NTN469GF **323-1059-090**

Nortel Networks

OPTera Metro 3500 Multiservice Platform

About the OPTera Metro 3500 NTP Library

Standard Release 12.0 Issue 1 November 2003

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About this document

This document provides an overview of the Nortel Networks technical publications (NTPs) and describes the content of each document. Also included in this document is a list of terms and acronyms, and master index to guide the user of the documentation on where to find information on a particular topic.

Standards

The Telecommunications Industry Association (TIA) and the Electronics Industries Alliance (EIA) accepted RS-232 as a standard in 1997 and renumbered this standard as TIA/EIA-232. In this document, RS-232 is used to reflect current labels on the hardware and in the software for the OPTera Metro 3500 Multiservice Platform.

Supported software

This document supports the software release for Nortel Networks OPTera Metro 3500 Multiservice Platform Release 12.0.

Supported hardware

This document supports the OPTera Metro 3500 shelf and Universal OPTera Metro 3500 shelf.

Audience

The following members of your company are the intended audience of this Nortel Networks technical publication (NTP):

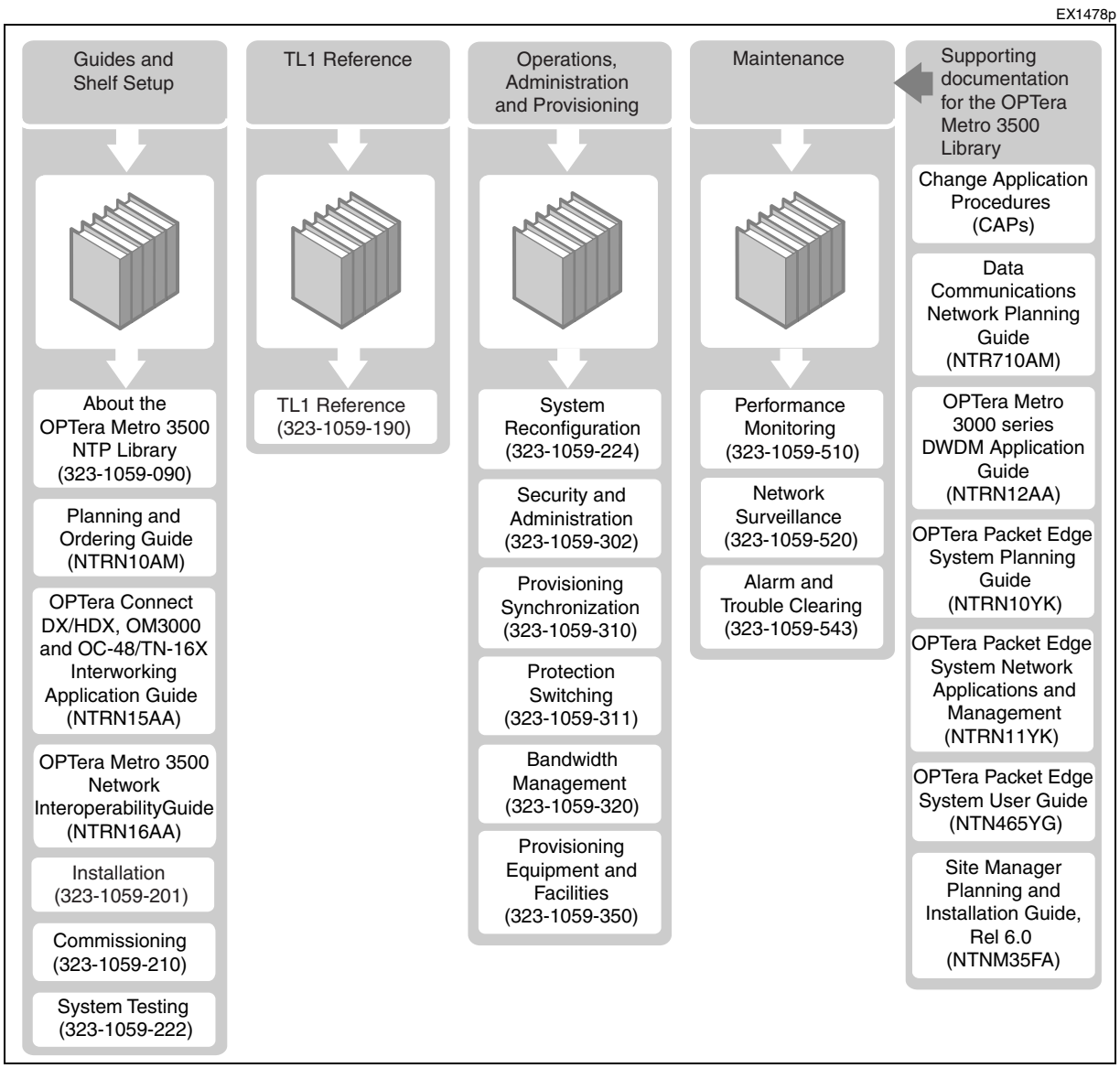
- planners
- provisioners
- network administrators
- transmission standards engineers

Hardware naming conventions

The following naming conventions are used throughout this document to identify the OPTera Metro 3500 hardware:

- The extended shelf processor (SPx) is referred to as the shelf processor.
- The extended network processor (NPx) is referred to as the network processor.

OPTera Metro 3500 NTP library



Technical support and information

For technical support and information from Nortel Networks, refer to the following table.

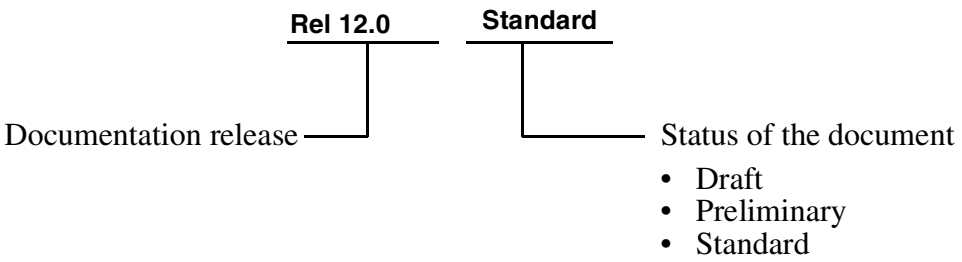
Technical Assistance Service	
For service-affecting problems: For 24-hour emergency recovery or software upgrade support, that is, for: • restoration of service for equipment that has been carrying traffic and is out of service • issues that prevent traffic protection switching • issues that prevent completion of software upgrades	**North America:** 1-800-4NORTEL (1-800-466-7835) **International:** 001-919-992-8300
For non-service-affecting problems: For 24-hour support on issues requiring immediate support or for 14-hour support (8 a.m. to 10 p.m. EST) on non-urgent issues.	**North America:** 1-800-4NORTEL (1-800-466-7835) ***Note:*** You require an express routing code (ERC). To determine the ERC, see our corporate Web site at www.nortelnetworks.com. Click on the Express Routing Codes link. **International:** Varies according to country. For a list of telephone numbers, see our corporate Web site at www.nortelnetworks.com. Click on the Contact Us link.
Global software upgrade support: For non-service affecting software upgrade issues	**North America:** 1-800-4NORTEL (1-800-466-7835) **International:** Varies according to country. For a list of telephone numbers, see our corporate Web site at www.nortelnetworks.com. Click on the Contact Us link.

Documentation overview

This *Technical Reference Library* is an integral part of the OPTera Metro 3500 Multiservice Platform network elements and is considered part of the equipment.

Release information

The current release of the *Technical Reference Library* is Release 12.0 Standard and is defined as follows:



Release information is found on the cover page and at the bottom of every page of a document.

Documents in this library

The *Technical Reference Library* consists of three volumes of information and a *Guides and Shelf Setup* module. See Document content description on page 1-4 for a description of each document.

Guides and Shelf Setup

323-1059-090	About the OPTera Metro 3500 NTP Library
NTRN10AM	Planning and Ordering Guide
NTRN15AA	Interworking Application Guide
NTRN16AA	Network Interoperability Guide
323-1059-201	Installation
323-1059-210	Commissioning
323-1059-222	System Testing
323-1059-180	DWDM Application Overview

Note: NTP 323-1059-180 (DWDM Application Overview), has changed to *DWDM Application Guide*, NTRN12AA. This guide is now listed as an associated document to the Technical Reference Library.

Volume 1 TL1 Reference

323-1059-090	About the OPTera Metro 3500 NTP Library
323-1059-190	TL1 Reference

Volume 2 Operations, Administration and Provisioning

323-1059-224	System Reconfiguration
323-1059-302	Security and Administration
323-1059-310	Provisioning Synchronization
323-1059-311	Protection Switching
323-1059-320	Bandwidth Management
323-1059-350	Provisioning Equipment and Facilities

Volume 3 Maintenance

323-1059-510	Performance Monitoring
323-1059-520	Network Surveillance
323-1059-543	Alarm and Trouble Clearing

Document identification numbers

User documents for the OPTera Metro 3500 shelf are referred to as Nortel Networks technical publications (NTP). Each NTP has a unique ten-digit identification number called an NTP number. This number is used to identify each document, and assist in cross-referencing from one NTP to another. In some instances, an alphanumeric product engineering code (PEC) is assigned to NTPs that are separately orderable.

The NTP number is found on the cover page and at the bottom of every page in a document.

Associated documents

The following are supporting documents to the *Technical Reference Library*:

- Change Application Procedures (CAPs)
- *DWDM Application Guide*, NTRN12AA
- *Data Communications Network Planning Guide*, NTR710AM
- *Site Manager Planning and Installation Guide*, NTNM35FA
- *OPTera Packet Edge System Planning Guide*, NTRN10YK
- *OPTera Packet Edge System Network Applications and Management*, NTRN11YK
- *OPTera Packet Edge System User Guide*, NTN465YG

Note: For more information on Site Manager, user documentation and the *Site Manager Planning and Installation Guide*, see Site Manager and user documentation on page 1-7.

NTP product engineering codes

A product engineering code (PEC) is assigned to each unique Nortel Networks product, including NTPs. The PEC is used to identify the product when ordering from Nortel Networks. The PEC is found on the cover page of each document. Table 1-1 shows the PECs for OPTera Metro 3500 Multiservice Platform NTPs.

Table 1-1
Release 12.0 PECs for OPTera Metro 3500 NTPs

Document Name	PEC code
Guides and Shelf Setup module ***Note:*** The Guides and Shelf Setup module (NTN469GF) is automatically included when you order the Technical Reference Library (NTN465GF)	NTN469GF
Technical Reference Library (Volumes 1, 2 and 3) including the Shelf Setup and Planning Guide ***Note:*** The Guides and Shelf Setup module (NTN469GF) is automatically included when you order the Technical Reference Library (NTN465GF)	NTN465GF
Planning and Ordering Guide	NTRN10AM
Interactive CD-ROM Technical Reference Library	NTN464GF
Helmsman CD-ROM Technical Reference Library	NTN464ZG

Ordering NTPs

NTPs can be ordered from Nortel Networks. To order NTPs, use the PEC corresponding to the document when placing your order. For complete ordering information, see the *OPTera Metro 3500 Multiservice Platform Planning and Ordering Guide.* To obtain a copy of the planning and ordering guide, call 1-800-4NORTEL.

Document content description

The following describes the content of each OPTera Metro 3500 Multiservice Platform NTP or guide that is part of the *Guides and Shelf Setup* module (NTN469GF) and the *Technical Reference Library* (NTN465GF).

About the OPTera Metro 3500 NTP Library, 323-1059-090

About the OPTera Metro 3500 NTP Library provides an overview of the NTP suite, a consolidated list of terms and abbreviations, and a master index to use in searching for information in the *Technical Reference Library.*

Planning and Ordering Guide, NTRN10AM

The *Planning and Ordering Guide* for the OPTera Metro 3500 Multiservice platform provides descriptive information essential for planning a network and the means for ordering equipment, documentation, and support services.

The *Planning and Ordering Guide* is for network planners, system administrators, provisioners, transmission standards engineers, and maintenance personnel.

Interworking Application Guide, NTRN15AA

The *Interworking Application Guide* describes interworking configurations between the following Nortel Networks products:

- the OPTera Connect DX optical switch and the OPTera Metro 3300/ OPTera Metro 3400/OPTera Metro 3500 Multiservice Platforms
- the OPTera Connect HDX optical switch and the OPTera Metro 3300/OPTera Metro 3400/OPTera Metro 3500 Multiservice Platforms
- the OPTera Connect DX/OPTera Connect HDX optical switch and the S/DMS TransportNode OC-48/TN-16X
- the S/DMS TransportNode OC-48 and the OPTera Metro 3300/OPTera Metro 3400/OPTera Metro 3500 Multiservice Platforms

This document is intended to help network planners design networks that contain these products. This document is also intended to help network operators configure and operate interconnections between these products.

Network Interoperability Guide, NTRN16AA

The *Network Interoperability Guide* describes the steps that you must take when you connect non-Nortel Networks equipment with Nortel Networks equipment. The Interoperability Guide covers both SONET and SDH protocols and includes information on interoperability principles, provisioning and troubleshooting.

The *Network Interoperability Guide* is for network planners, provisioners, transmission and standards engineers, network administrators, and system lineup and testing (SLAT) personnel.

Installation, 323-1059-201

Installation enables installation personnel to install the OPTera Metro 3500 Multiservice Platform network element.

Installation is for installation personnel.

Commissioning, 323-1059-210

Commissioning provides the procedures for commissioning the OPTera Metro 3500 network processor and shelf processor. Tasks included are changing the password, adding user accounts, and setting time and date.

Commissioning is for local craft personnel, and system administrators.

System Testing, 323-1059-222

System Testing describes the system and site testing procedures for the OPTera Metro 3500 Multiservice Platform network element. *System Testing* consists of verifying optical path continuity and system level switching.

System Testing is for local craft personnel, installation personnel and system administrators.

TL1 Reference, 323-1059-190

TL1 Reference provides details of the Transaction Language 1 (TL1) user interface implementation on the network element.

Topics covered in *TL1 Reference* include TL1 message common structure, syntax, and description of each TL1 message parameter.

TL1 Reference is for network planners, system administrators, provisioners, transmission standards engineers, and maintenance personnel.

System Reconfiguration, 323-1059-224

System Reconfiguration provides nodal reconfigurations, network reconfigurations, and reconfigurations for DWDM systems.

System Reconfiguration is for local craft personnel and system administrators.

Security and Administration, 323-1059-302

Security and Administration provides procedures for the administrative tasks on a network element, including user account administration, network element name, and time and date settings. *Security and Administration* also provides the procedures for saving and restoring provisioning data, and upgrading the network processor.

Security and Administration is for network planners and system administrators.

Provisioning Synchronization, 323-1059-310

Provisioning Synchronization provides procedures to synchronize each network element in a network and provision timing from a building-integrated timing supply (BITS).

Provisioning Synchronization is for network planners, system administrators, provisioners, transmission standards engineers, and maintenance personnel.

Protection Switching, 323-1059-311

Protection Switching provides procedures for protection switching in 1+1 linear, UPSR and BLSR configurations. Included in *Protection Switching* are the procedures for operating and releasing protection switches on tributary and optical circuit packs.

Protection Switching is for local craft personnel and system administrators.

Bandwidth Management, 323-1059-320

Bandwidth Management provides the procedures for configuring networks, provisioning cross-connects, and performing in-service traffic rollovers.

Bandwidth Management is for network planners, system administrators, provisioners, transmission standards engineers, and maintenance personnel.

Provisioning Equipment and Facilities, 323-1059-350

Provisioning Equipment and Facilities explains how to add and change equipment, facilities, services and SDCC for optical interface circuit packs on the network element.

Provisioning Equipment and Facilities is for network planners, system administrators, provisioners, transmission standards engineers, and maintenance personnel.

Performance Monitoring, 323-1059-510

Performance Monitoring includes procedures for performance monitoring parameter definition and monitoring.

Performance Monitoring is for network planners and surveillance personnel.

Network Surveillance, 323-1059-520

Network Surveillance provides the procedures for provisioning telemetry byte-oriented serial (TBOS). It provides path and section trace procedures as well as network processor and TARP provisioning.

Network Surveillance is for network planners and surveillance personnel.

Alarm and Trouble Clearing, 323-1059-543

Alarm and Trouble Clearing provides procedures for network alarm monitoring and management, trouble clearing, and circuit pack replacement.

Alarm and Trouble Clearing provides the procedures used to identify, isolate and resolve local and remote operational difficulties with the network element.

Alarm and Trouble Clearing is for network surveillance and maintenance personnel.

Site Manager and user documentation

The Site Manager graphical user interface (GUI) is available for the OPTera Metro 3500 Multiservice Platform network element. Site Manager provides a simple-to-use point-and-click user interface that enables you to perform operation, administration, and maintenance of the OPTera Metro 3500 Multiservice Platform network element.

User documentation for Site Manager is provided on-line and on paper. The installation and setup instructions are available in the *Site Manager Planning and Installation Guide*. The *Site Manager Planning and Installation Guide* explains the minimum hardware platform requirements for operation of Site Manager, and how to install the software.

Release history

The following information describes the feature content and NTP restructuring of this release and previous standard releases.

OPTera Metro 3500 Release 12.0

November 2003

OPTera Metro 3500 Multiservice Platform Release 12.0 introduces

- BLSR Line Protection Oscillation Control
- Intrusion Detection enhancements
- Generic Framing Procedure (GFP) and Virtual Concatenation (VCAT) support for Gigabit Ethernet and Fibre Channel (FC-100 and FICON)
- General Broadcast tool
- Modifiable Login Banner
- OPTera Packet Edge (OPE) enhancements
- Optical Loopback enhancements
- Performance monitoring threshold crossing alerts (TCA)
- STS Managed DSM
- Support for 12 DSM
- Test Access enhancements
- Third Level 5 User Support / Increased SOC visibility to 16 network elements per Level 5 user
- 1 new OC-192 IR circuit pack
- 1 new OC-192 LR G.709 FEC circuit pack
- 9 new OC-192 DWDM G.709 FEC circuit packs (Band 1, Channel 1 through to Band 2, Channel 4 and 1535.04 nm)
- 3 new OC-48 STS (single slot) circuit packs (SR, IR-2 and LR)
- 1 new OC-12x4 STS (single slot) circuit pack (IR)
- 1 new 2xGigE/FC-P2P (point-to-point) circuit pack supporting GFP and VCAT
- Small form-factor pluggables (SFP) for new 2xGigE/FC-P2P circuit pack
- 1 new STX-192 circuit pack

Documentation Changes

The NTP Library has expanded from two volumes to three volumes:

- Volume 1: TL1 Reference
- Volume 2: Operations, Administration and Provisioning
- Volume 3: Maintenance

NTP 323-1059-090 (About the OPTera Metro 3500 NTP Library) is now included in the Guides and Shelf Setup module.

The Planning and Ordering Guide (NTRN10AM) has expanded into two parts.

NTP 323-1059-180 (DWDM Application Overview) has been removed from the NTP Library. DWDM application information is now located in the DWDM Application Guide (NTRN12AA).

NTP 323-1059-190 (TL1 Reference) has expanded from three parts to four parts.

Alarm clearing procedures for alarms A through K (inclusive) have been moved from part 2 to part 1 of NTP 323-1059-543 (Alarm and Trouble Clearing).

OPTera Metro 3500 Release 11.0

April 2003 OPTera Metro 3500 Multiservice Platform Release 11.0 introduces

- Resilient Packet Rings (RPR) support up to 16 nodes
- BLSR wait-to-restore period supports the 'infinite' parameter
- Optical Ethernet - Private Line (10/100 Ethernet point-to-point) service
- Optical Ethernet - Private Line (Gigabit Ethernet point-to-point) service
- Alarm flow control
- Channelized DS3 service (DS3VTx12 circuit pack)
- Common Language Location Identifier (CLLI)
- OPE Distributed multilink trunking
- Full VT Access on BLSR pass-through nodes
- OC-48 physical PMs
- Optical loopbacks
- OPE: RPR bandwidth reservation
- Protection performance monitoring parameters for optical facilities
- 'Save and Restore' enhancements
- Centralized Security Administration (CSA)
- OPE: increased number of TDIs on a mapped UNI
- Test access
- Time of day synchronization
- TL1 event / log feature
- Topology enhancements
- 9 new OC-48 ER DWDM circuit packs
- 16 new OC-48 LR DWDM circuit packs (L-Band).
- L-Band coverage by 4 new OMX + Fiber Manager 4CH

OPTera Metro 3500 Release 10.1

June 2002 OPTera Metro 3500 Multiservice Platform Release 10.1 introduces support for the rear-facing I/O modules, DS3x12e, and EC-1x12 circuit packs. Supported configurations include both UPSR and linear point to point as well as BLSR at the OC-48 line rate. Security enhancements and connection ID features have also been introduced.

Documentation Changes
The Quick Configuration Guide, TL1 Quick Reference Booklet and Network Element description have been removed from the NTP suite. The circuit pack, technical specifications and feature descriptions previously given in the Network Element description, have been moved to the Planning and Ordering Guide (NTRN10AK).

OPTera Metro 3500 Release 9.0

July 2001

OPTera Metro 3500 Multiservice Platform Release 9.0 introduces support for the 2xGigE and 4x100FX OPTera Packet Edge System circuit packs on the OPTera Metro 3500 shelf. Also introduced in Release 9.0 is the DS1 service module, which provides up to 84 DS1 connections. Release 9.0 supports both UPSR and linear point to point network configurations at the OC-12 and OC-48 line rates.

Documentation changes
The Quick Configuration Guide (NTN468GC) has been added to the NTP suite, and can be ordered separately. The Ordering Guide and Planning Guides have been merged in to one document (NTRN10AJ). This document forms part of the NTP suite, and can be ordered separately.

The Installation NTP was restructured to segregate Commissioning tasks from installation activities. The Commissioning tasks are now covered in a separate NTP.

OPTera Metro 3500 Release 8.1

November 2000

OPTera Metro 3500 Multiservice Platform Release 8.1 introduces support for the DS3x12 and OPE circuit packs on the OPTera Metro 3500 shelf. Release 8.1 also supports the linear point to point network configuration at the OC-48 line rate.

Documentation changes
The System Reconfiguration NTP (323-1059-224) has been added to the NTP suite.

OPTera Metro 3500 Release 8.0

September 2000

OPTera Metro 3500 Multiservice Platform Release 8.0 introduces the OPTera Metro 3500 product to the OPTera Metro 3000 Multiservice Platform series (formerly Express). OPTera Metro 3500 provides the functionality and features of the OPTera Metro 3300 and 3400 Multiservice Platforms (formerly Express MX and HX), but includes an increase in line rate and switching to OC-48 bandwidth. The OPTera Metro 3500 provides full OC-48 connectivity to the customer premises.

Release 8.0 offers dense wavelength division multiplexing (DWDM) with time-division multiplexing (DS1, DS3, OC-3, OC-12, and OC-48) services. Release 8.0 introduces the OPTera Metro 3500 shelf, the DS3x3 mapper, and the OC-3x4 circuit pack.

Release 8.0 also introduces the Site Manager graphical user interface to the OPTera Metro 3000 Multiservice Platform series.

List of terms

1+1 protection

A protection switching scheme in which two equivalent channels carry the same traffic, but one is protection and one is working. The 1+1 protection switching scheme is nonrevertive.

1:N protection

A protection switching scheme in which one standby protection channel protects failures on any of the N working channels (revertive switching).

1:1 protection

A protection switching scheme in which one standby protection channel protects failures on one working channel.

1WAYPR

unidirectional path ring

2WAYBR

bidirectional bridged ring

4x100BT

4x100BT OPTera Packet Edge circuit pack (formerly called iPT100)

4x100FX

4x100FX OPTera Packet Edge circuit pack

2xGigE

2xGigE OPTera Packet Edge circuit pack

2xGigE/FC-P2P

2xGigE Fibre Channel point-to-point circuit pack

ACO

alarm cut-off

A push-button switch located on the OPTera Metro 3500 left interface (LIF) that disables an audible alarm.

ADM

add/drop multiplexer

A network element in which some facilities are added or dropped and some are passed directly through for transmission to other network elements.

AID

access identifier

An access identifier (AID) appears in most command argument strings. The AID identifies the equipment or facilities accessed by the command.

AINS

auto-in-service

AINS-DEA

auto-in-service-deactivated

AIS

alarm indication signal

A code sent to downstream sites to indicate an upstream failure (used to prevent unnecessary downstream alarms).

alarm cut-off

See ACO on page 3-2.

AMI

alternate mark inversion (line code, bipolar)

A digital line encoding technique for which a zero is transmitted by no pulse, while a one is transmitted by a pulse opposite in polarity to the previous pulse.

ANSI

American National Standards Institute

An organization supported by U.S. industry to coordinate, develop, and publish standards.

APDFET

avalanche photo diode field-effect transistor

A transistor that uses an avalanche photo diode to convert photons to electrons.

This transistor exhibits very high gain and is used in more sensitive optical receivers.

APS bytes

Automatic Protection Switching bytes

The K1 and K2 bytes of the SONET transport overhead of a line carrying protection channels.

ARP

address resolution protocol

A transmission control protocol/internet (TCP/IP) that dynamically binds a network-layer IP address to a data-link-layer hardware address; for example, an Ethernet address.

ATAG

automatic tag

A unique numeric string generated by the system.

ATM

asynchronous transfer mode

A high-speed connection-oriented mulitplexing technology that uses 53-byte cells to transmit data.

B3ZS

bipolar three zero substitution

B8ZS

bipolar eight zero substitution

bandwidth

The difference, in hertz (Hz), between the lowest and highest frequencies of a transmission channel. The range of signal frequencies transmitted by a communications channel with defined maximum loss or distortion. Bandwidth indicates the information carrying capacity of a channel.

BCC

Bay command console

BCVL

line bipolar code violation

For more information, see 323-1059-510, Montype parameter definitions on page 1-51.

BER

bit error ratio

A measure of transmission accuracy expressed as a ratio of bit errors received to bits sent.

BESL

line bipolar errored second

For more information, see 323-1059-510, Montype parameter definitions on page 1-51.

bidirectional ring

A ring in which all nodes send and receive duplex traffic by traversing the same set of nodes for both directions of transmission under normal circumstances.

bidirectional switching

A bridge to protection channel and a selection from a protection channel of both directions of duplex traffic.

BIP

bit-interleaved parity

bit

binary digit

The smallest unit of information in a binary system represented as a 0 (zero) or as a 1 (one).

bit/s

bits per second

The unit used to express transmission rate.

BITS

building-integrated timing supply

All digital equipment in a structure receives timing from the same master clock, which must be the most accurate and stable clock in the structure. The BITS is driven by a stratum 3 or better reference signal and sends a DS1 signal to all equipment in the same location.

BLSR

bidirectional line-switched ring

A method of SONET transport over a ring configuration for which half of the available channels are working and half are considered protection channels. The traffic is bidirectional. Half of the traffic is sent counter-clockwise over another fiber according to the path provisioned. The ring uses the line level status and performance parameters to initiate Automatic Protection Switching (APS). APS in BLSR is aligned such that working channels 1 through 24 are protected by channels 25 through 48 respectively.

BPV

bipolar violation

An error in the transmission of bipolar signals when two successive marks have the same polarity.

BR

bridged ring

A bidirectional connection at a matched-node network element. A path is selected based on a signal being dropped from the endpoint specified as the FromAID and its default or specified switch mate, to the endpoint specified as the ToAID. Traffic is also passed through from the FromAID to the Switch Mate, to continue around the ring and exit at the other matched node. Traffic is added to the ring in the reverse direction, from the endpoint specified as the ToAID to the endpoint specified as the FromAID.

bridge

The action of transmitting identical traffic on both the working and protection channels.

bridge request

A message sent from the tail-end node to the head-end node requesting the head-end perform a bridge of the working channels onto the protection channels.

bridge request status

A message sent from the tail-end node to all other nodes within the protection system (on the path not carrying the protection channels to be used) indicating the tail end has requested a bridge.

bridging to protection

The action of transmitting identical traffic on both the working and the protection channels.

BSESL

bipolar severely errored seconds count - line

The count of 1-second intervals that contain 51 or more bipolar code violations or a loss-of-signal event.

For more information, see 323-1059-510, Montype parameter definitions on page 1-51.

byte

A group of eight binary digits or eight signal elements representing binary digits operated upon as an entity.

CAP

change application procedure

Nortel Networks document used to perform an in-service upgrade or reconfiguration with no effect on traffic.

CBR

constant bit rate

An ATM service category which supports a constant or guaranteed rate to transport services which require rigorous timing control and performance parameters.

CCITT

Consultative Committee on International Telephone and Telegraph

This committee is now replaced by the International Telecommunications Union—Telecommunications (ITU-T). The CCITT prepared a series of recommendations for telecommunications protocol.

See also ITU-T on page 3-16.

CD-ROM

compact disk read-only memory

A read/write digital optical storage device of high capacity.

CI

command interpreter

A support operating system component that functions as the main interface between machine and user.

CLE

customer located equipment

Equipment located on customer premises that provides access to the operating company network.

CLEI

common language equipment identifier

A trademark of Bell Communications Research. It is a standard identification method for telephony equipment.

CLI

command line interface

The TL1 command line interface in the TL1 Command Builder.

CLNP

connection less network protocol

COLAN

central office local area network

A facility on the network processor that allows Preside to communicate with the OPTera Metro 3000 network using TCP/IP and Ethernet protocols.

Comm Log

A dialog box accessible from the File menu in Site Manager. The dialog box contains messages sent between Site Manager and the network elements Site Manager is connected to.

correlation tag

The sequential command identifier with every command input for the TL1 interface. The identifier is called a correlation tag (CTAG).

The format of the CTAG can be used to reflect its purpose, for example, JOB28, and TAG33.

CPE

customer premises equipment

Equipment located on the customer premises that is connected to the telephone line.

CPU

central processing unit

A functional unit that interprets and executes program instructions. The CPU transmits and receives data from the memories and peripheral units of the computer.

craft personnel

maintenance personnel

Employees assigned the routine recurring work required to keep a facility, such as a fiber optic transmission system, plant, building, structure, ground facility, or utility system, in such condition that it may be continuously used (a) at its original or designed capacity and efficiency and (b) for its intended purpose.

cross-connect

Connections between terminal blocks on the two sides of a distribution frame, or between terminals on a terminal block.

CTAG

See correlation tag on page 3-8.

CVL

line code violation

The count of the bipolar code violations on the DS3 line.

CVP

path code violation

The count of parity errors on the DS3 path.

CVS

section code violation

The count of bit-interleaved parity errors at the section layer.

dB

decibel

dBm

Decibels above one milliwatt.

dc

direct current

DCE

data communication equipment

The devices and connections of a communications network that connect the communication circuit between the data source and destination.

DCP

drop and continue on protection

A scheme used for matched-node configurations.

DCW

drop and continue on working

A scheme used for matched-node configurations.

demarcation point

Point of connection between one end of a data transmission circuit and the terminal facilities.

> ***Note:*** This term does not mean the boundary for installation and maintenance.

DISCD

disconnected - not carrying traffic

DMS

digital multiplex system

A central office switching system in which all external signals are converted to digital data and stored in assigned time slots. Switching is performed by reassigning the original time slots.

DS1

digital signal, level 1 (1.544 Mbit/s)

The 8-bit, 24-channel, 1.544 Mbit/s digital signalling format. DS1 is the North-American standard for digital links and the standard for signals used to interconnect Nortel Networks digital systems.

DS1 service module (DSM)

The DS1 service module is an extension unit of the OPTera Metro 3500 shelf that can multiplex up to 84 DS1 signals, into and from the OPTera Metro 3500 shelf, through an OC-3 SONET interface. The OC-3 line is linked to an OC-3 tributary known as the Host Link on the OPTera Metro 3500 shelf. A single OPTera Metro 3500 shelf can be connected to eight protected DS1 service modules, or eight unprotected DS1 service modules, or a combination of both. The DS1 service module may be connected to an OPTera Metro 3500 shelf using an OC-3 or OC-3x4 circuit pack.

DS1TM

DSM DS1x84 termination module

DS1TM is the term used in Site Manager to identify the DSM DS1x84 termination module.

DS3

digital signal, level 3 (44.7 Mbit/s)

A serial data stream carrying 28 DS1 signals plus overhead bits.

DSM DS1x84 TM

DSM DS1x84 termination module

The DSM DS1x84 termination module is developed for use in the DS1 service module. The DSM DS1x84 termination module supports 84 DS1 facilities.

DTE

data terminal equipment

Equipment which serves as a data transmitter, data receiver, or both. DTE controls information transfer according to a data link protocol, and reconverts the received data signals into user information.

DWDM

dense wavelength division multiplexing

DWDM is a transmission technique of multiplexing on the optical layer. In OPTera Metro 3500, DWDM allows up to 34 optical wavelengths to be transmitted over a single fiber.

EBER

excessive bit error rate

See also BER on page 3-4.

EC-1

electrical carrier level 1 (51.84 Mbit/s).

EOL

end of life

Stage at which either the hardware or the software has reached the end of its useful function or no longer meets business requirements.

ESD

electrostatic discharge

Sparks generated by static electricity that can damage integrated circuits.

ESL

line errored second

The count of 1-second intervals at the line layer that contain ore or more line code violations, alarm indication signals, or loss-of-signal events.

ESP

path errored second

The count of 1-second intervals on the DS3 path that contain one or more path code violations, out-of-frame events, or alarm indication signals.

ESS

section errored second

The count of 1-second intervals at the section layer that contain one or more section code violations, out-of-frame events, or loss-of-signal events.

ESWD

electronic software delivery

exerciser

See high-speed exerciser on page 3-14.

external timing

A synchronization scheme in which timing for a network element is provided by an external source such as BITS.

fault indicator

A device that presents a visual display or audible alarm when a failure or marginal condition exists.

FC

ferrule connector

A mechanical fixture, generally a rigid tube, used to confine the stripped end of a fiber bundle or a fiber.

FC

fibre channel

The Fibre Channel Standard defines a high-speed data transfer interface that can be used to connect together workstations, mainframes, supercomputers, storage devices and displays. This standard addresses the need for very fast transfers of large volumes of information and provides one standard for networking, storage and data transfer.

FCL

line failure count

The count of failure events at the line layer.

FCP

path failure count

The count of failure events on the DS3 path.

FCS

frame check size

Size of the frame used to transmit packets.

FFP

facility fault protection group

Used for 1+1 line switching.

FGRP

facility group

FLT

fault

The secondary state indicating that a fault has been detected in equipment.

freerun timing

A timing scheme in which a free-running clock in the transport interface circuit pack provides timing for a network element.

fromAID

from access identifier

The facility at one end of a cross-connect.

FTAM

file transfer, access, and management

FTP

file transfer protocol

The file-sharing protocol operating at layers 5 through 7 of the open systems interconnection (OSI) model that governs file-sharing and file-transfer capabilities.

full-duplex mode

In full-duplex mode, LAN traffic is transmitted and received simultaneously.

Gbits

gigabits per second

GCF

gateway control function

GCF indicates the session you are in is hosted by a network processor.

GFP

generic framing protocol

Protocol used to encapsulate Ethernate frames or to carry Fibre Channel (FC) traffic.

GigE

Gigabit Ethernet

GUI

graphical user interface

A display format that allows the user to choose commands, start programs, and see lists of files.

half-duplex mode

The mode where LAN traffic is transmitted or received alternately.

HBA

host bus adapter

high-speed exerciser

The high-speed exerciser tests the integrity of the protection switching bytes (K-bytes) communication between a SONET optical interface pair configured in a linear 1+1 or BLSR protected system.

hub

A network element that accepts several inputs originating from different areas.

A point on a network where a group of circuits are connected and provide centralized management capabilities. Hubs are useful for their ability to isolate nodes from disruptions.

ICMP

internet control message protocol

ICMP group

internet control message protocol group

IF group

interface group

The interface group provides configuration information, such as the interface type and speed, the status of the interface, incoming and outgoing traffic statistics, and counts of interface packet errors.

I/O modules

The modules that provide input and output of electrical signals for the traffic in OPTera Metro 3500.

The I/O modules, both front and rear facing, are removable and replaceable. The OPTera Metro 3500 I/O modules include the DS1 1-28 I/O module, DS1 29-56 I/O module, DS1 29-84 I/O module, 8xRJ45 module, and 12 Port I/O module.

ILAN

intershelf local area network

A facility that allows the network processor to communicate with the co-located shelf processor using SONET-defined OSI protocols.

ILAN circuit pack

The ILAN circuit pack provides Ethernet hubbing functionality required to interconnect OPTera Metro 3000 shelves.

The ILAN circuit pack provides a low cost solution to Ethernet connectivity between OPTera Metro 3000 multiservice platform series, as well as the capability to daisy-chain up to 16 OPTera Metro 3000 shelves.

IP

Internet protocol

A direct outward dialing (DOD) standard protocol designed for use in interconnected systems of packet-switching computer communication networks.

IS

in-service

An indication that some element of the network is carrying traffic or is ready to carry traffic. Standby units that are IS are prepared to carry traffic.

See also OOS on page 3-23.

IS-ANR

in-service - abnormal, or partial failure detected

ISCR

in-service channel rollover

ISO

International Organization for Standardization

The ISO technical committee was created to provide standards on the area of quality management and quality assurance in a common language for a global audience.

ISRR

in-service route rollover

ISTR

in-service traffic rollover

The ability to switch active traffic from one cross-connect endpoint to another within the transport network. In BLSR, there is route and channel rollover.

ITU-T

International Telecommunications Union—Telecommunications

An international organization with headquarters in Geneva, Switzerland that makes recommendations for standardization of telecommunications and functions through international committees of telephone administrations and private operating agencies. The ITU-T makes recommendations applying to the industry, administrations and agencies. This replaces the former committee known as CCITT.

kbit

kilobit

For processor storage, real and virtual storage, and channel volume, 1024 bits.

See also bit on page 3-4.

kbit/s

kilobits per second

The number of binary digits transmitted over a communications channel in one second. Standard measure of data rate and transmission capacity; 1024 bits per second.

See also bit on page 3-4.

kbyte

kilobyte

See also byte on page 3-6.

kHz

kilohertz

A measurement of frequency. One thousand cycles per second.

LAN

local area network

A data communications system that lies within a limited geographic area, has a specific user group, has a specific topology, and is not a public switched telecommunications network, but may be connected to one. A LAN has a moderate to high data transmission rate, and supports shared media. Examples of LAN technologies are Ethernet, token ring, and fiber-distributed data interface (FDDI).

LAPB

link access procedure balanced

The link layer for the X.25 protocol. LAPB provides two-way simultaneous communication between the data terminal equipment (DTE) and the data communication equipment (DCE) at the network gateway.

LAPD

link access procedure D-channel

LAPD is a protocol that operates at the data link layer (layer 2) of the OSI architecture.

laser

light amplification by stimulated emission of radiation

Amplification of light by a device that produces an intense, coherent, directional beam of optical radiation by stimulating electronic, ionic, or molecular transitions to higher energy levels, so that when the electrons, ions, or molecules return to lower energy levels, they emit energy.

leased circuit service office

Offices engaged in the business of leased circuit services.

LED

light-emitting diode

A semiconductor diode that emits light when a current is passed through it.

LI

line interface

Refers to the connection requirements at one end of the transmission system for subscriber lines. It is the terminal on the LT (line termination) side of the NT (network termination).

LIF

left interface

One of the core circuit packs of OPTera Metro 3500 network element. The LIF provides connections to the Left OAM (LOAM) and inventory interconnect for power interfaces.

line (SONET)

The segment of a fiber transmission system between network elements where traffic originates and terminates.

line timing

A synchronization scheme in which timing for a network element is derived from the primary or secondary receive line.

LOAM

left OAM

An extender attached onto the left interface (LIF) of OPTera Metro 3500 network element. The LOAM contains connections for the RS-232 terminal, telemetry byte-oriented serial protocol (TBOS), environmental alarms, shelf alarms, X.25 terminal, intershelf LAN, and central-office local-area network (COLAN).

LOF

loss of frame

An alarm where the system is unable to detect a framing indication on the optics signal. The framing indication is a specific pattern of bits that varies depending on traffic. This alarm condition corresponds to an information loss greater than 2 seconds. *See also* OOF on page 3-23.

LOP

loss of pointer

A fault, for example, a circuitry failure, as the misplacement of the address of a memory location. An alarm that occurs when a path endpoint detects a corrupt pointer for 2.5 seconds. The pointer is a mechanism used by the logical path to indicate where data starts in the payload of a frame.

LOS

loss of signal

A fault, for example, a circuitry failure, as the misplacement of telecommunications information. LOS can be caused by an optical signal failure.

LT

line termination

Terminal equipment installed within a leased circuit service office.

MAC

medium access control

A protocol governing access from a station to a network.

Magic number

The magic number is used during PPP negotiation only. When enabled, the magic number field is four octets and helps in detecting looped back links. A random string is sent across the link and if the same value is returned, then the circuit pack determines that the link is looped back and the negotiation fails. If this occurs, a "Link Down" alarm is raised against the WAN port. When disabled, the magic number is always transmitted as zero and is always ignored on reception.

Mbit/s

megabits per second

One megabit per second is equivalent to 1 048 576 bits per second.

MEA

mismatched equipment attributes

MHz

megahertz

One million cycles per second. A unit of frequency denoting one million Hz.

MIB

management information base

All data accessible by the end user is stored in the MIB. The MIB is a tree structure where each leaf of the tree represents a field in the MIB. Internal nodes in the tree depict group information. The MIB defines the field name, type of the field (such as string, unsigned integer, and counters), access type and position in the tree.

MLM

multi longitudinal mode laser, or multi mode laser

An injection laser diode which has a number of longitudinal modes.

MOA

Multiservice Managed Object Agent

See Multiservice MOA on page 3-21.

modem

modulator demodulator

A device that modulates and demodulates signals for transmission and reception, respectively, over communication facilities. Modems convert digital signals into quasi-analog signals for transmission and reconvert the quasi-analog signals into digital signals. Other functions may be added to modems to provide for customer service and control features.

Multiservice MOA

Multiservice Managed Object Agent

UNIX software that allows Preside (network management software) to communicate with the OPTera Metro 3000 Multiservice Platforms.

navigation area

The left side of the Site Manager (see Preside Site Manager on page 3-27) main window. When you connect to a network processor (NP), the navigation area displays the NP and displays the network elements (NEs) in the NP span of control as items branching from the NP. Use the navigation area to select an NP or an NE to view or edit details.

navigation tree

The network elements within a network processor span of control as represented in the navigation area (see navigation area on page 3-21) as items branching from the network processor.

NE

See network element on page 3-21.

network element

A collection of equipment that performs some operation in routing or transporting a telecommunications signal.

network processor

A circuit pack on OPTera Metro 3000 shelves that sets up connections for the network to communicate with external equipment such as Preside, Multiservice MOA, other OSSs, or a PC.

non-revertive switch

When the condition that caused a switch to protection is corrected, the traffic remains on the protection channels until another bridge request. Traffic does not automatically revert to its working channel.

NP

See network processor on page 3-21.

NPx

network processor extended. *See* network processor on page 3-21.

The network processor used on OPTera Metro 3500 shelves running Release 9.0 software or later version.

NSA

non-service-affecting

NSAP

network service access point

A number used internally in a SONET communications network to address a network element. The NSAP is a number up to forty hexadecimal digits.

NT

network termination

Equipment which converts data signals from the terminal equipment (TE) into suitable transmission mode, then sends such converted signals to the circuits. The NT also restores converted signals which have already been transmitted through the circuits back to the original data signals, then sends the restored signals to the TE.

NTP

Nortel Networks technical publication

A technical document that is intended to assist operating company personnel with the operations, administration, maintenance and provisioning of Nortel Networks products, including both hardware and software.

NVS

nonvolatile storage

Storage in which the contents are not permanently lost when power is removed, but become available again when power is restored.

OAM

operations, administration, and maintenance

All the tasks necessary for providing, maintaining, or modifying the services provided by a switching system.

OAM&P

operations, administration, maintenance, and provisioning

OC-1

An STS-1 signal translated into an optical signal.

OC-n

An optical carrier signal in the SONET optical format which is n times (where n is an integer) the OC-1 rate. For example, OC-1, OC-3, OC-12, OC-48, OC-192.

OMX

optical multiplexer

Equipment that uses a passive optical coupler to combine various wavelengths over a single fiber-optical cable.

OOF

out of frame

An event or an alarm where the system is unable to detect a framing indication on the optics signal. The framing indication is a specific pattern of bits that varies depending on the traffic. This alarm condition corresponds to an information loss of less than 2 seconds.

See also LOF on page 3-19.

OOS

out-of-service

An equipment state in which equipment is removed from service either automatically (by the system) or manually (by personnel).

See also IS on page 3-15.

OOS-AU

In-service; failure detected.

OOS-AUMA

Out-of-service autonomous management - the entity is not able to perform its provisioned functions and is intentionally removed from service.

OOS-MA

Out-of service maintenance for provisioning memory administration

OOS-MA-ANR

Out-of-service - maintenance - abnormal or partial failure detected

OPC

operations controller

OPM

optical power meter

Test equipment designed to measure power and attenuation within optical fiber cable.

OPTera Metro 3000

Nortel Networks OPTera Metro 3000 multiservice platform series

The OPTera Metro 3000 includes the series of OPTera Metro products 3100, 3300, 3400, and 3500.

The OPTera Metro 3000 network element provides transport for traffic in a SONET environment. A typical application for the network element is a small business park, where the network element can provide up to 2016 phone lines for voice and data communications. The simplicity and cost effectiveness of the OPTera Metro 3000 make it a logical choice for this small scale environment.

OPTera Metro 3100

Formerly Express CX.

See OPTera Metro 3000 on page 3-24.

OPTera Metro 3300

Formerly Express MX.

See OPTera Metro 3000 on page 3-24.

OPTera Metro 3400

Formerly Express HX.

See OPTera Metro 3000 on page 3-24.

OPTera Metro 3500

Formerly Express GX.

See OPTera Metro 3000 on page 3-24.

optical interface circuit pack

Any supported circuit pack that has an optical interface (OC-3, OC-12, OC-48) installed in shelf slots eleven and twelve.

OS

operations system

Software that controls the management and execution of programs.

OSI

open systems interconnection

A seven-layer reference model that defines a structured protocol suite for data communication. A suite of communication protocols, network architectures, and network management standards produced by the International Organization for Standardization (ISO).

OS-NE

operations system - network element interface.

OSS

operations support system

A network management application providing record keeping tasks such as work orders, invoicing, and trouble reports.

Packet Edge circuit pack

The Packet Edge circuit pack works as a distributed switch and IEEE 802.1D bridge to connect Ethernet LANs on a high-speed SONET network. OPTera Metro 3500 network elements support the following Packet Edge circuit packs: 4x100BT, 4x100FX, and 2xGigE.

pass-through network element

An add/drop multiplexer that does not terminate a connection.

See also network element on page 3-21.

path

Path layer of SONET overhead is a logical connection between a point where an STS or VT is multiplexed to the point where it is demultiplexed.

path AIS

AIS inserted into the SONET path layers (STS path or VT path) to allow suppression of downstream alarms in the event of traffic-affecting failure detected at, or upstream of, the insertion point.

PEC

product engineering code

PDU

protocol data unit

performance monitoring

Statistics which convey information about performance on a given facility.

PID

password identifier

A confidential code used with several security and administration commands, to qualify the authorized system user to access the account specified by a user identifier (UID).

PINFET

positive-intrinsic-negative field-effect transistor

A transistor with a positive-intrinsic-negative (P intrinsic N) diode which converts photons to electrons. This transistor exhibits low gain and is used in less sensitive optical receivers.

PM

See performance monitoring on page 3-26.

POS

PPP over SONET

The use of PPP with SONET, which is a point-to-point circuit.

power module

The module in slots 1b or 1c of an OPTera Metro 3500 shelf. The module provides the required -48 V dc interface to power the shelf.

power module

The module in slots 1b or 1c of an OPTera Metro 3500 shelf. The module provides the required -48 V dc interface to power the shelf.

PPP

point-to-point protocol

PPP is a standard method of communicating over point-to-point links. PPP has three main components:

- A method for encapsulating multi-protocol datagrams.
- A Link Control Protocol (LCP) for establishing, configuring, and testing the data-link connection.
- A family of Network Control Protocols (NCPs) for establishing and configuring different network-layer protocols.

Preside

A suite of service management applications designed to deliver multi-vendor support and end-to-end connection management in real-time.

Preside Site Manager

See Site Manager on page 3-32.

protection channels

The redundant bandwidth allocated to transport the working traffic subsequent to a bridge affecting the working channels.

protection switching (1+1)

A protection switching scheme in which two equivalent channels carry the same traffic, but one is protection and one is working. The 1+1 protection switching scheme is non-revertive.

protection switching (1:N)

A protection switching scheme in which one standby protection channel protects failures on any of the N working channels (revertive switching).

protection switching (1:1)

A protection switching scheme in which one standby protection channel protects failures on one working channel.

provisioning

The assignment of a specific set of parameters to a network element.

Provisioning involves adding, deleting, or changing components and setting the values of their attributes.

PSC

protection switch controller

The PSC circuit pack controls DS1 equipment protection switching for all 84 DS1 ports and monitors DS1 status, including alarm conditions, and performance monitoring thresholds. The PSC houses all the relays that provide protection switching for DS1 ports 1 through 28. The PSC is also responsible for the provisioning of all DS1 mappers.

PSC-W

protection switch count, working line

For a working line, PSC-W is the number of times that service switched from the working line to the protection line, plus the number of times that service switched back to the working line.

PSC-P

protection switch count, protection line

For a protection line, PSC-P is the number of times that service switched from the working line to the protection line, plus the number of times service switched back to the working line.

PSD

protection switch duration

For a working line, PSD is the number of seconds that service was carried on the protection line. For a protection line, PSD is the number of seconds that the line was used to carry service. The PSD parameter is applicable only if the protection scheme is revertive.

PSX

protection switch extender

The PSX circuit pack houses all of the relays that perform DS1 equipment protection switching for DS1 ports 29 through 84.

PUPS

point-of-use power supply

The PUPS converts the -48 V dc central office power supply to the specific, regulated, direct current (dc) voltage levels required for the circuitry on a circuit pack.

PVC

permanent virtual circuit

A continuously available virtual path between remote applications and digital multiplex system (DMS) applications. The PVC eliminates the need to establish a circuit on a per call basis.

See also VC on page 3-38.

RAM

random access memory

Memory into which data can be written and from which data can be read. A solid state memory device used for transient memory stores. Information can be entered and retrieved from any storage position.

reach

The maximum distance a signal is carried.

revertive switch

A 1:N protection scheme where, after a wait-to-restore (WTR) period, the working channels that have requested protection switch back to the working channel provided that the working channel is fully functional.

RFI

remote fault indicator

A message sent out to the upstream network element reporting a fault on the downstream network.

ring

A configuration used for survivability in which the protection channel and working channel are routed in opposite directions in a closed-loop system. This configuration provides immunity to fiber cuts.

ring interworking

A network topology wherein two rings are connected at two points, and operate such that a failure at either of these two points will not cause loss of any traffic, except possibly the traffic dropped or inserted at the point of failure.

ring switching

Protection mechanism that applies to BLSR two-fiber rings. In a ring, when a tail-end NE detects a failure or receives a request to switch working channels, it switches all the working channels that are normally received from the direction of the failure to the protection channels away from the failure, and bridges the outgoing channels in the failure-affected direction to the protection channels away from the failure. Hence, a ring switch is a switch where the nodes adjacent to the failure move the traffic normally sent on the working channels, to the protection channels away from the failure. All nodes on the ring share the protection channels for ring switching.

ROM

read only memory

A solid state memory device that has information permanently written into the memory during manufacture.

route diversity

A configuration used for survivability in which the protection channel fibers and working channel fibers are routed through different paths in order to protect the traffic against cable cuts and equipment failures.

Rx

receive

The incoming direction of signal transmission; signals are carried to a network element from customer equipment.

SA

service-affecting

SASP

path severely errored frame/alarm indication signal second

A 1-second interval at the DS3 section layer that contains one or more out-of-frame events or alarm indication signals.

SDCC

SONET data communications channel

SONET defines two data communications channel: a section data communications channel and a line data communications channel. This term is sometimes referred to as a section data communications channel.

SEFSS

section severely errored frame second

A 1-second interval at the section layer that contains at least one out-of-frame event.

For more information, see 323-1059-510, Montype parameter definitions on page 1-51.

SESL

line severely errored second

For more information, see 323-1059-510, Montype parameter definitions on page 1-51.

SESP

path severely errored second

For more information, see 323-1059-510, Montype parameter definitions on page 1-51.

SESS

section severely errored second

For more information, see 323-1059-510, Montype parameter definitions on page 1-51.

SFP

small form-factor pluggable

Module that must be physically attached to the ports of a 2xGigE/FC-P2P circuit pack.

shelf processor

The shelf processor is the circuit pack that houses the CPU, which is the intelligence center of the OPTera Metro 3000 shelves.

The shelf processor provides shelf level control, handles all shelf communications, and runs the system software. System software resides in the shelf processor or network nonvolatile memory.

SID

source identifier

The name assigned to a network element. Each network element must have a SID for the user to direct commands to the network element.

Site Manager

A standalone, nodal management graphical user interface (GUI) that is installed on a PC, and is used to operate, administer, maintain, and provision optical networks.

SLM

single longitudinal mode laser, or single mode laser

An injection laser diode which has a single longitudinal mode.

SNMP

Simple Network Management Protocol

A transmission protocol defined for TCP/IP-based network management. SNMP is used to monitor IP gateways and their networks. It consists of three parts: structure of management information (SMI), Management Information Base (MIB), and the protocol itself. The SMI and MIB define and store the set of managed entities. SNMP conveys information to and from these entities.

SOC

span of control

The total network resources over which a particular network operator has control.

SOL

start of life

Initial period of the lifetime of a product.

SONET

synchronous optical network

A standard for optical transport formulated by the Exchange Carriers Standards Association (ECSA) for the American National Standards Institute (ANSI). The standard defines optical carrier (OC) levels and their electrically equivalent synchronous transport signals (STS).

A fiber optic communication network that: a) consists of fiber optic data links and nodes; b) makes use of synchronous transmission; c) operates with internal synchronism; and d) may operate in synchronism with other networks.

Span

The set of SONET lines between two adjacent nodes on a ring

squelching traffic

In a BLSR configuration, squelching is the act of replacing traffic by the appropriate path AIS to prevent misconnections. STS level squelching occurs only into and out of the protection channels.

SSM

synchronization-status message

SSM indicates the quality of the timing signals currently available to a network element. The timing sources that can be provisioned in a network element include external timing from a BITS, timing derived from SONET interfaces, and the internal clock of the network element.

A network element can select the better of the two timing signals provided by the primary and secondary timing sources provisioned by the user. The selection is based on the quality values carried in the SSM.

STBYH

hot standby

STP

spanning tree protocol

The protocol that MAC bridges use in exchanging information across local area networks, in order to compute the active topology of a bridged local area network in accordance with the spanning tree algorithm.

Stratum n clock

Timing sources for networks are often described in terms of stratum levels. The different stratum clock sources define different levels of accuracy.

STS-1

synchronous transport signal level 1

The basic signaling rate for a synchronous optical network transmission medium (SONET, 51.84 Mbit/s).

STS-nc

synchronous transport signal level <n> concatenated (where <n> is 3, 12, 24 or 48)

A SONET standard for transmission over OC-3, OC-12, OC-48 or OC-192 optical fiber.

An STS-nc signal consists of <n> number of concatenated STS-1 signals. An OPTera Metro 3000 network can be dedicated to the transport of STS-nc signals or can be used to transport both STS-nc and STS-1 signals.

STS-n

synchronous transport signal level n (where n is an integer from 1 through 192)

The signal obtained by multiplexing integer multiples (n) of STS-1 signals (base rate of 51.84 Mbit/s). The rate of the STS-n is n times 51.84 Mbit/s.

STS-1	51.84 Mbit/s
STS-3	155.52 Mbit/s
STS-12	622.08 Mbit/s
STS-48	2488.32 Mbit/s
STS-96	4976.64 Mbit/s
STS-192	9953.28 Mbit/s

subscriber section

Section from the switchover terminal board on the user premise side of the transmission equipment installed in a leased circuit service office to the demarcation point within the user premise.

STX-192 circuit pack

The STX-192 circuit pack is a fully non-blocking STS switch matrix and clocking module. The STX-192 has switching capability for 40 Gbit/s, supporting 10 Gbit/s links to the line slots 11 and 12 and up to 2.5 Gbit/s links to slots 3 through 10.

The OPTera Metro 3500 network element must be equipped with STX-192 circuit packs to support the following circuit packs:

- OC-12x4 STS interfaces
- OC-48 STS interfaces
- OC-192 interfaces

SVC

switched virtual circuit

A virtual connection that is established for the duration of a transmission. Special signalling packets that have unique bit streams but usually contain no data, are used to set up the connection.

See also VC on page 3-38.

switch completion time

The interval from the decision to switch to the completion of the bridge and switch operation at a switching node initiating the request.

switch mate

The mate path of the FromAID for protected connections.

The FromAID and the SWMATE make up the two paths for path selection. If you do not specify a SWMATE for a protected connection, the default is the optical interface circuit pack in the adjacent odd or even slot of the odd/even pair of slots.

switching node

A node that either sources a bridge request or receives a bridge request. A node that is in any of the pass-through states cannot be a switching node. A switching node also performs any necessary squelching to prevent misconnecting of traffic for STS-1 or higher rate paths.

switching to protection

The action of selecting traffic (at the tail-end) from the protection channels instead of the working channels.

tail-end

The tail-end is the optics unit or the NE where the line overhead is terminated. When a failure occurs on a line, the tail-end NE detects the failure and requests the bridge. For bidirectional switching, a node functions as the head-end for the outgoing line and as the tail-end for the incoming line on the failed span.

TARP

target identifier (TID) address resolution protocol

TBOS

telemetry byte-oriented serial

A function that provides a simple and reliable means of transmitting alarm surveillance and control data between monitoring and monitored equipment.

A standard protocol for communication of alarm information from network elements to an OSS.

TCP/IP

transmission control protocol/Internet protocol

Transmission control protocol/internet protocol (TCP/IP) is a networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems.

TE

terminal equipment

Equipment connected to the NT (network termination) which transmits and receives data.

terminal facilities

Telecommunications facilities (equipment, lines, and other electrical facilities) which are connected to one end of a leased circuit (wiring board or protector closest to the service provider line facilities). The place of installation is within the same premise (including corresponding facilities) or within the same building.

TID

target identifier

The TID is a non-confidential code to identify the network element being addressed.

TL1

Transaction Language 1

User interface for OPTera Metro 3000 network element used to operate, administer, maintain, and provision the network.

TOD

time of day

The time of day feature maintains synchronized real-time between OPTera Metro 3000 network elements. Network time can be provisioned such that it automatically adjusts for time zone offsets and daylight savings periods from the reference time.

transport

The action of conveying signals from one point to one or more other points in the network.

TransportNode

A group of synchronous optical network (SONET)-based network elements for long-haul, interoffice, and local applications.

tributary

The link between a network element and the customer. The lower rate signal input to a multiplexer for combination (multiplexing) with other low rate signals to form an aggregate higher rate signal.

tributary circuit pack

Any supported circuit pack that is installed in the shelf slots 3 through 10.

TSTF

test failed

Tx

transmit

The outgoing direction of signal transmission; signals are carried from a network element to customer premises equipment.

UASL

line unavailable second

The count of 1-second intervals at the line layer with 10 consecutive severely errored seconds.

UASP

path unavailable second

The count of 1-second intervals at the path layer with 10 consecutive severely errored seconds.

UEQ

unequipped

UID

user identifier

The user identifier (UID) is used with several security and administration commands. It is essential to have a UID in order to activate a user login session.

unidirectional switching

A switching scheme in which only the failed direction of traffic switches to protection.

UPC

user privilege code

The network element supports five user security levels called user privilege codes (UPC). The lowest security of the UPC is 1 and the highest is 5. The five UPC security levels provide varying level of access for task execution.

UPSR

unidirectional path-switched ring

In the UPSR, the ring consists of two fibers on each span, transmitting traffic in opposite directions, between adjacent nodes. Traffic entering the ring at any node is transmitted in both directions around the ring until it reaches its exit point. Each node on the ring is line terminating, such that the connection across the ring is a path layer connection. At the exit point, the path layer integrity information is examined for each of the two signals to select the best quality signal. All of the selectors default to a particular direction, such that under normal conditions, all traffic is routed around the ring in the same direction.

VC

virtual circuit

A facility provided by the network for transferring data between a logical channel from the calling DTE and a logical channel to the called DTE, and which emulates facilities provided by a physical connection. It is established only for the duration of the call, and it may share a physical circuit with other virtual circuits.

See also PVC on page 3-29, and SVC on page 3-34.

virtual concatenation

Allows a number of STS-1 or STS-3c payloads to be cross-connected to the GE/FC WAN port of a 2xGigE/FC-P2P circuit pack. When a WAN port is provisioned in virtual concatenation mode, then one cross connection is needed for every increment of STS1 or STS3c bandwidth.

virtual tributary

A signal designed for transporting and switching of sub-STS-1 payloads. For example, OPTera Metro 3000 network elements use VT1.5 (1.728 Mbit/s).

VOA

variable optical attenuator

A device that prevents overloading the optical receiver.

VT

See virtual concatenation on page 3-38.

VTX-48

VTX-48 circuit packs are equipped in slots 13 and 14 of the OPTera Metro 3500 shelf.

VTX-48 circuit packs provide monitoring and control for provisioning, cross-connect management, shelf timing generation, and synchronization messaging. The circuit packs manage synchronization and shelf bandwidth as separate entities.

VTX-48 equipment operates in 1+1 redundant mode to provide cross-connect and clock distribution functions for OPTera Metro 3500. It is always auto-provisioned and cannot be deleted. Only one of the two VTX-48 circuit packs can be taken out of service at a time.

VTX-48e

VTX-48 enhanced

VTX-48e circuit packs are equipped in slots 13 and 14 of the OPTera Metro 3500 shelf. The VTX-48e circuit pack supports the OC-12 line rate in slots 11 and 12.

VTX-48e circuit packs provide monitoring and control for provisioning, cross-connect management, shelf timing generation, and synchronization messaging. The circuit packs manage synchronization and shelf bandwidth as separate entities.

VTX-48e equipment operates in 1+1 redundant mode to provide cross-connect and clock distribution functions for OPTera Metro 3500. It is always auto provisioned and cannot be deleted. Only one of the two VTX-48e circuit packs can be taken out of service at a time.

WAN

wide area network

working channels

The channels over which working traffic is transported when there are no switch events. An APS system performs restoration for the working channels only.

working traffic

Traffic traversing a ring normally carried in the working channels, except in the event of a ring or span protection switch, in which case it is restored on the protection channels.

WRKG

working

WRKRX

working in the receive direction

WRKTX

working in the transmit directions

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