Lucent Technologies
Bell Labs Innovations

WaveStar® Subnetwork Management System (SNMS)

Terminology Guide

Release 6.0

190–224–144
Issue 1
October 2001

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Contents

About this information product

Purpose

The ***WaveStar Subnetwork Management System (SNMS) Terminology Guide*** provides users with a list of acronyms and abbreviations and a glossary of terms that are associated with the WaveStar SNMS product, its documentation, and its user training.

Reason for reissue

The ***WaveStar SNMS Terminology Guide*** has been issued to support Release 6.0 of the WaveStar SNMS product and documentation line.

Safety labels

The safety labels (symbols) that appear in some documents that are used to caution and warn users about equipment hazards, data corruption or loss, and/or bodily danger do not apply to this document.

Conventions used

The ***WaveStar SNMS Terminology Guide*** relies on the following conventions:

- Words that appear in ***italics*** are unique titles or references.
- Words that appear in **BOLD** are words, abbreviations, or acronyms that are being defined.

1 Abbreviations and Acronyms

Overview

Purpose This section of the ***WaveStar SNMS Terminology Guide*** provides WaveStar SNMS users with a comprehensive list of abbreviations and acronyms that is used throughout the set of WaveStar SNMS customer documents.

□

A

ABN abnormal (condition)

ABS absent

AC alternating current

ACO alarm cut off

ACT active

ADM Add/Drop Multiplexer

ADR Add/Drop Ring

AGNE Alarm Gateway Network Element

AID access identifier

AIP Alarm Issuing Point

AIS Alarm Indication Signal

AITS Acknowledged Information Transfer Service: Confirmed mode of operation of the LAPD protocol.

AMI Alternate Mark Inversion

ANSI American National Standards Institute

APD Avalanche PhotoDiode

APS Automatic Protection Switch

APSD Automatic Power Shutdown

ASAP Alarm Severity Assignment Profile

AS&C Alarm, Status, and Control

ASCII American Standard Code for Information Interchange

ASN.1 Abstract Syntax Notation 1

ATM Asynchronous Transfer Mode

AUTO automatic

AVAIL available

B

B3ZS Bipolar 3-Zero Substitution

B8ZS Bipolar 8-Zero Substitution

BCLAN Board Controller Local Area Network

BDFB Battery Distribution and Fuse Bay

BER bit error rate

BERT bit error rate test; bit error rate threshold

BISDN Broadband Integrated Services Digital Network

BITS Building Integrated Timing Supply

BLK blank

BLSR Bidirectional Line-Switched Ring

BOC Bell Operating Company

C

CAC Circuit Access Code

CCITT Comité Consultatif International Télégrafique & Téléphonique

CCS Common Channel Signaling

CCT Cross-Connection Type

CEPT Conférence Européenne des Administrations des Postes et des Télécommunications

CID circuit identifier

CILINK Communication Interface Link

CIT or CIT-PC craft interface terminal

CL clear

CLEI Common Language Equipment Identifier

CLLI Common Language Location Identifier

CM communications module; Configuration Management

CMIP Common Management Information Protocol. OSI standard protocol for OAM&P information exchange.

CMISE Common Management Information Service Element

CO central office

CORBA™ Common Object Request Brokered Architecture

COV central office video

CP circuit pack; customer premises

CPE customer premises equipment

CR critical (alarm)

CSMA/CD Carrier Sense Multiple Access with Collision Detection

CS&O Customer Support and Operations of Lucent Technologies

CSU Channel Service Unit

CTL control (circuit pack prefix)

CTS Customer Technical Support within Lucent Technologies

CV coding violation

D

DACS/DCS Digital Access Cross-Connect System

dB decibels

DC direct current

DCC data communications channel

DCE data communications equipment

DCN data communications network

DFI Domain Format Identifier

DIB Directory Information Base

DNI dual node interconnection

DPLL Digital Phase Locked Loop

DRAM dynamic random access memory

DRI Dual Ring Interworking

DRIP Dual Ring Interworking on Protection

DS0, DS1, DS3 Digital Signal Levels 0, 1, 3

DSA Directory Services Agent

DS-N Digital Signal, Level N

DS-NE Directory Service Network Element

DSX Digital Cross-Connect Frame

DTCU Distant Terminal Channel Unit

DTE data terminating equipment

DTMF Dual Tone Multifrequency

DWDM Dense Wavelength Division Multiplexing

E

EBER equivalent bit error rate

EC echo canceller

EC-1, EC-N Electrical Carrier, Levels 1 and N

ECC Embedded Control Channel

EDFA Erbium Doped Fiber Amplifier

E-end near ned

EEPROM Electrically Erasable Programmable Read-Only Memory

EF equipment fail

EIA Electronic Industries Association

EM Event Management

EMC Electromagnetic Compatibility

EMI electromagnetic interference

EMS Element Management System

EPROM Erasable Programmable Read-Only Memory

EPT event-per-time

EQ equipped

EQPT equipment

ES end system; errored seconds

ESD electrostatic discharge

ESF Extended Super Frame (DS1 signal format)

ETSI European Telecommunications Standards Institute

EVT event

EXM Extended Switching Module

F

FCC Federal Communications Commission

FDDI Fiber Distributed Data Interface

FE far end

FEBE far end block error

FEP front end processor

FEPROM flash EPROM

FERT far end receive failure

FIT failure in time

FR Frame Relay

FTAM File Transfer, Access, and Management protocol

FTP File Transfer Protocol

G

GB GigaBytes

Gb/s or Gbps Gigabits per second

GHz GigaHertz

GNE Gateway Network Element

GR geographic redundancy

GR-XXX General Requirement-XXX of Telcordia Technologies

GUI graphical user interface

H

HDLC High-Level Data Link Control

HP-UX Hewlett Packard UNIX Operating System

HS high speed

http Hypertext Transfer Protocol

HW hardware

Hz Hertz

I

IAF Intelligent Alarm Filtering

IAO LAN Intraoffice Local Area Network

ID identifier

IDL Interface Definition Language

IEC International Electrotechnical Commission

IEEE Institute of Electrical and Electronics Engineers

I/O iInput/output

INTFC interface

IP Internet Protocol

IS in service

IS-3 Interconnect Signal-3

ISDN Integrated Services Digital Network

ISM Intelligent Synchronous Multiplexer

ITCO Independent Telephone Company

ITM Integrated Transport Management

ITM-NM Integrated Transport Management Network Module

ITM-SC Integrated Transport Management Subnetwork Controller

ITU International Telecommunications Union

ITU-R International Telecommunications Union — Radio standardization sector. Formerly known as CCIR: Comité Consultatif International Radio; International Radio Consultative Committee.

ITU-T International Telecommunications Union — Telecommunication standardization sector. Formerly known as CCITT: Comité Consultatif International Télégrafique & Téléphonique; International Telegraph and Telephone Consultative Committee.

IXC Interexchange Carrier

K

Kbps Kilobits per second

L

LAN local area network

LATA local access and transport area

LBC Laser Bias Current

LBFC Laser Backface Currents

LBO Lightguide Build-Out; Line Build-Out

LBP LAN bridge port

LCN local communications network

LCT Large Capacity Terminal

LEC Local Exchange Carrier

LED Light-Emitting Diode

LEN local exchange node

LGX Lightguide Cross-Connect

LMP LAN management port

LNC Line Controller (SLM)

LNE logical network element

LOF loss of frame

LOP loss of pointer

LOS loss of signal

LPBK loopback

LS low speed

LSBB low-speed broadband; refers to 150-750 Mb/s signal rates

LTA Line Terminal Application (SLM)

LTE line terminating equipment

M

m Microns

µm Micrometer

MB MegaBytes

Mbps Megabits per second

MCOND maintenance condition

MD mediation device

MDS Metallic Digital Server

MDSCU Metallic Digital Server Channel Unit

MEM memory

MFA Management Functional Area

MIB Management Information Base

MIPS millions of instructions per second

MJ Major (alarm)

MML Human-Machine Language

MN minor (alarm)

MONE monitoring near-end test mode

MONF monitoring far-end test mode

MONFE monitoring far-end and near-end test mode

MS Multiplexer Section

ms millisecond

MTBF Mean Time Between Failures

MTBMA Mean Time Between Maintenance Activities

MTTR Mean Time To Repair

N

NA or N/A not applicable

NCC Network Communication Controller

NE network element

NEBS Network Equipment-Building System

NEM Network Element Manager

NIC network interface card

nm nanometer (10^{-9} meters)

NMA Network Monitoring and Analysis System

NMA-F Network Monitoring and Analysis-Facility

NMON not monitored

NMS Network Management System

NORM normal

NPPA Non-Preemptible Protection Access

NRZ Nonreturn to Zero

NSA Non-Service Affecting

NSAP Address Network Service Access Point Address (used in the OSI network layer 3)

NTF no trouble found

NTP Network Time Protocol

NVM non-volatile memory

O

O&M operation and maintenance

OA Optical Amplifier

OALAN Overhead Access Local Area Network

OAM&P operations, administration, maintenance, and provisioning

OC, OC-N Optical Carrier

OC-1 Optical Carrier, Level 1 Signal (51.84 Mb/s)

OC-3 Optical Carrier, Level 3 Signal (155.52 Mb/s)

OC-3c Optical Carrier, Level 3 Concatenated Signal (155.52 Mb/s)

OC-12 Optical Carrier, Level 12 Signal (622.08 Mb/s)

OC-48 Optical Carrier, Level 48 (2488.32 Mb/s) (2.5 Gb/s)

OC-192 Optical Carrier, Level 192 (9953.28 Mb/s) (10 Gb/s)

ODU Optical Demultiplexing Unit

OI Operations Interworking

OI Optical Interface (*WaveStar*™ ADM 16/1)

OILU Optical Line Interface Unit

OLS Optical Line System

OMU Optical Multiplexing Unit

OOF out of frame

OOS out of service

OPS/INE Operations System for Intelligent Network Elements

ORM Optical Remote Module

OS operations system

OSI Open Systems Interconnect

OSMINE Operations Systems Modifications for the Integration of Network Elements

OT Optical Translator

OTCTL Optical Translator Controller

OTPM Optical Translator Port Module

OTU Optical Translator Unit

OW orderwire

OXC optical cross-connect product

P

PAD packet assembler/disassembler

PCB printed circuit board

PCM Pulse Code Modulation

PDH Plesiochronous Digital Hierarchy

PM Performance Monitoring; preventative maintenance

PMD Polarization Mode Dispersion

POA point of attachment

POH path overhead

POP point of presence

POTS plain old telephone service

PRC Primary Reference Clock

PRI primary

PROTN protection

PROV provisioned

PSDN public switched data network

PSN packet switched petwork

PSTN public switched telephone network

PTE path terminating equipment

PTY parity

PVC permanent virtual circuit

PWR power

PWR ON power on

Q

QOS quality of service

QOTU Quad Optical Translator Unit

QRSS Quasi-Random Signal Source

R

RA registration agent

RAM random access memory

RCV receive

RCVR receiver

RDI remote defect indication

RF radio frequency

RFI remote failure indication

RM Registration Manager

RNE Remote Network Element

RPP Reliability Prediction Procedure

RT remote terminal

RTAC Regional Technical Assistance Center

RTRV retrieve

RTV Remote Terminal Video

RZ Return to Zero

S

SA service affecting

SCSI® Small Comuter Systems Interface

SDH Synchronous Digital Hierarchy

SDS Standard Directory Service based on ANSI recommendation T1.245

SEC secondary

SES severely errored seconds

SF super frame (DS1 signal format)

SLN A 12-character circuit pack serial number

SM single-mode fiber

SNCP subnetwork connection protection

SNR Signal-to-Noise Ratio

SOH Section Overhead

SONET Synchronous Optical Network

SPE Synchronous Payload Envelope

STBY standby

STM Synchronous Transfer Mode

STS Synchronous Transport Signal

STS-1, STS-N Synchronous Transport Signal, Levels 1 and N

STS-3 Synchronous Transport, Level 3

STS-3c Synchronous Transport, Level 3 Concatenated Signal

STS-12 Synchronous Transport, Level 12

STS-12c Synchronous Transport, Level 12 Concatenated Signal

SU Supervisory Unit (RR)

SVC Switched Virtual Circuit

SYNC synchronized

SWIF switching interface (as in SWIF circuit pack)

T

TA Technical Advisory

TABS Telemetry Asynchronous Byte Serial (Protocol)

TARP Target Identifiers Address Resolution Protocol

TBD to be determined

TBOS Telemetry Byte-Oriented Serial (Protocol)

TCA Threshold-Crossing Alert

TCP Transmission Control Protocol

TCP/IP Transmission Control Protocol/Internet Protocol

TCM Trellis Code Modulation

TDEV Timing Deviation

TDM Time Division Multiplexing

THz TerraHertz (10^{12} Hz)

TID target identifier

TIRKS Trunks Integrated Records Keeping System

TL1 Transaction Language 1

TMF TeleManagement ForumTLMTelemetry Circuit Pack

TR technical requirement

TSA time slot assignment

TSI time slot interchange

TSO Technical Support Organization

TU tributary unit

U

UAS unavailable seconds

UITS Unacknowledged Information Transfer Service. Unconfirmed mode of LAPD operation.

UNEQ path unequipped

UNI User-to-Network Interface

UPSR Unidirectional Path-Switched Ring

URL universal resource locator

USAM User-Settable Alarm Monitoring

V

V volts

VAC volts alternating current

VC virtual container

VCG Virtual Connection Group

VDC volts direct current

VF voice frequency

VLAN virtual LAN

VM violation monitor

VMR violation, monitor, and Rremoval

VRT Virtual Remote Terminal

VT Virtual Tributary

VT1.5 Virtual Tributary, Level 1.5

VT-G Virtual Tributary Group

W

WAD Wavelength Add/Drop

WAN wide area network

***WaveStar* OLS 40G/80G/400G** WaveStar Optical Line System 40G/80G/400G

***WaveStar* SNMS** WaveStar SubNetwork Management System (formely known as ITM SNC [Integrated Transport Management SubNetwork Controller])

WBS Wideband Shelf

WDCS Wideband Digital Cross-Connect System

WDM Wavelength Division Multiplexing

WRT Wait-to-Restore Time

WS workstation

WTR Wait-to-Restore

WYSIWYG What you see, is what you get.

□

2 Glossary

Overview

Purpose This section of the ***WaveStar SNMS Terminology Guide*** provides WaveStar SNMS users with a comprehensive glossary of terms that is used throughout the set of WaveStar SNMS customer documents.

□

Numerics

0+1 Line Operation An unprotected operation. The connection between NEs has one bidirectional line (no protection line).

1+1 Line Protection A protection architecture in which the transmitting equipment transmits a valid signal on both the working and protection lines. The receiving equipment monitors both lines. Based on performance criteria and OS control, the receiving equipment chooses one line as the active line and designates the other as the standby line.

1xN Equipment Protection N number of circuit pack/port units protected by one circuit pack or port unit. When a protection switch occurs, the working signals are routed from the failed pack to the protection pack. When the fault clears, the signals revert to the working port unit.

1xN Multi-Cast Cross-Connection Consists of N one-way cross-connections from an input tributary to N output tributaries. 1:N Multi-cast (for N>2) is most commonly associated with providing video services.

10BaseFL A 10 megabit-per-second (Mbps) baseband Ethernet specification using fiber-optic cable for intermediate hubs and workgroups.

10BaseT A 10 megabit-per-second (Mbps) baseband local area network (LAN) running over twisted copper cable.

100BaseT A 100 megabit-per-second (Mbps) baseband local area network (LAN) running over twisted copper cable; aka ***Fast Ethernet***.

A

absent (ABS) Used to indicate that a given circuit pack is not installed.

access identifier (AID) A technical specification for explicitly naming entities (both physical and logical) of an NE using a grammar comprised of ASCII text, keywords, and grammar rules.

active (ACT) A state that indicates that a circuit pack or module is in-service and is currently providing service functions.

active path The path that is currently carrying the service in a circuit that is protected at the path level.

Add/Drop Multiplexer (ADM) A synchronous NE that can combine signals of different rates and have those signals added to or dropped from the stream.

aggregate A user-defined grouping of NEs. It most commonly consists of NEs located in a central office (CO) and the subnetworks to which they belong.

alarm A visible or audible signal indicating that an equipment failure or significant event/condition has occurred.

Alarm Correlation The search for a directly-reported alarm that can account for a given symptomatic condition.

Alarm Cut-Off (ACO) A button on the user panel used to silence audible alarms.

Alarm Cut-Off and Test (ACO/TST) The name of a push button on the user panel used to silence audible alarms.

Alarm Indication Signal (AIS) A code transmitted downstream in a digital network that indicates that an upstream failure has been detected and alarmed if the upstream alarm has not been suppressed.

alarm severity An attribute defining the priority of the alarm message. The way alarms are processed depends on the severity.

alarm suppression The selective removal of alarm messages from being forwarded to the GUI or to network management layer OSs.

alarm throttling A feature that automatically or manually suppresses autonomous messages that are not priority alarms.

Alternate Mark Inversion (AMI) A line code that employs a ternary signal to convert binary digits, in which successive binary ones are represented by signal elements that are normally of alternative positive and negative polarity but equal in amplitude and in which binary zeros are represented by signal elements that have zero amplitude.

American Standard Code for Information Interchange (ASCII) A standard 7-bit code that represents letters, numbers, punctuation marks, and special characters in the interchange of data among computing and communications equipment.

association A logical connection between manager and agent

through which management information can be exchanged.

asynchronous The essential characteristic of time-scales or signals such that their corresponding significant instants do not necessarily occur at the same average rate.

Asynchronous Transfer Mode (ATM) A high-speed transmission technology characterized by high bandwidth and low delay. It utilizes a packet switching and multiplexing technique which allocates bandwidth on demand.

attribute Alarm indication level: critical, major, minor, or no alarm.

autolock Action taken by the system in the event of circuit pack failure/trouble. System switches to protection and prevents a return to the working circuit pack even if the trouble clears. Multiple protection switches on a circuit pack during a short period of time cause the system to autolock the pack.

automatic (AUTO) One possible state of a port or slot. When a port is in the AUTO state and a good signal is detected, the port automatically enters the IS (in-service) state. When a slot is in the AUTO state and a circuit pack is detected, the slot automatically enters the EQ (equipped) state.

Automatic Protection Switch A protection switch that occurs automatically in response to an automatically detected fault condition.

Autonomous Message A message transmitted from the controlled NE to the ITM-SC which was not a response to an ITM-SC originated command.

B

backup The backup and restoration features provide the capability to recover from loss of NE data because of such factors as human error, power failure, NE design flaws, and software bugs.

bandwidth The difference in Hz between the highest and lowest frequencies in a transmission channel. The data rate that can be carried by a given communications circuit.

baud rate Transmission rate of data (bits per second) on a network link.

bidirectional line A transmission path consisting of two fibers

that handle traffic in both the transmit and receive directions.

Bidirectional Line-Switched Ring (BLSR) A bidirectional ring in which protection switching is accomplished by switching working traffic into protection time slots in the line going in the opposite direction around the ring.

Bidirectional Ring A ring in which both directions of traffic between any two nodes travel through the same NEs (although in opposite directions).

Bidirectional Switch Protection switching performed in both the transmit and receive directions.

Bipolar 3-Zero Substitution (B3ZS) A line coding technique that replaces three consecutive zeros with a bit sequence having special characteristics accomplishing two objectives: First, this bit sequence accommodates the ones density requirements for digital T3 carrier; Second, the sequence is recognizable at the destination (due to deliberate bipolar violations) and is removed to produce the original signal.

Bipolar 8-Zero Substitution (B8ZS) A line coding technique that replaces eight consecutive zeros with a bit sequence having special characteristics accomplishing two objectives: First, this bit sequence accommodates the ones density requirements for digital T1 carrier; Second, the sequence is recognizable at the destination (due to deliberate bipolar violations) and is removed to produce the original signal.

bit The smallest unit of information in a computer, with a value of either 0 or 1.

bit error rate (BER) The ratio of error bits received to the total number of bits transmitted.

bit error rate test (BERT) To measure the quality of data transmission, a known pattern of bits is transmitted, and errors received are counted to compute the BER. The BER is the ratio of received bits that are in error, relative to the number of bits received. The BER is typically expressed in a power of 10.

bit error rate threshold (BERT) The point at which an alarm is issued for bit errors.

Bit Interleaved Parity-N (BIP-N) A method of error monitoring over a specified number of bits (BIP-3 or BIP-8).

blank (BLK) The status of a circuit pack slot that contains a bus extender (blank) circuit pack.

Board Controller Local Area Network (BCLAN) The internal local area network that provides communications between the line and board controllers on the circuit packs associated with a high-speed line.

Bridge Cross-Connection The setting up of a cross-connection leg with the same input tributary as that of an existing cross-connection leg. This forms a 1:2 bridge from an input tributary to two output tributaries.

broadband communication Voice, data, and/or video communications at greater than 2 Mb/s rates.

byte Refers to a group of eight consecutive binary digits.

C

C-bit A framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3. This format provides for enhanced performance monitoring of both near-end and far-end entities.

cell relay Fixed length cells. For example, ATM with 53 octets.

central office (CO) A building where common carriers terminate customer circuits.

channel A sub-unit of transmission capacity within a defined higher level of transmission capacity.

Channel State Provisioning A feature that allows a user to suppress reporting of alarms and events during provisioning by supporting multiple states (automatic, in-service, and not monitored) for VT1.5 and STS-1 channels.

circuit A set of transmission channels through one or more NEs that provides transmission of signals between two points, to support a single communications path.

Clear Channel (CC) A digital circuit where no framing or control bits are required, thus making the full bandwidth available for communications.

client Computer in a computer network that generally offers a user interface to a server.

Closed Ring Network A network formed of a ring-shaped

configuration of NEs. Each NE connects to two others, one on each side.

coding violation (CV) A performance monitoring parameter indicating bipolar violations of the signal have occurred.

collocated System elements that are located in the same location.

command group An administrator-defined group that defines commands to which a user has access.

Common Language Equipment Identifier (CLEI) ***As in CLEI code.*** A text/barcode label assigned by Telcordia Technologies to identify telecommunications equipment in a uniform, feature oriented language. This text/barcode label resides on the front of all equipment installed in RBOC facilities. ***See*** *Telcordia Technologies,,* GR-485-CORE for more information.

Common Language Location Identifier (CLLI) Code Pronounced ***silly.*** An alphanumeric code of up to 38 characters developed by Telcordia Technologies as a method of identifying physical locations and equipment, such as buildings, central offices, poles, and antennae. In addition, telephone companies use CLLI codes to identify and order private lines, and to trap and trace annoying or threatening telephone calls.

Common Management Information Protocol (CMIP) The protocol used for exchanging network management information in OSI networks. It is an ITU-TSS standard for the message formats and procedures used to exchange management information in order to operate, administer, maintain, and provision a network. The information can be exchanged between two management stations (which is typical) or between an application and a management station. CMIP was designed for OSI networks; however, it is transport independent.

Common Management Information Service Element (CMISE) A wireless telecommunications term. The functionality provided by Common Management Information Protocol (CMIP) in transporting network management information.

Common Object Request Brokered Architecture (*CORBA*™) An architecture and specification for creating, distributing, and managing distributed program objects in a network. It allows programs at different locations that are developed by different vendors to communicate in a network.

Compact Disk—Read-Only Memory (CD-ROM) A format and system for recording, storing, and retrieving electronic information on a compact disk that is read using an optical drive. A CD-ROM player or drive does not allow writing to the disk.

concatenation A SONET/SDH term. A mechanism to allocate contiguous bandwidth for the transport of a payload associated with a super-rate service. The set of bits in the payload is treated as separate bits or bytes or time slots. The payload, therefore, is accepted, multiplexed, switched, transported, and delivered as a single, contiguous block of payload data.

Consultative Committee for the International Telephone and Telegraph (CCITT) International Telephone and Telegraph Consultative Committee—An international advisory committee under United Nations' sponsorship that has composed and recommended for adoption worldwide standards for international communications. Recently changed to the International Telecommunications Union Telecommunications Standards Sector (ITU-TSS).

co-resident A hardware configuration where two applications can be active at the same time independently on the same hardware and software platform without interfering with each others functioning.

correlation A process where related hard failure alarms are identified.

craft interface terminal (CIT) The user interface terminal used by craft personnel to communicate with an NE.

critical (CR) An alarm that indicates a severe, service-affecting condition.

Cross-Connection Path-level connections between input and output tributaries or specific ports within a single NE. Cross-connections are made in a consistent way even though there are various types of ports and various types of port protection. Cross-Connections are reconfigurable interconnections between tributaries of transmission interfaces.

crosstalk An unwanted signal introduced into one transmission line from another.

current value The value currently assigned to a provisionable parameter.

cut-through A capability that allows a user to utilize an NE's native command set (CIT or TL1 as appropriate) to communicate with NEs in the ITM SNC domain.

D

data A collection of system parameters and their associated values.

database administrator A user who administers the database of the application.

data communications channel (DCC) The embedded overhead communications channel in the synchronous line, used for end-to-end communications and maintenance. The DCC carries alarm, control, and status information between NEs in a synchronous network. Refers to the 192 Kb/s RS data channel byte D1 through D3, or the 576 Kb/s MS data channel (bytes D4 through D12) in the overhead section of the SONET frame format.

data communications equipment (DCE) The equipment that provides signal conversion and coding between the data terminating equipment (DTE) and the line. The DCE may be separate equipment or an integral part of the DTE or of intermediate equipment. A DCE may perform other functions usually performed at the network end of the line.

data terminating equipment (DTE) The equipment that originates data for transmission and accepts transmitted data.

DDM-1000 Lucent Technologies' Dual DS3 Multiplexer — A digital multiplexer that multiplexes DS1, DS1C, or DS2 signals into a DS3 signal or a 90 Mb/s or 180 Mb/s optical signal.

DDM-2000 Lucent Technologies SONET-ready network multiplexer that can function as a lightwave terminal. It is designed primarily for loop feeder and interoffice applications that work in existing asynchronous as well as the emerging SONET networks. This equipment multiplexes DS1, DS3, or EC-1 inputs into EC-1, OC-1, OC-3, or OC-12 outputs.

default An operation or value that the system or application assumes, unless a user makes an explicit choice.

default provisioning The parameter values that are preprogrammed as shipped from the factory.

defect A limited interruption of the ability of an item to perform

a required function. It may or may not lead to maintenance action depending on the results of additional analysis.

demultiplexer A device that splits a combined signal into individual signals at the receiver end of transmission.

demultiplexing A process applied to a multiplexed signal for recovering signals combined within it and for restoring the distinct individual channels of these signals.

Dense Wavelength Division Multiplexing (DWDM) Transmitting two or more signals of different wavelengths simultaneously over a single fiber.

deprovisioning The inverse order of provisioning. To manually remove/delete a parameter that has (or parameters that have) previously been provisioned.

Digital Cross-Connect Panel (DSX) A panel designed to interconnect equipment that operates at a designated rate. For example, a DSX-3 interconnects equipment operating at the DS3 rate.

Digital Link A transmission span such as a point-to-point 2 Mb/s, 34 Mb/s, 140 Mb/s, VC12, VC3 or VC4 link between controlled NEs. The channels within a digital link are insignificant.

digital multiplexer Equipment that combines by time-division multiplexing several digital signals into a single composite digital signal.

Digital Signal Levels 0, 1, 3 (DS0, DS1, DS3) An ANSI-defined signal or service level corresponding to the following: DS0 is 64 Kb/s, DS1 is 1.544 Mb/s (equivalent to T1), and DS3 is 44.736 Mb/s (equivalent to 28 T1 channels or T3).

directory name An ASCII string that fully specifies the path and the name of the target directory where the generic to be downloaded, the database to be restored, or the database to be backed up is to be found.

Directory Service Network Element (DSNE) A designated Network Element that is responsible for administering a database that maps Network Elements names (node names) to addresses (node Id). There can be one DSNE per (sub)network.

Directory Service Network Element (DSNE) A designated NE

that is responsible for administering a database that maps NE names (TIDs) to addresses [NSAPs (network service access points)] in an OSI subnetwork. One DSNE can exist per ring. A DSNE can also be a GNE.

disk mirroring A technique in which data is written simultaneously to two identical hard disks using the same hard disk controller. Disk mirroring is used to protect the information on hard disk drives.

dispersion Time-broadening of a transmitted light pulse.

Dispersion Shifted Optical Fiber 1330/1550 nm minimum dispersion wavelength.

divergence When there is unequal amplification of incoming wavelengths, the result is a power divergence between wavelengths.

doping The addition of impurities to a substance in order to attain desired properties.

downstream At or towards the destination of the considered transmission stream, for example, looking in the same direction of transmission.

double click With a MAC or IBM-compatible PC, the user's action of double clicking one of the buttons on the connected mouse, which causes the execution of an action, such as launching a new program.

drop and continue A circuit configuration that provides redundant signal appearances at the outputs of two NEs in a ring. Can be used for Dual Ring Interworking (DRI) and for video distribution applications.

drop-down menu A menu that is displayed from a menu bar.

DS1 signal Signal with a data rate of 1.544 Mb/s.

DS3 format Specifies the line format of a DS3 interface port, such as M13 or C-bit parity.

DS3 idle signal A signal that can be applied to any output port that is not cross-connected to an input port. This signal lets downstream NEs know that the facility is operating normally even though it is not sending a normal DS3 signal.

DS3 signal A logical or electrical B3ZS signal with a data rate

of 44.736 Mb/s.

DSX-1, 2, 3 Digital cross-connect used to interconnect equipment, provide patch capability, and provide test access at the DS1, DS2, or DS3 level.

Dual Ring Interworking (DRI) A topology in which two rings are interconnected at two nodes on each ring and operate so that inter-ring traffic is not lost in the event of a node or link failure at an interconnecting point.

E

Electrical Carrier, Level 1 (EC-1) An electrical interface signal at the SONET rate of STS-1.

Electromagnetic Compatibility (EMC) A measure of equipment tolerance to external electromagnetic fields.

electromagnetic interference (EMI) High-energy, electrically induced magnetic fields that cause data corruption in cables passing through the fields.

Electronic Industries Association (EIA) A trade association of the electronic industry that establishes electrical and functional standards.

electrostatic discharge (ESD) Static electrical energy potentially harmful to circuit packs and humans.

entity A specific piece of hardware (usually a circuit pack, slot, or module) that has been assigned a name recognized by the system.

entity identifier The name the system uses to refer to a circuit pack, memory device, or communications link.

equipped (EQ) Status of a circuit pack or interface module that is in the system database and physically in the frame, but not yet provisioned.

equivalent bit error ratio (EBER) The calculated average bit error rate over a data stream.

Erbium A soft rare earth element used in metallurgy and nuclear research.

Erbium Doped Fiber Amplifier (EDFA) An amplifier that performs by having a light signal pass through a section of erbium-doped fiber and using the laser pump diode to amplify the

signal.

errored seconds (ES) A performance monitoring parameter. ES ***type A*** is a second with exactly one error; ES ***type B*** is a second with more than one and less than the number of errors in a severely errored second for the given signal. ES by itself means the sum of the type A and type B ESs.

establish A user initiated command, at the WaveStar CIT, to create an entity and its associated attributes in the absence of certain hardware.

Ethernet The most widely-installed local area network (LAN) technology, an Ethernet LAN typically uses coaxial cable or special grades of twisted pair wires. The most commonly installed Ethernet systems are called 10BASE-T and provide transmission speeds up to 10 Mbps.

event A significant change. Events in controlled NEs include signal failures, equipment failures, signals exceeding thresholds, and protection switch activity. When an event occurs in a controlled NE, the controlled NE will generate an alarm or status message and send it to the management system.

event driven A required characteristic of NE software system: NEs are reactive systems, primarily viewed as systems that wait for and then handle events. Events are provided by the external interface packages, the hardware resource packages, and also by the software itself.

externally timed An operating condition of a clock in which it is locked to an external reference and is using time constants that are altered to quickly bring the local oscillator's frequency into approximate agreement with the synchronization reference frequency.

extra traffic Unprotected traffic that is carried over protection channels when their capacity is not used for the protection of working traffic.

F

facility A one- or two-way circuit that carries a transmission signal. Or, the equipment and services that make up a telecommunications system. ***Facilities*** can include, but are not limited to, offices, factories, and/or buildings, along with the actual telephone or data line.

failures in time (FIT) Circuit pack failure rates per 10^9 hours as calculated using the method described in *Reliability Prediction Procedure for Electronic Equipment*, Telcordia Technologies Method I, Issue 5, September 1995.

far end (FE) Any other NE in a maintenance subnetwork other than the one the user is at or working on. Also called remote.

far-end block error (FEBE) An indication returned to the transmitting node that an errored block has been detected at the receiving node. A block is a specified grouping of bits.

ear-end receive failure (FERF) An indication returned to a transmitting NE that the receiving NE has detected an incoming section failure. Also known as RDI.

fast start mode A temporary clock mode in which the clock acquires phase-lock quickly before changing to normal mode. The system clock is expected to operate in this mode temporarily, as determined by the hardware design, clock stratum level, and other internal clock parameters before it transfers to normal mode.

fault Term used when a circuit pack has a hard (not temporary) fault and cannot perform its normal function.

Fault Management Collecting, processing, and forwarding of autonomous messages from NEs.

Fiber Distributed Data Interface (FDDI) Fiber interface that connects computers and distributes data among them.

File Transfer Protocol (FTP) A protocol used to transfer files between network hosts. It is encapsulated by a TCP connection, and is the reliable analog to Trivial File Transfer Protocol (TFTP).

firewall A combination of hardware and software that limits the exposure of a computer or group of computers to external intrusion.

flash EPROM A technology that combines the nonvolatility of EPROM with the in-circuit reprogrammability of EEPROM (electrically-erasable PROM).

Folded Rings Folded (collapsed) rings are rings without fiber diversity. The terminology derives from the image of folding a ring into a linear segment.

forced Term used when a circuit pack (either working or protection) has been locked into a service-providing state by user command.

frame The smallest block of digital data being transmitted.

Frame Relay (FR) A form of packet switching that relies on high-quality phone lines to minimize errors. It is very good at handling high-speed, bursty data over wide area networks. The frames are variable lengths and error checking is done at the end points.

framework An assembly of equipment units capable of housing shelves, such as a bay framework.

free funning The operating condition of a clock in which its local oscillator is not locked to an internal synchronization reference and is not using any storage techniques to sustain its accuracy.

FT-2000 ADR Lucent Technologies' OC-48 rate Add/Drop Rings lightwave Terminal for 2-fiber BLSRs. It is designed primarily for interoffice applications. It supports adds, drop, and through connections for DS3/EC-1, OC-3, IS-3, and OC-12.

G

Gateway Network Element (GNE) An NE that passes information between other NEs and management systems through a data communication network; an NE that provides a means of communication between an OS and remote NEs over the SONET DCC.

In a primary/secondary GNE pair:

- The active GNE is the GNE (primary or secondary) that is currently serving as the GNE for the subnetwork.
- The primary GNE is the first GNE associated with a subnetwork that initially serves as the GNE for the subnetwork.
- The secondary GNE is the second GNE that is associated with the primary GNE for a subnetwork, and can take over communications in the event there is a failure in the communications via the primary GNE.
- The standby GNE is the GNE (primary or secondary) that is currently serving as the backup GNE for the subnetwork in the event there is a failure in communications via the active GNE.

Giga Prefix meaning one billion (1,000,000,000), which is one thousand million.

Gigabit (Gb) A measure of computer data storage capacity that is roughly one billion bits.

Gigabits per second (Gbps) A unit of transmission rate, equal to one billion bits per second.

GigaByte (GB) A measure of computer data storage capacity that is roughly one billion bytes.

graphical user interface (GUI) A graphics-based software interface to computer systems that allows the user to ***see*** pictorial representations and menus of operations and files.

H

hard failure An unrecoverable nonsymptomatic (primary) failure that causes signal impairment or interferes with critical network functions, such as DCC operation.

Hertz (Hz) A unit of frequency of one cycle per second.

High Level Data Link Control (HDLC) OSI reference model datalink layer protocol.

HP® An abbreviation for and a registered trademark of the *Hewlett-Packard*® Company.

Holdover mode An operating condition of a clock in which its local oscillator is not locked to an external reference but is using storage techniques to maintain its accuracy with respect to the last known frequency comparison with a synchronization reference.

host The host is an HP 9000/800 series platform running HP-UX.

hot standby A circuit pack ready for fast, automatic placement into operation to replace an active circuit pack. It has the same signal as the service going through it, so that choice is all that is required.

hub A component that serves as a common termination point for network equipment.

Human Machine Language (MML) A standard language developed by the ITU for describing the interaction between humans and dumb terminals.

HyperText Transfer Protocol (http) The actual protocol used by

the web server and the client browser to communicate over the Internet.

I

idle An output port not cross-connected to an input port.

Idle Code A signal transmitted downstream automatically from an idle output port. It can also be transmitted downstream by a manual command from a cross-connected output port.

insert To physically insert a circuit pack into a slot, thus causing a system initiated restoration of an entity into service and/or creation of an entity and associated attributes.

in service (IS) A memory administrative state for ports. IS refers to a port that is fully monitored and alarmed.

Integrated Transport Management Network Module (ITM NM) Lucent Technologies' integrated network management system that provides a broad end-to-end view of the SONET network.

Integrated Transport Management SubNetwork Controller (ITM SNC) Lucent Technologies' SONET element management layer system that provides fault, configuration, and security functions through the use of a GUI.

Intelligent Alarm Filtering The filtering of symptomatic alarms and events that are associated with a reported root-cause or symptomatic condition.

Intelligent Synchronous Multiplexer (ISM) A network multiplexer that is designed to flexibly multiplex plesiochronous and STM-1 tributary port signals into STM-1 or STM-4 line port signals.

Interconnect Signal-3 (IS-3) The logical equivalent to an OC-3 signal that uses a proprietary interface that allows short-range operation at a lower cost than an OC-3.

Interface Capacity The total number of STS-1 equivalents (bidirectional) tributaries in all transmission interfaces with which a given transmission interface shelf can be equipped at one time. The interface capacity varies with equipage.

Interface Definition Language (IDL) Generic term for a language that allows a program or object written in one language

to communicate with another program written in an unknown language.

interLATA Circuits that cross outside the LATA and to an interexchange carrier.

intraLATA Circuits with both endpoints within the LATA.

Internet Protocol (IP) A routing and connectionless delivery protocol, originally developed by the Department of Defense to support interworking of dissimilar computers across a network, that works in conjunction with Transmission Control Protocol (TCP) and is usually identified as TCP/IP. It is a connectionless protocol that operates at the network layer (layer 3) of the Open Systems Interconnection (OSI) model.

internetworking Communication between two networks or two types of networks or end equipment.

J

Java™ A programming language invented in 1995 by Sun Microsystems, which is designed for use in the distributed environment of the Internet. The Java language can be used to create complete applications that can run on a single computer or be distributed among servers and clients in a network.

jitter Short term variations of amplitude and frequency components of a digital signal from their ideal position in time.

K

Kilobits (Kb) A measure of computer data storage capacity. A kilobit is roughly a thousand bits.

Kilobits per second (Kbps) A measure of bandwidth on a digital data transmission medium, such as optical fiber.

L

Lead Time The time interval between placement of a product order and receipt of the product.

legacy equipment/legacy system Any piece of hardware or software that has been handed down or been around for a while.

Lightguide Build-Out (LBO) An attenuating (signal-reducing) element used to keep an optical output signal strength within desired limits.

line A transmission medium, together with the associated equipment, required to provide the means of transporting

information between two consecutive NEs. One NE originates the line signal; the other terminates it.

Line Build Out (LBO) An equalizer network that guarantees the proper signal level and shape at the DSX panel.

Line Controller Local Area Network (LCLAN) The internal local area network that provides communications between the controlled circuit packs.

Line Protection The optical interfaces can be protected by line protection. Line protection switching protects against failures of line facilities, including the interfaces at both ends of a line, the optical fibers, and any equipment between the two ends. Line protection includes protection of equipment failures.

line timing A type of timing that results when an NE derives its timing from an incoming OC-N signal.

link The mapping between in-ports and out-ports. It specifies how components are connected to one another.

literal character A letter, digit, or symbol that is entered in a command. The first hyphen in UNIT-{1-64} is a literal character; the braces and the second hyphen are not literal characters.

local area network (LAN) A communications network that covers a limited geographic area, is privately owned and user administered, is mostly used for internal transfer of information within a business, is normally contained within a single building or adjacent group of buildings, and transmits data at a very rapid speed.

location An identifier for a specific circuit pack, interface module, interface port, or communications link.

locked mode A clock mode in which the system timing is locked to an external clocking reference.

Lockout of Protection The WaveStar CIT command that prevents the system from switching traffic to the protection line from a working line. If the protection line is active when a `Lockout of Protection` command is entered, the working line is selected. The protection line is then locked from any Automatic, Manual, or Forced protection switches.

Lockout State A state for each working or protection circuit pack that includes the following two permitted states: ***none***,

meaning lockout is not set for the circuit pack ***set***, meaning the circuit pack has been locked out. The values (none and set) are taken independently for each working or protection circuit pack.

log in The process of identifying and authenticating oneself to a computer system.

log off To enter the needed keystrokes to terminate an on-line session with a computer.

log on To enter the needed keystrokes to start an on-line session with a computer.

loopback Type of diagnostic test used to compare an original transmitted signal with the resulting received signal. A loopback is established when the received optical or electrical external transmission signal is sent from a port or tributary input directly back toward the output.

loop timing A special case of line timing that applies to NEs that have only one OC-N/STM-N interface. For example, terminating nodes in a linear network are loop timed.

loss budget Loss (in dB) of optical power due to the span transmission medium (includes fiber loss and splice losses).

loss offFrame (LOF) A failure to synchronize to an incoming signal.

loss of pointer (LOP) A failure to extract good data from a signal payload.

loss of signal (LOS) The complete absence of an incoming signal.

M

M23-Format A standard framing format used for DS3 signals produced by multiplexing 28 DS1s into a DS3 (sometimes referred to as M13 format, without C-bit parity).

Management Functional Area (MFA) A category of service provided by the Network Management system, such as Fault Management, Configuration Management, Performance Management, or Security Management.

major Indicates a service-affecting failure, main or unit controller failure, or power supply failure.

maintenance condition An equipment state in which some

normal service functions are suspended, either because of a problem or to perform special functions (copy memory) that cannot be performed while normal service is being provided.

Management Connection Identifies the type of routing used (STATIC or DYNAMIC), and if STATIC is selected allows the gateway network element to be identified.

Management Information Base (MIB) The database in the Network Element and contains the configuration data of the Network Element.

Manual Switch State A protection group shall enter the Manual Switch State upon the initiation and successful completion of the Manual Switch command. The protection group leaves the Manual Switch state by means of the Clear or Forced Switch commands. While in the Manual Switch state the system may switch the active unit automatically if required for protection switching.

mapping The logical association of one set of values, such as addresses on one network, with quantities or values of another set, such as devices or addresses on another network.

mediation device (MD) A device that allows for exchange of management information between an Operations System and an NE.

Megabit (Mb) A measure of computer data storage capacity that is equal to a million bits.

Megabits per second (Mbps) A unit of transmission rate, equal to one million bits per second.

MegaByte (MB) A measure of computer data storage capacity that is 2 to the 20th power bytes.

MegaHertz (MHz) A unit of alternating current (AC) or electromagnetic (EM) wave frequency equal to one million Hertz (Hz).

mid-span meet The capability to interface between two lightwave NEs of different vendors. This applies to high-speed optical interfaces.

million of instructions per second (MIPS) A general measure of computing performance; the unit commonly used to indicate the rate at which a processor executes instructions.

minimize button For computer software, the button used to shrink a window to its icon.

minor (MN) Indicates a non-service-affecting failure of equipment or facility.

Miscellaneous Discrete Interface Allows an operations system to control and monitor equipment collocated within a set of input and output contact closures.

multiplexing The process of combining multiple signals into a larger signal at the transmitter by a multiplexer. The large signal is then split into the original smaller signals at the receiver by a demultiplexer.

N

network ***ISO TC97***. An interconnected group of nodes; a series of points, nodes, or stations connected by communications channels; the assembly of equipment through which connections are made between data stations. ***Also***, part of the destination (code) used in an address; similar to an international telephone code.

network element (NE) The basic telecommunications entity that WaveStar SNMS manages. An NE is a grouping of physical equipment that provides communication services over a network. An NE is both a node in a larger network of NEs and a complex network system itself. The software in an NE must manage both the physical (equipment) components of the NE and the network system provided by the NE.

network interface card (NIC) A printed circuit board that is used to connect a device to a LAN. A NIC executes the code needed by the connected device to share a cable or some other media with other NEs.

Network Monitoring and Analysis (NMA) An operations system designed by Telcordia Communications that is used to monitor network facilities.

node An NE in a ring or, more generally, in any type of network. With an NE supporting interfaces to more than one ring, node refers to an interface that is in a particular ring. Node is also defined as all equipment that is controlled by one system controller. A node is not always directly manageable by a management system.

non-managed device An NE or other telecommunications entity that is part of the network of NEs that communicate with WaveStar SNMS, but is not managed by WaveStar SNMS. WaveStar SNMS adds non-managed devices during the autodiscovery process to complete the network model and to avoid repeated attempts into these NEs.

Non-Preemptible Protection Access (NPPA) Non-preemptible protection access increases the available span capacity for traffic which does not require protection by a ring, but which cannot be preempted.

Non-Revertive Switching In non-revertive switching, an active and stand-by line exist on the network. When a protection switch occurs, the standby line is selected to support traffic, thereby becoming the active line. The original active line then becomes the stand-by line. This status remains in effect even when the fault clears. That is, there is no automatic switch back to the original status.

non-volatile memory (NVM) Memory that retains its stored data after power is removed. An example of NVM is a hard disk.

no request state The routine-operation quiet state in which external command activities do not occur.

not monitored (NMON) A provisioning state for equipment that is not monitored or alarmed.

O

OC-1 Optical Carrier level-1, which is 51.840 million bits per second. OC-1 is the counterpart of STS-1, which is a fundamental signaling rate of 51.840 Mbps on which the SONET hierarchy is based. OC-1 provides for the direct electrical-to-optical mapping of the STS-1 signal with frame synchronous scrambling.

OC-3 Optical Carrier level-3 is a SONET channel equal to three DS-3s, which is equal to 155.52 million bits per second.

OC-12 Optical Carrier level-12 is a SONET channel equal to 622.08 million bits per second.

OC-48 Optical Carrier level-48 is a SONET channel equal to 2.488 thousand million bits per second (Gbps).

OC-192 Optical Carrier level-192 is a SONET channel equal to 9.953 thousand million bits per second (Gbps).

Open Ring Network A network formed of a linear chain-shaped configuration of NEs. Each NE connects to two others, one on each side, except for two NEs at the ends that are connected on only one side. A closed ring can be formed by adding a connection between the two end nodes.

Open Systems Interconnection (OSI) Referring to the OSI reference model, a logical structure for network operations standardized by the International Standards Organization (ISO). Layer 1, the physical layer (physical connections), deals with the physical means of sending data over lines (the electrical, mechanical, and function control of data/circuits). Layer 2, the data link layer (technology-specific transfer), is concerned with the procedures and protocols for operating the communication lines. It also can detect and correct message errors. Layer 3, the network layer (routing and relaying), determines how data is transferred between computers. It also addresses routing within and between individual networks. Layer 4, the transport layer (reliable data transfer), defines the rules for information exchange and manages end-to-end delivery of information within and between networks, including error recovery and flow control. Layer 5, the session layer (dialog coordination), is concerned with dialog management. It controls the use of the basic communication facility provided by the transport layer. Layer 6, the presentation layer (syntax), provides transparent communications services by masking the differences of varying data formats (character codes, for example) between dissimilar systems. Layer 7, the applications layer (semantics), contains functions for particular applications services, such as file transfer, remote access, and virtual terminals.

Operations Interface Any interface providing information on system behavior or control, which include equipment LEDs, user panel, WaveStar CIT, office alarms, and all telemetry interfaces.

Operations Interworking (OI) The capability to access, operate, provision, and administer remote systems through craft interface access from any site in a SONET network or from a centralized operations system.

operations system (OS) A central computer-based system used to provide operations, administration, and maintenance functions.

Operations System for Intelligent Network Elements

(OPS/INE) A Telcordia Technologies configuration management operations system.

operator A user of the system with operator-level user privileges.

Optical Carrier N (OC-N) An optical carrier signal at the SONET rate of N, where n equals 1, 3, 12, 48, or 192. The basic rate of an OC-1 signal is 51.84 Mb/s, equivalent to an STS-1, with other values of N direct multiples of this basic rate.

Optical Channel An OC-N wavelength within an optical line signal. Multiple channels, differing by 1.5µ in wavelength, are multiplexed into one signal.

Optical Demultiplexer Unit (ODU) A circuit pack that receives the optical line signal and separates it into the original number of OC-N/STM-N signals.

Optical Line Signal A multiplexed optical signal containing multiple wavelengths or channels.

Optical Multiplexer Unit (OMU) A circuit pack responsible for combining multiple signals into one signal. The combined signal is called the Optical Line Signal.

Optical Translator (OT) A system feature used in conjunction with WaveStar OLS that concatenates multiple OLS terminals, regenerates signals in the 1.3µ and 1.5µ ranges, prevents wavelength blocking via wavelength interchange, provides wavelength add/drop (WAD) capabilities, and establishes open interfaces with multi-vendor signal compatibility.

Optical Translator Port Module (OTPM) A circuit pack that can electrically regenerate incoming OC-12/STM-4 and OC-3/STM-1 signals into specific outgoing signals of the same type

Optical Translator Unit (OTU) A circuit pack that can electrically regenerate incoming OC-N/STM-N signals (1.3 or 1.5µ ranges) into specific outgoing signals of the same type.

orderwire (OW) A dedicated voice-grade line for communications between maintenance and repair personnel.

Original Value Provisioning Preprogramming a system's original values at the factory. These values can be overridden using local or remote provisioning.

outage A disruption of service that lasts for more than one second.

out of frame (OOF) A designation for a condition that is defined as the network or the DTE sensing an error in framing bits. An OOF is declared when 2 of 4 or 2 of 5 framing bits are missed. An OOF condition that exists for 2.5 seconds generally creates a local red alarm.

out of service (oos) Equipment that is not in service because of any various condition.

P

packet assembler/disassembler (PAD) An interface between a device and an X.25 packet-switched network. A PAD converts the protocol used by the device and the X.25 protocol used by the network, allowing terminals to exchange data with other packet mode terminals and hosts.

packet switched network (PSN) An X.25 network that transmits groups of bits as a unit through the network. Packets usually include data and control information such as addressing, identification, and error-control fields.

parameter A variable that is given a value for a specified application. A constant, variable, or expression that is used to pass values between components.

parity check A check used to determine whether the number of ones (or zeros) in an array of binary bits is odd or even. A check used to determine whether the received signal is the same as the transmitted signal.

pass through Paths that are cross-connected directly across an intermediate node in a network.

path A logical connection between the point at which a standard frame format for the signal at the given rate is assembled, and the point at which the standard frame format for the signal is disassembled.

path overhead (POH) Informational bytes assigned to and transported with the payload until the payload is demultiplexed. POH provides for the integrity of communication between the point of assembly of a virtual container and its point of disassembly.

path terminating equipment NEs in which the path overhead is

terminated.

Performance Monitoring (PM) A WaveStar SNMS feature that measures the quality of service and identifies degrading or marginally operating systems (before an alarm would be generated).

Peripheral Control and Timing Facility Interface (PCTFI) A proprietary physical link interface supporting the transport of 21x2 Mb/s signals.

plain old telephone service (POTS) Narrowband voice telephone service, which is the traditional voice telephone service. POTS does not include such vertical telephony features as call waiting and/or call forwarding.

platform The hardware and software configurations that have been designed to support a particular application.

Plesiochronous Network A network that contains multiple subnetworks, each internally synchronous and all operating at the same nominal frequency, but whose timing may be slightly different at any particular instant.

Polarization Mode Dispersion (PMD) Output pulse broadening due to random coupling of two polarization modes in an optical fiber.

port (also called line) The physical interface, consisting of both an input and output, where an electrical or optical transmission interface is connected to the system and may be used to carry traffic between NEs. The words ***port*** and ***line*** can often be used synonymously. ***Port*** emphasizes the physical interface, and ***line*** emphasizes the interconnection. Either can be used to identify the signal being carried.

Port State Provisioning A feature that allows a user to suppress alarm reporting and performance monitoring during provisioning by supporting multiple states (automatic, in-service, and not monitored) for low-speed ports.

preprovisioning The process by which the user specifies parameter values for an entity prior to some equipment being present. These parameters are maintained only in NVM. These modifications are initiated locally or remotely by either a CIT or an OS. Preprovisioning provides for the decoupling of manual intervention tasks (for example, install circuit packs) from those

tasks associated with configuring the node to provide services (for example, specifying the entities to be cross-connected).

Proactive Maintenance The process of detecting degrading conditions not severe enough to initiate protection switching or alarming, but indicative of an impending signal fail or signal degrade defect.

prompt A visual or audible indication that is made apparent to a user. A prompt signifies that some process requires an action or that some process is completed.

protection Extra capacity (channels, circuit packs) in transmission equipment that is not intended to be used for service, but rather to serve as backup against equipment failures.

Protection Group Configuration The members of a group and their roles, for example, working protection, line number.

protection path One of two signals entering a path selector used for path protection switching or dual ring interworking. The other is the working path. The designations working and protection are provisioned by the user, whereas the terms active path and standby path indicate the current protection state.

protection state When the working unit is currently considered active by the system and that it is carrying traffic. The ***active unit state*** specifically refers to the receive direction of operation—since protection switching is unidirectional.

provisioned (PROV) Indicating that a circuit pack is ready to perform its intended function. A provisioned circuit pack can be active (ACT), in-service (IS), standby (STBY), provisioned out-of-service (POS), or out-of-service (OOS).

provisioning The modification of certain programmable parameters that define how the node functions with various installed entities. These modifications are initiated locally or remotely by either a CIT or an OS. They may arrive at the node via the IAOLAN, CIT port, or any DCC channel. The provisioned data is maintained in NVM and/or hardware registers.

public switched telephone network (PSTN) A public network that provides circuit switching for users; that is, the traditional telephone network.

Q

Quad Optical Translator Unit (QOTU) A unit that provides

functions similar to an Optical Translator Unit (OTU), except that an QOTU provides the equivalent functionality of four OTUs in a package that is only twice the size of an OTU.

R

radio buttons A standard Windows control that allows a user to select from a fixed set of mutually exclusive choices (also referred to as option buttons).

Random Access Memory (RAM) A temporary storage device into which data can be entered (written) and read without permanent storage.

Reactive Maintenance Refers to detecting defects/failures and clearing them.

Receive-Direction The direction towards the NE.

regeneration The process of reconstructing a digital signal to eliminate the effects of noise and distortion.

reliability The ability of a software system performing its required functions under stated conditions for a stated period of time. The probability for an equipment to fulfill its function. Some of the ways in which reliability is measured are: MTBF (mean time between failures) expressed in hours; Availability = (MTBF)/(MTBF+MTTR)(%) [where MTTR = mean time to restore]; outage in minutes per year; failures per hour; percentage of failures per 1,000 hours.

remote defect indication (RDI) An indication returned to a transmitting terminal that the receiving terminal has detected an incoming section failure. [Previously called far-end-receive failure (FERF).]

remote failure indication (RFI) A signal that alerts upstream STS-1 path terminating equipment that a downstream failure has been alarmed along the STS-1 path. This action prevents multiple alarms from being activated for the same failure and ensures that a technician is dispatched to correct the failure. (Previously called yellow signals.)

remote network element Any NE that is connected to the referenced NE through either an electrical or optical link. It may be the adjacent node on a ring, or N nodes away from the reference. It also may be at the same physical location but is usually at another (remote) site.

Return to Zero A code form having two information states (termed zero and one) and having a third state or an at-rest condition to which the signal returns during each period.

revertive A protection switching mode in which, after a protection switch occurs, the equipment returns to the nominal configuration (that is, the working equipment is active, and the protection equipment is standby) after any failure conditions that caused a protection switch to occur, clear, or after any external switch commands are reset. (See ***Non-Revertive Switching***.)

Revertive Switching In revertive switching, there is a working and protection high-speed line, circuit pack, etc. When a protection switch occurs, the protection line, circuit pack, etc. is selected. When the fault clears, service ***reverts*** to the working line.

right click To select an object by pressing and releasing the right mouse button which brings up a Right Click Pop-up Menu. The default command may be brought up by double-clicking on an object with the right mouse button.

ring A configuration of nodes comprised of NEs connected in a circular fashion. Under normal conditions, each node is interconnected with its neighbor and includes capacity for transmission in either direction between adjacent nodes. Path switched rings use a head-end bridge and tail-end switch. Line switched rings actively reroute traffic over the protection capacity.

Roll Cross-Connection A user operation which results in moving the input of any existing leg of any cross-connection from a given tributary to a second tributary, while leaving the output unchanged. Typically, a roll is used as a tail-end switch in a ***facility*** or ***tributary rolling*** operation, whereby traffic is moved from one facility to another or from one tributary to another on a facility. The head-end side of a facility or tributary roll usually has a bridge established (in one NE) so that the traffic flows on both the old and new facilities, minimizing the signal interruption time when the roll is carried out to that introduced by the roll itself (in the other NE). A roll is inherently a one-way operation, but because facilities are generally two-way, a head-end bridge/tail-end roll sequence is typically done on both directions.

router An interface between two networks. While routers are

like bridges, they work differently. Routers provide more functionality than bridges. For example, they can find the best route between any two networks, even if there are several different networks in between. Routers also provide network management capabilities such as load balancing, partitioning of the network, and troubleshooting.

S

section The portion of a transmission facility, including terminating points, between a terminal NE and a line-terminating NE, or two line-terminating NEs.

Section Layer The second of the four levels in a standard SONET signal, used to transport an STS frame across a physical medium. This layer uses the photonic layer to form the physical transport.

self-healing A network's ability to recover automatically from the failure of one or more of its components.

server Computer in a computer network that performs dedicated main tasks which generally require sufficient performance.

serving area A user-defined grouping of NEs. It most commonly consists of NEs located in a central office (CO) and the subnetworks to which they belong.

severely errored seconds (SES) This performance monitoring parameter is a second in which a signal failure occurs, or more than a preset amount of coding violations (dependent on the type of signal) occurs.

service The operational mode of a physical entity that indicates that the entity is providing service. This designation will change with each switch action.

shelf view A graphical depiction of one shelf. Selectable objects in this view are the shelf, the slots/circuit packs, and the ports.

shortcut key A keyboard key or key combination that invokes a particular command. Also referred to as an accelerator key or a hot key.

Signal-to-Noise Ratio (SNR) The relative strength of signal compared to noise.

signal rate An attribute that defines the bit-rate and format of the signal. The signal rate is defined by the STS-N path-level

signal bit-rate and format including the presence or absence of concatenation.

Single-Ended Operations Provides operations support from a single location to remote NEs in the same SONET subnetwork. With this capability you can perform operations, administration, maintenance, and provisioning on a centralized basis. The remote NEs can be those that are specified for the current release.

single-mode (SM) fiber An 8µ diameter, low-loss, long-span optical fiber typically operating at either 1310 nm, 1550 nm, or both.

site address The unique address for an NE.

slot A physical position in a shelf designed for holding a circuit pack and connecting it to the backplane. This term is also used loosely to refer to the collection of ports or tributaries connected to a physical circuit pack placed in a slot.

Small Computer System Interface (*SCSI*®) A processor-independent standard for system-level interfacing between a computer and intelligent devices including hard disks, floppy disks, CD-ROMs, printers, scanners, and others.

software backup The process of saving an image of the current NE's databases, which are contained in its NVM, to a remote location. The remote location could be the WaveStar CIT or an OS.

software download The process of transferring a generic (full or partial) or provisioned database from a remote entity to the target NE's memory. The remote entity may be the WaveStar CIT or an OS. The download procedure uses bulk transfer to move an uninterpreted binary file into the NE.

software ID Number that provides the software version information for the system.

software installation The process of actually interpreting and unpacking the binary program of data, that was loaded in the NVM by a previous software download operation, and copying the constituent data items to their designated locations within the network element's memory.

span An uninterrupted bidirectional fiber section between two NEs.

span growth A type of growth in which one wavelength is added to all lines before the next wavelength is added.

Squelch Map A map that contains information for each cross-connection in a ring and indicates the source and destination nodes for the low-speed circuit that is part of the cross-connection. This information is used to prevent traffic misconnection in rings with isolated nodes or segments.

standby A circuit pack that is in service, but is not providing service functions. It is ready to be used to replace a similar circuit pack either by protection or by duplex switching.

standby path One of two signals entering a constituent path selector, the standby path is the path not currently being selected.

state The state of a circuit pack indicates whether it is defective or normal (ready for normal use).

status The indication of a short-term change in the system.

STS-1E Now referred to as EC-1. A signal typically carried by coaxial cables from one equipment location to another. The term EC-1 refers to the organization and data rate of the signal and also to the voltage template the signal must conform to and the impedances for which the voltage template is valid.

STS-1 The basic building block logical signal in the SONET standard with a data rate of 51.84 Mb/s.

subnetwork A group of interconnected/interrelated NEs. The most common connotation is a synchronous network in which the NEs have Data Communications Channel (DCC) connectivity.

Supervisory Signal An optical signal originating with the telemetry circuit pack that is used to communicate maintenance information.

Suppression A process in which service-affecting alarms that are identified as an ***effect*** are not displayed to a user.

Symptomatic Alarm An alarm that is not indicative of an actual failure itself, but rather of a secondary manifestation.

Synchronization Messaging Synchronization messaging is used to communicate the quality of network timing, internal timing status, and timing states throughout a subnetwork.

synchronous The essential characteristic of time scales or signals

such that their corresponding significant instances occur at precisely the same average rate, generally traceable to a single Stratum-1 source.

Synchronous Digital Hierarchy (SDH) A hierarchical set of digital transport structures, standardized for the transport of suitable adapted payloads over transmission networks.

Synchronous Network The synchronization of transmission systems with synchronous payloads to a master (network) clock that can be traced to a reference clock.

Synchronous Optical NETwork (SONET) The North American standard for the rates and formats that defines optical signals and their constituents. A family of fiber optic transmission rates from 51.84 million bits per second to 13.27 gigabits per second, created to provide the flexibility needed to transport many digital signals with different capacities and to provided a design standard for manufacturers.

Synchronous Payload Payloads that can be derived from a network transmission signal by removing integral numbers of bits from every frame. Therefore, no variable bit-stuffing rate adjustments are required to fit the payload in the transmission signal.

Synchronous Payload Envelope (SPE) The combined payload and path overhead of an STS-1, STS-3c, STS-12c or STS-48c signal.

Synchronous Transport Module, Level N (STM-N) A building block information structure that supports SDH section layer connections, where N represents a multiple of 155.52 Mb/s. Normally N=1, 4, 16, or 64.

Synchronous Transport Signal (STS, STS-N) The basic logical building block signal for SONET with a rate of 51.84 Mb/s for an STS-1 signal and a rate of N times 51.84 Mb/s for an STS-N signal.

Synchronous Transport Signal, Level N, Concatenated (STS-Nc) A concatenated SONET payload signal at the STS-N rate, where N equals 3, 12, or 48. For example, an STS-3c signal is constructed by concatenating three STS-1 signals into a signal that uses a single path overhead, rather than three.

System Administrator A user of the computer system on which

the system's OS software application can be installed.

T

T1 A carrier system that transmits at the rate of 1.544 Mb/s (a DS1 signal).

T2 A carrier system that transmits at the rate of 6.312 Mbps (a DS2 signal).

T3 A carrier system that transmits at the rate of 44.736 Mbps (a DS3 signal).

Target Group An administrator-defined group that specifies to which NEs a user has access.

target identifier (TID) A provisionable parameter that is used to identify a particular NE within a network. It is a character string of up 20 characters where the characters are letters, digits, or hyphens (-).

Telemetry Feed-Through Operations capability for 4-fiber applications which allows the DCC to go from one OLS End Terminal (one subnetwork) through to the other collocated end terminal (separate subnetwork), thereby extending the OLS operations domain.

Thin Client A low-cost computing device that works in a server-centric computing model. Thin clients typically do not require state of the art, powerful processors and large amounts of RAM and ROM because they access applications from a central server or a network. Thin clients can operate in a application server environment.

Through (or Continue) Cross-Connection A cross-connection within a ring, where the input and output tributaries have the same tributary number but are in lines opposite each other. Threshold-Crossing Alert (TCA) A message type sent from an NE that indicates that a certain performance monitoring parameter has exceeded a specified threshold.

Through Timing Refers to an NE that derives its transmit timing in the east direction from a received line signal in the east direction and its transmit timing in the west direction from a received line signal in the west direction.

Time Division Multiplexing (TDM) A technique for transmitting a number of separate data, voice, and/or video signals simultaneously over one communications medium by interleaving

a portion of each signal one after another.

Time Slot Assignment (TSA) A capability that allows any tributary in a ring to be cross-connected to any tributary in any lower-rate, non-ring interface or to the same-numbered tributary in the opposite side of the ring.

Time Slot Interchange (TSI) The ability of the user to assign cross-connections between any tributaries of any lines within an NE. Three types of TSI can be defined: Hairpin TSI, Interring TSI (between rings), and Intraring TSI (within rings).

trail A physical link between NEs or aggregates that is represented graphically on the Map window pane of the network as a solid line between the NE or the aggregate symbol.

Transaction Language One (TL1) A machine-to-machine communications language that is a subset of ITU's human-machine language.

Transmission Control Protocol (TCP) A reliable protocol that provides connection- and stream-oriented services at the Open Systems Interconnection transport layer. It uses Internet Protocol (IP) to deliver its packets, and guarantees delivery of an ordered stream of data packets.

Transmission Control Protocol/Internet Protocol (TCP/IP) A suite of several networking protocols developed for the Internet that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems.

transmit direction The direction outwards from the NE.

tributary A path-level unit of bandwidth within a port, or the constituent signal(s) being carried in this unit of bandwidth, for example, an STS-1 tributary within an OC-N port.

True *Wave*™ Optical Fiber Lucent Technologies' fiber generally called non-zero dispersion-shift fiber, with a controlled amount of chromatic dispersion designed for amplified systems in the 1550/1310 nm range.

Two-Way Point-to-Point Cross-Connection A two-legged interconnection, that supports two-way transmission, between two and only two tributaries.

Two-Way Roll The operation which moves a two-way

cross-connection between tributary i and tributary j to a two-way cross-connection between the same tributary i and a new tributary k with a single user command.

U

unavailable seconds (UAS) In performance monitoring, the count of seconds in which a signal is declared failed or in which 10 consecutively severely errored seconds (SES) occurred, until the time when 10 consecutive non-SES occur.

uniform resource locator (URL) The address of a file that is accessible on the Internet.

upstream At or towards the source of the considered transmission stream, for example, looking in the opposite direction of transmission.

user privilege Permissions a user must perform on the computer system on which the system software runs.

User-to-Network Interface (UNI) The specifications for the procedures and protocols between a user and the Asynchronous Transfer Mode (ATM) network.

V

value A number, text string, or other menu selection associated with a parameter.

variable An item of data named by an identifier. Each variable has a type, such as int or Object, and a scope.

Violation Monitor and Removal (VMR) A provisionable mode for DS3 output that causes parity violations to be monitored and corrected before the DS3 signal is B3ZS encoded.

virtual Refers to artificial objects created by a computer to help the system control shared resources.

virtual circuit A logical connection through a data communication (for example, X.25) network.

Virtual Tributary (VT) A structure designed for transport and switching of sub-STS-1 payloads. There are currently four sizes: VT1.5 (1.728 Mb/s), VT2 (2.304 Mb/s), VT3 (3.456 Mb/s), and VT6 (6.912 Mb/s).

Virtual Tributary Group (VT-G) A 9-row by 12-column structure (108 bytes) that carries one or more VTs of the same size. Seven VT groups (756 bytes) are byte interleaved with the

VT-organized synchronous payload envelope.

Voice Frequency (VF) Circuit A 64 kilobit per second digitized signal.

Volatile Memory Type of memory that is lost if electrical power is interrupted.

VT1.5 Tributary A SONET logical signal with a data rate of 1.728 Mbps. In the nine-row structure of the STS-1 SPE, a VT1.5 occupies three columns. VT-structured STS-1 SPEs are divided into seven VT groups. Each VT group occupies twelve columns of the nine-row structure and, for VT1.5s, contains four VTs per group.

W

Wait-to-Restore (WTR) Applies to revertive switching operation. The protection group enters the WTR state when all Equipment Fail (EF) conditions are cleared, but the system has not yet reverted back to its working line. The protection group remains in the WTR state until the Wait-to-Restore timer completes the WTR time interval.

Wait to Restore Time (WRT) Corresponds to the time to wait before switching back after a failure has cleared, in a revertive protection scheme, which can be between 0 and 15 minutes, in increments of one minute.

Wavelength Add/Drop (WAD) The process of adding and dropping wavelengths to provide more efficient transmission. A central office that contains two or more OLS end terminals, some wavelengths can be added and dropped locally while others go express between the end terminals by means of OTs.

Wavelength Division Multiplexing (WDM) A means of increasing the information-carrying capacity of an optical fiber by simultaneously transmitting signals at different wavelengths.

Wavelength Interchange The ability to change the wavelength associated with an OC-N STM-N signal into another wavelength.

***WaveStar*™ Optical Line System** Lucent Technologies' lightwave transmission system. Utilizing DWDM technology, the system combines multiple signals of different wavelengths, transmits the resulting signal over a single fiber, and then demultiplexes the signal at the receive end.

Wide Area Network (WAN) A communication network that uses

common-carrier provided lines and covers an extended geographical area.

Wideband Communications Voice, data, and/or video communication at digital rates from 64 kb/s to 2 Mb/s.

working Label attached to a physical entity. In case of revertive switching the working line or unit is the entity that is carrying service under normal operation. In case of non-revertive switching the label has no particular meaning.

working state The working unit is currently considered active by the system and that it is carrying traffic.

X

X.25 An ITU standard defining the connection between a terminal and a public packet-switched network

X.25 Interface/Protocol The ITU packet-switched interface standard for terminal access that specifies three protocol layers: physical, link, and packet for connection to a packet-switched data network.

X-Terminal Workstation that can support an X-Windows interface.

X-Windows A graphical user interface on a UNIX OS-based system.

Z

Zero Code Suppression A technique used to reduce the number of consecutive zeros in a line-coded signal (B3ZS, B8ZS).

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