TCS Hub Commands

This appendix describes the test and control system (TCS), explains how to access the TCS hub interface, and provides procedures for using TCS commands to manage a network of LightStream 2020 multiservice ATM switches (LS2020 switches). TCS hub commands allow you to communicate directly to the TCS and they allow you to perform some functions when you do not have access to the command line interface (CLI). You can use the TCS hub commands to do the following:

- Get help on any TCS hub command
- Connect to a card
- Force a TCS hub on either of the switch cards (SA or SB) to become the primary or secondary TCS hub
- Find and change EEPROM values
- Change the default baud rates for the console and modem ports associated with each switch card

Each of these tasks is described in this appendix, except changing console and modem port baud rates, which is described in the *LightStream 2020 Installation Guide*. The commands discussed here are a subset of the TCS hub commands. The remaining TCS hub commands are not described here because you can use CLI commands to perform the same functions more easily. Refer to the *LightStream 2020 System Overview* for a further discussion of the TCS.

Test and Control System

Most communications between components (cards) within an LS2020 node involve the passing of messages through the concurrent cell switch. However, some functions cannot be performed through the switch, including initialization, low-level control, and nondisruptive servicing (diagnostics and maintenance). The LS2020 switch has an integrated test and control system (TCS) to perform these functions.

The TCS provides diagnostic and control functions that

- Are resilient to system and network failures
- Are nondisruptive to system operation
- Can be available even if other parts of the node are down

The TCS consists of a single-chip microcomputer on every line card, NP, and switch card in the LS2020 node. The microcomputer on line cards and NPs is called a TCS slave; the microcomputer on the switch card is called a TCS hub. Each slave is connected to one hub (or in systems with redundant switch cards, two hubs) by a point-to-point serial link. Messages can flow from slave to hub, from hub to slave, or from slave to slave (using the hub as an intermediary).

Each TCS microcomputer (hub or slave) stores a copy of its card's vital statistics (for example, serial number and card type), and data needed to initialize and run the card. The job of each TCS chip is to manage the low-level functionality of its card. It supervises such functions as power supply sequencing, logic reset, soft logic loading, loading and monitoring of power-on self tests, application program loading and startup. It also provides on/off control and voltage margining of the on-card DC-DC converters, handles updates to the card's EEPROM memory, and monitors air temperature.

The TCS provides access to each card in the system for diagnostics and maintenance operations via a local or remote console connection. When a card has been newly installed, for example, you can load and run diagnostics on the card without disturbing the rest of the system.

Access to the TCS Hub Interface

You access the TCS hub interface by connecting a VT100-compatible terminal (or modem) to the console (or modem) port on the back of the LS2020 switch. Press the **Return** key to obtain a TCS prompt.

Prompts

When you access the TCS, you see one of a variety of prompts. Table D-1 explains each of the possible prompts.

Table D-1 TCS Prompt Descriptions

Prompt	Character	Case
TCS HUB<A> tcs hub<a> TCS HUB<<A>> tcs hub<<a>>	The character **A** or **a** indicates you are connected to the TCS hub on switch card A.	A prompt shown in uppercase characters (TCS HUB<A>) indicates that the TCS hub is the primary TCS hub. A prompt in lowercase characters indicates the TCS hub is the secondary TCS hub.
TCS HUB<B> tcs hub<b> TCS HUB<<B>> tcs hub<<b>>[1]	The character B or b indicates you are connected to the TCS hub on switch card B.	A prompt shown in uppercase characters (TCS HUB<B>) indicates that the TCS hub is the primary TCS hub. A prompt in lowercase characters indicates the TCS hub is the secondary TCS hub.

1. The significance of the single or double brackets in the prompt is not relevant to this discussion.

User Interface for TCS Hub Commands

The TCS interface is similar to the CLI. Each CLI command includes the object identifier of the component to which the command is directed (chassis, card, port, and so forth). A TCS hub command is always directed to a card, so it includes the slot number rather than the object identifier.

Online Help

Like the CLI, the TCS interface has an online help facility. It provides a **help** command, and it also allows you to press **Return** after an incomplete command to list options for the command. Unlike CLI, the TCS does not provide a command completion feature using the **Tab** key, and it does not accept the question mark character **?** after an incomplete command. (In fact, entering **?** after a command can have undesirable results because some commands interpret the **?** character as input.)

Line Editing Keys

The TCS provides a number of line editing keys. Some of these keys are different from those used in the CLI. Table D-2 lists the TCS line editing keys.

Table D-2 TCS Command Line Editing Keys

Control Key	Function
^P	Yank previous command.
^N	Yank next command.
^A	Go to start of line.
^E	Go to end of line.
^B	Go back one character.
^F	Go forward one character.
^U	Kill entire line.
^D	Delete character under cursor.
Esc B	Go back one word.
Esc F	Go forward one word.

Getting Help on TCS Commands

This procedure tells you how to access online help on any TCS hub command. When you enter the **help** command, the TCS displays a list of all commands available. When you enter **help** followed by a command name, the system displays information on that command.

Procedure

At any TCS prompt, enter:

```
TCS HUB<<A>> help [<command>]
```

In this example

[<command>] is an optional argument—the name of any TCS hub command on which you want help.

Note If you use the TCS command **power <slot> off** to turn off a card, you must use the command **reset <slot>** to bring the card back into service. The command **power <slot> on** turns on the power, but does not activate the card.

When you enter the **help** command with no argument, you see the following display:

```
TCS HUB<<A>> help

        ?               [<command>]
        chassis         [<power>]
        connect         <slot>
        disable         <slot> [<application>]
        enable          <slot> [<diagnostic>]
        help            [<command>]
        hubstats        [<reset [<dcfail | limits>]]
        init            <slot> [<init_string>]
        margin          <slot> <percent>
        maxreq          <count>
        modem           [<ena | dis>]
        nmi             <slot>
        pmode           [<on | off>]
        power           <slot> <off>
        pollstat        [<slot> | <enable | disable | reset>]
        primary         <slot>
        ptrace          <slot>
        read            <slot><obj><addr>[<by,wo,lo,bl>]
        reset           <slot>
        secondary       <slot>
        set             <slot><obj1><obj2><value>
        show            <slot><obj1><obj2>
        skippoll        <count>
        skipalt         <count>
        slip            [<disable | reset | init [<threshold>]>]
        status          <slot>
        switch          [<ena | dis>]
        trace           <slot>
        write           <slot><obj><addr><data>[<by,wo,lo,bl>]
        vector          <0-4>
        verbose         <verbose | silent>
        version         (no arguments)

        Command-line editing keys:
             ^P: yank previous command
             ^N: yank next command
             ^K: kill to end of line
             ^A: goto start of line
             ^E: goto end of line
             ^B: back one character
             ^F: forward one character
             ^D: delete character under cursor
             <ESC>-b: go back one word
             <ESC>-f: go forward one word

        Commands can be abbreviated to any unique command string.

TCS HUB<<A>>
```

When you enter the **help show** command, the following is displayed**:**

```
TCS HUB<<A>> help show
SYNTAX:
        show <slot><obj1><obj2>
DESCRIPTION:
        show:   cli show command
```

TCS Hub Tasks

This section describes tasks performed from the TCS hub interface:

- Connecting to a card
- Forcing a TCS hub to become primary or secondary

The procedure for changing the baud rate on the console or modem port associated with a switch card is in the *LightStream 2020 Installation Guide.*

Connecting to a Card

This procedure describes how to logically connect from a terminal attached to the console or modem port to a given slot within an LS2020 switch. You can connect to a switch card, an NP, or a line card. You can also connect to an NP to access the CLI from the console or modem ports.

Step 1 Access the TCS hub interface by connecting a VT100-compatible terminal (or a modem) to the console (or modem) port on the back of the LS2020 switch. Press the **Return** key to obtain the TCS prompt.

Step 2 If you do not see a TCS prompt, enter the following characters:

```
‘.
```

Step 3 At the TCS prompt, enter

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

In this example

<slot#> is a number in the range 1 - 10, SA, or SB

Examples of the **connect** command:

```
TCS HUB<<A>> connect 1
```
(connects to an NP in slot 1)

```
TCS HUB<<A>> connect 7
```
(connects to a line card in slot 7)

Step 4 To exit from connect mode, enter

```
‘.
```

The information displayed when you connect to a card varies depending on the software running on that card at the time the connection is made.

If you get no response to a **connect** command, you may need to reset the card before you connect to it or download software to it.

Forcing a TCS Hub to Become Primary or Secondary

The TCS hub residing on a switch card controls the switch card itself and acts as a communications hub for the system-wide TCS. In an LS2020 with two switch cards (SA and SB), the TCS hub on one switch card is the primary TCS hub, and the TCS hub on the other switch card is the secondary TCS hub. The procedure below forces the TCS hub on one switch card to become the primary (or secondary) TCS hub. As you force one TCS hub to be come the primary, the other becomes the secondary and vice versa.

Use this procedure before removing the switch card with the primary hub from the chassis. This procedure does *not* disrupt the flow of traffic through the switch; it only specifies the card that is to be used as the TCS hub.

Note This procedure does not affect which switch card has the active switching fabric—that is, which card is actively passing traffic. The procedure to force active and backup switch cards to reverse roles is described in the *LightStream 2020 Network Operations Guide*.

Step 1 Access the TCS hub interface by connecting a VT100-compatible terminal (or a modem) to the console (or modem) port on the back of the LS2020 switch. Press the **Return** key to obtain the TCS prompt.

Step 2 If you do not see a TCS prompt, enter the following characters:

‘.

Step 3 Determine the status (primary/secondary) of the TCS hubs by noting the case of the prompt: upper case for the primary hub, lower case for the secondary hub. Refer to Table D-1 for details.

Step 4 To force a TCS hub to be the primary TCS hub, enter the following command at the TCS prompt:

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

or, to force a TCS hub to be the secondary TCS hub, enter the following command at the TCS prompt:

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

Where

<slot#> is SA or SB

The TCS hub you specified is set as the primary (or secondary) TCS hub. It takes the TCS approximately 4 seconds to switch the primary and secondary TCS hubs. This process delays only temporarily the servicing of pending TCS slave requests.

Finding and Changing EEPROM Values

When replacing a midplane, you must transfer the chassis ID from the old EEPROMs to the new ones. In addition, if you changed the default settings, you should transfer the old modem init string and modem password to the new EEPROMs. Procedures for doing this are provided in the chapter "Replacing FRUs."

In addition to the chassis ID, the EEPROMs contain other information as well. While this other information is not necessary for the node to function, you may want to include it on the new EEPROMs for the purpose of bookkeeping. To obtain this information:

Step 1 Access the TCS hub interface by connecting a VT100-compatible terminal (or a modem) to the console (or modem) port on the back of the LS2020 switch. Press the **Return** key to obtain the TCS prompt.

Step 2 If you do not see a TCS prompt, enter the following characters:

‘.

Step 3 Enter each command and record the values returned:

```
TCS HUB<<A>> show <slot#> midplane assembly
TCS HUB<<A>> show <slot#> midplane serial
TCS HUB<<A>> show <slot#> midplane boardrev
TCS HUB<<A>> show <slot#> midplane sys_model
```

```
TCS HUB<<A>> show <slot#> midplane sys_serial
TCS HUB<<A>> show <slot#> midplane sys_wip
```

Note You can also obtain a list of EEPROM values by entering the **sysver** command, as described in the section "Replacing the Midplane" in the chapter entitled "Replacing FRUs."

```
TCS HUB<<A>> show <slot#> console baudrate
TCS HUB<<A>> show <slot#> modem init_string
TCS HUB<<A>> show <slot#> modem baudrate
```

Where

<slot#> is SA or SB

The next procedure explains how to input the values obtained above into the EEPROMs on a new midplane:

Step 1 Access the TCS hub interface by connecting a VT100-compatible terminal (or a modem) to the console (or modem) port on the back of the LS2020 switch. Press the **Return** key to obtain the TCS prompt.

Step 2 If you do not see a TCS prompt, enter the following characters:

‘.

Step 3 Enter each command and record the values returned:

```
TCS HUB<<A>> set <slot#> midplane assembly
TCS HUB<<A>> set <slot#> midplane serial
TCS HUB<<A>> set <slot#> midplane boardrev
TCS HUB<<A>> set <slot#> midplane sys_model
TCS HUB<<A>> set <slot#> midplane sys_serial
TCS HUB<<A>> set <slot#> midplane sys_wip
TCS HUB<<A>> set <slot#> console baudrate
TCS HUB<<A>> set <slot#> modem init_string
TCS HUB<<A>> set <slot#> modem baudrate
```

Where

<slot#> is SA or SB