
config	Enter global configuration mode
ip route <i>A.B.C.D A.B.C.D A.B.C.D</i>	Configuring the network manager's IP address: <i>A.B.C.D</i> the first parameter is the subnet or the host IP address in decimal with dot <i>A.B.C.D</i> the second parameter is the net mask of subnet or host IP address in decimal with dot <i>A.B.C.D</i> the third parameter is the gateway's IP address in decimal with dot
exit	Exit from global configuration mode to privileged mode
show ip route	Show the routing information

Use `no ip route A.B.C.D A.B.C.D` to delete a routing in the global configuration mode, the *A.B.C.D A.B.C.D* are destination IP address and subnet mask.

For example: configure a routing from 192.168.14.250 to the destination address 192.168.2.18:

OPCOM3100# config

Configuration mode, one command input per time. End with CTRL-Z.

OPCOM3100(config)# ip route 192.168.2.18 255.255.255.0 192.168.4.250

Successfully add a route

OPCOM3100(config)# show ip route

ROUTE NET TABLE

destination	gateway	proto	Interface
192.168.2.0	192.168.4.250	static	sng0
192.168.4.0	192.168.4.28	connect	sng0

ROUTE HOST TABLE

destination	gateway	proto	Interface
127.0.0.1	127.0.0.1	connect	lo0

5.4 Configure SNMP COMMUNITY table

Command	Description
config	Enter global configuration mode
snmp community <i>COMMUNITYNAME</i> [RO RW]	Add one COMMUNITY <i>COMMUNITYNAME</i> name of the COMMUNITY RO read only RW both read and write
exit	Exit from global configuration mode to privileged mode
show snmp-server community	Show COMMUNITY table

Using no snmp-server community *COMMUNITYNAME* to delete one COMMUNITY in global configuration mode

For example: add a COMMUNITY named *raisecom* that can be both read and written

OPCOM3100# config

Configuration mode, one command input per time. End with CTRL

OPCOM3100(config)# snmp community raisecom rw

Set snmp community name successfully

OPCOM3100(config)# exit

OPCOM3100# show snmp community

ID	COMMUNITYNAME	RIGHT
1	public	ro
2	private	rw
3	raisecom	rw

5.5 Configure SNMP trap server host

The trap server host is in charge of receiving TRAP, the default interface is 162

Command	Description
config	Enter global configuration mode
snmp-server host <i>A.B.C.D</i> {<1-65535>}	Configuring a SNMP trap server host <i>A.B.C.D</i> the IP address of the host in decimal with dot {<1-65535>} interface number for trap server
exit	Exit from the global configuration mode to privileged mode
show snmp-server host	Show the information of the trap server host

Using **no snmp-server host** *A.B.C.D* to delete a trap server host in global configuration mode

For example: add a trap server host which IP address is 192.168.1.16

OPCOM3100# config

Configuration mode, one command input per time. End with CTRL

OPCOM3100(config)# snmp -server host 192.168.1.16

Set trap server successfully

OPCOM3100(config)# exit

OPCOM3100# show snmp -server host

Trap server:

ADDRESS PORT

192.168.1.16 162

6 Configure Ethernet interfaces

This chapter includes:

Configure timeslots of Ethernet interfaces

Command	Description
config	Enter global configuration mode
interface eth <1-8>	Enter Ethernet interface configuration mode <1-8> serial number of the interface
timeslot add sdh <1-2> vc12 TSSTRING	Configure the mapping of Ethernet interface and sdh-vc12
show interface eth <1-8>	Show the timeslots of Ethernet interface

For example: configure the timeslot of Ethernet interface 2 as {1, 3, 4, 5, 6, 7, 8, 9}

```
OPCOM3100# config
```

Configuration mode, one command input per time. End with CTRL-Z.

```
OPCOM3100(config)# interface eth 2
```

```
OPCOM3100(config-eth/2)# timeslot add sdh 1 vc12 1,3-9
```

Set Successfully

```
OPCOM3100(config-eth/2)# show interface eth 2
```

7 Configure E1 interfaces

This chapter includes:

Configure timeslots of E1 interfaces

Command	Description
config	Enter global configuration mode
interface e1 <1-32>	Enter E1 interface configuration mode <1-32> range of serial number of E1 interfaces, if there is E1 sub card the range is 1-32 and otherwise the range is 1-16
timeslot add sdh <1-2> vc12 <1-63>	Configure the mapping of E1 interface and sdh-vc12
show interface e1 1	Show the information of E1 interface

For example: configure the timeslot of E1 interface 2 as 10

```
OPCOM3100# config
```

Configuration mode, one command input per times. End with CTRL-Z.

```
OPCOM3100(config)# interface e1 2
```

```
OPCOM3100(config-eth/2)# timeslot add sdh 1 vc12 10
```

Set Successfully

```
OPCOM3100(config-eth/2)# show interface e1 2
```

8 Configure cross connect

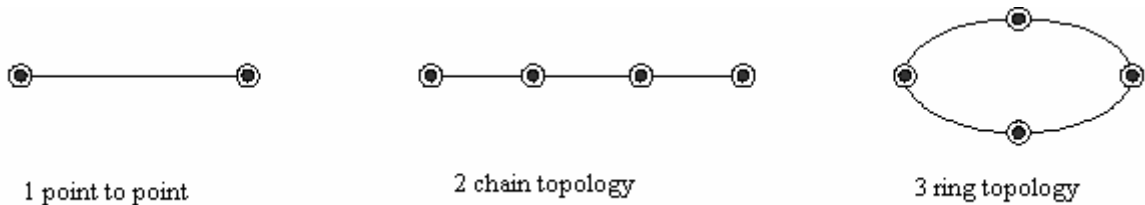
This chapter includes: configure SDH cross connect from one timeslot to the same or from one timeslot to another.

Command	Description
config	Enter global configuration mode
sdh crossconnect source-port 1 timeslot 1 destination-port 2 timeslot 1	Configure a crossconnect from timeslot 1 of optical interface 1 to timeslot 1 of optical interface 2
show sdh crossconnect	Show all the crossconnect information

9 Networking

OPCOM3100 is available for low order cross connect of VC-12.

With bi-directional optical interfaces and tributary interfaces of Ethernet and E1, OPCOM3100 can be configured conveniently to satisfy all the topologies of user access networks showing as follows:



Topologies

9.1 Point to point topology

Network of point to point topology is available for LAN relay and extending or replace the old PDH. The networking is as follows:



Topology

TM device can configure point to point none-protection network, and double TMs can configure the linear low order VC protection of STM-1 level. When configured as 1+1 protection mode, the two optical interfaces can protect each other to enhance service reliability.

9.2 Chain topology

Network of chain topology is available for the service flow distributed in chain form and tributary networks in chain form. Network with OPCOM3100 is as follows:



Chain topology

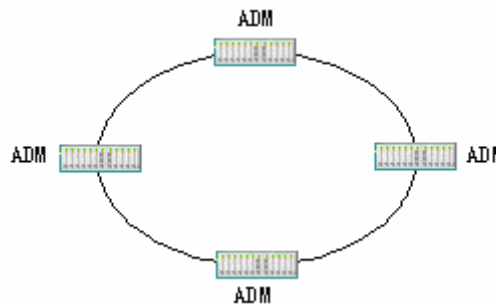
TM and ADM can configure none-protection chain topology network, and double TMs and ADM can configure the linear low order VC protection of STM-1 level.

When configured as 1+1 protection mode, service reliability will enhance but access ability will reduce; and when configured as none-protection mode, access ability will enhance but service reliability will reduce.

9.3 Ring topology

Network of ring topology is available for distribution of network elements in ring form.

With the feather of line interfaces self closed, service can be transmitted bi-directionally (east and west), so the network has high reliability and self-healing ability. Showing as follows:



Ring topology

This topology can establish 2F SNC-P.

2F SNC-P

The advantages of 2F SNC-P are high speed, flexibility and all level capacities. The switching depends on local environment and has nothing to do with the network topology, so 2F SNC-P is suitable for all kinds' topologies, especially dynamic network.

The disadvantage of 2F SNC-P is that all the tributaries in the ring are all APS architectures, that is between any two points, there are two transmission lines

transmitting the data bi-directionally, and every receiving node receives the data bi-directionally. So the total service flow is lower than the device capacity.

2F SNC-P is suitable for access network, relay network and long distance network., which are concentrated, low service flow.

Configuring in-band management channel

9.4 Configuration command

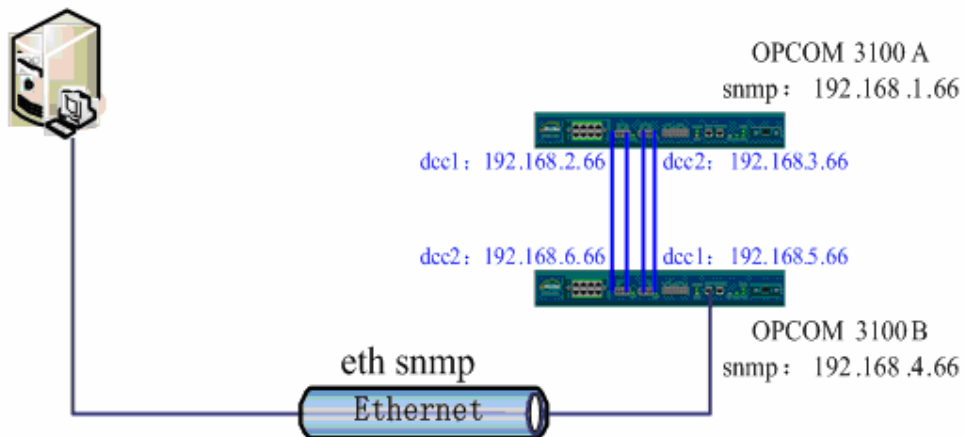
Command	Description	Mode	Limitation
hdlc channel select (d1d2d3 f2f3k3 f2f3)	Configure the overhead byte of in-band management channel, d1d2d3 are default configuration	opcom3100(config)#	
ip address A.B.C.D A.B.C.D	Configuring IP address of interface	opcom3100(config-dcc/X)#	
ip unnumbered	Configuring the IP address of DCC channel same as SNMP interface	opcom3100(config-dcc/X)#	

9.5 Configuration application

Point to point topology

Network of point to point topology:

Network manager



9.5.1 Point-to-point topology

Configuration commands:

OPCOM3100A:

OPCOM3100(config)# interface snmp

OPCOM3100(config-snmp)# ip address

OPCOM3100(config-snmp)# ip address 192.168.1.66

```
Set successfully
OPCOM3100(config-snmp)# exit
OPCOM3100(config)# interface dcc 1
OPCOM3100(config-dcc/1)# ip address 192.168.2.66
Set successfully
OPCOM3100(config-dcc/1)# exit
OPCOM3100(config)# interface dcc 2
OPCOM3100(config-dcc/2)# ip address 192.168.3.66
Set successfully
OPCOM3100(config-dcc/2)# work mode client
Set successfully
OPCOM3100(config-dcc/2)# auto-connect
Set successfully
OPCOM3100(config-dcc/2)#
```

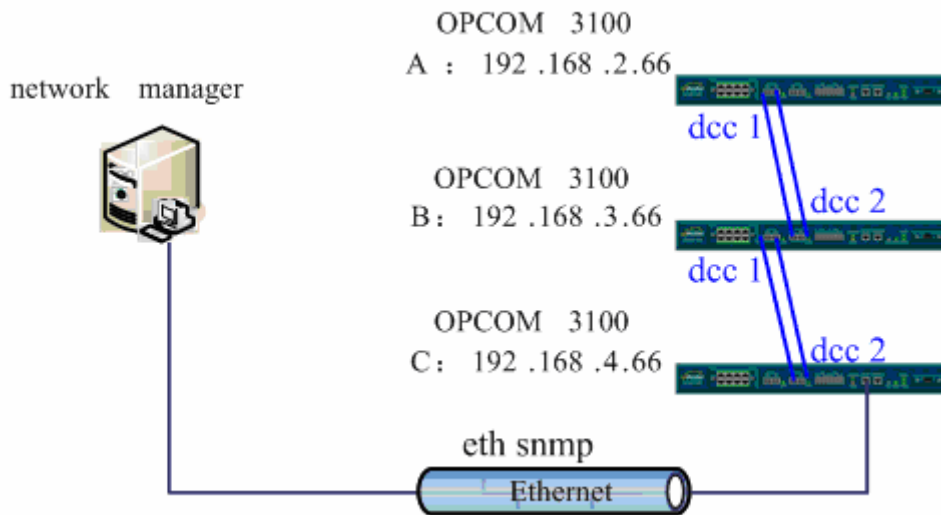
OPCOM3100B:

```
OPCOM3100(config)# interface snmp
OPCOM3100(config-snmp)# ip address
OPCOM3100(config-snmp)# ip address 192.168.4.66
Set successfully
OPCOM3100(config-snmp)# exit
OPCOM3100(config)# interface dcc 1
OPCOM3100(config-dcc/1)# ip address 192.168.5.66
Set successfully
OPCOM3100(config-dcc/1)# exit
OPCOM3100(config)# interface dcc 2
OPCOM3100(config-dcc/2)# ip address 192.168.6.66
Set successfully
OPCOM3100(config-dcc/2)# work mode client
Set successfully
OPCOM3100(config-dcc/2)# auto-connect
Set successfully
OPCOM3100(config-dcc/2)#
```

If two optical interfaces are used at the same time in the network of point to point topology, **ip unnumbered** command is not available, then you must configure IP address for either interface.

9.5.2 Chain topology

Network of chain topology:



Chain topology

Configuration commands:

OPCOM3100A:

```
OPCOM3100(config)# interface snmp
OPCOM3100(config-snmp)# ip address
OPCOM3100(config-snmp)# ip address 192.168.2.66
Set successfully
OPCOM3100(config-snmp)# exit
OPCOM3100(config)# interface dcc 1
OPCOM3100(config-dcc/1)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/1)#
```

OPCOM3100B:

```
OPCOM3100(config)# interface snmp
OPCOM3100(config-snmp)# ip address
OPCOM3100(config-snmp)# ip address 192.168.3.66
Set successfully
OPCOM3100(config-snmp)# exit
OPCOM3100(config)# interface dcc 1
OPCOM3100(config-dcc/1)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/1)# exit
OPCOM3100(config)# interface dcc 2
OPCOM3100(config-dcc/2)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/2)# work mode client
Set successfully
OPCOM3100(config-dcc/2)# auto-connect
Set successfully
```

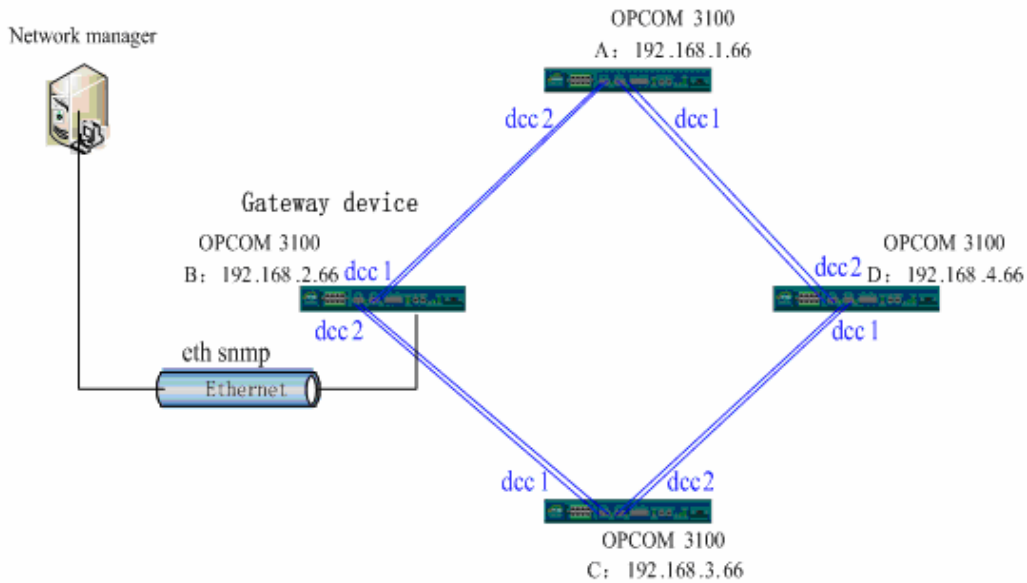
OPCOM3100(config-dcc/2)#

OPCOM3100B:

```
OPCOM3100(config)# interface snmp
OPCOM3100(config-snmp)# ip address
OPCOM3100(config-snmp)# ip address 192.168.4.66
Set successfully
OPCOM3100(config-snmp)# exit
OPCOM3100(config)# interface dcc 2
OPCOM3100(config-dcc/2)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/2)# work mode client
Set successfully
OPCOM3100(config-dcc/2)# auto-connect
Set successfully
OPCOM3100(config-dcc/2)#
```

9.5.3 Ring topology

Network of ring topology:



Ring topology

Configuration commands:

OPCOM3100A:

```
OPCOM3100(config)# interface snmp
OPCOM3100(config-snmp)# ip address
OPCOM3100(config-snmp)# ip address 192.168.1.66
Set successfully
OPCOM3100(config-snmp)# exit
OPCOM3100(config)# interface dcc 1
OPCOM3100(config-dcc/1)# ip unnumbered
```

```
Set successfully
OPCOM3100(config-dcc/1)# exit
OPCOM3100(config)# interface dcc 2
OPCOM3100(config-dcc/2)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/2)# work mode client
Set successfully
OPCOM3100(config-dcc/2)# auto-connect
Set successfully
OPCOM3100(config-dcc/2)#
```

OPCOM3100B:

```
OPCOM3100(config)# interface snmp
OPCOM3100(config-snmp)# ip address
OPCOM3100(config-snmp)# ip address 192.168.2.66
Set successfully
OPCOM3100(config-snmp)# exit
OPCOM3100(config)# interface dcc 1
OPCOM3100(config-dcc/1)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/1)# exit
OPCOM3100(config)# interface dcc 2
OPCOM3100(config-dcc/2)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/2)# work mode client
Set successfully
OPCOM3100(config-dcc/2)# auto-connect
Set successfully
OPCOM3100(config-dcc/2)#
```

OPCOM3100C:

```
OPCOM3100(config)# interface snmp
OPCOM3100(config-snmp)# ip address
OPCOM3100(config-snmp)# ip address 192.168.3.66
Set successfully
OPCOM3100(config-snmp)# exit
OPCOM3100(config)# interface dcc 1
OPCOM3100(config-dcc/1)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/1)# exit
OPCOM3100(config)# interface dcc 2
OPCOM3100(config-dcc/2)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/2)# work mode client
Set successfully
```

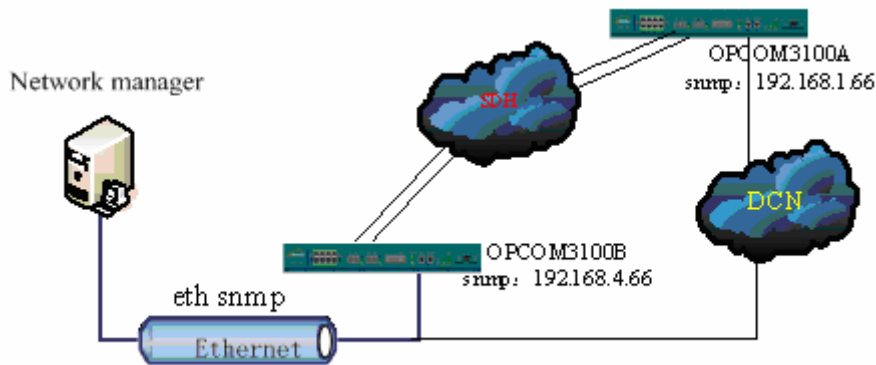
```
OPCOM3100(config-dcc/2)# auto-connect
Set successfully
OPCOM3100(config-dcc/2)#
```

OPCOM3100D:

```
OPCOM3100(config)# interface snmp
OPCOM3100(config-snmp)# ip address
OPCOM3100(config-snmp)# ip address 192.168.4.66
Set successfully
OPCOM3100(config-snmp)# exit
OPCOM3100(config)# interface dcc 1
OPCOM3100(config-dcc/1)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/1)# exit
OPCOM3100(config)# interface dcc 2
OPCOM3100(config-dcc/2)# ip unnumbered
Set successfully
OPCOM3100(config-dcc/2)# work mode client
Set successfully
OPCOM3100(config-dcc/2)# auto-connect
Set successfully
OPCOM3100(config-dcc/2)#
```

10 Network topology of incontinuous DCC

Network topology:



If the network is not only organized by OPCOM3100, DCC channel is not continuous when there are other types of device or network, in this case we use data network to manage and control remote OPCOM3100.

Network management configuration

10.1 Configuration commands

Command	Description	Mode	Limitation
ip address A.B.C.D	Configure network management IP	OPCOM3100(config-snmp)#	
snmp community COMMUNITYNAME [RO RW]	Configure SNMP community	opcom3100(config)#	
snmp-server host A.B.C.D {<1-65535>}	Configure trap server	opcom3100(config)#	

10.2 Examples

Configure the network management IP address of OPCOM3100 as 192.168.4.28, and network management host IP address is 192.167.4.250, ro and rw communities are *public*, *private*.

```
OPCOM3100# config
Configuration mode, one command input per times. End with CTRL-Z.
OPCOM3100(config)#interface snmp
OPCOM3100(config-snmp)#ip address 192.168.4.28 255.255.255.0
OPCOM3100(config-snmp)#exit
OPCOM3100(config)# snmp-server community private rw
Set successfully
OPCOM3100(config)# snmp-server community public ro
Set successfully
```

```
OPCOM3100(config)# snmp-server host 192.168.4.250  
Set successfully
```

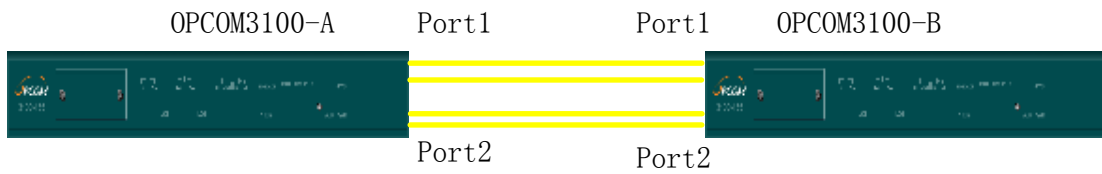
11 Configuration applications

This chapter includes:

- ✧ point to point 1+1 protection configuration
- ✧ chain topology none-protection configuration
- ✧ ring topology 2F SNC-P configuration

11.1 Point-to-point 1+1 protection configuration

Topology:



Point to point networking

Service requirement

There are 2 E1 services of which the timeslot is 1 and 3; one Ethernet service which timeslots are 20 21 25 27.

Configuring timeslots

name timeslot	TM1	TM2
STM-1	<p>1, 2</p> <p>E1 1, 2</p> <p>20, 21, 25, 27</p> <p>eth1</p>	<p>1, 2</p> <p>E1 1, 2</p> <p>20, 21, 25, 27</p> <p>eth1</p>

Configuration commands

Configure TM1

Command	Description
OPCOM3100#config	Enter global configuration mode
OPCOM3100(config)# sdh	Configure the work mode of the device as

device-type tm	TM
OPCOM3100(config)# sdh net-type line	Configure the network type of device
OPCOM3100(config)# exit	
OPCOM3100# write	Save the configuration
OPCOM3100# reboot	Reset device
OPCOM3100(config)# interface e1 1	Enter E1 interface 1
OPCOM3100(config-e1/1)# Timeslot add sdh 1 vc12 1	Configure timeslot 1 to E1 interface 1
OPCOM3100(config-e1/1)# exit	Exit to global configuration mode
OPCOM3100(config)# interface e1 2	Enter E1 interface 12
OPCOM3100(config-e1/2)# Timeslot add sdh 1 vc12 2	Configure timeslot 2 to E1 interface 2
OPCOM3100(config-e1/1)# exit	Exit to global configuration mode
OPCOM3100(config)# interface eth 1	Enter Ethernet interface 1
OPCOM3100(config-eth/1)# Timeslot add sdh 1 vc12 20,21,25,27	Configure Ethernet interface 1 the timeslots 21,21,25,27

Configure TM2 in the same way as TM1

11.2 Chain topology none-protection configuration

Topology:



Chain networking

Service requirement

There are 10 2M services between TM1 and ADM, 10 2M services between ADM and TM2, and 11 2M services between TM1 and TM2

Service matrix

Name	TM1(OPCOM3100-A)	ADM(OPCOM3100-B)	TM2(OPCOM3100-C)	Total
TM1		10	11	21

ADM	10		10	20
TM2	11	10		21
Total	21	20	21	62

Timeslot table

name	TM1	ADM	TM2
timeslot			
STM-1	port1 1-10 E1 1-10 port1 11-21 E1 11-21	port1 1-10 E1 1-10 port2 1-10 E1 17-26	port1 1-10 E1 1-10 port1 11-21 E1 11-21

Configuration commands

Configure TM1

Command	Description
OPCOM3100# config	Enter global configuration mode
OPCOM3100(config)# sdh device-type tm	Configure the work mode of device as TM
OPCOM3100(config)# sdh net-type line	Configure the network topology of device
OPCOM3100(config)# sdh protect-switch disable	Disable the protection
OPCOM3100(config)# exit	
OPCOM3100# write	Save the configuration
OPCOM3100# reboot	Reset the device
OPCOM3100(config)# interface e1 1	Enter E1 interface 1
OPCOM3100(config-e1/1)# Timeslot add sdh 1 vc12 1	Configure timeslot 1 to E1 interface 1
.....	Configure E1 interfaces 2 to 21 the timeslots 2 to 21, correspond one to one.

Configure ADM

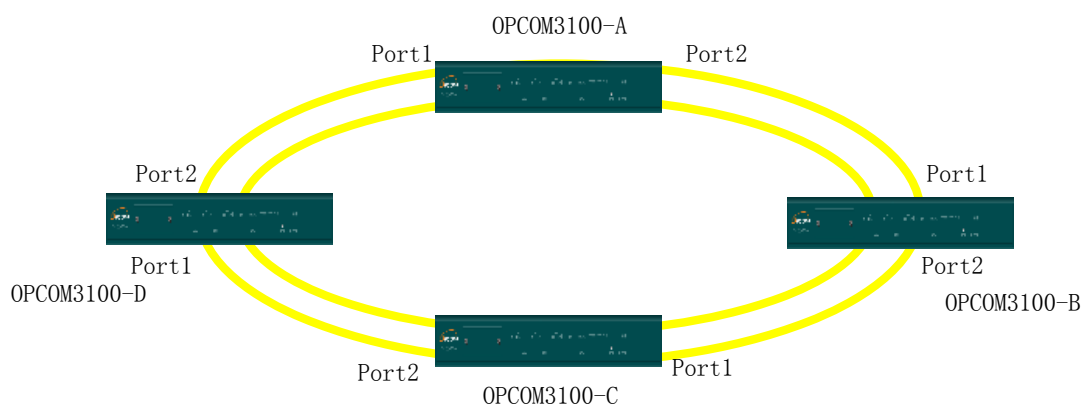
Command	Description
config	Enter global configuration mode
OPCOM3100(config)# sdh	Configure work mode of the device as ADM

device-type tm	
OPCOM3100(config)# sdh net-type line	Configure the network topology of device
OPCOM3100(config)# sdh protect-switch disable	Disable the protection
OPCOM3100(config)# exit	
OPCOM3100# write	Save the configuration
OPCOM3100# reboot	Reset the device
OPCOM3100(config-e1/1)# Timeslot add sdh 1 vc12 1	Configure E1 interfaces 1 to 10 the timeslots 1 to 10 of optical interface 1, correspond one to one.
OPCOM3100(config-e1/17)# Timeslot add sdh 2 vc12 1	Configure E1 interfaces 17 to 26 the timeslots 1 to 10 of optical interface 2, correspond one to one.
OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 11 destination-port 2 timeslot 11	Configure crossconnect of remote services, timeslot 11 of optical interface 1 to timeslot 11 of optical interface 2.
	Configure timeslot 12-21 of optical interface 1 to timeslot 12-21 of optical interface 2.

Configure TM2 in the same way as TM1

11.3 Example of 2F SNC-P configuration

The network topology is as follows:



Ring networking

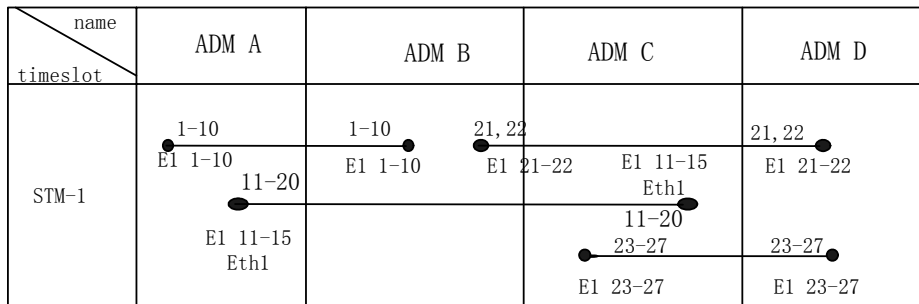
Service requirements

There are 10 2M Ethernet services from ADM A to ADM B, 5 2M and one 10M from A to C, 2 2M from B to D, and 5 2M from C to D.

Service matrix

Name	ADM-A (OPCOM3100-A)	ADM-B (OPCOM3100-B)	ADM-C (OPCOM3100-C)	ADM-D (OPCOM3100-D)	Total
ADM A		10	5+5	0	20
ADM B	10		0	2	12
ADM C	5+5	0		5	15
ADM D	0	2	5		7
Total	20	12	15	7	54

Timeslot table



Configuration commands

A configuring the device

Command	Description
OPCOM3100# config	Enter global configuration mode
OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 21 destination-port 2 timeslot 21 OPCOM3100(config)#	Configure crossconnect of the service from B to D, timeslot 21-22 of optical interface 1 to timeslot 21-22 of optical interface 2.

sdh crossconnect source-port 1 timeslot 22 destination-port 2 timeslot 22	
OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 23 destination-port 2 timeslot 23 ... OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 27 destination-port 2 timeslot 27	Configure crossconnect of the service from C to D, timeslot 23-27 of optical interface 1 to timeslot 23-27 of optical interface 2.
OPCOM3100(config)# Interface E1 1	Enter E1 interface configuration mode
OPCOM3100(config-e1/1)# Timeslot add sdh 1 vc12 1	Configure E1 interfaces 1 to 10 the timeslots 1 to 10, correspond one to one.
Same as previous	Configure E1 interfaces 11 to 15 the timeslots 11 to 15, correspond one to one.
OPCOM3100(config)# Interface Eth 1	Enter Ethernet interface configuration mode
OPCOM3100(config-eth/1)# Timeslot add sdh 1 vc12 16-20	Configure Ethernet interface 1 the timeslots 16-20
show sdh crossconnect	Show all the information of crossconnect
Show interface sdh 1 timeslot	Show the information of timeslot

B configure the device

Command	Description
config	Enter global configuration mode
OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 11 destination-port 2 timeslot 11 OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 20 destination-port 2 timeslot 20	Configure crossconnect of the service from A to C, timeslot 11-20 of optical interface 1 to timeslot 11-20 of optical interface 2.
OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 23 destination-port 2 timeslot 23	Configure crossconnect of the service from C to D, timeslot 23-27 of optical interface 1 to timeslot 23-27of optical interface 2.

OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 27 destination-port 2 timeslot 27	
OPCOM3100(config)# Interface E1 1	Enter E1 interface configuration mode
OPCOM3100(config-e1/1)# Timeslot add sdh 1 vc12 1	Configure E1 interfaces 1 to 10 the timeslots 1 to 10, correspond one to one.
OPCOM3100(config-e1/21)# Timeslot add sdh 1 vc12 21	Configure E1 interfaces 21 to 22 the timeslots 21 to 22, correspond one to one.
show sdh crossconnect	Show all the information of crossconnect
Show interface sdh 1 timeslot	Show the information of timeslot

C configure the device

Command	Description
config	Enter global configuration mode
OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 1 destination-port 2 timeslot 1 OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 10 destination-port 2 timeslot 10	Configure crossconnect of the service from A to B, timeslot 1-10 of optical interface 1 to timeslot 1-10 of optical interface 2.
OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 21 destination-port 2 timeslot 21 OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 22 destination-port 2 timeslot 22	Configure crossconnect of the service from B to D, timeslot 21-22 of optical interface 1 to timeslot 21-22 of optical interface 2
OPCOM3100(config)# Interface E1 11	Enter E1 interface configuration mode
OPCOM3100(config-e1/11)# Timeslot add sdh 1 vc12 11	Configure E1 interfaces 11 to 15 the timeslots 11 to 15, correspond one to one.
OPCOM3100(config)# Interface Eth 1	Enter Ethernet interface configuration mode

OPCOM3100(config-eth/1)# Timeslot add sdh 1 vc12 16-20	Configure Ethernet interface 1 the timeslots 16-20
OPCOM3100(config-e1/23)# Timeslot add sdh 1 vc12 23	Configure E1 interfaces 23 to 27 the timeslots 23 to 27, correspond one to one.
show sdh crossconnect	Show all the information of crossconnect
Show interface sdh 1 timeslot	Show the information of timeslot

D configure the device

Command	Description
config	Enter global configuration mode
OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 1 destination-port 2 timeslot 1 OPCOM3100(config)# sdh crossconnect source-port 1 timeslot 20 destination-port 2 timeslot 20	Configure crossconnect of the service from A to B, timeslots 1-10 of optical interface 1 to timeslots 1-10 of optical interface 2. Configure crossconnect of the service from A to C, timeslots 11-20 of optical interface 1 to timeslots 11-20 of optical interface 2.
OPCOM3100(config)# Interface E1 21	Enter E1 interface configuration mode
OPCOM3100(config-e1/21)# Timeslot add sdh 1 vc12 21	Configure E1 interfaces 21 to 22 the timeslots 21 to 22, correspond one to one.
OPCOM3100(config-e1/23)# Timeslot add sdh 1 vc12 23	Configure E1 interfaces 23 to 27 the timeslots 23 to 27, correspond one to one.
show sdh crossconnect	Show all the information of crossconnect
show interface sdh 1 timeslot	Show the information of timeslot

12 Appendix: Abbreviation

Abbreviations	English
ADM	Add-Drop Multiplexer
AIS	Alarm Indication Signal
APS	Automatic Protection Switching
AU	Administrative Unit
AU-n	Administration Unit, level n
AUG	Administration Unit Group
AU-PTR	Administration Unit Pointer
BBE	Background Block Error
BBER	Background Block Error Ratio
BER	Bit Error Ratio
CMI	Coded Mark Inversion
C-n	Container- n
CORBA	Common Object Request Broker Architecture
CV	Code Violation
DCC	Data Communications Channel
DCE	Data Circuit-terminating Equipment
DCF	Data Communications Function
DCN	Data Communications Network
DDN	Digital Data Network
DTE	Data Terminal Equipment
DXC	Digital Cross Connect
ECC	Embedded Control Channel
EM	Element Management
EML	Element Management Layer
EMS	Element Management System
EOS	Ethernet Over SDH
ES	Error Second
ESR	Error Second Ratio
ETSI	European Telecommunication Standards Institute
FEBBE	Far End Background Block Error
FEES	Far End Error Second
FESES	Far End Severely Error Second
GUI	Graphical User Interface
HDLC	High Digital Link Control
HPC	Higher order Path Connection
IP	Internet Protocol
ITU-T	International Telecommunication Union-Telecommunication Standardization Sector
L2	Layer 2
LAN	Local Area Network

LCT	Local Craft Terminal
LOF	Loss Of Frame
LOP	Loss Of Pointer
LOS	Loss Of Signal
LPC	Lower order Path Connection
MAC	Medium Access Control
MAN	Metropolitan Area Network
MCU	Micro Control Unit
MD	Mediation Device
MF	Mediation Function
MII	Medium Independent Interface
MM	Multi Mode
MS	Multiplex Section

Sequel

Abbreviations	English
MS-AIS	Multiplex Sections - Alarm Indication Signal
MSOH	Multiplex Section OverHead
MSP	Multiplex Section Protection
NE	Network Element
NEF	Network Element Function
NEL	Network Element Layer
NML	Network Manager Layer
NMS	Network Management System
OAM	Operation, Administration and Maintenance
OFS	Out of Frame Second
OOF	Out of Frame
OS	Operation System
OSI	Open System Interconnect
PCM	Pulse Code Modulation
PDH	Plesiochronous Digital Hierarchy
PJE+	Pointer Justification Event +
PJE-	Pointer Justification Event -
POH	Path OverHead
PPP	Point to Point Protocol
PRC	Primary Reference Clock
RAM	Random Access Memory
RDI	Remote Defect Indication
REI	Remote Error Indication
REG	Regenerator
RFI	Remote Failure Indication
RIP	Router Information Protocol

Sequel

Abbreviations	English
RMII	Reduced Medium Independent Interface
RS	Regenerator Section
RSOH	Regenerator Section OverHead
SDH	Synchronous Digital Hierarchy
SEC	SDH Equipment Clock
SES	Severely Error Second
SESR	Severely Error Second Ratio
SETS	Synchronous Equipment Timing Source
SM	Single Mode
SNCP	Subnetwork Connection Protection
SOH	Section Overhead
SPRING	Shared Protection Ring
SSM	Synchronous State Message
STM-N	Synchronous Transport Module Level-N
TCP	Transport Control Protocol
TDEV	Time Deviation
TDM	Time Division Multiplex
TM	Terminal Multiplexer
TMN	Telecommunications Management Network
TU	Tributary Unit
TU-m	Tributary Unit, level m
TUG-m	Tributary Unit Group, level m
UAS	Unavailable Second
VC	Virtual Container
VC-n	Virtual Container, level n
VLAN	Virtual Local Area Network
WAN	Wide Area Network

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