CHAPTER 1

# Glossary

## Numbers

### 10Base2

An Ethernet physical interface defined by IEEE and supported by LightStream with the use of an external transceiver. Uses thin 50-Ohm baseband coaxial cabling. Two 15-pin AUI ports on each Ethernet access card support connections to 10Base2 transceivers.

### 10Base5

An Ethernet physical interface defined by IEEE and supported by LightStream with the use of an external transceiver. Uses standard (thick wire) 50-Ohm baseband coaxial cabling. Two 15-pin AUI ports on each Ethernet access card support connections to 10Base5 transceivers.

### 10Base-T

An Ethernet physical interface defined by IEEE and supported by LightStream. Uses unshielded twisted pair cabling. All eight ports on an Ethernet access card support 10Base-T connections.

## A

### access card

An I/O card located at the back of the LightStream chassis. Together with their associated line cards, access cards provide data transfer services for the switch using physical interfaces such as OC-3c. A LightStream switch can have up to 10 access cards. Access card types include low-speed (jumper-settable to V.35 or RS-449/X.21), T3, E3/PLCP, E3/G.804, Ethernet, FDDI, OC-3c, and an NP access card to provide Ethernet connectivity for network management. (Access cards are occasionally referred to as *paddle card*.)

### ANSI

American National Standards Institute, a voluntary organization that develops positions for the United States in international standards organizations such as ITU-T. ANSI helps develop international network protocols and standards, including ATM, and US standards such as T1.

### ARP

Address resolution protocol. Uses an IP network address to determine a physical hardware address (i.e., a MAC address). LightStream's implementation of ARP conforms to RFC 826.

### asynchronous transfer mode (ATM)

The communications technology on which the LightStream 2020 is based. ATM is an international standard for cell relay. Traffic in an ATM network consists of 53-byte cells designed to take advantage of high-speed transmission media such as T3, E3 and SONET. ATM's fixed-length cells allow cell processing to occur in hardware, reducing transit delays.

### ATM Forum

An international organization that develops implementation agreements for ATM technology. The Forum expands on official standards developed by ANSI and ITU-T, and develops implementation agreements in advance of official standards.

### ATM UNI

ATM user-network interface. The LightStream edge interface used for connections to non-LightStream ATM devices. ATM UNI offers users direct access to the ATM network's cell relay service.

### attribute

LightStream configuration data is structured as a series of attributes, or parameters, that you can set using the configuration program or CLI commands. Attributes define the characteristics of database objects such as chassis, cards, ports, virtual circuits and custom filters.

### AUI

Attachment unit interface. The interface between a station on an Ethernet and its transceiver. LightStream Ethernet access cards have two AUI ports. See also *transceiver*.

## B

### bandwidth

The traffic-bearing capacity of the lines and switches in a network.

### bandwidth allocation

The process of assigning bandwidth to the users and applications served by a network. In a LightStream network, bandwidth allocation involves assigning priority to different flows of traffic based on how critical and how delay-sensitive they are. If the network becomes congested, lower-priority traffic can be dropped.

### bash

The LynxOS Bourne-again shell. This UNIX shell is presented when you log into a LightStream switch as root or fldsup; its prompt is bash# (for root) or bash$ (for fldsup).

### basic configuration

The minimal configuration information entered when a new LightStream system is installed, including IP addresses, the date, and parameters for at least one trunk line. The basic configuration enables the node to receive a full configuration from the NMS.

### blower

A cooling device. Each LightStream chassis contains two blowers; one is accessible from the front of the chassis, one from the rear. Blowers are temperature-controlled; under normal operating conditions, they slow down after start-up to reduce noise.

### BPDU

Bridge protocol data unit. As part of the spanning tree protocol, these frames are sent out at a configurable interval to exchange information among bridges in the network. See also *spanning tree protocol*.

### bridge

A device that links two networks that use the same communications method and addressing structure (i.e., the same protocol). Bridges function at the data link level (level 2) of the OSI reference model. LightStream bridging conforms to the IEEE 802.1d standard. The following 802.1d bridging services are provided by the LightStream switch:

- bridge forwarding
- bridge static filtering
- local traffic filtering
- MAC address learning
- spanning tree protocol
- translation bridging
- transparent bridging

Each bridging service is described in an entry of its own.

### bridge forwarding

The bridge forwarding process uses the entries in the filtering database to determine if frames with a given MAC destination address can be forwarded to a given port or ports. LightStream bridging implements bridge forwarding, which is defined in the IEEE 802.1d standard.

### bridge static filtering

A bridge maintains a filtering database consisting of static entries. Each static entry equates a MAC destination address with a LightStream port that can receive frames with this MAC destination address and a set of LightStream ports on which the frames can be transmitted. LightStream bridging implements bridge static filtering, which is defined in the IEEE 802.1d standard.

### broadcast

A data link broadcast is a frame with a MAC destination address that consists of all 1's. These frames are received by all end stations on an extended LAN.

## C

### call admission control

The traffic management mechanism that determines whether the network can offer a path with sufficient bandwidth for a requested VCC.

### cell payload scrambling

A technique used to maintain framing on some medium-speed edge and trunk interfaces. You can use the configurator or the **setsnmp** command in the CLI to turn this feature on or off.

### CLC

Cell line card. In conjunction with an access card, supports up to two OC-3c edge ports or one OC-3c trunk port.

### CLI

LightStream's command line interface. CLI runs on NPs and Sun SPARCstations; it lets you monitor and control the LightStream network. CLI is introduced in the *LightStream 2020 Operations Guide*, and CLI commands are described in the *LightStream 2020 Command and Attribute Reference Guide*.

### CLP

Cell loss priority. A CLP bit in each ATM cell's header determines how likely it is the cell will be dropped if the network becomes congested. Cells with CLP=0 are insured traffic, which is unlikely to be dropped. Cells with CLP=1 are best effort traffic, and may be dropped in congested conditions, freeing up resources to handle higher-priority CLP=0 traffic.

### configuration database

A file of attribute settings that you create using the LightStream configurator. The global database holds configuration information for the entire LightStream network and is stored on the network management station. Each switch also has a file containing just its own configuration information, called a local database. Configuration data includes definitions of chassis, cards, ports, virtual circuits, and the attributes that describe them.

### congestion avoidance (CA)

The mechanism by which the LightStream network controls traffic entering the network to minimize delays. In order to use resources most efficiently, lower-priority traffic is discarded at the edge of the network if conditions indicate that it cannot be delivered.

### ControlStream™ traffic management

LightStream's intelligent traffic management scheme, which includes congestion avoidance, traffic shaping, and traffic policing, allows links to operate at high levels of utilization by scaling back lower-priority, delay-tolerant traffic at the edge of the network when congestion begins to occur.

### cps

Cells per second.

### csumon

A tool accessible from the bash shell of a LightStream switch. It lets you:

- connect to an external DSU/CSU on a low-speed line for purposes of monitoring and control, or
- display statistics on a medium-speed line's internal DSU/CSU.

### custom filtering

A bridge's ability to allow or discard frames of traffic based on such criteria as their source address, destination address, or protocol. Custom filtering criteria are defined on a per-port basis. In a LightStream network, you define custom filters using the configurator.

## D

### data circuit-terminating equipment (DCE)

(1) The device at the network end of the user-to-network interface. The DCE provides a physical connection to the network, forwards traffic, and provides a clocking signal used to synchronize data transmission between DCE and DTE devices. (2) The port for connecting a DTE into a data network. The DCE here can be a LightStream interface or modem.

### data terminal equipment (DTE)

The device at the user end of the user-to-network interface; usually a processor. A DTE connects to a data network via data circuit-terminating equipment (DCE), and typically uses clocking signals generated by the DCE.

### database object

A chassis, card or port as defined in a LightStream configuration database. Database objects have associated attributes that describe them.

### disk assembly

A LightStream disk assembly is composed of a 120-Mbyte hard disk drive, a 3.5-inch floppy disk drive, and a disk power supply. The hard disk holds system and application software and configuration data. The floppy drive is used for loading software. Each NP in a chassis has its own disk assembly.

### DLCI

Data link connection identifier. Frame relay PVCs are identified by DLCIs. A DLCI in a LightStream network identifies a unique circuit between two ports.

### DS1

Digital signal level 1, a wide-area digital transmission scheme that carries data at a rate of 1.544 Mbps. DS1 lines can be leased for private use from common carriers. In conjunction with an external DSU/CSU, LightStream can use DS1 for low-speed trunks and edge connections. (DS1 is also referred to as T1.) See also *E1*.

### DS3

Digital signal level 3, a wide-area digital transmission scheme that carries data at a rate of 44.736 Mbps. DS3 lines can be leased for private use from common carriers. LightStream uses DS3 for medium-speed trunks and edge connections. (DS3 is also referred to as T3.) See also *E3*.

### DSU/CSU

Data service unit/channel service unit. A device that adapts the physical interface (such as V.35) on a bit serial device (such as a LightStream frame relay or frame forwarding DTE) to a network interface (such as T1 or E1). Each DSU/CSU serves one LightStream I/O port.

## E

### E1

A wide-area digital transmission scheme used predominantly in Europe that carries data at a rate of 2.048 Mbps. E1 lines can be leased for private use from common carriers. LightStream can use E1 for low-speed trunks. See also *DS1*.

### E3

A wide-area digital transmission scheme used predominantly in Europe that carries data at a rate of 34.368 Mbps. E3 lines can be leased for private use from common carriers. LightStream uses E3 for medium-speed trunks and ATM UNIs. See also *DS3*.

### ECC

Edge card control process. Each ECC process on the NP performs per-card processing for an edge card, including protocol management (ATM connection management) and media-specific (Ethernet and FDDI) management tasks, internetworking operations such as packet forwarding and filtering, and network management tasks. See also *LCC*.

### edge card

A line card configured to communicate with devices outside the ATM network. LightStream edge cards offer frame forwarding, frame relay, Ethernet, FDDI, OC-3c, and ATM UNI interfaces. See also *trunk card*.

### edge device

A non-LightStream entity such as a LAN segment, host, or router that connects to the LightStream network via an edge card. Edge devices send and receive the data that passes through the LightStream network.

### EEPROM

Electrically erasable, programmable read-only memory. Two EEPROM chips on the LightStream midplane store the node's chassis ID, modem information and other data, which you can edit using TCS commands. Flash EEPROMs on the function cards store firmware that is periodically upgraded by LightStream software releases, but cannot be edited.

### endpoint

The device at which a virtual circuit begins or ends. (This term may refer to an edge device, to a specific port on a LightStream switch, or (most often) to the LightStream switch as a whole.)

### Ethernet

A widely used LAN protocol. The LightStream Ethernet implementation, which conforms to IEEE's 802.3 CSMA/CD network standard, is compatible with 10Base-T cabling and can be connected to 10Base2 and 10Base5 cabling via transceivers. It operates at 10 Mbps. See also *LAN*.

### excess rate

Traffic in excess of the insured rate for a given call. (Specifically, the excess rate equals the maximum rate minus the insured rate.) Excess traffic is delivered only if network resources allow; it may be discarded if the network is congested. See also *insured rate (IR)* and *maximum rate (MR)*.

## F

### FDDI

Fiber distributed data interface, a LAN standard specified by ANSI X3T9.5. FDDI transmits data over fiber optic cable and supports up to 100 Mbps of bandwidth. The LightStream FDDI implementation uses SMT 7.3. See also *LAN*.

### filtering

See *bridge static filtering*, *custom filtering*, and *local traffic filtering*.

### fldsup account

One of the four default user accounts that are created in the factory on each LightStream switch. The fldsup account is for use by LightStream field service personnel. Its default interface is the bash shell.

### flooding

A method used to distribute certain control information and some LAN packets among interconnected LightStream switches. Flooding of control information within the LightStream network occurs when a switch receiving new information on a trunk port “floods” or retransmits the information on all of its other trunk ports. Bridge flooding is the retransmission of a datagram on all bridge interfaces of the LightStream switch except the receiving port.

### flow

A stream of data travelling between two endpoints across a network (for example, from one LAN station to another). One circuit can support multiple flows.

### frame forwarding (FF)

A LightStream interface that allows any traffic based on HDLC or SDLC frames to traverse the LightStream network. FF circuits are port-to-port, and only one circuit (PVC) is allowed between a pair of ports. FF is supported by the low-speed interface module, which offers V.35, RS-449, or X.21 physical interfaces.

### frame relay (FR)

An industry standard switched data link protocol that handles multiple data streams (VCs) using HDLC encapsulation between connected devices. FR is supported by LightStream’s low-speed interface module, which offers V.35, RS-449 or X.21 physical interfaces.

### FRU

Field-replaceable unit. A component that can be removed and replaced in the field. LightStream FRUs include switch cards, function cards, access cards, power trays, blowers, disk assemblies, and the midplane.

### FSU

From switch unit. The subsystem on each line card that accepts cells from the switch card, verifies their checksums, and passes them to the reassembly unit. The FSU selectively drops cells if the network becomes congested.

### FTP

File transfer protocol. An application protocol from the IP family that controls the transfer of files from one network host to another. FTP is defined in RFC 959.

### function card

A line card or an NP card in a LightStream switch.

# G

### G.804

The framing standard used by the G.804 version of LightStream's E3 access card. Defines the mapping of ATM cells into the physical media (E3). The standard is CCITT Recommendation G.804 (1993).

### Gbps

Gigabits per second.

### GID(D)

Global information distribution, a process that runs on every NP in the LightStream network. GID maintains a database and keeps nodes in the network apprised of changes in topology such as ports, cards, and nodes being added or removed, and trunks going up or down. This information is supplied by the ND process. GID is sometimes referred to as GIDD, the global information distribution daemon.

# H

### high-level data link control (HDLC)

A protocol for placing packets on a serial line, with frame characters and checksums. The ISO layer 2 (data link) protocol for X.25 networks, HDLC is based on IBM's SDLC. LightStream's frame forwarding interface handles HDLC and SDLC traffic.

### hop

When data travels across the network, it may pass through many LightStream switches. The journey between each pair of switches in the path is known as a hop.

# I

### IEEE

Institute of Electrical and Electronics Engineers, a professional organization whose activities include the development of communications standards.

### insured burst (IB)

The largest burst of data above the Insured Rate that will be temporarily allowed on a PVC but will not be tagged (CLP bit set to 1) by the traffic policing function for dropping in the case of network congestion. Specified in bytes or cells. See also *insured rate (IR)*, *maximum burst (MB)*, and *maximum rate (MR)*.

### insured rate (IR)

The long-term data throughput, in bits or cells per second, that the LightStream network commits to support under normal network conditions. The insured rate is 100% allocated: the entire amount is deducted from trunk bandwidth along the path of the circuit. See also *insured burst (IB)*, *maximum rate (MR)*, and *maximum burst (MB)*.

### insured traffic

Traffic within the insured rate specified for the PVC. This traffic should not be dropped by the network. See also *insured rate (IR)* and *CLP*.

### interface module

The combination of a line card and access card that together allow you to connect a LightStream switch to other devices.

### internet protocol (IP)

The basic data transport mechanism used between Internet hosts and gateways. It offers a datagram (connectionless) internetwork service that provides features for addressing, type-of-service specification, fragmentation and reassembly, and security. The Internet Protocol suite is often referred to as TCP/IP, because TCP and IP are the two most prominent elements in it. IP is defined in RFC 791. See also *IP addressing*.

### IP addressing

An IP address is a 32-bit quantity that belongs to one of five classes (A, B, C, D, or E). The address consists of a network number, a subnetwork number, and a host number. The network and subnetwork numbers together are used for routing, while the host number is used to address an individual host within the network/subnetwork. A subnet mask is used to extract network and subnetwork from the IP address by logically ANDing the IP address with the subnet mask. (For more information, see Appendix B of the *LightStream 2020 Installation and Troubleshooting Manual*.)

### ITU-T

Also I-TSS, ITU-TSS, and ITU-TS; the International Telecommunications Union Telecommunication Standardization Sector. ITU-T develops worldwide standards for telecommunications technologies, including ATM. ITU-T has produced ATM standards for the ATM layer, AAL5, the UNI, physical layer mappings, signalling, and more. ITU-T, formerly known as CCITT, operates under the umbrella of the United Nations.

## J

### jumper

An electrical switch consisting of a set of pins and a connector that can be attached to the pins in two different ways. Jumpers on LightStream's low-speed access card control the type of interface (V.35 or RS-449/X.21) presented by I/O ports.

# K

### KB
Kilobytes.

### Kb
Kilobits.

### Kbps
Kilobits per second.

# L

### LAN
Local area network. A high-speed, low-error data communications facility that operates over distances up to a few thousand meters. LANs connect workstations, peripherals, terminals, and other devices in a building or in a geographically limited area. LAN standards specify cabling and signalling at layers 1 (physical) and 2 (data link) of the OSI network model. Ethernet, token ring and FDDI are widely used LANs.

### LCC
Line card control process. Among other things, the LCC process establishes VCCs, maintains the link management protocol for the line card, and continually monitors line quality on each trunk using the trunk up-down protocol. An instance of the LCC runs on the NP for each LSC, MSC, and CLC. See also *ECC*.

### learning bridge
See *MAC address learning*.

### LED
Light-emitting diode. LEDs indicate the status of cards in the LightStream chassis.

### line card
Together with its access card, a line card provides I/O services for the LightStream switch. Cell line cards, medium-speed line cards and low-speed line cards can be configured as edge or trunk cards. Packet line cards can be configured only as edge cards. Edge cards provide lines to devices outside the ATM network and trunk cards provide lines to other switches inside the network.

### LLC

Logical link control. A sublayer of the data link layer that defines the multiplexing fields and gives optional types of service that can be run over IEEE 802 LANs.

### LMI

Local management interface. A frame relay protocol for getting the status of frame relay circuits from attached frame relay devices. In a LightStream network, external devices receive information from LightStream switches.

### local database

See *configuration database*.

### local traffic filtering

A bridge's ability to filter out (drop) frames of local traffic—that is, frames whose MAC source and destination addresses are located on the same interface of the bridge, and therefore do not need to be forwarded across the bridge. LightStream bridging implements local traffic filtering, which is defined in the IEEE 802.1d standard.

### LSC

Low-speed line card. In conjunction with an access card, supports eight trunk or edge (frame relay or frame forwarding) ports at individual port speeds up to 3.584 Mbps, or an aggregate rate of 6 Mbps per line card.

### LynxOS

The real-time, UNIX-like operating system that runs on LightStream NPs. Lynx commands are described in the *LightStream 2020 Command and Attribute Reference Guide*. LynxOS is a product of Lynx Real-Time Systems, Inc.

## M

### MAC

Medium access control. A sublayer of the data link layer concerned with access to the shared media of each type of LAN.

### MAC address

Physical shared media address of a LAN device. MAC addresses are 6 bytes long. They are controlled by IEEE.

### MAC address learning

The service that characterizes a learning bridge, in which the source address of each received packet is stored. Future packets for that address are forwarded only to the bridge interface on which that address is located. Packets for unrecognized addresses are forwarded to every bridge interface. This scheme helps minimize traffic on the attached LANs. LightStream bridging implements MAC address learning, which is defined in IEEE 802.1d.

### MAU

Medium access unit. See *transceiver*.

### maximum burst (MB)

Specifies the largest burst of data above the Insured Rate that will temporarily be allowed on the PVC but will not be dropped at the edge by the traffic policing function, even if it exceeds the Maximum Rate. This amount of traffic will be allowed in only temporarily; on average, the traffic source needs to be within the Maximum Rate. Specified in bytes or cells. See also *insured burst (IB)*, *insured rate (IR)*, and *maximum rate (MR)*.

### maximum rate (MR)

The maximum insured plus uninsured data throughput rate that the LightStream network will attempt to deliver on a given virtual circuit. The uninsured data may be dropped if the network is congested. This throughput, which cannot exceed the media rate, is the highest that the virtual circuit will ever deliver. MR is measured in bits or cells per second. See also *insured rate (IR)*, *insured rate (IR)*, and *maximum burst (MB)*.

### MB

Megabyte.

### Mb

Megabit.

### Mbps

Megabits per second.

### MIB

Management information base. A database of network management information used and maintained by SNMP. Objects in the MIB are organized as a tree structure; their values can be changed or retrieved using SNMP commands. For more information, refer to Chapter 4 of the *LightStream 2020 Command and Attribute Reference Guide*.

### MMA

Master management agent. The MMA runs on the NP; it is the SNMP agent for the NP, and translates between an external network manager using SNMP and the internal switch management mechanisms.

### modem

Modulator/demodulator. A device that modulates digital signals onto an analog carrier (line) at the transmitting site and performs the reverse process at the receiving site. Modems allow data to be transmitted over voice-grade telephone lines. Each LightStream chassis has a modem port for connecting to an external modem. The modem port is for remote monitor and control of the node; it's particularly useful if the node becomes isolated from the rest of the network.

### MSC

Medium-speed line card. In conjunction with an access card, supports two trunk or edge (ATM UNI) ports at data rates up to T3 or E3.

## N

### ND(D)

Neighborhood discovery, a process that runs on every NP in the LightStream network. For call routing purposes, every node in the network needs to know about changes in network topology, such as trunks and ports going up or down. ND learns about such changes at the chassis level and forwards this information to the GID process, which sends the information throughout the network. ND is sometimes referred to as NDD, the neighborhood discovery daemon. See also *GID(D)*.

### network administrator

A person responsible for the operation, maintenance, and management of a network.

### network operator

A person who performs routine monitoring and control of a network. Tasks include reviewing and if necessary responding to traps, monitoring throughput, configuring new circuits and resolving problems.

### NMS

Network management system. A device from which you can configure and manage a network. The NMS for a LightStream network must be a Sun SPARCstation running LightStream management software. NMS requirements are listed in the *LightStream 2020 Site Planning and Cabling Guide*.

### NNI

Network-to-network interface. NNI is concerned with the transfer of information between network nodes belonging to two different frame relay or ATM networks.

### node

An endpoint of a network connection, or a junction common to two or more lines in a network. Nodes can be processors, controllers, or workstations. Nodes, which vary in routing and in other functional capabilities, can be interconnected by links and serve as control points in the network. Each LightStream chassis is one node.

### NP card

The network processor card is the LightStream 2020 system's main computational and storage resource. Each LightStream switch has one or two NPs. The second card, if present, serves as a backup to the first. Each NP is associated with a floppy disk drive for loading software and a hard disk drive for storing software and configuration data. Each NP also has an access card that provides an Ethernet port.

### NP module

The NP module includes the NP card, NP access card, and disk assembly.

### npadmin account

One of the four default user accounts that are created in the factory on each LightStream switch. The npadmin account is for privileged users. Its default interface is the CLI.

## O

### OC-3

Optical carrier 3. A physical protocol used by LightStream's OC-3 access cards to put STS frames onto a 155.52-Mbps fiber line. (An STS-3c signal carried on an OC-3 physical medium is often referred to as OC-3c.) LightStream supports both single mode and multimode OC-3 fiber interfaces. See also *STS-3c* and *SONET*.

### oper account

One of the four default user accounts that are created in the factory on each LightStream switch. The oper account is for general users. Its default interface is the CLI.

### OUI

Organizationally unique identifier. The three octets assigned by the IEEE in a block of 48-bit LAN addresses.

## P

### packet switch

A WAN device that routes packets along the most efficient path and allows a communications channel to be shared by multiple connections.

### paddle card

See *access card*.

### path name

The full name of a LynxOS (or UNIX ) file or directory, including all directory and subdirectory names. Consecutive names in the path are separated by slashes (/), as in /usr/app/base/config.

### PLC

Packet line card. In conjunction with an access card, supports up to eight Ethernet or two FDDI edge ports.

### PLCP

Physical layer convergence protocol. Defines the mapping of ATM cells into physical media such as T3 and E3.

### POST

Power-on self test. A set of hardware diagnostics that runs on each NP, switch card and line card whenever the card is powered up. If the fault (FLT) LED on a card is on, the card is not working and may have failed POST.

### power-on servicing (POS)

A feature that allows faulty components of a LightStream switch to be diagnosed, removed and replaced while the rest of the switch continues to operate normally.

### power tray

A LightStream switch can have one or two bulk power trays; both are accessible from the rear of the chassis. In a redundant system the two power trays load-share, but either can power the whole system. LightStream offers two power options, one for sites with AC power and one for sites with DC power.

### PVC

Permanent virtual circuit. A VCC created by a network operator using the configurator. For each PVC, you specify endpoints, a VCI or DLCI number, and bandwidth allocation attributes such as insured and maximum data rates. PVCs remain in place until they are explicitly deleted. All VCCs for LSC, MSC, and CLC edge cards are PVCs.

## R

### redundant system

A fully redundant LightStream system has two network processor cards with disks, two switch cards, and two bulk power trays. The power trays load-share; the extra NP and switch cards serve as hot spares and become active automatically if needed. A partially redundant system has two of some subsystems but not others; for example, it might have two NPs, one switch card, and one power tray.

### RFC

Request for comments. RFCs are published by the Internet Engineering Task Force (IETF) to define internetworking protocols and standards.

### root account

One of the four default user accounts that are created in the factory on each LightStream switch. The root account is for use by the system or network administrator only. Its default interface is the bash shell.

### RouteStream™ internetworking

LightStream's LAN/WAN internetworking architecture provides bridging services (autolearning and spanning tree), custom filtering, broadcast storm control, frame relay service, and frame forwarding service.

### RS-449

Radio standard 449. A physical and electrical OSI layer 1 (physical) interface developed by the Electronic Industries Association. The standard is EIA-449. LightStream's low-speed interface modules can provide up to eight RS-449 ports each.

### run-time memory

Memory on a LightStream node whose contents includes the configuration data for that node. Run-time memory is accessed while the node operates.

## S

### SAP

Service access point. A field defined in IEEE 802.2 that is part of an address specification. Thus, the destination plus the destination SAP (DSAP) define the recipient of a packet, similarly for the source SAP (SSAP).

### shaping

To limit surges that congest the network, bursts of user traffic are buffered on an edge card and then sent into the network in regulated amounts. (Also known as smoothing and metering.)

### simple network management protocol

See *SNMP*.

### SMT

The station management task that controls FDDI interfaces. LightStream FDDI interfaces implement SMT 7.3.

### SNAP SAP

Subnetwork access protocol SAP. A particular value of SAP reserved by IEEE 802.2 for all protocols whose SAP value is not globally assigned. See *SAP*.

### SNMP

Simple network management protocol. The network management protocol used by LightStream, and the management protocol most often associated with TCP/IP systems. It provides tools for monitoring and controlling network devices and for managing configuration, statistics collection, performance, and security. The LightStream configurator uses SNMP to send configuration data from the NMS to each switch in the network.

### SNMP communities

A scheme that enables SNMP devices to validate requests from sources such as the NMS or the CLI. A LightStream switch is configured to recognize several communities. Each community has a name and an associated access privilege, which is either read-only or read-write. A LightStream switch responds only to SNMP requests that come from members of known communities and that have the access privileges required for that request. You can set the community used by CLI for its requests using the command **set snmp community <name>**.

### SONET

Synchronous optical network. The overall US specifications for the range of telco synchronous optical networking, including many transmission formats and management systems. See also *STS-3c* and *OC-3*, which are components of SONET supported by LightStream.

### spanning tree protocol

Enables a learning bridge to dynamically work around loops in a network topology. Without spanning tree, a learning bridge can't tolerate loops in the network because loops can cause the bridge to receive the same packets on several interfaces, which makes the learning process impossible. Spanning tree bridges exchange BPDU messages to detect loops, then remove the loops by shutting down selected bridge interfaces. LightStream bridging implements the spanning tree protocol, which is defined in the IEEE 802.1d standard. (See also *MAC address learning*.)

### static route

See *bridge static filtering*.

### StreamView™ network management

LightStream's suite of SNMP-based network management tools includes a configuration program and a monitoring program with easy-to-use graphical user interfaces, as well as a command line interface (CLI).

### STS-3c

Synchronous transport signal, level 3, concatenated. A SONET format used by LightStream that specifies the frame structure for the 155.52-Mbps lines used to carry ATM cells. See also *SONET*.

### subnet (IP)

A convention whereby a network administrator can arbitrarily divide an IP network into multiple subnetworks. Subnets provide a multilevel hierarchical/ routing structure. This concept allows an internet to be shielded from the addressing complexity of attached networks. See also *internet protocol (IP)*.

### subnet mask

See *internet protocol (IP)*.

### switch card (SWC)

Handles communication between other cards in the LightStream switch. Each LightStream switch has one or two switch cards; the second card, if present, serves as a backup to the first.

### synchronous data link control (SDLC)

The IBM SNA bit-oriented, full-duplex data communications protocol. SDLC is a serial, OSI layer 2 protocol. LightStream's frame forwarding interface handles SDLC traffic. See also *high-level data link control (HDLC)*.

### systems network architecture (SNA)

The IBM-defined network architecture that allows a variety of IBM devices to exchange data.

## T

### T1

See *DS1*.

### T3

See *DS3*.

### tagged traffic

ATM cells whose CLP bits are set to 1. If the network is congested, tagged traffic may be dropped to ensure delivery of higher-priority (CLP=0) traffic. See also *CLP*.

### TCS

Test and control system. An independently powered subsystem used to initialize, monitor and troubleshoot LightStream hardware. It consists of a hub residing on the switch card and slaves on NPs and line cards.

### telnet

A member of the IP family of protocols, telnet is used for remote terminal connection in a LightStream network. It enables you to log in to a remote system and use its resources just as if you were connected directly (locally) to the system. Telnet is defined in RFC 854.

### traffic management

See *ControlStream‰ traffic management*.

### traffic policing

At the edge of the LightStream network, traffic policing discards traffic exceeding the total admissible bandwidth for a given connection. Traffic that falls outside the committed rate for the connection is tagged by setting its CLP bit to 1; this traffic may be discarded en route if congestion develops. (Also known as rate enforcement, usage parameter control (UPC), admission control, and permit processing.)

### traffic shaping

See *shaping*.

### transceiver

On an Ethernet, a device that lets a station transmit and receive data. The transceiver provides the interface between the station's AUI port and the common medium of the Ethernet. The transceiver may be built into the station, or it may be a separate device. Transceivers are also known as MAUs, medium access units.

### translation bridging

Connects networks using dissimilar media. LightStream's translation bridging service, for example, connects Ethernet and FDDI. The implementation conforms to the IEEE 802.1d standard.

### transmit priority

Each LightStream internal type of service correlates to a relative priority in queues in the LightStream network. This priority determines which traffic is serviced first in the case of contention for a network resource. (Also known as transfer priority and forwarding priority.)

### transparent bridging

Connects networks of the same media type. LightStream's transparent bridging service, for example, connects Ethernet to Ethernet and FDDI to FDDI. The implementation conforms to the IEEE 802.1d standard.

### trap

A message that indicates a LightStream network event or status. Traps include error messages and reports about port or device abnormalities. They are usually logged and forwarded to the local console or a monitoring host as requested.

### trunk

The physical and logical connection between two LightStream switches. Traffic within the LightStream network travels over trunks.

### trunk card

A line card configured to communicate with other LightStream switches. LightStream trunk cards offer V.35, RS-449, X.21, OC-3c, T3 and E3 interfaces. (LSCs, MSCs, and CLCs can operate as trunk cards.) See also *edge card*.

### TSU

To switch unit. The subsystem on each line card that appends ATM routing information to outgoing cells and sends the cells to the switch card.

### TUD

Trunk up-down protocol. The TUD protocol monitors trunks and detects when one goes down or comes up. The switch sends regular test messages from each trunk port to test trunk line quality. If a trunk misses a given number of these messages, TUD declares the trunk *down*. When a trunk comes back up, TUD recognizes that the trunk is up, declares the trunk *up*, and returns it to service.

## U

### UDP

User datagram protocol. A member of the IP familyof protocols, UDP exchanges datagrams without acknowledgements or guaranteed delivery. UDP is a transport layer interface to the IP layer so that higher layers can send datagrams that do not guarantee delivery and do not require the formal establishment of a session with the recipient. UDP is defined in RFC 768.

### UNI

User-network interface. See *ATM UNI*.

### uninsured traffic

Traffic within the excess rate (the difference between the insured rate and maximum rate) for the VCC. This traffic can be dropped by the network if congestion occurs. See also *insured rate (IR)*, *maximum rate (MR)* and *CLP*.

### UPC

Usage parameter control. See *traffic policing*.

### UNI

User-network interface. See also *ATM UNI*.

# V

### V.35

An ITU-T (formerly CCITT) recommendation describing a synchronous protocol that conforms to layer 1 (physical) of the Open Systems Interconnect model. The standard is CCITT Recommendation V.35. LightStream's low-speed interface modules can provide up to eight V.35 ports each.

### VC

Virtual circuit. A general term used to indicate a logical circuit between two end points in a network, for instance a frame relay virtual circuit.

### VCC

(1) Virtual channel connection. A logical circuit that carries data between two end points in an ATM network. (2) An LED on each function card indicating that 5-volt power is on.

### VCI

Virtual channel identifier. The VCI is a number used by an ATM device to identify a virtual channel link that makes up a part of the virtual channel connection. Its function is analogous to the DLCI's in frame relay. (See also *DLCI*.)

### VCL

Virtual channel link. Link (or connection) between two ATM devices (for instance, LightStream switches). A virtual channel connection is made up of one or more virtual channel links. (See also *hop*.)

### VirtualStream™ virtual workgroups

A workgroup is a collection of stations on a LAN that are allowed to communicate with each other. LightStream's workgroup architecture allows geographically dispersed stations on connected LANs to be logically grouped, providing easy access within the workgroup while ensuring privacy between workgroups and limiting the impact of each group's work on the others. Workgroups are configured on a per-port basis using the LightStream configurator.

### VLI

Virtual LAN internetworking. The set of features that supports LightStream bridging services by letting LAN stations communicate as if they were directly connected, without regard for the structure of the underlying network.

### VPC

Virtual path connection. The VPC is a bundle of virtual channel connections that share one or more contiguous VPLs.

### VPI

Virtual path identifier. The VPI is a number used by an ATM device to identify a virtual path link that makes up a part of a virtual path connection.

### VPL

Virtual path link. Within a virtual path, multiple unidirectional virtual channel links with the same end points are regarded as a single entity, a virtual path link. Grouping virtual channel links in this way reduces the number of connections to be managed, thereby decreasing network control overhead and cost. A virtual path connection is made up of one or more virtual path links.

## W

### WAN

Wide area network. A data communications system that serves users over a broad geographic area and often uses transmission devices provided by common carriers. ATM and time division multiplexing (TDM) networks are examples of WANs.

### workgroups

See *VirtualStream‰ virtual workgroups*.

## X

### X.21

An ITU-T (formerly CCITT) recommendation defining the interface between a DTE and a DCE, where network access is over synchronous digital lines. The standard is CCITT Recommendation X.21. The LightStream X.21 implementation uses the physical (OSI layer 1) X.21 interface only. LightStream’s low-speed interface modules can provide up to eight X.21 ports each. The X.21 protocol is used primarily in Europe and Japan.