CHAPTER 1

About This Book

Audience • Organization • Related Documentation • Notation

The *LightStream 2020 Operations Guide* is a task-oriented guide that describes how to operate a network of LightStream 2020 enterprise ATM switches. The guide presents an overview of network operation tasks, describes the command line interface (CLI), and provides procedures for monitoring switches and collecting statistics.

Your network should be fully installed and configured before you attempt to operate it. Refer to the *LightStream 2020 Installation and Troubleshooting Manual* for installation instructions and to the *LightStream 2020 Configuration Guide* for information on configuration.

Audience

The *LightStream 2020 Operations Guide* is intended for anyone who operates a LightStream network. This guide provides detailed procedures to help you operate the LightStream network after the network has been installed and configured.

Users of the LightStream document set are expected to have a general understanding of basic data communications concepts, some knowledge of UNIX, and a familiarity with the interfaces used by the devices connecting to their LightStream network.

It is recommended that you have a working knowledge of TCP/IP networks. For more information about TCP/IP networks, refer to *Internetworking with TCP/IP, Volume 1, Principals, Protocols, and Architecture* by Douglas E. Comer, 1991, Prentice-Hall, Inc. (ISBN 0-13-468505-9).

Organization

This guide is organized as follows:

- About This Book — Describes the audience, organization, related documentation, recommended reading, and conventions for this book.
- Operations Overview — Presents network operation tasks, tools for network operations, and network scenarios.
- The Command Line Interface — Tells you how to use the LightStream command line interface (CLI).
- Getting Started — Gives procedures to start the CLI and obtain help. Provides procedures for basic CLI functions.
- Monitoring LightStream Switches — Explains how to monitor LightStream switches and their components.

- LightStream Statistics and Data Collection — Tells you how to collect and view statistics from LightStream switches and how to set up collections.
- Field Descriptions Appendix — Lists and describes all fields that might appear in a screen display as the result of issuing a CLI command.

Related Documentation

The following is a list of LightStream manuals and other material relevant to LightStream users.

- *LightStream 2020 System Overview*

  The system overview explains what a LightStream switch is and how it works. It also outlines ATM technology.

- *LightStream 2020 Site Planning and Cabling Guide*

  The site planning and cabling guide (SPCG) tells you how to prepare your site to receive LightStream hardware. It includes space, environmental and electrical requirements, rack selection guidelines, requirements for the management workstation, and information on cables and connectors.

- *LightStream 2020 Installation and Troubleshooting Manual*

  The installation and troubleshooting manual (I&TM) tells you how to install LightStream hardware and software, how to diagnose hardware problems, and how to replace faulty hardware components.

- *LightStream 2020 Configuration Guide*

  The configuration guide provides the information you need to configure LightStream switches. It describes the configuration tools and how to use them. It describes the configuration database and defines all configurable attributes and their settings. The guide also provides step-by-step configuration procedures.

- *LightStream 2020 Administration Guide*

  The administration guide describes LightStream network management functions such as setting up a new network, troubleshooting, and optimizing the load across trunks. The guide describes network management tools, then presents step-by-step procedures for performing the functions.

- *LightStream 2020 Traps Reference Manual*

  This manual presents an overview of LightStream traps (error and event messages) and a list of operational, SNMP, and informational traps generated by the LightStream switch.

- *LightStream 2020 Command and Attribute Reference Guide*

  The reference guide provides detailed descriptions of the syntax and functions of all CLI commands. It also indicates CLI equivalents of configuration procedures, describes the LightStream private MIB, and gives UNIX-style manual pages for selected LynxOS commands.

- *LightStream 2020 Command Line Interface (CLI) Reference Card*

  The reference card compactly summarizes the syntax and arguments of all CLI commands.

- *LightStream 2020 Release Notes*

  The release notes provide a software upgrade procedure and describe new features and special considerations, including information on known software bugs.

Note The release notes contain important information that does not appear in other documents.

- *LightStream 2020 Online Help*

  The LightStream command line interface (CLI) and configuration program both produce online help facilities.

Before attempting to install, configure, operate, or troubleshoot a network of LightStream switches, read the *LightStream 2020 System Overview.* This overview provides important background information about the LightStream product and the ATM technology on which the product is based. After reading the *LightStream 2020 System Overview,* refer to Table 1-1 to determine which manuals you should read next.

Table 1-1 LightStream Reading Path

If you want to:	Read the following manuals in the order listed below:
Install LightStream switches	*LightStream 2020 Release Notes*[1]
	LightStream 2020 Site Planning and Cabling Guide
	LightStream 2020 Installation and Troubleshooting Manual
Configure LightStream switches	*LightStream 2020 Release Notes*[1]
	LightStream 2020 Configuration Guide
	LightStream 2020 Online Help Screens
Set up or expand a LightStream network	*LightStream 2020 Release Notes*[1]
	LightStream 2020 Administration Guide
	LightStream 2020 Online Help Screens
Operate a LightStream network	*LightStream 2020 Release Notes*[1]
	LightStream 2020 Operations Guide
	LightStream 2020 Command and Attribute Reference Guide
	LightStream 2020 Command Line Interface (CLI) Reference Card
	LightStream 2020 Traps Reference Manual
	LightStream 2020 Online Help Screens
Manage or troubleshoot a LightStream network	*LightStream 2020 Release Notes*[1]
	LightStream 2020 Operations Guide
	LightStream 2020 Administration Guide
	LightStream 2020 Command and Attribute Reference Guide
	LightStream 2020 Command Line Interface (CLI) Reference Card
	LightStream 2020 Traps Reference Manual
	LightStream 2020 Online Help Screens
Troubleshoot LightStream hardware	*LightStream 2020 Release Notes*[1]
	LightStream 2020 Installation and Troubleshooting Manual
	LightStream 2020 Site Planning and Cabling Guide

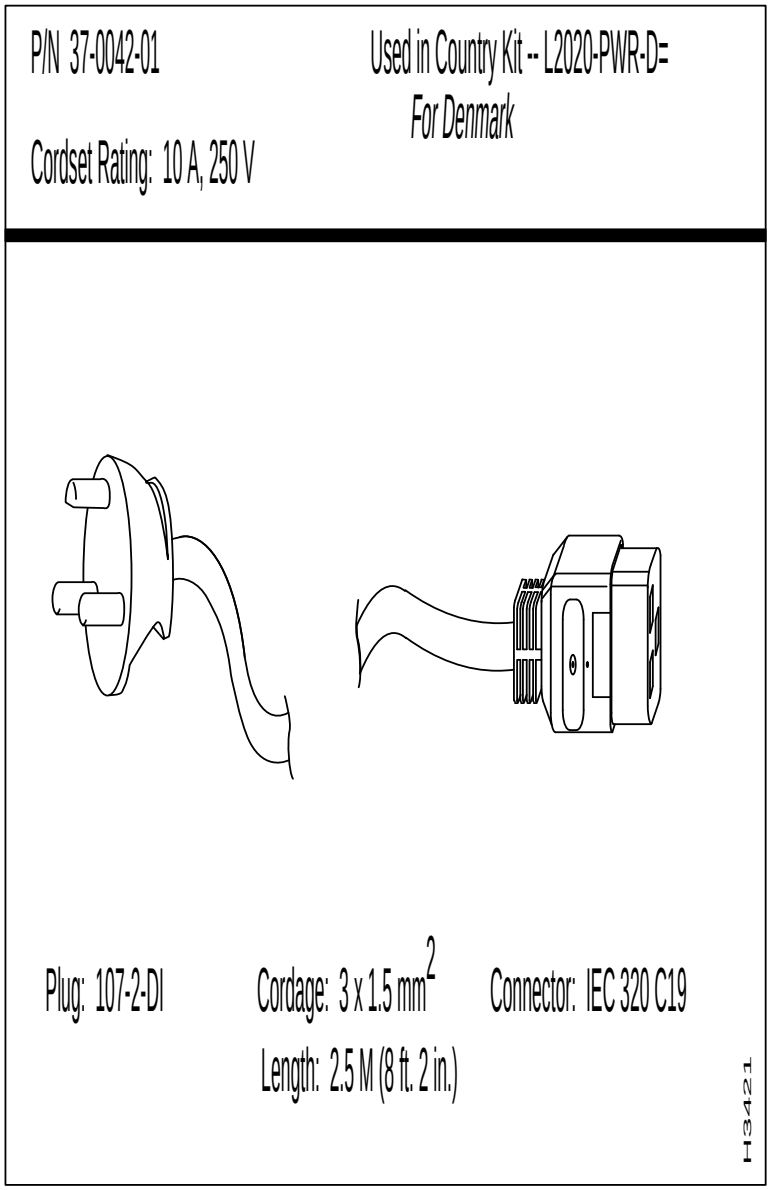
[1]We recommend that you review the release notes before attempting to install, configure, operate, or troubleshoot a LightStream switch. The release notes contain important information that does not appear in other documents.

Notation

In this document, several conventions distinguish different types of graphics and text.

Graphics Conventions

Figure 1-1 Icons



Text Conventions

Convention	Purpose	Example
`Bold screen literal` type	Represents user input.	$**`date`**
`Screen literal` type	Represents system output.	`Wed May 6 17:01:03 EDT 1994`
Boldface type	Denotes names of commands, command arguments, and switches. Command names are case sensitive; enter them exactly as they appear in the text.	Issue the **clear** command.
Italic type	Used for titles of documents and for emphasis.	*LightStream 2020 Configuration Guide*. File names are *case* sensitive.
Angle brackets < >	Indicate user-specified parameters or classes of user responses. When you see this notation in a syntax statement, make the substitution but do not type the angle brackets.	If you see: **`set port`** `<c.p> <state>` you might type: **`set port 4.3 active`**
Square brackets [ ]	Indicate keys on the keyboard, or optional arguments or parameters for commands. You can omit optional arguments and parameters in any command.	Press **[Return]**. `cli>` **`help`** `[<topic>]`
Caret symbol ^	When the caret symbol precedes a character, it refers to the control key.	**^X** is the same as **[Control]X**
Curly braces { }	Indicate a choice of arguments or parameters for commands. Arguments or parameters are separated by a vertical line {|}, and you must select *one*.	`cli>` **`set cli traplevel {off|info|oper|trace|debug}`**

2

Operations Overview

Where to Begin • Network Operations Tasks • Tools for Network Operation

This chapter provides a list of activities you should complete before you attempt to operate your network of LightStream 2020 enterprise ATM switches. It then describes operations activities that you can perform on a LightStream network.

This chapter also explains some of the different ways you can operate your LightStream network, depending on your hardware and software. Once you determine how you will operate your network, you can use that information to determine whether you need to start the command line interface (CLI) or a third-party network management system (NMS). The LightStream CLI is described in detail in this guide. For information on a third-party NMS, refer to the documentation that came with the NMS.

Where to Begin

Before you attempt to operate your network, each LightStream switch should be fully installed, powered on, and configured. The following checklist describes the tasks that should be complete before you begin operating your network. For information on these tasks, refer to the *LightStream 2020 Installation and Troubleshooting Manual* and the *LightStream 2020 Configuration Guide*, or check with your network administrator.

Things to Do Before Operating Your LightStream Network

1. Read the *LightStream 2020 System Overview* and become familiar with the LightStream documentation set.
2. Check with your network administrator to be sure that the installation is complete, the network is powered up, and basic configuration information has been entered.
3. Check with your network administrator to be sure that the appropriate set-up procedures in the "Administrative Tasks" chapter of the *LightStream 2020 Administration Guide* have been completed.
4. Become familiar with CLI and any other network management tools available to you. (Refer to Chapter 3 and Chapter 4 in this guide for a discussion of the CLI.)

Network Operation Tasks

You can perform a wide variety of tasks on your LightStream network. You will perform some tasks every day and others only occasionally. This section lists the different types of tasks that you can perform.

General Monitoring and Control

- Display the status of LightStream hardware (chassis, cards, ports, and circuits) to determine whether the switch is up or down, or how it is configured
- Display the operating parameters for the modem interface
- Display the status of software components (CLI, SNMP, the collector, global information distribution, neighborhood discovery, and other processes)
- Display the temperature, voltage, and serial number of a particular card or chassis
- Display traps and alarms
- Browse through the LightStream Management Information Base (MIB)
- Copy files between LightStream switches
- Configure, log, and view traps

Statistics and Data Collection

- View port statistics
- Program collections of statistics to provide you with a historical record of system performance

Trap Monitoring

- View traps
- Set trap levels
- Log traps

This guide covers general monitoring and control and statistics and data collection. General monitoring and control refers to all the day-to-day activities you perform on the LightStream network, except for monitoring traps. Trap monitoring is discussed in the *LightStream 2020 Administration Guide*.

Tools for Network Operation

A LightStream network can be operated and managed in two different ways:

- By running the LightStream management software program on a Sun SPARCstation.
- By using an external, third-party, SNMP-compatible network management station (NMS).

This section describes these two methods of network operation.

Self-Management Tools

The LightStream Configurator

The LightStream switch comes with a configuration program called the *configurator*. The configurator is a user-friendly graphical interface that, in many cases, reduces configuration tasks to the simple click of a mouse button. A network administrator uses the configurator (for the most part) to manage a network of LightStream 2020 enterprise ATM switches. See the *LightStream 2020 Configuration Guide* for further details.

The LightStream Monitor

LightStream technology provides graphical displays of individual LightStream switches, cards, and ports via the LightStream monitor. In most instances, you will want to monitor the network with the LightStream monitoring tool. (See Chapter 5 of this guide.) However, if the monitor is unavailable to you, you can use the CLI commands in this document to perform many monitoring tasks.

The Command Line Interface

Every LightStream switch includes a software program called the CLI. The CLI is a simple, line-based interface that runs on a LightStream switch or a Sun SPARCstation. You can access the CLI by connecting a terminal to a LightStream switch, by telnetting to the NP, or by running the CLI on a Sun SPARCstation.

In many instances you will want to perform operational procedures with the LightStream monitor or configurator. However, if the LightStream monitor or configurator is unavailable to you, you can use the CLI to perform many procedures. You should be aware, however, if you make changes to any configuration attributes, those changes you make may cause the local configuration database to be out of synchronization with the global database.

Third-Party Network Management Tools

You can use any industry-standard, SNMP-compatible NMS to manage a LightStream network. The following three systems can be used with the LightStream switch:

- OpenView, Release 3.0 from Hewlett Packard
- SunNet Manager, Release 2.0 from SunConnect
- NetDirector Enterprise Network Management software from Ungermann-Bass

You cannot configure a LightStream network using a third-party NMS. The LightStream configurator that runs on a Sun 4 workstation running SunOS 4.1.x/Solaris 1.1.x is used to configure LightStream switches and networks. For information on the LightStream configurator, refer to the *LightStream 2020 Configuration Guide*.

The LightStream documentation set does not provide instructions on how to use a third-party NMS. Use the product documentation for your third-party NMS to get specific instructions.

You can perform operations tasks in a number of different ways, depending on your hardware and software and whether or not traps are interleaved with, or separated from, your general monitoring and control functions. (See Table 2-1.) In most cases, you will perform all monitoring and control functions from a central site. Before operating your LightStream network, you need to know what method of operation you will use. Refer to the “Before You Begin” chapter of the *LightStream 2020 Administration Guide* or see your network administrator to find the appropriate method for your network. The following table describes possible network operation scenarios.

Table 2-1 Network Operation Scenarios

No.	Hardware	Software	Interleave Traps?	Reference
1	Sun SPARC-station	Configure, monitor, and control the network on a Sun SPARCstation using LightStream management software. The configurator, the monitor, and the CLI, run and display on the SPARCstation running SunOS 4.1.x. HP OpenView is optional. If you cannot access the SPARCstation, you can use CLI to perform management tasks. (Optionally, other third-party SNMP-compatible network management software can be used.)	Yes	Manage Network from a Sun SPARC-station Using the Light-Stream configurator, LightStream monitor, and the CLI.
2	VT100-compatible terminal	After configuring the network using the LightStream configurator on a Sun SPARCstation, monitor and control the network from the VT100 terminal. However, if you must add or move hardware or add ports or VCs, you *must* access the Sun SPARCstation to run the configurator. The CLI runs on a LightStream network processor (NP) and displays on the VT100.	Yes	Manage Network from VT 100 Terminal Using CLI.
3	Sun SPARC-station	After configuring the network using the LightStream configurator, monitor and control the network from the Sun SPARCstation using the CLI and the third-party NMS. The configurator, the CLI, and the third-party NMS trap monitoring tool run and display on the SPARCstation.	No	Manage Network from a Sun SPARC-station Using CLI and a Third-party Trap Monitoring Tool.
4	Non-Sun workstation	After configuring the network using the LightStream configurator on a Sun SPARCstation, monitor and control the network from the non-Sun workstation using the CLI. However, if you must add or move hardware or add ports or VCs, you *must* access the Sun SPARCstation to run the configurator to complete these tasks. The CLI runs on a LightStream NP and displays on the workstation.	No	Manage Network from a Non-Sun Workstation Using CLI Only.
5	Non-Sun workstation	After configuring the network using the LightStream configurator on a Sun SPARCstation, monitor and control the network from the non-Sun workstation. However, if you must add or move hardware or add ports or VCs, you *must* access the Sun SPARCstation to run the configurator to complete these tasks. The CLI runs on a LightStream NP and displays on the workstation. The third-party NMS trap monitoring tool runs and displays on the workstation.	No	Manage Network from a Non-Sun Workstation Using CLI and a Third-party Trap Monitoring Tool.

Note You can access traps from a single CLI application running on an NP or from one application of a third-party trap monitoring tool running on a workstation. If you attempt to display traps on a second copy of either program running on another single processor (the NP or workstation), a message is displayed indicating that traps have been intercepted by another user.

3

The Command Line Interface

Introduction to the CLI • User Accounts • Commands Available in the CLI • CLI Command Syntax • Port Number Formats • Normal and Protected Mode • Command Completion Feature • Line Editing Keys

This chapter is an introduction to the command line interface (CLI) that is used to operate and manage LightStream 2020 enterprise ATM switches. It contains a list of CLI commands and describes their syntax and port number formats. It also discusses normal and protected modes, the command completion feature, line editing keys, and the user accounts that are provided with your LightStream switch.

Introduction to The CLI

The CLI is a simple line-oriented interface that you use to perform network operations from any node in the network. The CLI can also be loaded and run on a Sun SPARCstation. The CLI allows you to operate your LightStream network with or without a third-party network management system (NMS).

The CLI allows you to issue commands to only one node at a time. This means that you cannot view the status of several LightStream chassis by entering a single command. You must issue a separate command to each chassis.

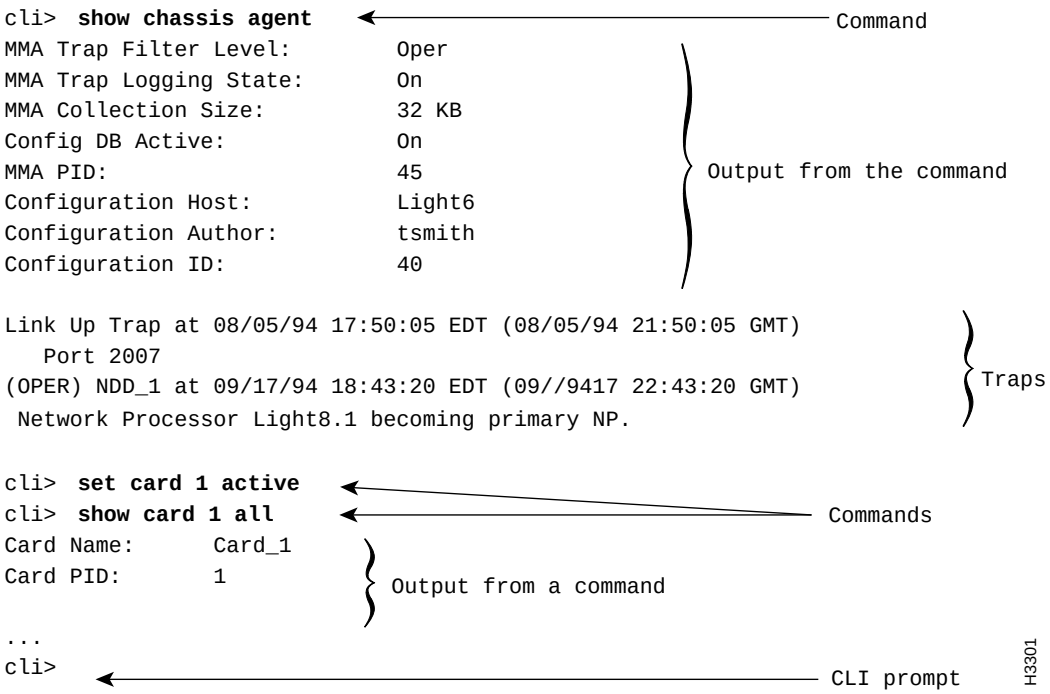
You can access the CLI in three different ways:

- You run the CLI application on a Sun SPARCstation and issue commands to the LightStream nodes in the network.
- You connect a VT100-compatible terminal to the console port on a LightStream switch card (or connect a modem to the modem port) and run the CLI application from a local network processor (NP).
- You telnet to an NP and run the CLI application remotely.

Refer to Chapter 4 for detailed instructions on how to access the CLI using each of the methods described above. From the CLI, you can access any LightStream node in the network and perform network operations on that node

To issue a CLI command, type the command, then press **[Return]**. Output is displayed on the screen. Error messages or traps may be displayed on a separate terminal or window, or they may be interleaved with the CLI commands and their output. Figure 3-1 shows a sample CLI session with traps interleaved with the commands and output.

Figure 3-1 A sample session of CLI. In this example, all commands that you type are shown in bold. Callouts show the different types of information you may see in a CLI session.



If you are running the CLI on an NP, any command you issue is executed on the LightStream switch you are logged in to. However, you have the option of executing any of the commands listed in Table 3-1 on another LightStream switch. To do this, you must first specify the name of the other switch. This is called *setting the target switch*. Once you set the target switch, you can issue any of the commands in Table 3-1 to that switch.

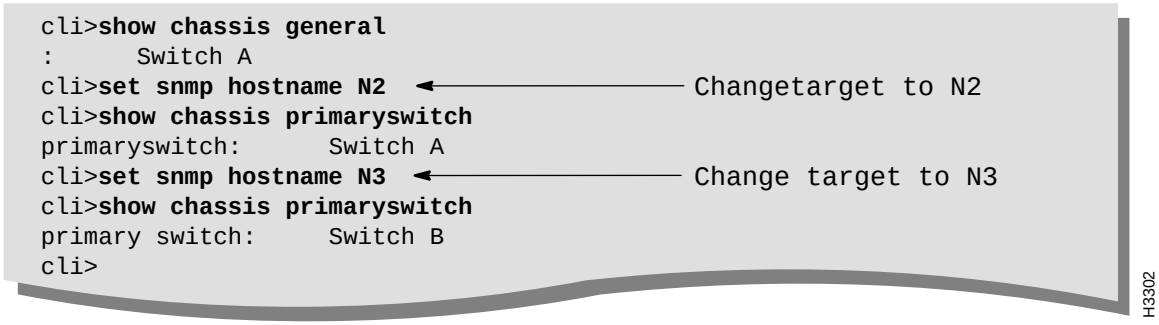
Note If you run the CLI on a Sun SPARCstation, you must set the target switch before executing any commands.

Table 3-1 Commands Available for Use with a Specified Target Switch

Command Type	Command Name	Command Arguments
MIB	browse	MIBaddress
	set	card, chassis, cli, collection, pid, port, stb
	show	bflt, card, chassis, cli, collection, gid, nd, pid, port stb
SNMP	getsnmp	MIBaddress
	getnextsnmp	MIBaddress
	setsnmp	MIBaddress
	walksnmp	MIBaddress
VLI	define	bflt
	delete	bflt
Monitor and Control	clear	none
	exit	none
	help	none
	protected	none

Figure 3-2 shows a CLI session displaying the `primaryswitch` attribute for two switches. Before viewing the `primaryswitch` attribute on the second switch, the target switch is reset to the appropriate switch. (Callouts in the figure indicate when the target is reset.)

Figure 3-2 Sample CLI session



User Accounts

When you install your LightStream switch, the system automatically creates the four accounts shown in Table 3-2. None of these accounts has default passwords. Passwords for the accounts are usually set when the LightStream switch is installed. If you do not know the password for these accounts, see your network administrator.

Table 3-2 System Accounts, Purposes, and Prompts

Account Name	Purpose	Default Prompt
Operator (oper)	Used to access the CLI in the normal mode	`cli>`
NP Administration (npadmin)	Used primarily for protected mode. Can also be used to access the CLI in the normal mode.	`*cli>`
Field Support (fldsup)	Used primarily by field support personnel to perform advanced troubleshooting and maintenance using the LynxOS bash shell.	`bash$`
root	Used for installation and for certain administration tasks using the LynxOS bash shell.	`bash#`

When you access either the operator or the NP administration accounts, the LightStream switch automatically runs the CLI so you can start operations immediately. If you access either of the other accounts, the LightStream switch runs the bash shell or command interpreter and displays the bash (UNIX) prompt.

All users can access shared accounts to operate and manage the network from the CLI. If you prefer, additional accounts can be created so that each user has his or her own account. For more information, see your network administrator.

Commands Available in the CLI

The CLI supports the following types of commands:

- CLI control commands — Basic commands that allow you to perform such functions as accessing protected mode and online help, running a CLI script file, and exiting from the CLI.
- Object-oriented commands — Two commands (**show** and **set**) that allow you to view and modify attributes of a LightStream switch.
- SNMP emulation commands — Commands that perform the same functions as the standard SNMP commands (**get**, **getnext**, and **set**) and some other common SNMP commands (**walk**). These commands allow you to look at and modify MIB objects.
- TCS commands — Commands used primarily to run hardware diagnostics. In addition to the information provided in this guide, more information on these commands is provided in the *LightStream 2020 Installation and Troubleshooting Manual*.

Table 3-3 lists the commands by type and gives a brief description of what each command does. For a detailed description of each command, refer to the *LightStream 2020 Command and Attribute Reference Guide* or to the *LightStream 2020 Command Line Interface (CLI) Reference Card.*

Table 3-3 Commands Available in CLI

Type	Name	Function
CLI control commands	**browse**	Allows you to move through the MIB tree and follow any branch down to its endpoint.
	clear	Clears the screen.
	define	Defines bridge filters.
	delete	Deletes bridge filters.
	exit	Exits either the CLI program or the protected mode of the CLI program.
	help	Provides online help for CLI commands.
	password	Allows you to change the password for the protected mode of CLI.
	ping	Sends ICMP echo packets to any IP address and reports on any returned packets.
	protected	Allows access to protected mode commands.
	quit	Exits protected mode or the CLI program.
	shell	Executes a shell command to allow you access to the LynxOS shell.
	source	Executes a CLI script file stored on a disk.
	test1	Runs diagnostics on a specified card to determine whether it should be replaced.
Object-oriented commands	**set**	Changes the state of the object specified.
	show	Displays the value of the object specified.
SNMP protocol emulation commands	**getsnmp**	Displays the value of the specified MIB object.
	getnextsnmp	Displays the value of the object in the MIB tree that follows the object specified in this command.
	setsnmp	Changes the state of the specified MIB object.
	walksnmp	Displays the values of all MIB objects in the MIB subtree starting with the object that you specified.
TCS commands	**connect**	Logically attaches the console/modem I/O ports to a given slot within a LightStream switch.
	loadcard	Loads the specified file into the card located in the specified slot, starts the card, and establishes a console connection between CLI and the TCS slave on the card. This command is usually used for diagnostics.

1This command is not available for CLCs or PLCs.

CLI Command Syntax

This section shows you some sample CLI commands and describes their syntax. All CLI commands start with the command name. Some commands require no further information; others require arguments such as file names, component names, or values. For a full description of the CLI command syntax, refer to the *LightStream 2020 Command and Attribute Reference Guide* or to the *LightStream 2020 Command Line Interface (CLI) Reference Card*.

Table 3-4 shows sample CLI syntax and command examples. In the syntax examples, optional arguments are surrounded by square brackets ([ ]); placeholders that you must replace with meaningful arguments are surrounded by angle brackets (<>).

Table 3-4 CLI Syntax and Command Examples

Syntax	Command Examples
exit	exit
protected	protected
help [<topic>]	help
	help setsnmp
show <object type> [<component name>] <parameter>	show card 1 all
	show chassis all
set <object type> [<component name>] <parameter> [<value>]	set chassis traplevel debug
	set port 3.4 loop internal
getsnmp <MIB-address> [<MIB-address>]	getsnmp cardName.4 pidName.23

Port Number Formats

Several CLI commands require port numbers. The port number must be entered in the card.port format. The card number is between 1 - 10 for line cards. The port number is between 0 - 7 for a low-speed line card(LSC) and a packet line card (PLC) and 0 - 1 for a medium-speed line card (MSC) and a cell line card (CLC). For example, to issue a **show all** command to port 4 on card 3 in card.port format, you would enter the following command:

```
show port 3.4 all
```

Normal and Protected Mode

The CLI has two modes: normal and protected.

- Normal mode allows you to perform most routine operations.
- Protected mode provides access to additional commands for running hardware diagnostics and performing advanced troubleshooting.

The protected commands are shown in Table 3-5.

Table 3-5 Protected Commands and Their Functions

Protected Command	Command Function
connect	Connect to a card in a specific slot.
loadcard	Perform a diagnostics load.
password	Change the password for protected mode.
set	Set the values of certain CLI attributes in the runtime environment. Not all set commands are protected. Protected sets include **set trap** and **set tcs**.
setsnmp	Set the value of a MIB object.
shell	Execute a shell command and give the user access to the LynxOS shell.
write	Write to TCS/board memory. (This command is for use only by LightStream support personnel.)

Command Completion Feature

It is not always necessary to enter the full name of a CLI command or its argument. If you have typed enough letters to make the command or argument unambiguous, the CLI will accept the abbreviated name. Once you type enough letters of a command name or command argument to make it unambiguous, you can use the **[Tab]** key to complete the name. (See the examples in Table 3-6.)

Table 3-6 CLI Command Completion Examples

If you type:	CLI completes the command and displays:
`br[TAB]`	`browse`
`sh[TAB]`	`show`
`walk[TAB]`	`walksnmp`

If you type,

```
cli> show por 4.2 statistics
```

The CLI cannot interpret the command because the component name (port) is not fully spelled out.

However, any of the following commands would work:

```
cli> show port 4.2 statistics
```

```
cli> sho port 4.2 stati
```

```
cli> sho[TAB] por[TAB] 4.2 stati[TAB]
```

Note The system does, however, recognize and use an unexpanded command or argument, if the word is unique and is the last item in the command line. Thus, you could issue either of the following commands:

```
cli> show port 4.2 stati
```

```
cli> sho[TAB] por[TAB] 4.2 stati
```

Line Editing Keys

The CLI uses a set of line editing keys that is a subset of those found in the Emacs editor. In general you can use these line editing keys for any terminal type except a hard copy terminal.

Table 3-7 shows the line editing keys that are available from the CLI.

Table 3-7 CLI Line Editing Keys

Key Sequence	Result
^A	Moves cursor to beginning of line.
^B	Moves cursor back one space.
^C	Interrupts command being executed.
^D	Deletes character at cursor position.
^E	Moves cursor to end of line.
^F	Moves cursor forward one character.
^K	Deletes all characters from cursor position to end of line.
^L	Redisplays current line.
^N	Scrolls forward through all commands that have been entered. (You must scroll backwards using ^P before this command provides any results.)
^O	Toggles between overwrite mode and insert mode.
^P	Scrolls backwards through all commands, beginning with the most recent command.
^R	Searches backwards through all commands for a particular word that you specify at the question mark prompt.
^S	Searches forward through all commands for a particular word that you specify at the question mark prompt. (You must scroll backwards using ^P before this command provides any results.)
^T	Transposes the character at the cursor position with the previous character.
^U	Deletes all characters on line, regardless of cursor position.
[Backspace]	Deletes character to left of cursor.
[Rubout]	Deletes character to left of cursor.
[Return]	Executes command.
[Line feed]	Executes command.
[Tab]	Completes command entry.

4

Getting Started

Procedures to Start CLI • Basic CLI Functions

This chapter describes how to log in to the command line interface (CLI) and perform basic CLI functions.

Procedures to Start CLI

This section describes how to start CLI and begin operating your network using the CLI.

The method you'll use to log in will vary depending on the network management option you select. Refer to Network Scenarios in Table 3-1 for a description of different network operation and management possibilities. If you choose an option that requires you to run CLI on a Sun SPARCstation, refer to the *LightStream 2020 Installation and Troubleshooting Manual* for installation instructions. To start a workstation (Sun or non-Sun) or load and start a third-party network management system (NMS), refer to the documentation for the workstation and NMS.

Logging in to CLI

This section tells you how to log in to CLI. Step-by-step instructions are given for the following access methods:

- Access CLI on an NP by telnetting to the network processor (NP)
- Access CLI on an NP by connecting a terminal to the console port on the console/modem assembly
- Access CLI installed on a Sun SPARCstation by logging in to the Sun SPARCstation

If you will be using telnet to reach the NP, check with your network administrator to be sure a basic configuration to define the IP address of that NP was entered during installation. If you will be accessing the CLI from either a terminal or modem port, it is not necessary to have the IP addresses defined for the NP.

Note If you do not log in to either the oper or npadmin accounts on CLI, you must start CLI manually (issue the **cli** command) from the `bash$` (UNIX) prompt.

Procedure 1: Accessing CLI by Telnetting to the NP

Step 1 Determine the name and password for the user account you will be using. (See your network administrator if you need assistance.)

Step 2 Enter the following at the prompt on the system from which you are telnetting:

```
telnet <IP address of the NP>
```

or

```
telnet <host name>
```

The system displays the following information while it makes the connection:

```
Trying <IP address or host name>
Connected to <IP address or host name>
Escape character is '^]'.

Lynx OS (<host name>)
```

Step 3 Enter the user name when you see the following prompt:

```
user name:
```

You usually log in to the oper account. However, you can also log in to npadmin, root, fldsup, or any other user account that your network administrator has defined. If you do not know the user name, see your network administrator.

Step 4 Enter the password when you see the following prompt:

```
password:
```

If you do not know the password, see your network administrator.

If you log in correctly to either the oper or npadmin account, the CLI opens automatically. If you log in to the fldsup or root accounts, you are placed at the `bash$` prompt.

Step 5 To start CLI from the `bash$` prompt, enter the following:

```
cli
```

Procedure 2: Accessing CLI by Connecting a Terminal to the Console Port on the Console/Modem Assembly

Step 1 From the terminal attached to the console (or modem) port on the console/modem assembly, enter the following at the TCS prompt:

```
TCS HUB<<A>> connect <slot #>
```

where `<slot #>`

The slot number of the NP card on which you want to run CLI (1 or 2).

Step 2 Enter the user name when you see the following prompt:

```
user name:
```

If you do not know the user name, see your network administrator.

Step 3 Enter the password when you see the following prompt:

```
password:
```

If you do not know the password, see your network administrator.

If you log in correctly to either the oper or npadmin account, CLI opens automatically. If you log in to the fldsup or root accounts, the `bash$` prompt is displayed.

Step 4 To start CLI from the `bash$` prompt, enter the following at the prompt:

```
cli
```

Procedure 3: Accessing CLI Running on a Sun SPARCstation

Step 1 If CLI has been installed on your SPARCstation, log in to your SPARCstation. If you have trouble starting CLI, ensure that the directory containing CLI is included in your Lynx search path. (Refer to the *LightStream 2020 Installation and Troubleshooting Manual* for further information.)

Step 2 Open CLI on the SPARCstation by entering the following command at the prompt:

```
cli [<flags>]
```

where`[<flags>]` = any of the following options:

- `help` Prints this help message.
- `community=<community>` Defines the default community name
- `hostname=<hostname>` Defines the name or address of the host to manage
- `prompt=<string>` Defines the line prompt
- `logfile=<filename>` Turns on logging of all CLI activities. The entry `<filename>` specifies the name of the log file.
- `nolinedit` Turns off line edit
- `nomore` Turns off **more**-like scrolling
- `notraps` Disables reception of traps
- `trapmon` Acts only as a trap monitor (no user input is allowed)

Step 3 Set the target switch by entering the following at the `cli>` prompt:

```
cli> set snmp hostname <hostname>
```

where `<host name>`

The name (a text string) or IP address of the LightStream switch to which you want to set the target. This is the switch that CLI commands are sent to until you change the target again.

Expected Results

When you have successfully logged in to CLI, the following text appears on the screen:

```
CLI (Version 2.1.0 of April 21, 1995)
cli>
```

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If you are unable to start the CLI, you might see messages that indicate the shell cannot find a program, permission was denied because CLI is not an executable file, or this user is not allowed to access CLI. (See your network administrator if you need assistance.)

Basic CLI Functions

This section describes the following CLI functions:

- Accessing Online Help
- Clearing the screen
- Setting CLI attributes
- Accessing protected mode
- Setting the target for CLI commands
- Executing a CLI script file

Accessing Online Help

This section explains how to access online help.

Procedure 1: Displaying a List of All CLI Commands Available

Step 1 Enter the following at the `cli>` prompt:

```
cli> help
```

or

```
cli> ?
```

Expected Results

A list of all the commands available from CLI is displayed as shown in Figure 4-1. Commands preceded by an asterisk (*) can be used only in protected mode. All other commands are available in normal mode and protected mode.

Figure 4-1 The output of the help command when executed without an argument

```
cli> help
 browse                    Browse the MIB tree
 clear                     Clear the screen
*connect                   Connect to card in slot
 define                    Define bridge filter
 delete                    Delete Bridge filter
 exit                      Exit program
 getsnmp                   Print MIB value
 getnextsnmp               Print next MIB value
 help [topic]              Print this message and more
*loadcard                  Load line card software
*password                  Change protected mode password
 ping                      Send ICMP echo packets to host
 protected                 Enter protected mode
 quit                      Exit program
 read                      Read board memory
*setsnmp                   Set a MIB value
 set                       Change the state of an object
*shell                     Execute a shell command
 show                      Display the state of an object
 source                    Run shell script
*test                      Run diagnostic programs
 walksnmp                  Walk MIB starting at mib±address
*write                     Write to TCS/board memory
  `*' indicates command requires protected mode.
cli>
```

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Procedure 2: Displaying Detailed Help on a Particular Topic

Step 1 Enter the following at the `cli>` prompt:

```
cli> help [<topic>]
```

where `[<topic>]`

An optional argument that allows you to enter the name of a command on which you want help.

Expected Results

Whenever you use the **help** command with an argument, the display includes the command name, a syntax statement, and a description, as shown in Figure 4-2.

Figure 4-2 The output of the help command when executed with the argument quit

```
cli> help quit
NAME
       quit or exit ± halt program

SYNTAX
       quit

DESCRIPTION
       If in protected mode return to normal mode. If in normal mode,
       leave the program immediately
cli>
```

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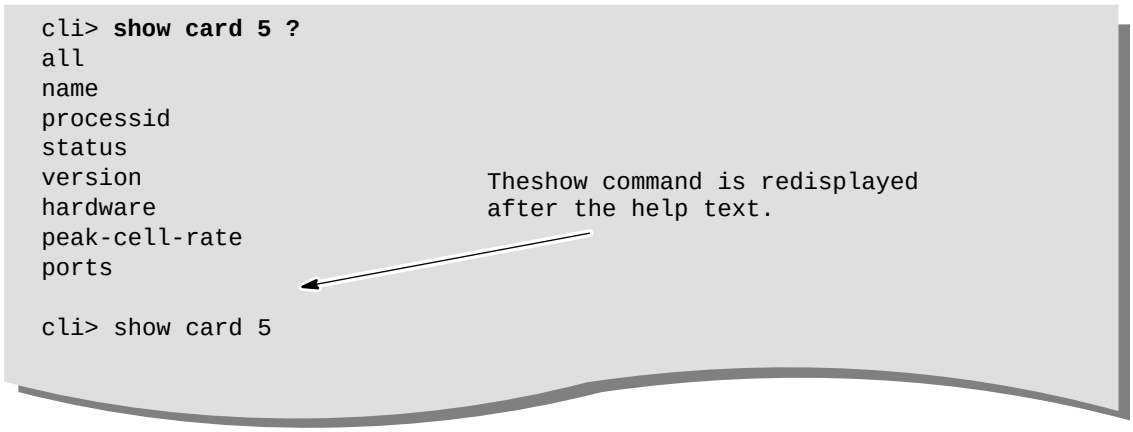
Procedure 3: Displaying the Options Available for a Particular Command

Step 1 Enter a question mark [**?**] in a command to display a list of the options. For example, if you are using the **show card 5** command and you do not know what type of objects you can display, enter:

```
cli> show card 5 ?
```

CLI displays a list of the objects that you can show for card 5. This command also redisplays the command that you typed, so that you do not have to retype it; just enter the name of the object you want to show. (See Figure 4-3.)

Figure 4-3 Output of the show ? command



You can continue to use the question mark to complete your **show** command as shown in Figure 4-4.

Figure 4-4 Sample CLI session showing how to use the question mark for help

```
cli> show card
syntax error
cli> show card ?
Card number required
cli> show card 5 ?
all
name
processid
status
version
hardware
peak-cell-rate
ports
cli> show card 5 name
Card Name:  ls±card±5
cli>
```

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CLI indicates that you must enter the card number. If you enter **show card 5 ?** at this point, CLI displays a list of the options you can enter for card 5. CLI automatically redisplays **show card 5.** Then, you enter the option you want to view (**name**, for example).

Clearing the Screen

This section describes how to clear your screen of the current display.

Step 1 Enter the following at the `cli>` prompt:

```
cli> clear
```

The screen clears and the `cli>` prompt reappears at the top of the screen.

Setting CLI Attributes

This section explains how to set a number of CLI attributes. These attributes determine how CLI operates. The attributes that you can set are:

- Echo Source
- Line Edit
- Logging
- Terminal Type
- Timer
- Traplevel

- Debug

Setting the Echo Source Attribute

This attribute specifies whether or not the commands in a script file are displayed as they are executed by the **source** command. If echosource is set to *yes*, the commands are displayed. If echosource is set to *no*, the commands are not displayed.

Step 1 To set the CLI echosource attribute, enter the following at the `cli>` prompt:

```
cli> set cli echosource <value>
```

where `<value>`

- on—displays each command of a script file as it is executed (default)
- off—does not display each command of a script file as it is executed

Step 2 To verify that the command has been executed, enter the following at the `cli>` prompt:

```
cli> show cli echosource
```

Expected Results

```
*cli> show cli echosource
Echo source: on
*cli>
```

Setting the Line Edit Attribute

Set lineedit to *on* to use the emacs-like editing commands on the command line. Set lineedit to *off* if you use a hard copy terminal.

Procedure

Step 1 To set the CLI line edit attribute, enter the following at the `cli>` prompt:

```
cli> set cli lineedit <value>
```

where `<value>`

- on—use emacs-like line editor (default)
- off—does not support the CLI line edit commands

Step 2 To verify that the command has been executed, enter:

```
cli> show cli lineedit
```

Expected Results

```
*cli> show cli lineedit
Line Edit:   on
*cli>
```

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Setting the Logging Attribute

This attribute specifies whether the LightStream switch logs all input to and output from CLI. To keep a log of CLI activity, enter a log file name as the value shown in Step 1. Otherwise, set the value to off.

Step 1 To set the CLI logging attribute, enter the following at the `cli>` prompt:

```
cli> set cli log <value>
```

where `<value>`

- <log file name>
- off—no logging takes place (default)

Note You cannot view this log file unless you use the **set cli log off** command or until the CLI session in which the file was opened is closed. Logging from subsequent CLI sessions will be appended to this file. No default log file name exists.

Step 2 To verify that the command has been executed, enter the following at the `cli>` prompt:

```
cli> show cli log
```

Expected Results

```
*cli> show cli log
Logging: off
*cli>
```

Setting the Terminal Type Attribute

This attribute specifies the type of terminal you are using. Valid terminal types include VT100 and xterm. A complete list of valid terminal types can be found in the /etc/termcap file on your LightStream switch.

Step 1 To set the CLI terminal type, enter the following at the `cli>` prompt:

```
cli> set cli term <terminal type>
```

where `<terminal type>`

- VT100 (default)
- xterm
- Any other valid terminal type listed in the /etc/termcap file

Step 2 To verify that the command has been executed, enter the following at the `cli>` prompt:

```
cli> show cli term
```

Expected Results

```
*cli> show cli term
Terminal type: sun
*cli>
```

Setting the CLI Timer

This attribute resets the CLI timer, which indicates the elapsed time since CLI was restarted or since this timer was reset.

Step 1 To reset the CLI timer, enter the following at the `cli>` prompt:

```
cli> set cli timer
```

Step 2 To verify that the command has been executed, enter the following at the `cli>` prompt:

```
cli> show cli timer
```

Expected Results

```
*cli> show cli timer
Timer: 30 Minute(s) 1 Seconds
*cli>
```

Setting the Traplevel Attribute

This attribute specifies the severity level of traps to be displayed by CLI or sets the trap level so that no traps are displayed. (Refer to the *LightStream 2020 Administration Guide* for information on trap severity levels.)

Step 1 To set the CLI traplevel attribute, enter the following at the `cli>` prompt:

```
cli> set cli traplevel <value>
```

where `<value>`

- off
- oper
- info
- trace
- debug (default)

Step 2 If you are setting the CLI traplevel attribute to *off*, enter the following additional command at the `cli>` prompt:

```
cli> set chassis consoletraplevel off
```

Step 3 To verify that the command has been executed, enter the following at the `cli>` prompt:

```
cli> show cli traplevel
```

Expected Results

A screen similar to the following is displayed:

```
*cli> show cli traplevel
Traplevel: Debug
*cli>
```

Setting the Debug Attribute

This attribute turns on the debugging mode. This feature is available in protected mode only and is used for development and testing purposes.

Step 1 To set the CLI debug attribute, enter the following at the `cli>` prompt:

```
*cli> set cli debug <value>
```

where `<value>`

- on— debugging mode is enabled
- off —debugging mode is disabled (default)

Step 2 To verify that the command has been executed, enter the following at the `cli>` prompt:

```
*cli> show cli debug
```

Expected Results

A screen similar to the following is displayed:

```
*cli> show cli debug
Debug: off
*cli>
```

Accessing Protected Mode

This procedure shows you how to access protected mode. Your network administrator can provide you with the protected mode password, if you need access.

Note The password used for protected mode is the same password used for the npadmin user account.

Procedure 1: Entering Protected Mode

Step 1 To enter protected mode, type the following at the `cli>` prompt:

```
cli> protected
```

Step 2 Enter the protected mode password when you see the following prompt:

```
Enter password:
```

Expected Results

If you enter the password correctly, you enter protected mode. The `cli>` prompt changes to `*cli>`. You can now execute protected mode commands in addition to normal mode commands.

If you enter an invalid password, the following message appears:

```
Sorry
```

If you enter a command that requires protected mode while you are in normal mode, the following message appears:

```
Command requires 'protected' mode.
```

Operational Tips

Once you enter protected mode, you remain in that mode until you take explicit action to return to normal mode. (Refer to Procedure 2: Exiting Protected Mode, below.) To prevent unauthorized access, always return to normal mode when you are finished or before you leave your terminal. It is also good practice to log out whenever you leave your terminal to prevent unauthorized access.

Procedure 2: Exiting Protected Mode

Step 1 To exit from protected mode, enter the following at the `*cli>` prompt:

```
*cli> exit
```

or

```
*cli> quit
```

Expected Results

When you exit protected mode, the `*cli>` prompt reverts to `cli>`.

Forcing a Switch Card to Become Active or Backup

In a LightStream switch with two switch cards (SA and SB), one card is the active switch card and the other card is the backup switch card (a hot spare*)*. In case of a problem with the active switch card, the backup switch card *automatically* becomes the active switch card, assuming the IP address associated with the active switch card.

In addition, you can *force* either of the switch cards to become the active (or backup) switch card. This is called a *planned cutover.* You would do this, for example, if you planned to swap out the active switch card. When you force the backup switch card to become the (new) active switch card, the process forces the (original) active switch card to become the (new) backup switch card. The procedure below shows how to do this.

Note This procedure is different from forcing the TCS hub on the switch card to become the primary or secondary TCS hub. That procedure is part of the diagnostic process and is described in the *LightStream 2020 Administration Guide*.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

A screen similar to the following is displayed:

```
*cli> show snmp

Community: public
HostName: localhost
cli>
```

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Step 2 To determine which switch card is the active, enter the following at the `cli>` prompt:

```
cli> show chassis primaryswitch
```

A screen similar to the following is displayed:

```
cli> show chassis primaryswitch

Switch:                          Switch A
Secondary Switch Users:          None
Secondary Switch Clock Faults:   None
```

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Step 3 At the `cli>` prompt, enter:

```
cli> set chassis primaryswitch <slot #>
```

where `<slot #>`

SA, SB

Expected Results

The switch card you designate is set to be the active switch card. It takes approximately four seconds to switch the active and backup switch cards.

Setting the Target Switch for CLI Commands

If you are running CLI on an NP, CLI commands are executed on the LightStream switch you are logged in to. You can issue some CLI commands to a different LightStream switch. Table 3-1 lists those commands. However, to execute any of those commands on another switch, you must first specify the name of the other LightStream switch. This is referred to as *setting the target switch*. You set the target switch by issuing the **set snmp hostname** command.

Note If you are running CLI on a Sun workstation, you must set the target switch before executing any other CLI commands.

This procedure tells you how to display a list of all LightStream switches in the network and then describes how to set the target switch.

Procedure

Step 1 Enter the following at the `cli>` prompt:

```
cli> protected
```

Step 2 Enter the protected mode password when you see the following prompt:

```
Enter password:
```

Step 3 To display a list of all LightStream switches in your network and their IP addresses, enter the following at the `*cli>` prompt:

```
*cli> shell "more /etc/hosts"
```

The following is a sample of the output from that command:

```
*cli> shell  more /etc/hosts

128.1.22.41   Light1
128.1.22.42   Light2
128.1.22.43   Light3
128.1.22.46   Light6
128.0.0.1     localhost
```

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Step 4 Find the name or IP address of the switch you want from this list.

Step 5 To change the target switch, enter the following at the `*cli>` prompt:

```
*cli> set snmp hostname <host name>
```

where `<host name>`

The name (a text string) or IP address of the LightStream switch to which you want to set the target. This is the switch that CLI commands are sent to.

Step 6 To reset the target switch to the local switch, enter the following at the `*cli>` prompt:

```
*cli> set snmp hostname {localhost|127.0.0.1}
```

Step 7 To verify the name of the current target switch, enter the following at the *cli> prompt:

```
*cli> show snmp
```

Operational Tips

When you issue commands that affect the operation of a particular switch, be sure to check that the target is set to the correct switch.

Displaying Log Files

The log files include the trap log file, the configurator log file, and the collection files. You can use the LynxOS **cbufpr** command to display these files. Both commands begin the display with the oldest entry and end with the most current entry.

Fixed-size, circular files are used to limit the amount of space required to store data. When a log file becomes full, the oldest data is overwritten by new data.

Procedure: Displaying a Log File Using the cbufpr Command

Step 1 To display a circular file from the LynxOS shell, enter the following at the bash$ prompt:

```
bash$ cbufpr [-h] [-v] [-all] [-tail] -<number> [-f] [-trap] <file> |more
```

To display a circular file from CLI, enter the following at the *cli> prompt:

```
*cli> shell "cbufpr [-h] [-v] [-all] [-tail] -<number> [-f] [-level] <file> |more"
```

where

- h Displays this help message.
- v Displays **cbufpr** version information.
- all Allows you to read files of all formats, including files that are not circular.
- tail Reads the last 20 lines of the trap log file.
- <number> Specifies the number of lines to display. This switch can be used with the tail switch to specify the number of lines from the bottom of the file to display.
- f Continues reading from end of file rather than exiting. The switch allows you to display traps that accumulate during the time you are viewing other parts of a circular file.
- level Defines the level of traps to be displayed (SNMP, oper, info, trace, or debug).
- <file> Name of the log file to be printed, for example: usr/tmp/mma/mma.traplog
- |more Displays one page of the file at a time. Press the spacebar to display the next page. If you do not use |more, the file will scroll across the screen.

Step 2 To exit from the log file display, press **q**.

Expected Results

Depending on the switches and file you select, the results displayed using **cbufpr** will vary. A screen similar to the following is displayed if you enter **shell "cbufpr -tail /usr/tmp/mma/mma.traplog"** at the *cli> prompt.

Figure 4-5 A typical cbufpr command

```
*cli> shell ∫cbufpr -t /usr/tmp/mma/mma.traplog∫
PROGRAM: cbufpr: compiled Aug 10 1993 @ 03:25:14
(OPER) NPTMM_6 at 09/30/93 12:35:51 EDT (09/30/93 16:35:51 GMT)
TEMPERATURE#2 (40C [104F]) of card 1 is outside of the normal range
(OPER) NPTMM_6 at 09/30/93 12:36:42 EDT (09/30/93 16:36:42 GMT)
   TEMPERATURE#2 (41C [107F]) of card 1 is outside of the normal range
(OPER) LCC_1 at 09/28/93 16:26:43 EDT (09/28/93 20:26:43 GMT)
   Warning LCC FR port 5000 dlci 31 VC connect request from incorrect
   endpoint, from node Light6 port 6001 dlci 31
(INFO) LCC_3040 at 09/30/93 12:11:05 EDT (09/30/93 16:11:05 GMT)
UNI VC created, Starting Flow port 6000 VCI 16
(OPER) NPTMM_6 at 09/30/93 12:37:45 EDT (09/30/93 16:37:45 GMT)
TEMPERATURE#2 (41C [107F]) of card 1 is outside of the normal range
(OPER) NPTMM_6 at 09/30/93 12:38:23 EDT (09/30/93 16:38:23 GMT)
TEMPERATURE#2 (41C [106F]) of card 1 is outside of the normal range
Link Up Trap at 09/24/93 20:56:24 EDT (09/25/93 00:56:24 GMT)
Port 4001
Link Down Trap at 09/24/93 20:57:14 EDT (09/25/93 00:57:14 GMT)
Port 4001
(INFO) LCC_3039 at 09/30/93 12:12:33 EDT (09/30/93 16:12:33 GMT)
FF VC created, Starting Flow port 10000 status= 0

*cli>
```

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Executing a CLI Script File

This section explains how to execute a CLI script file. (Refer to the *LightStream 2020 Administration Guide* for instructions on how to create your own CLI script files.)

Procedure

Step 1 Enter the following at the `cli>` prompt:

```
cli> source "<file name>"
```

where <file name>

The name of the CLI script file containing CLI commands. The file name must be surrounded by quotes. If you are not running in the same directory that contains the CLI script file, the filename must be the full path name of the file.

Note Note: You can interrupt individual commands in a CLI script file by typing **^C**.

Expected Results

The results of the **source** command depend upon the contents of the CLI script file that it runs and the value of the CLI attribute called echosource. If you have turned on the echosource attribute in CLI (the default), the command being executed by the CLI script file is echoed to the screen preceded by a plus sign (+).

5

Monitoring LightStream Switches

Introduction to Monitoring • Monitoring Hardware Components from CLI • Using the LightStream Monitor • Monitoring Software Components from CLI • Monitoring the Test and Control System • Accessing the MIB Tree

This chapter tells you how to determine the status of LightStream 2020 enterprise ATM switches and their components. It shows command examples and explains how you can obtain additional information.

The LightStream monitor is described in this chapter. The monitor displays a graphical representation of a LightStream switch, its cards and ports.

This chapter discusses the **browse** command, which allows you to view the value of any object in the LightStream management information base (MIB). Information about every object in a LightStream switch is stored in the MIB. You can issue CLI (command line interface) commands to retrieve and display the MIB information so you can determine how a switch is configured and how it is operating. This chapter also discusses the **show** command. When you issue a **show** command, the switch retrieves the requested information from the MIB. You may see a collection of MIB attributes displayed or you may see only a single attribute.

Introduction to Monitoring

Two tools are available for monitoring: the LightStream monitor program and the CLI. In the CLI, you use the **show** command to monitor a switch or its components. In the monitor program, you click on components to display information about them. You can monitor the following LightStream components and subsystems:

- Bridge filter
- Card
- Chassis
- Collector
- Command line interface (CLI)
- Connections (frame forwarding, frame relay and virtual channel)
- Modem
- Port
- Processes (global information distribution and neighborhood discovery)
- Switch cards, NPs, and power supplies
- SNMP
- Test and Control System (TCS)
- Traps

CLI procedures to monitor all of these components and subsystems, except traps, are described next. Monitoring traps is described in the *LightStream 2020 Administration Guide*. Use of the LightStream graphical monitor to view switches, cards, and ports begins in the section entitled "Using the LightStream Monitor."

Monitoring Hardware Components from CLI

This section provides the procedures for monitoring the hardware components of a LightStream switch:

- Chassis
- Cards
- Ports
- DSU/CSUs
- Modems
- Redundant components

Monitoring a Chassis

This procedure allows you to monitor the chassis. The information displayed by this procedure applies to the LightStream switch.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 Enter the following at the `cli>` prompt:

```
cli> show chassis <parameter>
```

where `<parameter>`

- all (default)
- general
- agent
- congestion
- primaryswitch
- powersupply
- cards
- listff
- listdlci
- listvci

Expected Results

When you enter **show chassis all**, information similar to the following is displayed:

Figure 5-1 Example of the show chassis all command

```
cli> show chassis all
Name:                          Light7
Description:                   ATM Data Switch
Contact:                       Jim Smith
Location:                      New York
System Up Time:                39 Hr 26 Min 27 Sec

R2.1:
Software Version: xxxxx
Console Trap Level:            Oper
Chassis ID:                    5143
Slot of Primary NP:            1
Slot of This NP:               1
Primary Addr:                  127.1.32.47
Secondary Addr:                0.0.0.0
Subnet Mask:                   255.255.255.0
Ethernet Address:              127.1.22.47
Ethernet IP Mask:              255.255.255.0
Default Router:                127.1.22.1

MMA Trap Filter Level:         Oper
MMA Trap Logging State:        On
MMA Collection Size:           32 KB
Config DB Active:              On
MMA PID:                       11
Configuration Host:            Light2
Configuration Author:          rwilliams
Configuration ID:              26

Maximum Interval between Permit Limit Updates:       5000 ms.
Minimum Interval between Permit Limit Updates:       1000 ms.
Minimum Interval between CA Updates:                 1000 ms.
Primary Switch:                Switch A
Power Supply A:                Empty
Power Supply A Type:           Empty
Power Supply B:                Good
Power Supply B Type:           Todd Power Supply

Slot 1:          NP
Slot 2:          LS Trunk
Slot 3:          LS Edge
Slot 4:          LS Edge
Slot 5:          MS Trunk
Slot 6:          ATM-UNI
Slot 7:          Empty
                                                        (Continued)
```

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Figure 5-2 Example of the show chassis all command (concluded)

```
Slot 8:          Empty
Slot 9:          Empty
Slot 10:         Empty
Slot SA:         Switch
Slot SB:         Empty

                  Frame forwarding connections list:

S Node    Port      Node   Port      IR        IB        MR        MB
* Light7  4.4 <±> Light2   7.0       511841    1491      511841    1491
  Light7  4.5 <±> Light2   7.3       511841    1491      511841    1491
* Light7  4.6 <±> Light2   3.1       1791955   1491      1791955   1491
  Light7  4.7 <±> Light2   3.2       1791955   1491      1791955   1491

                        Frame Relay DLCI list:

S  Node   Port  DLCI     Node  Port  DLCI  IR        IB       MR       MB
* Light7  3.0   31 <±> Light2  2.1   12    31713     1491     63767    3026
* Light7  3.0   32 <±> Light2  2.3   15    31713     1419     63767    3026
  Light7  3.0   33 <±> Light4  3.2   42    31713     1419     63767    3026
  Light7  3.0   34 <±> Light4  3.3   43    31713     1419     63767    3026
* Light7  3.0   35 <±> Light4  9.1   44    31713     1419     63767    3026
  Light7  3.0   36 <±> Light6  9.2   45    31713     1491     63767    3026

                          ATM±UNI VCI list:

S Node    Port  VCI       Node   Port   VCI  IR      IB     MR     MB
  Light7  6.0   1023 <±> Light2  6.0    16   9434    1000   9434   1000
* Light7  6.0   1025 <±> Light2  6.0    16   9434    1000   9434   1000
  Light7  6.0   1026 <±> Light2  6.0    16   9434    1000   9434   1000
  Light7  6.1   1025 <±> Light2  6.1    16   9434    1000   9434   1000
...

cli>
```

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Note The column labeled S indicates the state of the connection. If there is an asterisk (*) in the state column for a particular connection, the connection is down. If the state column is blank, the connection is up.

If you enter any parameter except **all**, a subset of the screen shown above is displayed. For example, if you enter the command **show chassis agent**, information similar to the following is displayed:

Figure 5-3 Example of the show chassis agent command

```
cli> show chassis agent
MMA Trap Filter Level:        Oper
MMA Trap Logging State:       On
MMA Collection Size:          32 KB
Config DB Active:             On
MMA PID:                      11
Configuration Host:           boston
Configuration Author:         Bob Williams
Configuration ID:             26
cli>
```

H3324

Monitoring Cards

This procedure allows you to monitor the cards in the LightStream switch. You can monitor network processor (NP) cards, edge cards, trunk cards, and switch cards. You select the card you want to monitor by specifying its card number (slot number). When you specify a card, you also get information on its associated access card.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 Enter the following at the `cli>` prompt:

```
cli> show card <card #> <parameter>
```

where

- `<card #>` The slot in which the card you want to monitor is located.

  1 - 2 for NP cards

  2 - 10 for line cards

  SA or SB for switch cards

- `<parameter>` all (default)

  name1

  processid

  status

  version

  hardware

ports

Note No information is available for switch cards.

Note No information is available for NP or switch cards.

Expected Results

The results of this command will very, depending on the type of card in the slot. If you enter any parameter except the **all** parameter, a subset of the attributes is displayed.

When you enter **show card 5 all**, information similar to the following (for a low speed edge card) is displayed:

Figure 5-4 Example of the show card all command

```
cli> show card 5 all
Card Name:                    Light7.5_ls-e
Card PID:                     19
Operational Status:           Up
Administrative Status:        Up
Configuration Register:       Up

LC Software Version:          Version: 1.2 Compiled cp_ms1.aout:compiled
Jul 21 1994 @ 01:59:54

LCC Software Version:         LCC (Version 1.000 of Jul 21 1994)

Card Type:                              LS Edge
Temperature Top:                        88 F
Temperature Bottom:                     76 F
TCS Voltage:                            5.151 volts
VCC Voltage:                            5.078 volts
Vee Voltage:                            ±4.978 volts
Temperature Paddle Card Region 1:       89 F
Temperature Paddle Card Region 2:       78 F

Port  5000 Frame Forwarding Name:       Light7.5.0_ff
Port  5001 Frame Relay  Name:           Light7.5.1_fr
Port  5002 Frame Relay  Name:           Light7.5.2_fr
Port  5003 Frame Relay  Name:           Light7.5.3_fr
Port  5004 Frame Relay  Name:           Light7.5.4_fr
Port  5005 Frame Forwarding Name:       Light7.5.5_ff
Port  5006 Frame Forwarding Name:       Light7.5.6_ff
Port  5007 Frame Forwarding Name:       Light7.5.7_ff

cli>
```

H3325

Monitoring DSU/CSU Statistics

The **csumon** tool, available from the bash shell, lets you monitor the DSU/CSU for the following:

- Low-speed line card
- Medium-speed line card

In addition, you can use **csumon** to issue commands to an external DSU/CSU attached to a low-speed interface.

Monitoring the DSU/CSU on a Low-speed Line Card

You can obtain CSU statistics by connecting to an external data service unit/channel service unit (DSU/CSU) from a LightStream switch through a serial line. This provides a terminal to the DSU/CSU. You use its own interface to set up and monitor the DSU/CSU. (Refer to the documentation for the DSU/CSU for details.)

Procedure to Monitor a Low-speed Line Card DSU/CSU

Step 1 Connect the LightStream switch to the external DSU/CSU by connecting an RS-232 serial cable from the control port on the fantail to the CSU craft (or console) port.

Step 2 To access the bash prompt, log in as root or fldsup on the LightStream switch to which the DSU/CSU you want to monitor is attached.

Step 3 Test the connection by using the following command:

```
bash$ csumon <.card.port#>
```

where `<.card.port#>`

The target switch card and port number in the LightStream switch, entered in .card.port format (card 2 - 10; port 0 - 7).

Note You must use the leading "." in the card and port entry shown above.

Figure 5-5 shows a screen displaying the kind of information you might see in a DSU/CSU status display. The display you see will probably look different, depending on the DSU/CSU you are using.

Figure 5-5 Example - csumon display

```
bash$ csumon .7.5

    ========== P O R T 5 ==========    ========== P O R T 6 ==========

      Current   Intrvl 7      Total    Current   Intrvl 7        Total

PES         0          0          2          0          0            2
PSES        0          0          2          0          0            2
SEFS        0          0          2          0          0            2
UAS         0          0          6          0          0            9
LCV         0          0          0          0          0            0
PCV         0          0          2          0          0            0
LES         0          0          0          0          0            0
CCV         0          0          2          0          0            0
CES         0          0          2          0          0            2
CSES        0          0          2          0          0            2

CONFIG T1,  NORM,  CBIT, SHORT           T1,  NORM, CBIT, SHORT
STATUS OK                                OK

CELLS IN:   20936  OUT:       20998      IN   20925   OUT:        20990
==================================       ==============================
Enter: ? to refresh, + to increment interval, ± to decrement interval
```

H3326

Step 4 While the statistics are displayed, you can enter the input shown below to refresh the screen or alter the counter display.

Input	Action
?	Refresh screen
+	Display the next interval counters
-	Display the previous interval counters

Step 5 Terminate the display by pressing **^C**. This returns you to the `bash$` prompt.

Step 6 To learn about commands you can issue to the DSU/CSU, consult its documentation. To obtain help on **csumon**, enter the following command at the `bash$` prompt:

```
bash$ csumon
```

Monitoring the DSU/CSU on a Medium-speed Line Card

The medium-speed line card has a built-in DSU/CSU. Use the procedure below to monitor and display the DS3 MIB statistics for MSC ports. MSC CSU statistics are available using the standard DS3 MIB variables.

Procedure to Monitor a Medium-speed Line Card DSU/CSU

Step 1 To access the bash prompt, log in as root or fldsup to the LightStream switch.

Step 2 Enter the following at the bash prompt:

```
bash$ csumon <.card.port#>
```

where `<.card.port#>`

The target switch card and port number in the LightStream switch, entered in .card.port format (card 2 - 10; port 0 - 1).

Note You must use the leading "." in the card and port entry shown above.

A screen similar to Figure 5-6 will be displayed. Although you enter only one port number, information for both ports on the MSC is displayed.

Figure 5-6 Example - csumon display

```
LSnode:2$ csumon .7.0

MS1 Line Card S/W Version:      1.2
Time Since Line Card Boot:      1 hour 46 minutes 9 seconds
Current Interval Elapsed Time:  1 minute 7 seconds
Number of Valid Intervals:      7

    ========== P O R T 0 ==========    ========== P O R T 1 ==========

     Current   Intrvl 7       Total    Current   Intrvl 7         Total

PES        0          0          2          0          0            2
PSES       0          0          2          0          0            2
SEFS       0          0          2          0          0            2
UAS        0          0        804          0          0          804
LCV        0          0       1786          0          0         1786
PCV        0          0          2          0          0            0
LES        0          0          0          0          0            0
CCV        0          0          2          0          0            0
CES        0          0          2          0          0            2
CSES       0          0          2          0          0            2

CONFIG T3,  NORM,  CBIT, SHORT          T3,  NORM, CBIT, SHORT
STATUS OK                               OK

CELLS IN:   20936  OUT:       20998     IN   20925   OUT:        20990
================================       ==============================
Enter: ? to refresh, + to increment interval, ± to decrement interval
```

H3327

The DS3 MIB maintains these counters over a 24-hour period in 15-minute intervals. The Total column in the display includes up to 96 complete intervals. The Current column includes all counts that will make up the next complete interval. The Intrvl column shows the selected complete interval (from 1 to 96), depending on the actual number of complete intervals. The values that change are updated once per second.

Table 5-1 explains the counters displayed in Figure 5-6.

Table 5-1 csumon Display Term Definitions

Counter*	Definition
PES	P-bit Errored Seconds
PSES	P-bit Severely Errored Seconds
SEFS	Severely Errored Framing Seconds
UAS	UnAvailable Seconds
LCV	Line Coding Violations
PCV	P-bit Coding Violations
LES	Line Error Seconds
CCV	C-bit Coding Violations
CES	C-bit Errored Seconds
CSES	C1-bit Severely Errored Seconds
Status Term	**Definition**
OK	No alarms present
RED	Loss of Framing
YELLOW	Far End Receive Failure
BLUE	Receiving an Alarm Indication Signal
***** See RFC 1407 for a further description of these counters.	

Step 3 While the statistics are displayed, you can enter the input shown below to refresh the screen or alter the counter display.

Input	Action
?	Refresh screen
+	Display the next interval counters
-	Display the previous interval counters

Step 4 Terminate the display by pressing **^C**. This returns you to the `bash$` prompt.

Step 5 To obtain help on **csumon**, enter the following command at the `bash$` prompt:

```
bash$ csumon
```

Monitoring Ports

This procedure allows you to monitor the ports on a particular card. You can look at information for a single port, a collection of ports, or a range of ports.

Note No information is available for ports on NP and switch cards.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 Enter the following at the `cli>` prompt:

```
cli> show port <port#> <parameter1> <parameter2>
```

where

- `<port#>`

  The number of the port for which information will be displayed. The port number is in card.port format (card = 2 - 10; port = 0 - 7 for ports on an LS line card or 0 - 1 for ports on a CLC, PLC, or MSC).

- `<parameter>` all (default)

  name

  status

  statistics

  physical

  frameforward

  framerelay

  listdlci

  dlci

  listvci

  vci

  smt

  fddi

  wgrp

  bflt

  bcast-limit

Expected Results

An example for some of the port types is shown in this section. When you enter **show port 5.0** all for an MS trunk port, information similar to the following is displayed:

Figure 5-7 Example of the show port all command for an MS trunk port

```
cli> show port 5.0 all
Description:                Medium Speed Trunk Line Card Rev 1.0
Port Name:                  Light5.5.0_t3
Port Type:                  MS Trunk
MIB2 Type:                  ds3
Port MTU:                   53 Octets
Port Speed:                 44736000 bps

Admin Status:               Up
Oper Status:                Up
Last Oper Change:           13 Hr 45 Min 21 Sec ago

Octets Rcvd:                7247432
Normal Packets Rcvd:        136744
Multicast Packets Rcvd:     0
Discarded Rcvd Packets:     26
Receive Errors:             294
Unknown Protocols Rcvd:     0
Octets Sent:                7347920
Normal Packets Sent:        164430
Multicast Packets Sent:     0
Discarded Output Packets:   0
Output Errors:              26

Oper Protocol:              T3 Trunk
Admin Protocol:             T3 Trunk
Port Data Cell Capacity:    93120 cells
Port Available Capacity:    93120 cells
Link Transmit Utilization:  22
Cell Payload Scrambling:    Disabled
Cable Length (in feet):     0±450
Framing Type:               Clear Channel
cli>
```

H3328

Note When the Operational Status for the trunk port is down, the Port Unreserved Capacity field shows the capacity that has been configured for the trunk port, rather than a capacity of zero (0).

When you enter **show port 3.0 all** for a frame forwarding port, information similar to the following is displayed:

Figure 5-8 Example of the show port all command for a frame forwarding port

```
cli> show port 3.0 all
Description:                 Low Speed Edge Line Card Rev 1.0
Port Name:                   Light5.3.0_ff
Port Type:                   LS Edge
MIB2 Type:                   ds1
Port MTU:                    1516 Octets
Port Speed:                  1536000 bps

Admin Status:                Up
Oper Status:                 Up
Oper loop:                   none
Admin loop:                  none
Last Oper Change:            13 Hr 43 Min 56 Sec ago

Octets Rcvd:                 42162
Normal Packets Rcvd:         4885
Multicast Packets Rcvd:      0
Discarded Rcvd Packets:      0
Receive Errors:              0
Unknown Protocols Rcvd:      0
Octets Sent:                 42564
Normal Packets Sent:         4945
Multicast Packets Sent:      0
Discarded Output Packets:    0
Output Errors:               0

Port Type:                   v35
Oper CSU Type:               Unknown
Admin CSU Type:              Unknown
Oper DCE Bit Rate:           1536000 bps
Admin DCE Rcv Bit Rate:      1536000 bps
Oper DCE Xmit Bit Rate:      1536000 bps
Measured Bit Rate:           1536000 bps
Link Transmit Utilization:   0 cells/sec
Admin Expected DTE Rate:     1536000 bps
Oper Net Interface Type:     dte
Admin Net Interface Type:    dte
Oper Protocol:               Frame Forwarding
Admin Protocol:              Frame Forwarding
LC Auto Enable State:        Disabled
LC Debug Level:              0
Port Data Cell Capacity:     0 cells
Port Available Capacity:     0 cells
```

(Continued)

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Figure 5-9 Example of the show port all command for a frame forwarding port (concluded)

```
Call Setup Retry Time:        0
Call Setup Backoff Time:      0
Oper Max Frame Size:          1516
Modem Status:                 DCD:0  DSR:0

Src Node:                     Light5
Src Port:                     3.0
Dest Admin Node:              Light3
Dest Operational Node:        Light3
Dest Admin Port:              7.3
Dest Operational Port:        7.3

Src Admin Insured Rate:       1536000 bps
Src Oper Insured Rate:        1535864 bps
Src Admin Insured Burst:      3000 bytes
Src Oper Insured Burst:       2983 bytes
Src Admin Max Rate:           1536000 bps
Src Oper Max Rate:            1535864 bps
Src Admin Max Burst:          3000 bytes
Src Oper Max Burst:           2983 bytes

Dest Oper Insured Rate:       1535864 bps
Dest Oper Insured Burst:      2983 bytes
Dest Oper Max Rate:           1535864 bps
Dest Oper Max Burst:          0 bytes

To-Net Circuit ID:            6
To-Net Circuit State:         Active
From-Net Circuit ID:          4
From-Net Circuit State:       Active
Last ATMM Error:              OK
Cells Required:               4504

CLP=0 Frames to Switch:       2855597
CLP=0 Cells to Switch:        5706365
CLP=1 Frames to Switch:       2293693
CLP=1 Cells to Switch:        4587386
Discarded Frames:             0
Discarded Cells:              0
CLP=0 Frames from Switch:     1344755
CLP=0 Cells from Switch:      4033323
CLP=1 Frames from Switch:     448244
CLP=1 Cells from Switch:      1344623

cli>
```

H3330

Monitoring Modems

This procedure allows you to monitor the modem port on the switch card's console/modem assembly. If you have a redundant switch card, you can monitor the modem port on either the active or backup switch card. (This command is not used for monitoring modems connected to line card ports.)

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 Enter the following at the prompt:

```
cli> show modem <slot #> <parameter>
```

where

- `<slot #>`

  SA or SB for the `cli>` switch cards

- `<parameter>`

  all

  initstring

  password (Only available from protected mode.)

Expected Results

When you enter **show modem sa all**, information similar to the following is displayed:

```
cli> show modem sa all
Initstring:  AT&S&D2&C1S0=1S7=30S36=7S95=44
cli>
```

H3331

Monitoring Switch Cards, NPs, and Power Supplies

This procedure tells you how to monitor the status of your redundant components (switch cards, NP, and power supplies).

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 To look at the status of switch cards, enter the following at the `cli>` prompt:

```
cli> show chassis primaryswitch
```

This command indicates which switch card is the active switch card. If you have a second switch card, you can assume it is the backup switch card.

Step 3 To look at the slot associated with each of the NPs, enter the following at the `cli>` prompt:

```
cli> show chassis general
```

This command displays a number of details including the slot for the active NP, the slot of this NP, and the system up time. The system up time indicates how long this NP has been up.

Step 4 To look at the status of power supplies, enter the following at the `cli>` prompt:

```
cli> show chassis powersupply
```

This command displays the status and type of the two power supplies, A and B.

Expected Results

The following shows the output for the three commands described in the procedure above:

Figure 5-10 Example of the show chassis commands

```
cli> show chassis primaryswitch
Primary Switch:      Switch A

cli> show chassis general
Name:                Light7
Description:         LightStream Data Switch
Contact:             Bob Williams
Location:            Cambridge
System Up Time:      63 Hr 28 Min 43 Sec

Software Version: xxxx
Console Trap Level: Oper
Chassis ID:          5145
Slot of Primary NP:  1
Slot of This NP:     1

Primary Addr:        192.1.74.77
Secondary Addr:      0.0.0.0
Subnet Mask:         255.255.255.0
Ethernet Address:    192.1.71.77
Ethernet IP Mask:    255.255.255.0
Default Router:      192.1.71.1

cli> show chassis powersupply
Power Supply A:      Empty
Power Supply A Type: Empty
Power Supply B:      Good
Power Supply B Type: 1200W AC Power Supply

cli>
```

H3332

Using the LightStream Monitor

The LightStream monitor provides a graphical display of individual LightStream switches, cards, and ports. When the monitor is opened, it displays the front of a LightStream switch with bulkheads for the cards as they appear in the actual switch. Information pertinent to the switch is displayed above the bulkheads. This section shows you how to access the monitor to display switches, cards, and ports. You must have a color monitor to use the monitor software.

Procedure

Step 1 Log into the NMS workstation.

Step 2 Invoke the LightStream monitor by selecting it from the HP OpenView menu or by entering the following command at the system prompt:

```
% monitor <chassisname>
```

where

`<chassisname>`

is the name of the node you want to view

A display appears showing the front view of the LightStream switch, its components, and their status. The area above the bulkhead in the display contains general indicators and summary information about the switch. For a description of the LEDs displayed on each card in the monitor, refer to the "Hardware Description" chapter of the *LightStream 2020 Installation and Troubleshooting Manual*.

Step 3 To select an object in the display, point the mouse at the object and click on it with the left mouse button. The object will appear highlighted.

Step 4 To display the access card for a particular line card, click on the screw above it.

Step 5 To display more information for a particular object in the display, point the mouse at the object and double click with the left mouse button. If more information is available for the object, a screen will appear with the relevant information.

Step 6 Select Show All Access Cards from the Slot menu to obtain a rear view of the switch.

Step 7 To select a menu option from the menus at the top left of your display:

- Point to the menu name.
- Click on the menu name and hold the button down.
- Slide the mouse button down to display the available menu options.
- Release the button on the option to select it.

The possible options are shown in Table 5-2. All menu options may not be available at all times. Availability depends on the display in the window. Available options are highlighted.

Table 5-2 Monitor Menu Options

Menu Name	Options
File	Open
	New Chassis
	Exit

Menu Name	Options
Edit	No Options Available
Slot	Open Selected Object
	Show Access Card for Slot
	Show Line Card for Slot
	Show All Access Cards
	Show All Line Cards
General	snmp CLI

Step 8 You can also display the additional information for an object (discussed in Step 5) by selecting the object with a single click of the left mouse button and then choosing the Open Selected Object option from the Slot menu.

The color of the objects displayed by the monitor provide you with valuable information, as shown in Table 5-3. As you view an object with the monitor, note its color and refer to the table for an explanation. LEDs on the rear view of the switch are unreadable and appear in white.

Table 5-3 Monitor Object/Color Display Explanations

Object	Color	Meaning/Cause
LED	Amber	LED is amber in color. LED is lit.
LED	Black	Shut off the machine. Bad connection.
LED	Green	LED is green in color. LED is lit.
LED	Red	Shut off the machine. Over voltage condition exists. Serious power supply problem.
LED	White	LED state is unknown.
Screw	Black	No information available for card.
Screw	Gray	Card is missing.
Screw	Red	Card is not operational. (The card has failed or it has been powered off.)
Screw	White	Normal card.
Any Icon	Red	Abnormal condition. The orange rectangle around a red icon emphasizes the abnormal condition.
Any Icon	Yellow	Abnormal condition. The orange rectangle around a yellow icon emphasizes the abnormal condition.
Power Supply	Red	Power supply is not operational.
Thermometer	Blue	Temperature is within normal range.
Thermometer	Red	Temperature is over normal range. Cause unknown.
Thermometer	Orange	Temperature is in the warning range. Cause unknown.
Thermometer	Yellow	Temperature is in the warning range. Cause unknown.

Step 9 To iconify a monitor display, click in the Close box in the bar at the top of the window.

Step 10 To exit the monitor, select Exit from the File menu.

Monitoring Software Components from CLI

This section provides procedures to monitor the software components (ATM UNI, frame relay, frame forwarding, Ethernet, FDDI, and OC3 connections; CLI; collector; GID; ND; processes; and SNMP) of a LightStream switch.

Monitoring ATM Connections

This procedure allows you to monitor the ATM UNI virtual channel identifiers (VCIs) configured on a particular ATM UNI port. It provides you with information on the individual connections configured on each port. This information is available for ATM UNI ports only.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 To get a list of all VCIs configured on a particular ATM UNI port, enter the following at the `cli>` prompt:

```
cli> show port <port#> listvci
```

where `<port#>`

The number of the port for which information will be displayed. The port number is in card.port format (card = 2 - 10; `port` =0 - 1 for ports on an MS line card or CLC).

Step 3 Once you have a list of all ATM-UNI VCIs, you can look at a particular VCI by entering the following at the `cli>` prompt:

```
cli> show port <port#> vci <vci#>
```

where `<vci#>`

The number of the VCI for which information will be displayed.

Expected Results

When you enter **show port 6.0 vci 16**, information similar to the following is displayed:

Figure 5-11 Example of the show port vci display

```
cli> show port 6.0 vci 16

Source Node:                 Light8
Source Port:                 6.0
Source VCI:                  16
Src Admin Insured Rate:      9434 cells/sec
Src Oper Insured Rate:       9434 cells/sec
Src Admin Insured Burst:     1000 cells
Src Oper Insured Burst:      1000 cells
Src Admin Max Rate:          9434 cells/sec
Src Oper Max Rate:           9434 cells/sec
Src Admin Max Burst:         1000 cells
Src Oper Max Burst:          1000 cells

Dest Oper Node:              Light6
Dest Oper Port:              9.0
Dest Oper VCI:               16
Dest Oper Insured Rate:      9434 cells/sec
Dest Oper Insured Burst:     1000 cells
Dest Oper Max Rate:          9434 cells/sec
Dest Oper Max Burst:         1000 cells
Oper Bandwidth Type:         guraranteed
Admin Bandwidth Type         guaranteed
Oper Transfer Priority       1
Admin Transfer Priority      1
To-Net Circuit ID:           16
To-Net Circuit State:        Active
From-Net Circuit ID          16
From-Net Circuit State:      Active
Last ATMM Error:             OK

Cells Required:              9434
CLP=0 Cells to Switch:       0
CLP=0/1 Cells to Swtich:     0
CLP=1 Cells to Switch:       0
Discarded Cells:             0

cli>
```

H3333

Monitoring Frame Relay Connections

This procedure allows you to monitor individual data link connections configured on frame relay ports. These connections are recognized by their data link connection identifiers (DLCIs).

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Setting the Target Switch for CLI Commands."

Step 2 To get a list of all data link connections configured on a particular frame relay port, enter the following at the `cli>` prompt:

```
cli> show port <port#> listdlci
```

where `<port#>`

The number of the port for which information will be displayed. The port number is in card.port format (card = 2 - 10; `port` = 0 - 7).

Step 3 Once you have a list of DLCIs, you can look at a particular circuit, by entering the following at the `cli>` prompt:

```
cli> show port <port#> dlci <dlci#>
```

where `<dlci#>`

The DLCI number for which information will be displayed. The DLCI number must be between 16 and 991.

Note See the *LightStream 2020 Configuration Guide* for a description of the attributes displayed by the show port commands and for information on setting them with the configurator. See the *LightStream 2020 Command and Attribute Reference Guide* for information on setting port attributes with the CLI.

Expected Results

When you enter **show port 10.7 dlci 141**, information similar to the following is displayed:

Figure 5-12 Example of the show port dlci display

```
cli> show port 10.7 dlci 141

Src Node:                              Light8
Src Port:                              10.7
Src DLCI:                              141
Src Admin Insured Rate:                32000 bps
Src Oper Insured Rate:                 31713 bps
Src Admin Insured Burst:               1516 bytes
Src Oper Insured Burst:                1491 bytes
Src Admin Max Rate:                    64000 bps
Src Oper Max Rate:                     63767 bps
Src Admin Max Burst:                   3032 bytes
Src Oper Max Burst:                    2983 bytes

Dest Admin Node:                       Light6
Dest Admin Port:                       3.4
Dest Admin DLCI:                       141

Dest Oper Node:                        Light6
Dest Oper Port:                        3.4
Dest Oper DLCI:                        141

Dest Oper Insured Rate:                31713 bps
Dest Oper Insured Burst:               1491 bytes
Dest Oper Max Rate:                    63767 bps
Dest Oper Max Burst:                   2983 bytes

Local LMI State:                       Inactive
Remote LMI State:                      Active
To-Net Circuit ID:                     36
To-Net Circuit State:                  Active
From-Net Circuit ID:                   31
From-Net Circuit State:                Active
Last ATMM Error:                       OK
Last ATM Error Location:
Cells Required:                        116

cli>
```

H3334

Monitoring CLI

This procedure allows you to monitor the attribute settings for the CLI program.

Procedure

Step 1 Enter the following at the `cli>` prompt:

```
cli> show cli <parameter>
```

where `<parameter>`

- all (default)
- echosource
- lineedit
- log
- term
- time
- timer
- traplevel
- debug
- banner

Note Refer to Chapter 4 for information on changing these settings.

Expected Results

When you enter **show cli,** information similar to the following is displayed:

```
cli> show cli
Echo source:                on
Line edit:                  on
Logging:                    off
Terminal Type:              vt100
Date/Time:                  Fri Jul  29 10:58:08 1994
Timeout:                    SNMP Timeout value = x seconds
Timer:                      2 Hour(s) 10 Minute(s) 55 Seconds

Traplevel:                  Debug
Debug:                      off
Banner:                     CLI (Version 2.100 of Mar 07 1995)
PROGRAM: cli:               compiled Mar 04 1995 @ 01:54:42

cli>
```

H3335

Monitoring the Collector

The collector allows you to run up to 25 collections at one time. You can set up the collections to save user-defined data at a user-defined time interval and you can use this data for future analysis. This procedure describes how to monitor the status of a particular collection. For further information on creating collections, see Chapter 6.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 If you do not know what collections have been defined, enter the following at the `cli>` prompt:

```
cli> walk collectIndex
```

This command lists the number of all the collections defined on the LightStream switch. You may see a display similar to the following:

```
cli walk collectIndex
Name: collectIndex.2 Value: 2
Name: collectIndex.3 Value: 3
Name: collectIndex.5 Value: 5
Name: collectIndex.6 Value: 6
cli>
```

This display tells you that collection numbers 2, 3, 5, and 6 have been defined.

Step 3 To look at the status of a particular collection, enter the following at the `cli>` prompt:

```
cli> show collection [<collection #>]
```

where `[<collection #>]`

The number of any collection that has been defined. If you do not enter a collection number, CLI displays all collections that have been defined.

Expected Results

When you enter **show collection 5**, information similar to the following is displayed:

Figure 5-13 Example of the show collection display

```
cli> show collection 5

      *** Collection Record 5 ***
Collection Status:     Valid
Operational Status:    Running
Begin Time:            Mon Sep 27 13:12:34 1994
End Time:              Fri Oct 1 13:00:00 1994
Interval:              60 sec
File:                  /usr/tmp/collect.5
File Size:             100 KB

Collection Items:

Name: collectDBObjectID.5.1    Value: ifInOctets.3000
Name: collectDBObjectID.5.2    Value: ifInOctets.3001
Name: collectDBObjectID.5.3    Value: ifInOctets.3002
Name: collectDBObjectID.5.4    Value: ifInOctets.3003
cli>
```

H3336

Monitoring GID

This procedure allows you to monitor the status of the global information distribution (GID) software.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 Enter the following at the `cli>` prompt:

```
cli> show gid <parameter>
```

where `<parameter>`

all (default)

general

flooding

synchronization

cards

clients

neighbors

ports

ip

Expected Results

When you enter **show gid all**, information similar to the following is displayed:

Figure 5-14 Example of the show gid all command

```
cli> show gid all
Software Version Number:                        Jul 29 1994 @ 19:49:33
GID Process ID (PID):                           10
Memory In Use:                                  0 Bytes
Memory Allocation Failures:                     0

Neighbors in Existent Sync State:               0
Neighbors in Exchange Start State:              0
Neighbors in Exchange State:                    0
Neighbors in Loading Sync State:                0
Neighbors in Full Sync State:                   3

                    Cards Managed by Gid:
Chassis     Slot     Seq#      Age    Originating-NP  Ports
Light8        1   3348489269   1503        Light8.1      0
Light8        4   3348491724   1511        Light8.1      8
Light8        5   3348491404   1489        Light8.1      8
Light5        1   3348488326   1513        Light5.1      0
Light5        3   3348488339   1497        Light5.1      8
. . .

                    Clients Managed by Gid:
Client PID   LSA-Rx     IPA-Rx   Gen-Rx   Events-Tx  Paths-Generated
     11      1317124        46        0           0         18492
     12      1317130        37        0           0          7132
     13      1317121        22       45          33            24
     14      1317123      2224        0           0         19888
     15      1317125        29        0           0             0
     17      1317122      2386        0           0             0
```

(Continued)

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Figure 5-15 Example of the show gid all command (concluded)

```
                    Neighbors Managed by Gid:
Chassis   VCI   State   SYNC RLL SLL Hello  LSA  NLSA  IPA  NIPA  GA NGA
Light8.1  38145 loading   7   0   0   2   4731  4731   45   45   0   0
Light5.1  29953 loading   7   0   0   2   1036   280   90   48   0   0
Light6.1  34049 loading   7   0   0   2   1056   756   87   42   0   0
...

                      Ports Managed by Gid:
Chassis  Port Service  Up/Down     BW0      BW1      BW2   Remote-Port
Light8    4.0   port   Down       4072     3868      203   Light7.4.0
Light8    4.1   port   Down       2036      114       13   Light7.4.1
Light8    4.2   port   Down       2036      114       13   Light7.4.2
Light8    4.3   port   Down       2036      114       13   Light7.4.3
Light8    4.4   port   Down       2036      114       13   Light7.4.4
Light8    4.5   port   Down       1163       12       14   Light7.4.5
...

                   IP Addresses Managed by GID:
IP Address     Age     Seq#    Advertising-NP   Net-Mask      Port
0.0.40.45    1710 3348489265   Light8.1        0.0.0.0    Light8.0.511
0.0.40.47    1718 3348488336   Light5.1        0.0.0.0    Light5.0.511
0.0.40.51    1732 3348487425   Light7.1        0.0.0.0    Light7.0.511
0.0.40.59    1731 3348487410   Light6.1        0.0.0.0    Light6.0.511
192.1.71.75  1719 3348488335   Light5.1 255.255.255.0    Light5.0.511
...

cli>
```

H3338

If you enter any parameter except **all**, a subset of the attributes is displayed.

Monitoring ND

This procedure allows you to monitor the status of the neighborhood discovery (ND) software. This information can tell you what hardware configuration the running software is using or the neighbors of the switch.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 Enter the following at the `cli>` prompt:

```
cli> show nd <parameter>
```

where `<parameter>`

all (default)

general

ndcards

neighbors

switchupdown

switchstat

clients

Expected Results

When you enter **show nd all**, information similar to the following is displayed:

Figure 5-16 Example of the show nd all command

```
cli> show nd all

Software Version Number:Jul 21 1994 @ 01:59:54
ND Process ID (PID):                    22
Memory In Use:                          78165 Bytes
Timers Processed:                       19142
Number of Line Cards managed by ND:     4
Neighbor NPs known to ND:               1
Registered ND Client Processes:         8

Cards Managed by ND:
EIA: 5143:3      Channel:  9731    State: Up
EIA: 5143:5      Channel: 14341    State: Up
EIA: 5143:7      Channel:  5639    State: Up
EIA: 5143:9      Channel: 18441    State: Up

ND Neighbor Information
EIA: 5143:1     Channel: 21761   State: Up

ND Up/Down Parameters:
Slot:  1 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
Slot:  2 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
Slot:  3 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
Slot:  4 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
Slot:  5 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
Slot:  6 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
Slot:  7 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
Slot:  8 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
Slot:  9 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
Slot: 10 Oper Intvl: 900   J: 2     K: 31    M: 2     N: 32
         Admn Intvl: 900   J: 2     K: 31    M: 2     N: 32
```

(Continued)

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Figure 5-17 Example of the show nd all command (concluded)

```
ND Switch Statistics:
Slot:  1  In Cells:      6413  Errs:    0  Out Cells:      6413  Errs: 0
Slot:  2  In Cells:         0  Errs:    0  Out Cells:      6413  Errs: 0
Slot:  3  In Cells:      6409  Errs:    0  Out Cells:      6413  Errs: 0
Slot:  4  In Cells:         0  Errs:    0  Out Cells:      6414  Errs: 0
Slot:  5  In Cells:      6409  Errs:    0  Out Cells:      6414  Errs: 0
Slot:  6  In Cells:         0  Errs:    0  Out Cells:      6414  Errs: 0
Slot:  7  In Cells:      6438  Errs:    0  Out Cells:      6442  Errs: 0
Slot:  8  In Cells:         0  Errs:    0  Out Cells:      6442  Errs: 0
Slot:  9  In Cells:      6438  Errs:    0  Out Cells:      6443  Errs: 0
Slot: 10  In Cells:         0  Errs:    0  Out Cells:      6443  Errs: 0

ND Clients:
PID: 11 Type: lcc      Subtype: 0      EIA: 5143:7  Mask: 0x32
PID: 13 Type: ca       Subtype: -1     EIA: 0:0     Mask: 0x2
PID: 17 Type: gid      Subtype: -1     EIA: 0:0     Mask: 0x64
PID: 27 Type: lcc      Subtype: 0      EIA: 5143:9  Mask: 0x32
PID: 33 Type: lcc      Subtype: 0      EIA: 5143:3  Mask: 0x32
PID: 37 Type: lcc      Subtype: 0      EIA: 5143:5  Mask: 0x32
PID: 38 Type: lcc      Subtype: 0      EIA: 5143:1  Mask: 0x52

cli>
```

H3340

If you enter any parameter except **all**, a subset of the attributes shown above is displayed.

Monitoring Processes

This procedure allows you to monitor the status of a particular process. You select the process you want to monitor by entering either its number or name.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

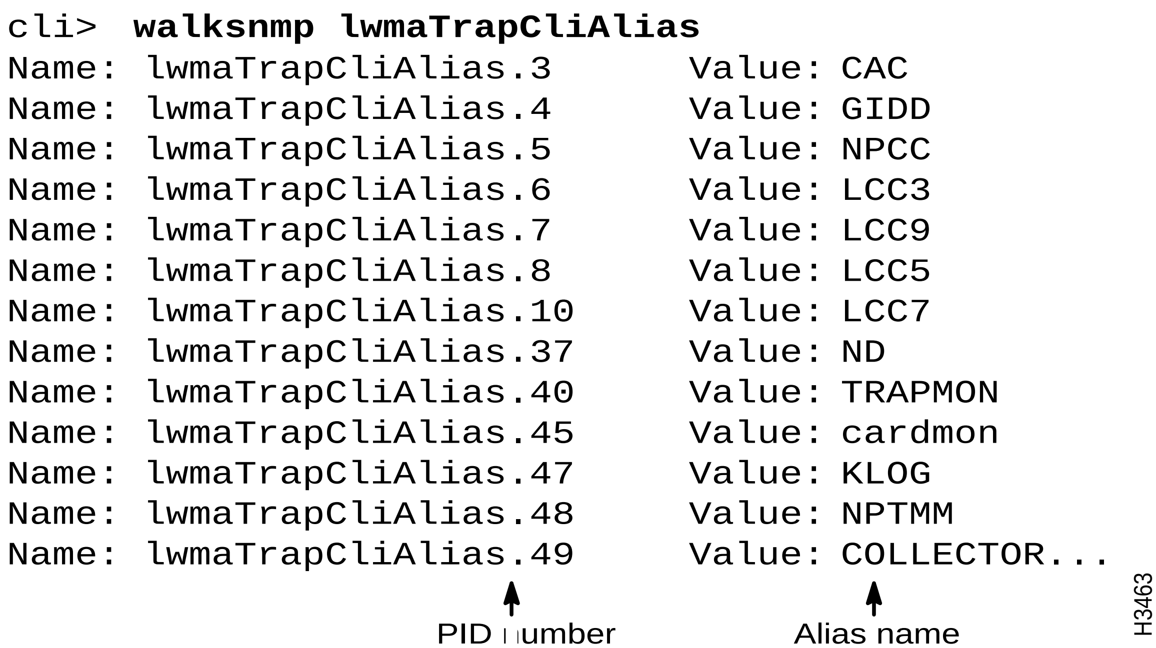
```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 If you do not know which processes are running, enter the following at the `cli>` prompt:

```
cli> walksnmp lwmaTrapCliAlias
```

This command lists the process identification (pid) numbers and alias names of all the processes running on this LightStream switch. The pid numbers follow the term “Name: lwmaTrapCliAlias.” and the alias names follow the term “Value:”. For example, you may see



Step 3 Choose the processes that you want to monitor from this list.

Step 4 To display the status of a particular process, enter the following at the `cli>` prompt:

```
cli> show pid {<#>|<alias>} [<parameter>]
```

where

- {<#>|<alias>}

  The number of the process or the alias name of the process from which you want to display status.

- [<parameter>]

  all (default)

  name

  clialias

  createtime

  adminstatus

  operstatus

  traplevel

Expected Results

When you enter **show pid 9 all**, information similar to the following is displayed:

```
cli> show pid 9 all
PID Name:                     lcc
PID Alias:                    LCC9
PID Up Time:                  18 Hr 15 Min 55 Sec
PID Administrative Status:    Active
PID Operation Status:         Active
PID Trap Level:               Info
cli>
```

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The same information is displayed when you enter **show pid lcc9** (The lcc9 entry is the alias name for process 9).

If you enter any parameter except **all**, a subset of these attributes is displayed.

Monitoring SNMP Parameters

This procedure allows you to monitor the way in which SNMP operates. SNMP operation is controlled by a number of parameters that are set to default values when the system is started. These parameters can be changed using the **set snmp** command. (See the subsection entitled “Creating a Collection” for a discussion of this command.)

Procedure

Step 1 Enter the following at the `cli>` prompt:

```
cli> show snmp
```

Information similar to the following is displayed:

```
*cli> show snmp

Community: public
HostName: localhost
cli>
```

H3314

Monitoring the Test and Control System

This section gives you procedures to monitor the Test and Control System (TCS).

Monitoring TCS

The procedure allows you to monitor the values collected by the TCS on a particular card in the chassis. The cards you can monitor are in slots 1 - 10, SA, and SB.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 Enter the following at the `cli>` prompt:

```
cli> show tcs <card #> [<parameter1>] [<parameter2>]
```

where `<card #>`

- 1- 2 for NPs
- 2- 10 for line cards
- SA and SB for switch cards

Table 5-4 describes `<parameter1>` and `<parameter2>`.

Table 5-4 Parameter Options—show tcs Command

<parameter1> =	<parameter2>[a] =
all (default)	N/A
state	N/A
config	all
	assembly
	postcode
	serialnum
	slavecode
	type
daughter	all
	assembly
	serialnum
paddle	all
	assembly
	serialnum
oem	all
	assembly
	serialnum
midplane	all
	assembly
	serialnum
	nodeaddress
temperature	N/A
voltage	N/A
power	

[a]Parameter2 is dependent on parameter1. When you enter a command, you first select the value of parameter1 from this table. Based on that selection, you can choose a value of parameter2 that is associated with parameter1.

Expected Results

When you enter **show tcs 1 all**, a display similar to Figure 5-18 is displayed. If you use any value except **all** for the argument, a subset of this information is displayed.

Figure 5-18 Example show tcs 1 all

```
cli> show tcs 1 all
Slot  1 State:
          Power Supply:                OK
          Temperature:                 OK
          Clock:                       OK
          POST:                        OK
          XILINX Load:                 OK
          Application Load:            OK
          Paddle Card:                 PRESENT
          Paddle Card:                 OK
          Paddle Card Override         DISABLED
          Paddle Power Override:       DISABLED
          Flash:                       ENABLED
          CP POST:                     ENABLED
          Application:                 ENABLED
          Card:                        ENABLED
          TCS VCC Power:               OK
          VCC Power:                   OK
          VPP Power:                   OK
          SCSI Power:                  OK
          Top Temperature:             OK
          Bottom Temperature:          OK
          Board Initialization:        OK
          Flash Initialization:        OK
          TCS HUB:                     OK
Slot  1 Config Assembly:               2121701G01
Slot  1 Config Postcode:               00
Slot  1 Config Serialnum:              311±08
Slot  1 Config Slavecode:              B2
Slot  1 Config Type:                   N1
Slot  1 Daughter Assembly:             2121861G01
Slot  1 Daughter Serialnum:            308±01
Slot  1 Paddle Assembly:               2121992G01
Slot  1 Paddle Serialnum:              315±09
Slot  1 Oem Assembly:
Slot  1 Oem Serialnum:
Slot  1 State:
        Top:         85 F (warning 165 F, shutdown 174 F)
                     29 C (warning  73 C, shutdown  78 C)
        Bottom:      94 F (warning 113 F, shutdown 174 F)
                     34 C (warning  45 C, shutdown  78 C)
Slot  1 Voltage:
        TCS VCC Voltage:      5.126 (Normal Range: 4.614 / 5.371)
        VCC Voltage:          5.029 (Normal Range: 4.370 / 5.615)
        SCSI Voltage:         4.833 (Normal Range: 4.614 / 5.371)
        VPP Voltage*:         0.000 (Normal Range: 11.067 / 12.858)
           *VPP Voltage Is Valid Only During FLASH Initialization
Slot 1 power: On
cli>
```

H3344

Accessing the MIB Tree

This section explains how to use the **browse** command. The CLI **browse** command lets you travel through the MIB from the top down and display the value of any MIB object. The **browse** command is easy to use and allows you to move through the MIB even if you are not familiar with its structure. When the MIB tree branches, you can go in any direction. At any time you can return to the branch and go in a different direction. Refer to the *LightStream 2020 Command and Attribute Reference Guide* for an illustration of the MIB tree.

Note While using the **browse** command, you enter a number to select the next branch of the MIB tree. These numbers are not related to the actual MIB addresses for the objects shown in the *LightStream 2020 Command and Attribute Reference Guide*.

Browsing the MIB

This procedure allows you to travel down through the MIB tree and obtain the value of any MIB object you see.

Procedure

Step 1 Verify that the target switch is correct by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled "Forcing a Switch Card to Become Active or Backup."

Step 2 Enter the following at the `cli>` prompt:

```
cli> browse [<mib-address>]
```

where `[<mib-address>]`

An optional argument. If you do not enter a MIB address, the browse command starts at the top of the MIB tree (at the iso object). If you enter a MIB address, the browse command starts at the address you specify. For example, the MIB address can be mib2 or chassisInfo.

Step 3 Continue down the "org" subtree by entering the following at the `browse>` prompt.

```
browse> 1
```

Step 4 Exit by entering the **exit** or **quit** command at the `browse>` prompt:

```
browse> exit
```

or

```
browse> quit
```

Expected Results

The following example shows the information that is displayed when you enter the **browse** command.

```
cli> browse

iso:
   1) org
Enter line number to go down, 'q' or 'e' to quit browse.
```

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The highest level object of the MIB tree is the iso object and the only subtree below it is the org subtree.

Figure 5-19 shows an example of how you can use the browser to travel through the MIB and look at the values of the chassisId and chassisActiveIpAddr objects. (User input is shown in bold.)

Figure 5-19 Sample session of browse command

```
cli> browse

iso:
   1) org
Enter line number to go down, 'q' or 'e' to quit browse.
browse> 1

iso.org:
   1) dod
Enter line number to go down, 'u' to go up, 'q' or 'e' to quit browse.
browse> 1

iso.org.dod:
   1) internet
Enter line number to go down, 'u' to go up, 'q' or 'e' to quit browse.
browse> 1

iso.org.dod.internet:
   1) mgmt
   2) experimental
   3) private
Enter line number to go down, 'u' to go up, 'q' or 'e' to quit browse.
browse> 3

iso.org.dod.internet.private:
   1) enterprises
Enter line number to go down, 'u' to go up, 'q' or 'e'to quit browse.
browse> 1

iso.org.dod.internet.private.enterprises:
   1) LightStream
Enter line number to go down, 'u' to go up, 'q' or 'e'to quit browse.
browse> 1

iso.org.dod.internet.private.enterprises.LightStream:
   1) lightStreamOIDS
   2) lightStreamProducts
   3) lightStream Internet
   4) lightStreamVli
   5) lightStreamCbr
   6) lightStreamEOM
   7) lightStreamDebug
Enter line number to go down, 'u' to go up, 'q' or 'e'to quit browse.
browse> 2
```

(Continued)

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Figure 5-20 Sample session of browse command (continued)

```
iso.org.dod.internet.private.enterprises.LightStream.lightStream-
Products:
   1) LightStream ATM Switch
Enter line number to go down, 'u' to go up, 'q' or 'e' to quit browse.
browse> 1
1iso.org.dod.internet.private.enterprises.LightStream.lightStream-
Products.LightStream ATM Switch:
   1) chassisInfo
   2) cardInfo
   3) portInfo
   4) portTransmission
   5) congestionAvoidance
   6) mmaInfo
   7) collectInfo
   8) lsPortProtocols
   9) lsPrivate
   10) lsExperimental
   11) lsIR
   12) lsStatistics
   13) tcsInfo
   14) lsGID
   15) lsPID
   16) lsND
   17) lwmaInfo
Enter line number to go down, 'u' to go up, 'q' or 'e' to quit browse.
browse> 1

iso.org.dod.internet.private.enterprises.LightStream.lightStream-
Products.LightStream ATM Switch.chassisInfo:
   1) chassisId
   2) chassisActiveIpAddr
   3) chassisSecondaryIpAddr
   4) chassisNetworkMask
   5) chassisEthernetIpAddr
   6) chassisEthernetIpMask
   7) chassisDefaultIpRouter
   8) chassisStatusWord
   9) chassisConsoleTraplevel
   10)chassisSwVersion
   11)chassisTod
Enter line number to go down, 'u' to go up, 'q' or 'e' to quit browse.
browse> 1
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Name: chassisId.0              Value: 5143
```

(Continued)

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Figure 5-21 Sample session of browse command (concluded)

```
iso.org.dod.internet.private.enterprises.LightStream.lightStream-
Products.LightStream ATM Switch.chassisInfo:
   1) chassisId
   2) chassisActiveIpAddr
   3) chassisSecondaryIpAddr
   4) chassisNetworkMask
   5) chassisEthernetIpAddr
   6) chassisEthernetIpMask
   7) chassisDefaultIpRouter
   8) chassisStatusWord
   9) chassisConsoleTraplevel
   10)chassisSwVersion
   11)chassisTod

Enter line number to go down, 'u' to go up, 'q' or 'e' to quit browse.
browse> 2
++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Name: chassisActiveIpAddr.0    Value: 127.1.32.45

iso.org.dod.internet.private.enterprises.LightStream.lightStream-
Products.LightStream2020.chassisInfo:
   1) chassisId
   2) chassisActiveIpAddr
   3) chassisSecondaryIpAddr
   4) chassisNetworkMask
   5) chassisEthernetIpAddr
   6) chassisEthernetIpMask
   7) chassisDefaultIpRouter
   8) chassisStatusWord
   9) chassisConsoleTrapLevel
Enter line number to go down, 'u' to go up, 'q' or 'e' to quit browse.
```

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The next screen shows how you can access information quickly by entering the name of the subtree you want to look at. For example, instead of going through all of the steps to get to the chassisId as shown in Figure 5-19, you can enter the command **browse chassisInfo** as shown in Figure 5-22 and immediately access the chassisId object.

Figure 5-22 Example of the browse command using a subtree name

```
cli> browse chassisInfo

chassisInfo:
   1) chassisId
   2) chassisActiveIpAddr
   3) chassisSecondaryIpAddr
   4) chassisNetworkMask
   5) chassisEthernetIpAddr
   6) chassisEthernetIpMask
   7) chassisDefaultIpRouter
   8) chassisStatusWord
   9) chassisConsoleTrapLevel
Enter line number to go down, 'u' to go up, 'q' to quit browse.
browse> 1
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Name: chassisId.0              Value: 5143

chassisInfo:
   1) chassisId
   2) chassisActiveIpAddr
   3) chassisSecondaryIpAddr
   4) chassisNetworkMask
   5) chassisEthernetIpAddr
   6) chassisEthernetIpMask
   7) chassisDefaultIpRouter
   8) chassisStatusWord
   9) chassisConsoleTrapLevel
Enter line number to go down, 'u' to go up, 'q' to quit browse.
browse>
```

H3308

6

LightStream Statistics and Data Collection

Using LightStream Statistics • Using Data Collection

Statistics are counters collected by a LightStream 2020 enterprise ATM switch. This chapter tells you how to monitor and evaluate the state and performance of your LightStream switch by reviewing and sometimes processing the statistics.

Using LightStream Statistics

LightStream statistics are stored in MIB objects. Examples of statistics include the following MIB objects:

- ifInOctets
- ifInErrors
- ifOutErrors

Many statistics of interest for the LightStream switch are defined in the Frame Relay DCE MIB, FDDI MIB, Ethernet MIB, OC3 MIB, and MIB-2. For a complete list of MIB objects, refer to the *LightStream 2020 Command and Attribute Reference Guide*.

All statistics in a LightStream switch are initialized at system startup. When they reach their maximum value (or if you do another startup), they are reset to 0. You can use the collector to collect statistics at regular intervals. Refer to the subsection entitled “Using Data Collection” for more information.

Viewing Port Statistics

This procedure shows you how to view port statistics with the **show** command. All of the information displayed for port interfaces is generic and applies to all interfaces, regardless of the interface type.

Procedure

Step 1 Verify that the target switch is set correctly by entering the following at the `cli>` prompt:

```
cli> show snmp
```

If you need instructions on changing the target switch, refer to the subsection entitled “Forcing a Switch Card to Become Active or Backup.”

Step 2 Enter the following at the `cli>` prompt:

```
cli> show port <port#> statistics
```

where `<port#>`

The port number for which statistics will be displayed. The port number is in card.port format (card = 2 - 10; `port` = 0 - 7).

Expected Results

When you enter **show port 2.0 statistics**, information similar to the following is displayed:

Figure 6-1 Sample port statistics display

```
cli> show port 2.0 statistics
Octets Rcvd:             372684
Normal Packets Rcvd:     43269
Multicast Packets Rcvd:  0
Discarded Rcvd Packets:  0
Receive Errors:          0
Unknown Protocols Rcvd:  0
Octets Sent:             1977615601
Normal Packets Sent:     20643144
Multicast Packets Sent:  0
Discarded Output Packets:0
Output Errors:           1
cli>
```

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where

- `Octets Rcvd` = Total octets received from the media
- `Normal Packets Rcvd` = Number of unicast packets delivered (a portion of the total)
- `Multicast Packets Rcvd` = Number of broadcast/multicast packets delivered (a portion of the total)
- `Discarded Rcvd Packets` = Packets discarded due to resource limitation
- `Receive Errors` = Packets discarded due to format error
- `Unknown Protocols Rcvd` = Packets destined for unknown protocols
- `Octets Sent` = Total octets sent on the media
- `Normal Packets Sent` = Number of unicast packets sent (a portion of the total)
- `Multicast Packets Sent` = Number of broadcast/multicast packets sent (a portion of the total)
- `Discarded Output Packets` = Packets discarded due to resource limitation
- `Output Errors` = Packets discarded due to error

The first time you request statistics for a particular port, you see a display like the one shown in Figure 6-1. However, if you again show statistics on that port, the current value of each statistic is displayed with additional information. The additional information shows the amount that each

statistic increased since your last request and the rate at which the statistic is changing. The following figure shows the statistics display when you enter **show port 2.0 statistics** anytime after the first time.

Figure 6-2 Sample subsequent port statistics display

```
cli> show port 2.0 statistics
Octets Rcvd:              374742     (Increase: 2058     Rate: 8.43/sec)
Normal Packets Rcvd:      43513      (Increase: 244      Rate: 1.00/sec)
Multicast Packets Rcvd:   0          (Increase: 0        Rate: 0.00/sec)
Discarded Rcvd Packets:   0          (Increase: 0        Rate: 0.00/sec)
Receive Errors:           0          (Increase: 0        Rate: 0.00/sec)
Unknown Protocols Rcvd:   0          (Increase: 0        Rate: 0.00/sec)
Octets Sent:              1989120805 (Increase: 11505204 Rate: 47152.47/sec)
Normal Packets Sent:      20763243   (Increase: 120099   Rate: 492.20/sec)
Multicast Packets Sent:   0          (Increase: 0        Rate: 0.00/sec)
Discarded Output Packets:0           (Increase: 0        Rate: 0.00/sec)
Output Errors:            1          (Increase: 0        Rate: 0.00/sec)
cli>
```

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Using Data Collection

In addition to displaying statistics, the LightStream switch provides a data collection facility called the collector. The collector allows you to define a set of MIB objects, collect their values at regular intervals, and save the information in a file. The set of MIB objects and their collected values is a collection.

The collector maintains a table called collectTable in the private section of the LightStream MIB. It uses the information in this table to control the operations of its collections. A sample collection table is shown in Table 6-1. Each row defines a collection.

Table 6-1 Sample Collection Table

Collection Number	Collection Status	Operational Status	Begin Time	End Time	Interval	File Name	File Size
1	valid	Running	10:00:00 Tues 5/4/94	11:00:00 Tues 5/4/94	60	collect.1	100
2	under Creation	Waiting	12:30:15 Fri 5/14/94	12:00 Fri 5/28/94	360	collect.2	100
75	valid	Running	00:01:00 Mon 8/2/94	00:01:00 Tues 8/3/94	3600	collect.75	50

You can use the **begintime** and **endtime** arguments to control the collection duration and the **filesize** argument to control the collection size. If you do not specify the **begintime** and **endtime** arguments, the collection runs continually.

The collector can run up to 25 collections simultaneously on a particular LightStream switch. If you attempt to start more than 25 collections, any additional collections will have an operational status of **waiting**. When the number of running collections falls below 25, the next waiting collection will begin running.

You can collect any set of MIB objects you want at any time interval you want. For example, you can define a collection of ifInErrors and ifOutErrors objects for a particular set of ports to be collected once an hour or once a day. Once the collection is started, the specified information is collected at the correct interval and appended to the collection file.

The collector automatically generates the file and file name for every collection that you create. The file name is of the form collect.<collection number>. All collection files are placed in the /usr/tmp/collector directory. Sample names are /usr/tmp/collector/collect.6 and /usr/tmp/collector/collect.128.

Collection files are circular ASCII files containing the time each object was collected, the object name, and the object value. Figure 6-3 shows a sample collection file. When the circular file is full, the oldest data is overwritten by newer data. Files are displayed in chronological order from the oldest entries to the newest.

Figure 6-3 Sample collection file. In this collection, the ifInUcastPkts value is collected for several ports at one minute intervals

```
12:13:37 ifInUcastPkts.7000           0
12:13:37 ifInUcastPkts.7001     7790663
12:13:37 ifInUcastPkts.9000           0
12:13:37 ifInUcastPkts.9001           0
12:13:37 ifInUcastPkts.9002       45347
12:13:37 ifInUcastPkts.9003   279082332
12:13:37 ifInUcastPkts.9004       45346
12:13:37 ifInUcastPkts.9005   278173235
12:13:37 ifInUcastPkts.9006      239398
12:13:37 ifInUcastPkts.9007    57462208
12:14:37 ifInUcastPkts.7000  2124113265
12:14:37 ifInUcastPkts.7001  1261205209
12:14:37 ifInUcastPkts.9000   123177948
12:14:37 ifInUcastPkts.9001     2063392
12:14:37 ifInUcastPkts.9002      740698
12:14:37 ifInUcastPkts.9003    90800255
12:14:37 ifInUcastPkts.9004      237879
12:14:37 ifInUcastPkts.9005      240500
12:14:37 ifInUcastPkts.9006       46828
12:14:37 ifInUcastPkts.9007   543157670
```

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You can view and use the collection files as they are or you can process the data. (You may want to sort the data or make calculations to determine when changes in performance or state occur.)

To begin a new collection, follow the procedures described in this chapter in the order listed below.

- Create a collection
- Set the time interval for data collection
- Specify the MIB objects to add to or delete from the collection
- Specify the maximum size of the collection file
- Start the collection

You may also want to perform the following functions on your collections.

- Specify a start and end time
- View the data that has been collected
- List all collections that have been defined
- Stop a particular collection
- Delete a particular collection

Each of these procedures is explained in the sections that follow.

Creating a Collection

This procedure tells you how to create a collection. It sets up a row in the collectTable object for a collection with the number you specify.

Procedure

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

```
cli> set snmp community <community name>
```

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 Enter the following at the `cli>` prompt:

```
cli> set collection <collection number> create
```

where `<collection number>`

An integer between 1 and 128, inclusive.

Step 3 To verify that the collection has been created, enter the following at the `cli>` prompt:

```
cli> walk collectIndex
```

This lists the collection numbers that have been created for this switch.

Expected Results

If you enter the number of a collection that already exists, a message is displayed telling you that you cannot create that collection.

If you enter the **walk collectIndex** command, you will see a display similar to the following:

```
cli> walk collectIndex
Name: collectIndex.2 Value: 2
Name: collectIndex.3 Value: 3
Name: collectIndex.5 Value: 5
Name: collectIndex.6 Value: 6
cli>
```

The numbers that appear after `Value`: are the numbers of the collections that have been created. The display above indicates that collection numbers 2, 3, 5, and 6 have been defined.

Setting the Collection Interval

This procedure shows you how to set the time interval for collecting data for a particular collection.

Procedure

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

```
cli> set snmp community <community name>
```

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 Enter the following at the `cli>` prompt:

```
cli> set collection <collection number> frequency <interval>
```

where

- `<collection number>`

  The number of a collection for which you are setting the collection interval.

- `<interval>`

  The interval (in seconds) at which you want to collect the data. The default is 60 seconds. Typical intervals include:

Table 6-2 Collection Interval Details

Typical Time Interval	Number of Seconds in Interval
1 second	1 seconds
10 seconds	10 seconds
30 seconds	30 seconds
1 minute	60 seconds
5 minutes	300 seconds
10 minutes	600 seconds
15 minutes	900 seconds
30 minutes	1800 seconds
1 hour	3600 seconds
2 hours	7200 seconds
12 hours	43200 seconds
24 hours	86400 seconds
1 week	604800 seconds

Step 3 To verify the collection interval for a particular collection, enter the following at the `cli>` prompt:

```
cli> show collection <collection number>
```

Check the information in the Collection Interval field.

Adding or Deleting Collection Objects

This procedure explains how to specify a MIB object and add or delete it from a collection. Each MIB object is added or deleted individually.

Note You cannot add or delete multiple items with one command.

Procedure 1: Adding Objects to a Collection

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

```
cli> set snmp community <community name>
```

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 If you do not know which MIB objects are available for collection, use the **browse** command or the **walksnmp** command to list the objects that are available.

Step 3 To add MIB objects to a collection, enter the following at the `cli>` prompt:

```
cli> set collection <collection number> addvar
<MIB address>
```

where

- `<collection number>`

  The number of a collection for which you are adding objects.

- `<MIB address>`

  The MIB name or address of the object you want to add to the collection. The MIB address must include the instance identifier as described in the "SNMP Commands" chapter of the *LightStream 2020 Administration Guide*.

For example, to collect the ifInOctets MIB object for ports 1 and 2 on card 3, enter the following at the `cli>` prompt:

```
cli> set collection 10 addvar ifInOctets.3.1

cli> set collection 10 addvar ifInOctets.3.2
```

Step 4 To verify that the object(s) you specified in Step 3 will be collected, enter the following from the `cli>` prompt:

```
cli> show collection <collection number>
```

Check the information in the Collection Items field. You should see the MIB object(s) listed that you added to the collection.

Procedure 2: Deleting Objects from a Collection

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

```
cli> set snmp community <community name>
```

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 To delete objects from a collection, enter the following from the `cli>` prompt:

```
cli> set collection <collection number> delvar <MIB address>
```

where

- `<collection number>`

  The number of a collection for which you are deleting objects.

- `<MIB address>`

  The MIB name or address of the object you want to delete from the collection.

Step 3 To display the current objects to be collected for the collection, enter the following from the `cli>` prompt:

```
cli> show collection <collection number>
```

Check the information in the Collection Items field. The MIB object you specified should not appear in the display.

Specifying Collection Size

This procedure tells you how to specify the size of a collection file.

Procedure

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

```
cli> set snmp community <community name>
```

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 Enter the following at the `cli>` prompt:

```
cli> set collection <collection number> filesize <size>
```

where

- `<collection number>`

  The number of a collection for which you are specifying the collection file size.

- `<size>`

  The size of the collection file in Kbytes. The default is 100 Kbytes. The actual file size is 100 x 1024 bytes.

Step 3 To display the size of the collection, enter the following from the `cli>` prompt:

```
cli> show collection <collection number>
```

Check the information in the Collection File Size.

Starting a Collection

This procedure tells you how to start the collector. Starting the collector causes the LightStream switch to collect the specified MIB objects (at the defined times) and store the data in the collection file.

Procedure

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

```
cli> set snmp community <community name>
```

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 Enter the following at the `cli>` prompt:

```
cli> set collection <collection number> start
```

where `<collection number>`

The number of a collection that you are starting.

Step 3 To confirm that the collection has been started, enter the following from the `cli>` prompt:

```
cli> show collection <collection number>
```

Look at the Collection Status field.

Expected Results

If the Collection Status field status is Valid, the collection has been started and is running. If the status is Waiting, you have more than 25 collections running on this switch, or the collection is scheduled to start at a future time.

Specifying Collection Start and End Times

This optional procedure tells you how to specify a start and end time for a collection.

Procedure 1: Specifying Start Time

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

```
cli> set snmp community <community name>
```

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 To specify the start time, enter the following from the `cli>` prompt:

```
cli> set collection <collection number> begintime <time>
```

where

- `<collection number>`

  The number of a collection for which you are specifying the start time.

- `<time>`

  The time when you want the collection to start. Enter the time in [[[yy:]mm:]dd:]hh:mm:ss format. The default is the current time and date.

Step 3 To determine collection start time, enter the following from the `cli>` prompt:

```
cli> show collection <collection number>
```

Look at the Start Time field.

Procedure 2: Specifying End Time

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

```
cli> set snmp community <community name>
```

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 To specify the stop time, enter the following from the `cli>` prompt:

```
cli> set collection <collection number> endtime <time>
```

where

- `<collection number>`

  The number of a collection for which you are specifying the end time.

- `<time>`

  The time when you want the collection to stop. Enter the time in [[[yy:]mm:]dd:]hh:mm:ss format. The default is the time when the LightStream system clock runs out (for example, Thu Dec 31 23:59:59 2037).

Viewing a Collection

You can view the collection file from the command line interface (CLI) or you can copy it to a third-party network management system (NMS) or workstation where you can view it or process it.

Two procedures can be used to view the collection from CLI. The first is used if you are running CLI on the network processor (NP) of the LightStream switch on which the collection is being run and the second is used if you are running CLI on a remote NP or Sun SPARCstation.

Note You must be in protected mode to view a collection if CLI is running from a remote NP or Sun SPARCstation, or if you are moving the collection file to a third-party NMS or workstation. Refer to the subsection entitled "Accessing Protected Mode" for instructions on accessing protected mode. You must also have an account (user name and password) for the workstation or host to which you are moving the collection file. Your network administrator should provide you with this information.

Procedure 1: Viewing a Collection

Step 1 Enter the following at the `*cli>` prompt:

```
*cli> shell "cbufpr /usr/tmp/collector/collect.<collection#>"
```

For more information on the circular buffer print (**cbufpr**) command, see the subsection entitled "Displaying Log Files."

Procedure 2: Copying a Collection File for Viewing or Processing

Step 1 Enter the following at the `cli>` prompt:

```
cli> protected
```

Step 2 Enter the protected mode password when you see the following prompt:

```
Enter password:
```

Step 3 Enter the following at the *cli> prompt:

```
*cli> shell "ftp <name or address of workstation or host to which you want to move
the collection file>"
```

The LightStream switch responds with a message similar to the following:

```
Connection to 127.1.41.22.
220 NMS1 FTP server (version 4.162 Tue Nov 1 10:50:37 PST 1988) ready.
```

Step 4 When you see the following prompt, enter the user name for the account on the workstation or host to which you are moving the collection file:

```
Name (127.1.41.22:<user name>):
```

Step 5 Enter the password for the account when you see the following prompt:

```
Password:
```

If you enter the user name and password correctly, the workstation or host displays information similar to the following:

```
230 User <user name> logged in.
ftp>
```

Step 6 Enter the following at the ftp> prompt:

```
ftp> put /usr/tmp/mma/collectIndex.8 [<new name>]
```

where <new name>

The name of the file that identifies the chassis or appropriate directory name for the file. For example, if you are moving a trap log for a switch called Light5, the new name could be mma_Light5.traplog.

Step 7 To exit the file transfer program and return to CLI, enter the following at the ftp> prompt:

```
ftp> bye
```

or

```
ftp> quit
```

Expected Results

The **put** command sends the log file to the specified workstation or host. The system tells you when the transfer is complete.

You can use a standard UNIX command such as **more** or **cat** to view the collection file on the workstation or host. You can also use the text file with any text processing tool you have available.

Figure 6-3 shows a sample of a collection file that you may see if you perform either procedure 1 or 2 above.

Listing Defined Collections

This procedure tells you how to get a list of all defined collections. It also explains how to determine the status and contents of any defined collection.

Procedure

Step 1 Enter the following at the `cli>` prompt:

```
cli> walksnmp collectIndex
```

The **walksnmp** command displays a list of all collections that have been defined, as follows:

```
cli> walk collectIndex
Name: collectIndex.1 Value: 1
Name: collectIndex.2 Value: 2
Name: collectIndex.3 Value: 3
Name: collectIndex.4 Value: 4
Name: collectIndex.5 Value: 5
Name: collectIndex.6 Value: 6
Name: collectIndex.7 Value: 7
Name: collectIndex.8 Value: 8
Name: collectIndex.10 Value: 10
Name: collectIndex.128 Value: 128
cli>
```

The numbers following the term `Value:` are the collection numbers that have been defined.

Step 2 Once you know the numbers of the collections that have been defined, you can determine the contents and status of each collection by typing the following from the `cli>` prompt:

```
cli> show collection <collection number>
```

If you don't enter a collection number, all collections are displayed.

Expected Results

The following is an example of the output that is displayed when you enter **show collection 10**:

Figure 6-4 Sample individual collection display

```
cli> show collection 10
Collection Record 10:
Collection Status:     Under Creation
Begin Time:            Mon Aug  2 15:43:54 1993
Ending Time:           Thu Dec 31 23:59:59 2037
Collection Interval:   30 sec
Collection File:       /usr/tmp/collector/collect.10
Collection File Size:  100 KB

Collection Items:

Name: collectDBObjectID.10.1   Value: ifInOctets.3000
Name: collectDBObjectID.10.2   Value: ifInOctets.3001
Name: collectDBObjectID.10.2   Value: ifInOctets.3005
cli>
```

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Stopping a Collection

This procedure explains how to temporarily stop a collection. Use this procedure if you may want to resume this collection at a later time. If you restart this collection at a later time, new data is appended to the existing collection file.

Procedure

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

`cli>` **`set snmp community <community name>`**

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 Enter the following at the `cli>` prompt:

`cli>` **`set collection <collection number> halt`**

where `<collection number>`

The number of a collection you are stopping.

Step 3 To determine if a collection has been stopped, enter the following from the `cli>` prompt:

`cli>` **`show collection <collection number>`**

Expected Results

The **show collection <collection number>** command displays the Collection Status field. If the status is Under Creation, the collection has been stopped.

If a collection has been restarted, the Collection Status changes from Under Creation to Valid.

If you have 25 collections running and you stop one or more of them, collections with a Collection Status of Waiting may be started as a result. (In this case, you may not be able to restart the collection you just stopped, unless you halt another collection.)

Deleting a Collection

This procedure tells you how to delete the definition of a collection. It deletes the definition of the collection from the collecTable, but it does not delete the collection file itself. Once a collection is deleted, you can no longer restart it because its definition no longer exists.

Procedure

Step 1 Set the SNMP community to a read/write community by entering the following at the `cli>` prompt:

```
cli> set snmp community <community name>
```

where `<community name>`

The name for the SNMP community with read/write privileges that you want to access.

Step 2 Enter the following at the `cli>` prompt:

```
cli> set collection <collection number> delete
```

where `<collection number>`

The number of a collection to be deleted.

Step 3 To list the collection numbers that have been defined for this switch, enter the following from the `cli>` prompt:

```
cli> walksnmp collectIndex
```

Expected Results

The **walksnmp collectIndex** command displays the collection numbers that have been defined for this switch. The number that you deleted should *not* appear on this list.

Sample Collection Scenario

The following shows a list of commands used to create, define, and then start a collection. This sample collection is defined to collect the ifInErrors MIB object for two ports on card 1 and two ports on card 3 of the target LightStream switch. It is placed in /usr/tmp/collector/collect.2. The data is collected every hour starting when you issue the **set collection start** command and continuing until you stop it. (No end time has been defined.)

```
cli> set collection 2 create
cli> set collection 2 frequency 3600
cli> set collection 2 addvar ifInErrors.1000
cli> set collection 2 addvar ifInErrors.1001
cli> set collection 2 addvar ifInErrors.3000
cli> set collection 2 addvar ifInErrors.3001
cli> set collection 2 start
```

You can view the collection file by following the instructions in the subsection entitled “Viewing a Collection.” The following is a sample display of the collection file:

```
06:14:23 ifInErrors.1000      0
06:14:23 ifInErrors.1001      0
06:14:23 ifInErrors.3000      0
06:14:23 ifInErrors.3001      0
07:14:23 ifInErrors.1000      0
07:14:23 ifInErrors.1001      3276418
07:14:23 ifInErrors.3000      0
07:14:23 ifInErrors.3001      631645383
08:14:23 ifInErrors.1000      2
08:14:23 ifInErrors.1001      0
08:14:23 ifInErrors.3000      94
08:14:23 ifInErrors.3001      0
...
```

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A

Field Descriptions Appendix

This appendix contains an alphabetical list and description of all fields that may appear in a screen display as the result of a command line interface (CLI) command.

Table A-1 Field Names and Definitions

Field Name	Definition
Active LMI System	The local management interface (LMI) for a frame relay port.
Address Length	The length of the address.
Admin CSU Type	The channel service unit (CSU) type for the specified port.
Admin DCE Bit Rate	The speed per second set for the DCE.
Admin DSE Bit Rate	The speed per second set for the DSE.
Admin Expected DTE Rate	The expected rate of the data terminal equipment (DTE) for the specified port.
Admin Net Interface Type	The administrative net interface type for the specified port.
Admin Protocol	The administrative protocol for the specified port.
Admin Status	The administrative status (up or down) of the named port.
Administrative Status	The administrative status (up or down) of the named card.
Application	This indicates the current condition of the application as collected by the test and control system (TCS) for a particular card in the chassis. The possible values are enabled (activated) or disabled (not activated).
Application Load	This indicates the current condition of the Application Load as collected by the test and control system (TCS) for a particular card in the chassis.
ATM Data Switch Contact	The name of the person to contact for issues relating to this switch. The information should include how to contact this person.
ATM-UNI VCI list	This displays the list of ATM-UNI VCI connections. If a connection is down, an asterisk (*) appears in the state (S) column for that connection.
Banner	The program name, version number, and date display.
Begin Time	This indicates the begin time of the specified collection. (A collection runs from its begin time to its ending time. If the begin and ending times are not specified, the collection runs continuously.)
Board Initialization	This indicates the condition of the board initialization as collected by the test and control system (TCS) for a particular card in the chassis.
Bottom Temperature	The temperature indicated by the bottom sensor of the named card.
Broadcast Support	The type of broadcast supported for the specified port.
Cable Length (in feet)	The length of the cable connected to this trunk port.
Call Setup Backoff Time	The number that determines the successively longer periods of time that the system will wait before retrying call set-ups.
Call Setup Retry Time	The waiting period between the first two attempts to establish a connection on this port. If the second attempt fails, Call Setup Backoff Time is invoked.

Field Name	Definition
Card	Depending on the CLI command you entered, this indicates the name of the card in the named slot or the current condition of the specified card as collected by the test and control system (TCS).
Card Name	The name of an NP, switch, or line card.
Card PID	The process identification number (PID) of the specified card.
Card Type	This indicates the type of card in the named slot.
Cards Managed by Gid	The cards (listed by chassis name and slot number) managed by the global information distribution (GID) process.
Cards Managed by ND	The cards managed by the neighborhood discovery (ND) process.
Chassis ID	This identifies the chassis by number.
Client Announcements Received	The number of client announcements received.
Client Announcements Transmitted	The number of client announcements transmitted.
Clients Managed by Gid	The clients (listed by process identification number) managed by the global information distribution (GID) process.
Clock	This indicates the current condition of the clock as collected by the test and control system (TCS) for a particular card in the chassis.
Collection Interval	This indicates the frequency (in seconds) that information is collected in the named collection. (The default is 60 seconds.)
Collection Items	This indicates the MIB objects being collected in the named collection.
Collection Status	This indicates the status of the named collection. Values are Under Creation (stopped), Waiting (not running), or Valid (running).
Community	The name of the SNMP community.
Config DB Active	The active configuration data base.
Configuration Author	The creator of the current configuration.
Configuration Host	The name of the host where the configuration was created.
Configuration ID	The identifying number of the current configuration.
Console Trap Level	The level set for the console traps. Values are SNMP, Oper, Info, Trace, Debug, or off.
Contact	The name of the person to contact for issues relating to this switch.
CP POST	The state of power of self test (POST) commands on the card, either enabled or disabled.
Date/Time	The current date and time.
Debug	The level of the CLI debug attribute. Values are on (debugging enabled) or off (debugging disabled, the default).
Default Router	The address of the default router, if one exists.
Description	This identifies the type of device. The information should include the full name and version identification of the device.
Dest Admin DLCI	The data link connection identifier at the destination port.
Dest Admin Node	The data link connection identifier at the destination port.
Dest Oper DLCI	The data link connection identifier (DLCI) of the LightStream port at the other end of the frame relay virtual circuit.

Field Name	Definition
Dest Oper Insured Burst	The maximum amount of data (in bytes or cells) that the LightStream network will transfer under normal conditions during the measurement interval from the destination port to the source port.
Dest Oper Insured Rate	The data throughput specification (in bps or cps) that the LightStream network is committed to support under normal network conditions.
Dest Oper Max Burst	The maximum amount (insured plus uninsured) data (in bytes or cells) that the LightStream network will attempt to deliver under normal conditions from destination to source during the measurement interval.
Dest Oper Max Rate	The maximum amount (insured plus uninsured) data (in bps or cps) that the LightStream network will attempt to deliver under normal conditions from destination to source.
Dest Oper Port	The LightStream port at the other end of the frame relay, frame forwarding, or ATM UNI virtual circuit.
Dest Oper VCI	The virtual channel identifier (VCI) for this ATM UNI VCC.
Dest Operational Node	The destination node**.**
Dest Operational Port	The destination port.
Discarded Output Packets	Number of output packets discarded due to resource limitation. If the statistic has increased since the last polling, the increase is displayed by the rate of increase on this port.
Discarded Packets Rcvd	The number of received packets that were received but discarded on this port.
Discarded Rcvd Packets	The number of packets discarded due to resource limitation. If the statistic has increased since the last polling, the increase is displayed by the rate of increase on this port.
DS3 Line Type	The type of DS3 line used on this ATM UNI port.
Echo source	The value of the echo source attribute. If the attribute value is *on* (default), the commands in script files are displayed as they are executed. If the value is *off*, the commands are not displayed.
Ending Time	This indicates the end time for the specified collection. (A collection runs from its begin time to its ending time. If the begin and ending times are not specified, the collection runs continuously.)
Errs	The switch error statistics for neighborhood discovery (ND) process (given for both In Cells and Out Cells).
Ethernet Address	The IP address for the NP's Ethernet interface. This address is not associated with a particular NP or slot; it points to the active NP in the chassis that is used for network management.
Ethernet IP Mask	The Ethernet IP Mask of the IP address.
File	The name of a collection record.
File Size	The size (in KB) of a collection record.
Finish Time	This indicates the begin time of the specified collection.
Flash	A read only memory (ROM) that can be erased at common signal levels.
Flash Initialization	This indicates the condition of the flash initialization as collected by the test and control system (TCS) for a particular card in the chassis.
Frame forwarding connections list	This displays the list of frame forwarding connections. If a connection is down an asterisk (*) appears in the state (S) column for that connection.
Frame Relay DLCI connections list	The list of frame relay data link connection identifiers (DLCIs).
Frame Relay DLCI list	This displays the list of frame relay DLCI connections. If a connection is down an asterisk (*) appears in the state (S) column for that connection.

Field Name	Definition
Full Enquiry Interval	The number of status enquiry intervals that pass before a full status enquiry message is issued.
GID Process ID (PID)	The process identification number (PID) of the global information distribution (GID) process.
Hostname	The name of the current target switch.
Initstring	The current contents of the modem initialization string for the switch card (stored in EEPROM on the midplane).
Interval	The time interval for collection of data collection for a collection.
IP Addresses Managed by Gid	This field identifies the Internet addresses managed by the global information distribution (GID) process.
iso	The highest level object of the MIB tree.
iso.org	The subtree below the iso level of the MIB tree.
LC Software Version	This indicates the version of the LC software.
LCC Software Version	This indicates the version of the line card control process (LCC) that is running.
Line edit	The value of the CLI line edit attribute. If the line edit attribute value is *on* (default), you have access to an emacs-like editor. If the attribute value is *off*, line edit characters are not supported.
Local LMI State	The local management interface (LMI) that is active on the frame relay port.
Location	The physical location of the device.
Logging	The indication that the logging attribute is off (default) or on. If the logging attribute value is *off*, no logging takes place. To set the logging attribute to *on*, enter a log file name as the value.
Max Query Period	The maximum length of time that unanswered status enquiries are tolerated before the system declares the LMI port unreliable at the network end.
Max Status Query Errs	The maximum number of unanswered status enquiries tolerated before the system declares the LMI port unreliable at the network end.
Max Supported VCs	The maximum number of virtual circuits (VCs) allowed for this interface.
Maximum Interval between Permit Limit Updates	The maximum interval specification (in milliseconds) for trunk and outgoing edge cards to report permit limits.
Measured Bit Rate	The received bit rate for a frame relay or frame forwarding port on a low-speed edge line card.
Memory Allocation Failures	The number of memory allocation failures.
Memory In Use	This indicates the amount of memory (given in bytes) in use by the specified process.
MIB2 Type	The MIB2 type as shown for the specified port.
Minimum Interval between CA Updates	The minimum interval specification (in milliseconds) at which congestion avoidance information processes distribute aggregated congestion avoidance (CA) updates to input edge cards.
Minimum Interval between Permit Limit Updates	The minimum interval specification (in milliseconds) for trunk and outgoing edge cards to report permit limits.
MMA Collection Size	The amount of memory available to the Master Management Agent (MMA) for data collection.
MMA PID	The process identification number of the MMA.
MMA Trap Filter Level	The priority level of traps sent from the MMA to the CLI or an NMS. Priority levels are 1 - operational, 2 - informational, 3 - trace, and 4 - debug.
MMA Trap Logging State	The trap logging state of the MMA. The settings are on (default) or off.

Field Name	Definition
Multicast Packets Rcvd	Number of broadcast/multicast packets delivered (a portion of the total). If the statistic has increased since the last polling, the increase is displayed by the rate of increase.
Multicast Packets Sent	Number of broadcast/multicast packets sent (a portion of the total). If the statistic has increased since the last polling, the increase is displayed by the rate of increase.
Name	Depending on the CLI command you entered, this field may specify a card, collection, collection item, MIB object, node, process (alias name), traplog file, or groups file.
ND Clients	The list of neighborhood discovery (ND) clients.
ND Process ID (PID)	This indicates the process identification number (PID) of the neighborhood discovery (ND) process.
ND Switch Statistics	The statistics for slot, in cells, out cells, and errors for the neighborhood discovery (ND) process.
Neighbor Generic Announcements Received	The number of Neighbor Generic Announcements received.
Neighbor Generic Announcements Transmitted	The number of Neighbor Generic Announcements transmitted.
Neighbor IP Announcements Received	The number of Neighbor IP Announcements received.
Neighbor IP Announcements Transmitted	The number of Neighbor IP Announcements transmitted.
Neighbor Link Announcements Received	The number of Neighbor Link Announcements received.
Neighbor Link Announcements Transmitted	The number of Neighbor Link Announcements transmitted.
Neighbor New Announcements Received	The number of Neighbor New Announcements received.
Neighbor New Generic Announcements Received	The number of Neighbor New Generic Announcements received.
Neighbor New Link Announcements Received	The number of Neighbor New Link Announcements received.
Neighbor NPs known to ND	The neighbor network processors (NPs) known to the neighborhood discovery (ND) process.
Neighborhood Announcements Received	The number of Neighbor Announcements received.
Neighborhood New Announcements Received	The number of Neighborhood New Announcements received.
Neighbors in Exchange Start State	The number of neighbors in exchange start state.
Neighbors in Exchange State	The number of neighbors in exchange state.
Neighbors in Existent Sync State	The number of neighbors in existent sync state.
Neighbors in Full Sync State	The number of neighbors in full sync state.
Neighbors in Loading Sync State	The number of neighbors in loading sync state.
Neighbors Managed by Gid	The list of neighbors managed by the global information distribution (GID) process.
Net Interface Type	The type of frame relay network interface on this port. The types are user network interface (UNI) and network to network interface (NNI).

Field Name	Definition
New Neighbor IP Announcements Received	The number of New Neighbor IP Announcements received.
Normal Packets Rcvd	Number of unicast packets received by the indicated port. If the statistic has increased since the last polling, the increase is displayed by the rate of increase.
Normal Packets Sent	Number of unicast packets sent by the indicated port. If the statistic has increased since the last polling, the increase is displayed by the rate of increase.
Number of Line Cards managed by ND	The number of line cards managed by the neighborhood discovery (ND) process.
Octets Rcvd	Total octets received from the media from the indicated port. If the statistic has increased since the last polling, the increase is displayed by the rate of increase.
Octets Sent	Total octets sent on the media by the indicated port. If the statistic has increased since the last polling, the increase is displayed by the rate of increase.
Oper CSU Type	The channel service unit (CSU) type for the named port.
Oper DCE Bit Rate	The DCE bit rate for the named port.
Oper Expected DTE Rate	The expected DTE rate for the named port.
Oper Interval	The channel service unit (CSU) type for the named port.
Oper Net Interface Type	The interface type for the named port.
Oper Protocol	The protocol operating on the interface.
Oper Status	The operational status (up or down) of the named port.
Operational Max Frame Size	The maximum frame size (in bytes) for the named port.
Operational Status	This indicates the status (up or down) of the card in the named slot.
Output Errors	Packets discarded due to error. If the statistic has increased since the last polling, the increase is displayed by the rate of increase.
Paddle Card	This indicates the current status of the access card (presence and condition) as collected by the test and control system (TCS) for a particular card in the chassis.
Paddle Card Override	This indicates the current condition of the access card override (enabled or disabled) as collected by the test and control system (TCS) for a particular card in the chassis.
PID	The process identification number.
PID Administrative Status	This indicates the administrative status (active or inactive) of the named process.
PID Alias	This indicates the alias name for the specified process.
PID Name	This indicates the name for the specified process.
PID Operation Status	The operation status of the process.
PID Trap Level	This indicates the trap level setting for the specified process. Values are oper, info (default), trace, or debug.
PID Up Time	The length of time the process has been running.
CP Scrambling	This indicates whether the cell payload scrambling is enabled or disabled for the named card. (The default is disabled.)
Port Data Cell Capacity	The available data cell capacity for the named port.
Port Frame Forwarding Name	The name of the frame forwarding port.
Port Frame Relay Name	The name of the frame relay port.
Port MTU	The maximum transmission unit number for the specified port.
Port Name	The name of the specified port.

Field Name	Definition
Port Speed	The speed (in bps) for the specified port.
Port Type	The port type (MS Trunk or LS Edge, for example).
Port Unreserved Capacity	The available capacity (in cells) for the named port.
Ports Managed by Gid	The list of ports managed by the global information distribution process.
POST	This indicates the current condition of the power on self test (POST) as collected by the test and control system (TCS) for a particular card in the chassis.
Power Supply	This indicates the current condition of the power supply as collected by the test and control system (TCS) for a particular card in the chassis.
Power Supply A	This indicates the condition of the bulk power tray in power slot A of the LightStream chassis. If this slot is unused, Empty will appear in this field.
Power Supply A Type	This indicates the power type in power slot A of the LightStream chassis. If this slot is unused, Empty will appear in this field.
Power Supply B	This indicates the condition of the bulk power tray in power slot B of the LightStream chassis. If this slot is unused, Empty will appear in this field.
Power Supply B Type	This indicates the power type in power slot B of the LightStream chassis. If this slot is unused, Empty will appear in this field.
Primary Addr	This indicates the IP address for the primary NP's switch interface.
Primary Switch	This identifies the primary active switch card (SA or SB).
PROGRAM:	The program name and its compile time.
Receive Errors	The packets discarded due to format error. If the statistic has increased since the last polling, the increase is displayed by the rate of increase.
Registered ND Client Processes	The list of registered neighborhood discovery (ND) processes.
Remote LMI State	The state of the remote LMI. LMI is local management interface; a frame relay protocol for getting the status of frame relay circuits from attached frame relay devices.
Request Interval	The maximum number of seconds specified that the system expects to elapse between status enquiry messages from the user end of the frame relay connection.
SCSI Power	This indicates the current condition of the SCSI power as collected by the test and control system (TCS) for a particular card in the chassis.
Secondary Addr	This indicates the IP address for the secondary NP.
Slot #	This indicates the type of card in Slot #. If the slot is unused, Empty will appear in this field.
Slot # Config Assembly	This identifies the configuration assembly as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Config Postcode	This identifies the configuration post code as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Config Serialnum	This identifies the configuration serial number as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Config Slavecode	This identifies the configuration slave code as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Config Type	This identifies the configuration type as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Daughter Assembly	This identifies the daughter assembly number as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Daughter Serialnum	This identifies the daughter serial number as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.

Field Name	Definition
Slot # Oem Assembly	This identifies the OEM assembly number as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Oem Serialnum	This identifies the OEM serial number as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Paddle Assembly	This identifies the access card assembly number as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Paddle Serialnum	This identifies the paddle serial number as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # State	The temperature conditions (top and bottom) as collected by the test and control system (TCS) for the card in the indicated slot of the chassis.
Slot # Voltage TCS VCC Voltage VCC Voltage SCSI Voltage VPP Voltage	This indicates the TCS VCC, VCC, SCSI, and VPP voltages as collected by the test and control system (TCS) for the card in the indicated slot of the chassis. The current voltages are shown as well as the normal voltage ranges.
Slot 2	This indicates the type of card in slot 2. If the slot is unused, Empty will appear in this field.
Slot 3	This indicates the type of card in slot 3. If the slot is unused, Empty will appear in this field.
Slot 4	This indicates the type of card in slot 4. If the slot is unused, Empty will appear in this field.
Slot 5	This indicates the type of card in slot 5. If the slot is unused, Empty will appear in this field.
Slot 6	This indicates the type of card in slot 6. If the slot is unused, Empty will appear in this field.
Slot 7	This indicates the type of card in slot 7. If the slot is unused, Empty will appear in this field.
Slot 8	This indicates the type of card in slot 8. If the slot is unused, Empty will appear in this field.
Slot 9	This indicates the type of card in slot 9. If the slot is unused, Empty will appear in this field.
Slot 10	This indicates the type of card in slot 10. If the slot is unused, Empty will appear in this field.
Slot of Primary NP	This indicates the slot that contains the primary active NP.
Slot of This NP	This indicates the slot that contains the NP being displayed.
Slot SA	This indicates the type of card in slot SA. If the slot is unused, Empty will appear in this field.
Slot SB	This indicates the type of card in slot SB. If the slot is unused, Empty will appear in this field.
Software Version Number	The version number of the specified application.
Source Node	The node at the source of the service.
Source Port	The port at the source of the service.
Source VCI	The source virtual channel identifier (VCI) for the VCC.
Src Admin Insured Burst	The maximum amount of data (in bytes or cells) that the LightStream network will transfer under normal conditions from the destination port to the source port during the measurement interval.
Src Admin Insured Rate	The data throughput (in bits per second or cells) that the LightStream network is committed to support under normal network conditions. The insured rate (IR) is specified in bits per second for FF and FR interfaces, in cells per second for ATM UNI.
Src Admin Max Burst	The maximum amount (insured plus uninsured) data (in bytes or cells) that the LightStream network will attempt to deliver under normal conditions from destination to source during the measurement interval. (Measurement interval is calculated by dividing maximum burst size by maximum rate.)

Field Name	Definition
Src Admin Max Rate	The maximum amount (insured plus uninsured) data (in bps or cps) that the LightStream network will attempt to deliver under normal conditions from destination to source. (The uninsured data may be dropped if the network is congested.)
Src DLCI	The LightStream node at the other end of the frame relay, frame forwarding, or ATM UNI virtual circuit.
Src Node	The node at the source of the service.
Src Oper Insured Burst	The data throughput on a given virtual circuit that the LightStream network commits to transfer during a specified interval.
Src Oper Insured Rate	The data throughput specification in bps or cps that the LightStream network supports under normal network conditions.
Src Oper Max Burst	The maximum insured plus uninsured data throughput on a given virtual circuit that the LightStream network commits to transfer during a specified interval, in bytes (for FF and FR) or cells (for ATM UNI),
Src Oper Max Rate	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 is the highest that the virtual circuit will ever deliver.
Src Port	The LightStream port at the other end of the frame relay, frame forwarding, or ATM UNI virtual circuit.
State	The state of the cards managed by the neighborhood discovery (ND) process.
Status Query Period	The maximum length of time that unanswered status enquiries are tolerated before the system declares the LMI port unreliable at the network end.
Subnet Mask	The address mask used to identify which bits in the address are network significant, subnet significant, and host significant portions of the complete address.
System Up Time	The length of time the system has been up. The time is given in hours, minutes, and seconds.
TCS Hub	This indicates the current condition of the TCS hub as collected by the test and control system (TCS) for a particular card in the chassis.
TCS VCC Power	This indicates the current condition of the test and control system (TCS) VCC (+5V) power as collected by the TCS for a particular card in the chassis.
TCS Voltage	This indicates the TCS voltage of the named card.
Temperature	This indicates the current temperature condition collected by the test and control system (TCS) for a particular card in the chassis.
Temperature Bottom	The temperature indicated by the bottom sensor of the named card.
Temperature Paddle Card Region 1	The temperature in region 1 of the named access card.
Temperature Paddle Card Region 2	The temperature in region 2 of the named access card.
Temperature Top	The temperature indicated by the bottom sensor of the named card.
Terminal Type	This indicates the terminal type you are using.
Timer	The CLI timer that indicates the time since the CLI was restarted or since this timer was reset.
Top Temperature	The temperature indicated by the top sensor of the named card.
Traplevel	The level that the CLI debug attribute has been set to. (Values are off, oper, info, trace, or debug.)
Type	The type of service for this ATM UNI circuit (guaranteed or insured).

Field Name	Definition
Unknown Protocols Rcvd	The number of packets received that were destined for unknown protocols. If the statistic has increased since the last polling, the increase is displayed by the rate of increase.
User Monitored Events	The number of monitored events.
User Polling Interval	The number of seconds specified between consecutive status enquiries sent by the user portion of a frame relay interface that has a local management interface (LMI).
Value	The alias name of a PID.
VCC Power	This indicates the current condition of the VCC (+5 V) power as collected by the TCS for a particular card in the chassis.
VCC Voltage	This indicates the VCC (+5 V) voltage of the named card.
VEE Power	This indicates the current condition of the VEE power as collected by the TCS for a particular card in the chassis.
VPP Power	This indicates the current condition of the VPP power as collected by the TCS for a particular card in the chassis.
XILINX Load	This indicates the current condition of the XILIN Load as collected by the test and control system (TCS) for a particular card in the chassis.