CHAPTER 2

# Command Line Interface

This chapter introduces the command line interface (CLI) that you use to operate and manage LightStream 2020 multiservice ATM switches (LS2020 switches). It lists CLI commands, procedures to start the CLI, and instructions to perform basic CLI functions.

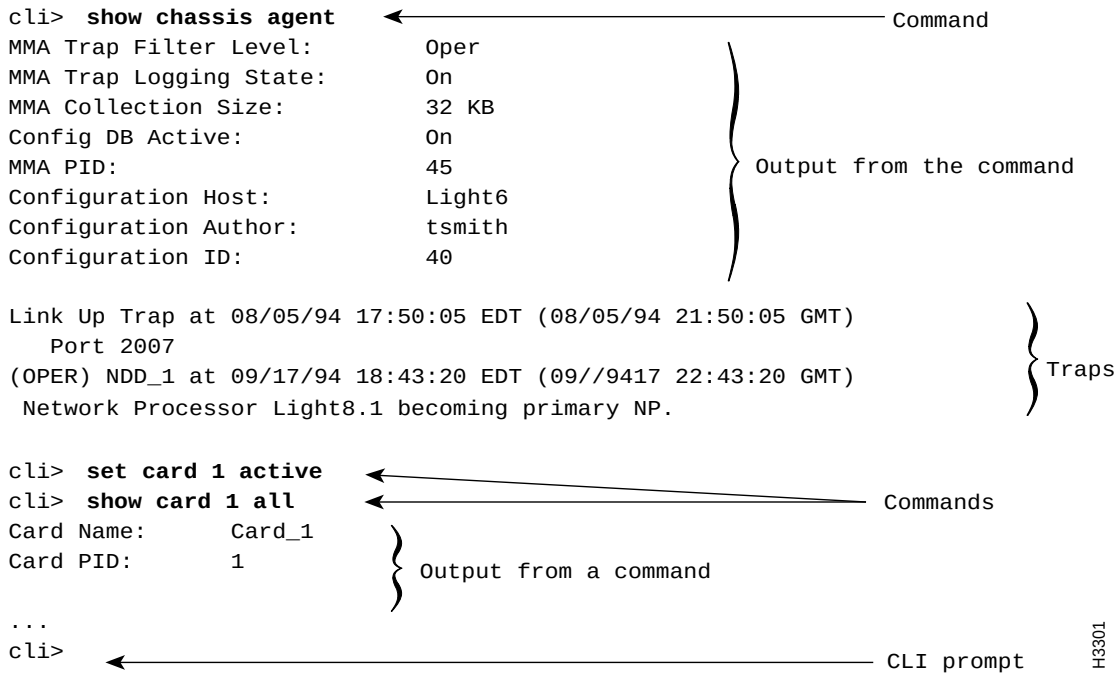
## Introduction to the CLI

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. It allows you to operate your LS2020 network with or without a network management system (NMS).

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

From the CLI, you can access any LS2020 switch in the network and perform network operations on that switch. 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 2-1 shows a sample CLI session with traps interleaved with the commands and output.

**Figure 2-1 Sample Session of the CLI**




If you are running the CLI on an NP, any command you issue is executed on the switch you are logged in to. However, you have the option of executing any of the commands listed in Table 2-2 from another switch. To do this, you must first specify the name of the other switch. This is called setting the target switch. (Refer to the section “Setting the Target Switch for CLI Commands” later in this chapter.)

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

## User Accounts

When you install your switch, the system automatically creates the four accounts shown in Table 2-1 for your network node. None of these accounts has default passwords. For the LS2020 to run properly, you must enter passwords for each user account. Passwords for the accounts are usually set when the LS2020 switch is installed. If you do not know the password for these accounts, see your network administrator.

**Table 2-1 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)[1] | 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. | LSnode:2$ [2] |
| root | Used for installation and for certain administration tasks using the LynxOS bash shell. | LSnode:2# |

1. To enter the protected mode from the CLI running on an NMS, you must add the npadmin username and associated password to the Sun workstation that is running the NMS software.
2. LSnode represents the chassis name for this example. The bash shell prompt reflects the name of chassis at which you are logged in. The number 2 is used in this example. The slot number can either be 1 or 2 depending on which slot the NP is in.

When you access either the operator or the NP administration account, the switch automatically runs the CLI so you can start operations immediately. If you access either of the other accounts, the switch runs the bash shell and displays the bash (UNIX) prompt. The bash shell prompt includes the name of the chassis and the slot number of the NP. For example, LSnode:2$ means that the primary NP is on LSnode in slot 2. The dollar sign ($) indicates that you are logged in as field support. If the bash shell prompt has a pound (#) sign instead of a $, you are logged in as root (see Table 2-1).

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 command:

- General—Commands that allow you to perform such functions as accessing protected mode and online help, running a CLI script file, viewing and modifying node attributes, and exiting from the CLI.
- MIB monitor/control—Commands that perform the functions of the standard SNMP commands (**get**, **getnext**, and **set**) and some other common SNMP commands. These commands allow you to look at and modify MIB objects.
- TCS—Commands used primarily to run hardware diagnostics. However, these commands are not available when you are running the CLI on a SPARCstation. In addition to the information provided in this guide, see the *LightStream 2020 Hardware Reference and Troubleshooting Guide*.

For descriptions of the syntax and functions of all CLI commands, see the *LightStream 2020 CLI Reference Guide*.

# 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.

**Caution** Protected mode is dangerous. You can bring the chassis down if you are not careful.

Table 2-2 lists the protected commands and their functions.

**Table 2-2 Protected Commands and Their Functions**

| Name | Function |
|---|---|
| connect | Connects the CLI to a card as a console. |
| loadcard | Loads diagnostics. |
| password | Changes the password for protected mode. |
| set | Sets the values of certain CLI attributes in the runtime environment. Not all set commands are protected. Protected commands include **set modem, set trap,** and **set tcs.** |
| setsnmp | Sets the value of a MIB object. |
| shell | Executes a shell command and gives the user access to the LynxOS shell. |
| write | Writes to TCS/board memory. For Cisco customer support only. |

# 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 description of the CLI command syntax, see the *LightStream 2020 CLI Reference Manual* or the *LightStream 2020 Command Line Interface (CLI) Reference Card*.

Table 2-3 lists 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 2-3 CLI Syntax and Command Examples**

| Syntax | Command Example |
|---|---|
| exit | exit |
| protected | protected |
| help [<topic>] | help<br>help setsnmp |
| show <object type> [<component name>] <parameter> | show card 1 status<br>show chassis cards |
| set <object type> [<component name>] <parameter> [<value>] | set chassis traplevel debug<br>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 and 10 for line cards. The port number is between 0 and 7 for line cards. For example, to issue a **show port** command to port 4 on card 3 in card.port format, you would enter the following command:

```
show port 3.4
```

# Command Completion Feature

It is not always necessary to enter the full name of a CLI command or its argument. In most cases, if you enter enough letters to make the command or argument unambiguous, the CLI accepts the abbreviated name in most cases, not all. Once you type enough letters of a command name or command argument to make it unambiguous, you can usually use the **Tab** key to complete the name unless the argument is at the end of a very long command. For example, if you the type br[Tab], the CLI completes the command **browse**.

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, the CLI does recognize `por` followed by a [**Tab**].

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]
```

# 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 hardcopy terminal. Table 2-4 lists the line editing keys that are available in the CLI.

**Table 2-4 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 backward through all commands, beginning with the most recent command. |
| ^R | Searches backward 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 backward 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. |

# Starting the CLI

This section describes how to start the CLI and how to perform basic CLI functions. The method you use to log in varies depending on the network management option you select. For a description of different network operation and management possibilities, see Table 1-1. If you choose an option that requires you to run the CLI on a Sun SPARCstation, see the *LightStream 2020 Installation Guide* for installation instructions.

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**Note** You should exit the CLI when you have finished using it, or when you expect an extended period of inactivity in the CLI session. The CLI uses up a certain amount of network processor or NMS system resources (memory and CPU) when active. Exiting the CLI when you have finished optimizes system performance.

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You can access the CLI by

- Running the CLI application on a Sun SPARCstation and issuing commands to the LS2020 switches in the network.
- Connecting a VT100-compatible terminal or network processor (NP) to the console port on an LS2020 switch card (or connecting a modem to the modem port) and running the CLI application from the local NP.
- Using Telnet to connect an NP, running the CLI application, and receiving the output at the remote location.

If you use 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 access the CLI through one of the console ports, it is not necessary to have the IP addresses defined for the NP.

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**Note** If you do not log in to either the oper or npadmin account on the LS2020 node (see Table 2-1), you must start the CLI manually by issuing the **cli** command from the UNIX prompt.

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## Accessing the CLI Running on a Sun SPARCstation

To access the CLI running on a Sun SPARCstation, follow these steps:

**Step 1** If the CLI has been installed on your SPARCstation, log in to your SPARCstation. If you have trouble starting the CLI, ensure that the directory containing the CLI is included in your search path. (For more details, see the *LightStream 2020 Installation Guide.*)

**Step 2** Open the CLI on the SPARCstation by typing **cli** at the prompt.

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

```
cli> set snmp host {name|IPaddress}
```

Where

{name | IPaddress} is the name (a text string) or the IP address of the LS2020 switch to which you want to set the target. You can choose *name* only if the /etc/hosts file maps the host name to an IP address. Otherwise, you need to supply the IP address. CLI commands are now sent to the target switch.

The following text appears on the screen when you have successfully logged in to the CLI:

```
CLI (Version 2.2 of March 16 1996)
Copyright 1995. Cisco systems, Inc. All Rights Reserved.
```

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

## Accessing the CLI by Connecting a Terminal to the Console Port

To access the CLI by connecting a terminal to the console port, follow these steps:

**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 #> is the slot number of the NP card on which you want to run the CLI (1 or 2).

If you do not see the TCS prompt, enter a backquote followed by a period:

```
‘.
```

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

```
user name:
```

---

**Note** A previous user may have left the system in a logged-in state.

---

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

```
password:
```

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 account, bash (UNIX) prompt is displayed.

**Step 4** To start the CLI from the bash (UNIX) prompt, enter **cli** at the prompt:

## Accessing the CLI by Using Telnet to Reach the NP

To access the CLI using Telnet to reach the NP, follow these steps:

**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 using Telnet:

**telnet <IP address of the NP>**
or
**telnet <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.

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

```
password:
```

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 (UNIX) prompt.

**Step 5** To start the CLI from the bash (UNIX) prompt, enter the following:

```
cli
```

# Accessing the MIB Tree

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. For an illustration of the MIB tree, see the *LightStream 2020 CLI Reference Manual.*

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**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 CLI Reference Manual.*

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## Browsing the MIB

To travel down through the MIB tree and obtain the value of any MIB object you see, follow these steps:

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

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

Where

[<mib-address>] is 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 2** Continue down the "org" subtree by entering the following at the browse> prompt.

```
browse> 1
```

**Step 3** Exit by entering the **exit** or **quit** command at the browse> prompt.

**Step 4** When you enter the **browse** command, the following information is displayed.

```
cli> browse

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

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

The following text 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. (**Bold** type indicates user input.)

```
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) lightStreamInternet
        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>
```

The following example 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 the previous display, you can enter the command **browse chassisInfo** and immediately access the chassisId object.

```
cli> browse chassisInfo

chassisInfo:
        1) atmChassisInfo
        2) chassisId
        3) chassisActiveIpAddr
        4) chassisSecondaryIpAddr
         .
         .
         .
        Enter line number to go down, 'u' to go up, 'q' or 'e' to quit browse.
```

# Frequently Used CLI Functions

This section includes steps on how to perform these frequently used CLI functions:

- Accessing online help
- Clearing the screen
- Setting CLI attributes
- Accessing protected mode
- Forcing a switch card to become active or backup
- Setting the target switch for CLI commands
- Displaying log files
- Displaying card types
- Displaying port status

## Accessing Online Help

To display a list of all CLI commands, enter **help** or a question mark [**?**] at the `cli>` prompt. In the resulting display, commands preceded by an asterisk can be used only in protected mode. All other commands are available in normal mode and protected mode. The following example shows the output of the **help** command when you execute it without an argument.

```
cli> help
browse          Browse the MIB tree
clear           Clear the screen
*connect         Connect to card in slot
define          Define filter, multicast group, traffic profile
delete          Delete filter, multicast group/member, traffic profile
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>
```

To display detailed help on a particular topic, enter the following at the `cli>` prompt:

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

Where

[<topic>] is an optional argument that allows you to enter the name of a command on which you want help.

The following example shows the output of the **help** command 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>
```

To display the options available for a particular command, enter a question mark [**?**] in a command to display a list of the options.

```
cli> show card 8 ?
```

The CLI displays a list of the objects that you can show for card 8. 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 as shown in the following example:

```
cli> show card 8 ?
all
name
processid
status
version
hardware
peak-cell-rate
ports
cli> show card 8
```

The **show** command is redisplayed after the help text.

You can continue to use the question mark to complete your **show** command as shown in the following example:

```
cli> show card ?
cli> show card ?
Enter Card ([1-10], sa, sb
cli> show card 8 ?
all
name
processid
status
version
hardware
peak-cell-rate
ports
cli> show card 8

cli> show card 8 name
Card Name:              lstb3.8
cli>
cli>
```

The CLI indicates that you must enter the card number. If you enter **show card 8 ?** at this point, the CLI displays a list of the options you can enter for card 8. It automatically redisplays **show card 8.** Then, you enter the option you want to view (**name**, for example).

## Clearing the Screen

To clear the screen, enter the **clear** command at the `cli>` prompt. The screen clears and the `cli>` prompt reappears at the top of the screen.

## Setting CLI Display and Logging Attributes

You use the **set cli** command to set the values of specified CLI attributes. These attributes determine how the CLI operates. You use the **show cli** command to view the current settings of the attributes.

- debug — sets the debug flag
- echosource — turns the echoing of sourced commands on or off
- lineedit — turns the line editing capability on or off
- log — records a copy of user input and CLI output
- term — sets the terminal type to termtype (see the file /etc/termcap for acceptable values.)
- timout — specifiies an SNMP timeout value
- timer— reininitializes the timer
- timestamp — controls the appearance of a timestamp after each CLI prompt
- traplevel — sets the CLI trap reporting threshold

For example, to set the line edit attribute (the default is on), follow these steps:

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

```
cli> set cli lineedit on
```

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

```
cli> show cli lineedit
```

A screen similar to the following displays:

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

For more information about these attributes, see the *LightStream 2020 CLI Reference Manual*. It provides more information about the **set** and **show** commands, including command attributes, syntax, and arguments.

## Accessing Protected Mode

You access protected mode to run hardware diagnostics and to perform advanced troubleshooting. For a list of these commands, see Table 2-2.Your network administrator can provide you with the protected mode password, if you need access.

**Caution** Protected mode is dangerous. You can bring down the chassis if you are not careful.

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

**Step 1** To enter protected mode, enter the **protected** command at the `cli>` prompt.

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

```
Enter password:
```

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.
```

Once you enter protected mode, you remain in that mode until you take explicit action to return to normal mode. 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.

To exit from protected mode, enter **exit** or **quit** at the `*cli>` prompt. The `*cli>` prompt reverts to `cli>`.

## Forcing a Switch Card to Become Active or Backup

In an LS2020 switch with two switch cards (SA and SB), one card is the active switch card and the other card is the backup switch card. In case of a problem with the active switch card, the backup switch card automatically becomes 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.

To force a switch card to become active or backup, follow these steps:

**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 Hardware Reference & Troubleshooting Guide*.

**Step 1** Verify that the target switch is correct by entering the **show snmp** command at the `cli>` prompt.

A screen similar to the following is displayed:

```
cli> show snmp
Community: public
HostName: localhost
cli>
```

**Step 2** To determine which switch card is 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
cli>
```

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

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

Where

<slot #> is Switch A or Switch B

The switch card you designate is set to be the active switch card.

**Note** If you enter the **set chassis primaryswitch** command, you have to wait for the chassis to reboot.

## Setting the Target Switch for CLI Commands

You run a CLI session on a specific NP on a specific switch. If you want to run a CLI session on a different switch than the one you are logged in to, you need to specify the name of the other switch. To set the target switch, follow these steps.

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

**Step 1** To change the target switch, enter the following at the `*cli>` prompt:

```
*cli> set snmp host {name | IPaddress}
```

Where

{name | IPaddress} is the name (a text string) or the IP address of the LS2020 switch to which you want to set the target. You can choose *name* only if the /etc/hosts file maps the host name to an IP address. Otherwise, you need to supply the IP address. CLI commands are now sent to the target switch.

**Step 2** To reset the target switch to the local switch, enter the following at the *cli> prompt:

```
*cli> set snmp host {localhost|128.0.0.1}
```

**Step 3** To verify the name of the current target switch, enter the **show snmp** command at the *cli> prompt:

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. 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. The following two commands begin the display with the oldest entry and end with the most current entry.

To display a circular file from the LynxOS shell using the cbufpr command, enter the following at the bash (UNIX) prompt:

```
LSnode:2# cbufpr [-h] [-v] [-all] [-tail] -<number> [-f] [-trap] <file> |more
```

To display a circular file from the 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.

-tail reads the last 20 lines of the trap log file.

-<number> is 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 the end of the 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 <file> defines the level of traps to be displayed (SNMP, oper, info, trace, or debug). The <file> argument is the 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 space bar to display the next page. If you do not use | more, the file scrolls across the screen.

Depending on the switches and file you select, the results displayed using **cbufpr** vary. A screen similar to the one in Figure 2-2 is displayed if you enter **shell "cbufpr -tail /usr/tmp/mma/mma.traplog"** at the *cli> prompt.

**Step 4** To exit from the log file display, press **q**.

**Figure 2-2 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>
```

H3317

## Displaying Card Types

By using the CLI **show chassis cards** command, you can quickly differentiate between edge cards and trunk cards and see how the physical configuration is set up. The display differs depending on your system configuration. A sample screen output looks similar to the following:

```
cli> show chassis cards
Slot 1:   NP
Slot 2:   LS Trunk
Slot 3:   LS Edge
Slot 4:   MS Trunk
Slot 5:   OC3 Trunk
Slot 6:   T3 Trunk
Slot 7:   Cemac
Slot 8:   Ethernet
Slot 9:   FDDI
Slot 10:  Cemac
Slot SA:  Switch2
Slot SB:  Empty
```

**Note** The term Unknown displays beside the slot number if a card is down. You can also type **show card <slot #>** to see if a card is down.

## Displaying Port Status

Once you see the cards that populate the system, you can display the port status for any ports. The LS2020 switch supports several interfaces to connect LS2020 systems to one another or to other devices.

Table 2-5 lists the supported port types, their configuration (edge or trunk port), and the line module necessary to configure a specific type of port.

**Note** The line module you choose when you configure a port type depends on the external media you select.

**Table 2-5 Supported Port Types**

| Port Type | Configuration | Line Module |
|---|---|---|
| OC3 ATM UNI | Edge | Cell line card with OC3 access card (single mode or multimode) |
| OC3 trunk | Trunk | Cell line card with OC3 access card (single mode or multimode) |
| T3 ATM UNI | Edge | Cell line card with 8T3 access card or medium speed card with T3 medium-speed access card (4 port) |
| T3 trunk | Trunk | Cell line card with 8T3 access card or medium speed card with T3 medium-speed access card (4 port) |
| E3 ATM UNI | Edge | Cell line card with 8E3 access card or medium speed card with E3 medium-speed access card (4 port) |
| E3 trunk | Trunk | Cell line card with 8E3 access card or medium speed card with E3 medium-speed access card (4 port) |
| Ethernet | Edge | Packet line card with Ethernet access card |
| Fiber Ethernet | Edge | Packet line card with fiber Ethernet access card |
| FDDI | Edge | Packet line card with FDDI access card |
| CEMAC | Edge | Packet line card with circuit emulation access card |
| Frame Relay | Edge | Packet line card with serial access card or low-speed card with low-speed access card |
| Frame forwarding | Edge | Packet line card with serial access card or low-speed card with low-speed access card |
| LightStream trunk | Trunk | Packet line card with serial access card or low-speed card with low-speed access card |

The following is an example of a port status display for an Ethernet port. This example includes additional statistical data. The additional data is contained in parentheses and is preceded by the term Delta. To get this extra data, you must re-enter the **show port** command.

```
cli> show port 8.0
Description:              Ethernet CSMACD
Port Name:                ECC Port 0
Port Type:                Ethernet
MIB2 Type:                ethernet-csmacd
Interface address:        8:0:8:0:28:78

Ethernet Medium Type:     AUI
Port MTU:                 1500 Octets
Port Speed:               10000000 bps

Admin Status:             Up
Oper Status:              Down
Last Oper Change:         2 Hr 18 Min 44 Sec ago

Octets Rcvd:              0    (Delta: 0    Rate: 0.00/sec)
Normal Packets Rcvd:      0    (Delta: 0    Rate: 0.00/sec)
Octets Sent:            384    (Delta: 0    Rate: 0.00/sec)
Normal Packets Sent:      0    (Delta: 0    Rate: 0.00/sec)
.
.
.


                   WorkGroup List:
                   ---------------
Card         Port          WgrpId          Mode
----         ----          ------          ----
8            0             1               Include

Default Bridge Filter action is FORWARD
Default IP Filter action is FORWARD
Default IPX Filter action is FORWARD
NP Deliver:          block
Port STB data:
Port State:               disable
Priority:                 128
Path Cost:                100
```