CHAPTER 5

Network Management

This chapter describes the SNMP-based tools for managing network operations. It also briefly describes the command line interface (CLI) for performing network operations through a Telnet connection to any LS2020 switch in the network from a Sun SPARCstation.

Network Management Tools

To manage your LightStream 2020 (LS2020) network, you can connect to a local console port on the LS2020 switch, Telnet to a network processor (NP) on an LS2020 switch, or use a network management system (NMS) connected to an LS2020 switch. The NMS is a standalone Sun SPARCstation on which you can run the StreamView network management application to configure, monitor, and control LS2020 switches throughout your network. User interaction with these network management tools is provided by the LightStream command line interface (CLI), which runs on the LS2020 NPs and the Sun SPARCstations.

An LS2020 network uses SNMP as its basic network management protocol, making an LS2020 network compatible with a variety of SNMP-based management systems.

The following sections briefly describe the tools that you can use to perform network management tasks.

StreamView Network Management Application

StreamView is an SNMP-based network management application that provides a graphical user interface for viewing the status of each LS2020 switch in your network. StreamView provides a suite of network configuration and monitoring tools for conveniently and effectively managing an LS2020 network. StreamView incorporates three network management modules: the LS2020 Configurator, the LS2020 Monitor, and the LS2020 Topology Map.

LS2020 Configurator

You configure your LS2020 network using an NMS-based configuration program called the LS2020 Configurator. Initially, you use the LS2020 Configurator to create configurations for all the LS2020 switches in your network. You can then use this tool to change existing configurations or to add new ones as your network grows. The LS2020 Configurator features a user-friendly graphical interface that, in many cases, reduces configuration tasks to the clicking of a mouse button. The LS2020 Configurator runs on a Sun SPARCstation and consists of the following tools:

- **Node Configurator tool (cfg)**—Used to configure LS2020 chassis, card, and port parameters, such as the following: filter assignment, multicast groups, traffic profiles, bridge static routes, and the network spanning tree (to prevent bridging loops).

To support LS2020 network timing services, the cfg tool provides the following windows for user interaction:

— Cards Configuration window—This window displays representations of the types of cards installed in the front of the LS2020 chassis. You can use this window to determine the types of switch cards present in your system: Release 1 switch card (SC1), or Release 2 switch card (SC2). When activated, this window shows appropriate representations of switch cards installed in chassis Slots A and B, as well as appropriate representations of any other line cards present in Slots 1 through 10.

In addition, this window contains a *Nettime* pushbutton that you can click on to activate a secondary NETTIME window (see below).

— Ports window—You use this window to configure the ports on certain access cards (such as OC3AC and T1/E1 UNI) for network timing purposes. Each port on such cards can be configured independently to handle either internal or external clocking signals. If a port is configured for external clocking, the port will not use the Nettime-provided clocking signal.

— NETTIME window—You use this window to configure network timing service parameters. From this window, secondary windows can be invoked to set specific Nettime parameters, as indicated below:

Filter Definition Window

Multicast Group Window

Traffic Profile Window

Spanning Tree Window

Bridge Static Route Window

Chassis Window

Filter Assignment Window

- **Permanent Virtual Circuit tool (pvc)**—Used to configure permanent virtual circuits in an LS2020 environment.
- **Virtual Lan Interface tool (vli)**—Used to configure workgroups in an LS2020 environment.

For more information about the LS2020 node configurator tool, see the *LightStream 2020 Configuration Guide.*

LS2020 Monitor

The LS2020 Monitor is a graphical interface that displays the status of individual LS2020 switches, cards, and ports. When you open the LS2020 Monitor application, the main monitor screen displays a representation of the front of the LS2020 switch, together with representations of all line cards and switch cards present in the chassis. By double-clicking on a particular card, you can view card information, port descriptions, and port status information.

The main monitor screen contains a color-coded icon (in the form of a clock) that provides Nettime status information “at a glance.” Depending on the color exhibited by the Nettime clock icon, any one of several defined Nettime conditions can be identified (see Table 5-1).

To get detailed Nettime status information, you must double-click on the Release 2 switch card image on the main monitor screen.

Table 5-1 Nettime Clock Icon Status Indications

Clock Icon Color Code	Description
Purple	Nettime status has not been polled yet; initialization has not been completed.
Black	Nettime is not available for this chassis, either because it contains a Release 1 switch card or because Nettime polling failed.
Green	Nettime is up and running normally, and the configured Nettime clock equals the active Nettime clock.
Yellow	Nettime is up and running, but the configured Nettime clock does not equal the active Nettime clock, and the configured Nettime clock is down.
Orange	Nettime is up and running, but the configured Nettime clock does not equal the active Nettime clock, and the configured Nettime clock is up.
Red	The active Nettime clock does not appear anywhere in the list of configured Nettime clock sources.

Note To take advantage of network timing functionality, your LS2020 system must be equipped with at least one Release 2 switch card with the BITS interface. For example, if a Release 1 switch card is present in Slot A or B, or both, the color-coded clock icon on the main monitor screen is black, indicating that no network timing services are available for your system.

For more information about the LS2020 Monitor, see the *LightStream 2020 Network Operations Guide.*

LS2020 Topology Map

The LS2020 Topology Map module, which must be run on the HP OpenView platform, displays a physical representation of the topology of an LS2020 network. When you start HP OpenView, the LS2020 Topology Map is automatically invoked. The Topology Map module builds a map of the current LS2020 network and then periodically polls each LS2020 node for status information. Thus, the application continues to reflect the topology of an LS2020 network, even though the network may be undergoing frequent change.

The LS2020 Topology Map displays all the LS2020 switches and the trunks that connect them. Status changes are indicated in color. You can display trunk information by double-clicking on the desired trunk.

For more information about the LS2020 Topology Map, see the *LightStream 2020 Network Operations Guide.*

Command Line Interface

The command line interface (CLI) is a simple line-oriented tool that you can use to perform network operations for any switch in the network. The CLI runs through a Telnet connection, but you can also load and run it on a Sun SPARCstation. In this case, the CLI converts the commands you enter into SNMP messages which are sent to the LS2020 switches. Using the CLI, you can perform a variety of network management tasks, such as network monitoring, control, and troubleshooting.

For details about using the CLI to perform a variety of task-oriented functions, see the *LightStream 2020 Network Operations Guide.* For detailed information about the syntax of CLI commands, see the *LightStream 2020 CLI Reference Manual.*

LS2020 Network Management Functions

Table 5-2 lists the network management tools and documents you can use when performing LS2020 network management functions.

Table 5-2 LS2020 Network Management Functions

To do this...	Use the...	And See the...
Configure the network	LS2020 Configurator: (cfg, pvc, and vli tools)	*LightStream 2020 Configuration Guide*
Manage security	CLI	*LightStream 2020 Network Operations Guide*
Issue network control commands	CLI	*LightStream 2020 Network Operations Guide* and *LightStream 2020 CLI Reference Manual*
Monitor network status	LS2020 Monitor, CLI, and LS2020 Topology Map	*LightStream 2020 Network Operations Guide*
View and collect network statistics	CLI, LS2020 Monitor	*LightStream 2020 Network Operations Guide*
Run diagnostics to isolate hardware problems	CLI and diagnostics	*LightStream 2020 Hardware Reference & Troubleshooting Guide*

Using SNMP for Network Management

The LS2020 uses SNMP as its basic management protocol. LS2020 software contains an SNMP agent, called the master management agent (MMA), that interacts with the LS2020 network management tools. You can manage your network with minimal knowledge of SNMP. However, if you are familiar with SNMP, you can use low-level CLI commands, such as **getsnmp** and **setsnmp**, to monitor and manage your LS2020 network.

The MMA, which runs on the NP, is the focal point for all requests, responses, and trap messages to and from network management software. The MMA manages the management information base (MIB) and provides access to the MIB for external users (via an SNMP-compatible NMS) and for internal users (via the CLI). The MMA provides a single interface to all data internal to the LS2020 switch.

For details on the LS2020 MIB, see the *LightStream 2020 CLI Reference Manual*. For more information about SNMP, see *The Simple Book: An Introduction to Management of TCP/IP-based Internets*, Marshall T. Rose, 1991, Prentice-Hall, Inc. (ISBN 0-13-812611-9).