Configuration Procedures

This chapter tells you how to perform configuration tasks for a LightStream 2020 enterprise ATM switch, including how to create configuration objects (chassis, cards, and ports), how to provision for PVCs, and how to configure Virtual LAN internetworking attributes. It addition, it describes general database management functions, such as saving and backing up the global database, and updating a local database.

This chapter contains the step-by-step procedures for performing all configuration tasks. It does not define any attributes nor recommend attribute settings: that reference material is provided in Configuration Attributes and Expert Mode. Therefore, you may want to refer to Configuration Attributes and Expert Mode while you are using this chapter to configure a switch. Once you are familiar with using the configurator, you will probably only use Configuration Attributes and Expert Mode to perform configuration tasks.

Preparing to Configure a Network

To create a new configuration, you need information on each LightStream switch. If the switch is already installed in the network, then you can use the configurator's verify function to obtain default settings for many switch attributes.

If the switch isn't installed, then you need to consider:

- Hardware configuration:

    — Determine how many NPs are in the chassis.

    — Determine which NPs, if any, require NP IP addresses as well as the NP IP mask?

    — Obtain the primary Ethernet IP address, secondary IP address (if one is needed), subnet mask, and default router address (if one exists).

    — Determine the number of line cards of each type (LSC, MSC, PLC, CLC).

    — Determine whether the line cards are to be configured as edge or trunk interfaces.

    — Determine which chassis slot is each line card in.

    — Determine how many ports of each type will be configured on each line card.

- Determine the names you will assign to the nodes, cards, and ports in your LightStream network. (The configurator will create default names for cards and ports, but you can change them if you want to.)

- Obtain the chassis ID number for each node. (The chassis ID is stored in EEPROM on the midplane; use the CLI command **show chassis** to display it.)

- Determine how many trunk ports will connect this LightStream switch to others in the network? What will be the bit-rate on each trunk?

- Determine how many edge ports will connect this LightStream switch to devices outside the LightStream network? What will be the bit-rate on each port?

- Familiarize yourself with the configuration of edge devices that will connect to the LightStream network. For example, you should know

    — What types of interfaces are present (frame relay, frame forwarding, ATM UNI, FDDI or Ethernet)?

    — What is the destination and what are the bandwidth requirements for each permanent virtual circuit?

    — Which local management interface (LMI) is used?

    — Clocking: what device is providing it, what is the speed?

- Make a list of attributes and values for each chassis, card, and port. See Configuration Attributes to determine which attributes apply to the interfaces you'll be configuring.

- If your LightStream network is configured with bridging interfaces (FDDI or Ethernet), then you should know

    — Are the default values for the spanning tree bridge attributes acceptable for your application?

    — Do you want to specify any custom filters for those ports?

    — Do you need to specify any static routes for devices on the attached LANs?

    — Do you want to create any workgroups for those ports?

- For each virtual circuit, you will be required to specify the node, card, and port at each end and the required bandwidth. As you configure the virtual circuits, you might find it helpful to create a form like the one shown below to keep track of them.

Node	Interface #	DLCI/VCI #	Connects to	Node	Interface #	DLC/VCI
LightStream1	2.0	16		LightStream2	9.0	500
LightStream1	2.0	17		LightStream2	9.1	501
LightStream1	2.0	18		LightStream2	9.1	502
LightStream1	3.2	40		LightStream2	2.1	600
LightStream1	4.2	50		LightStream2	3.1	660

Now you're ready to use the configurator to create and load a configuration database, as described in the sections that follow.

Starting the Configurator

There are actually three separate configuration programs available from the OpenView Root dialog box:

- Node Configure (also known as cfg), which you use to configure chassis, cards, ports, internetworking (such as bridging and filters) and SNMP trap attributes

- PVC Configure (also known as pvc), which you use to configure permanent virtual circuit (PVC) attributes

- VLI Configure (also known as vli), which you use to configure virtual LAN internetworking (VLI) attributes

All of the configuration programs read from and write to the same database. Because of a locking mechanism, only one configurator can write to the database at a time.

You can start and run the configurator under HP OpenView or without it. The following sections describe both procedures.

Starting Under HP OpenView

In general, you start each configurator in the same way. The procedures below use Node Configure as an example. Any differences are noted.

To start the configurators, use the following procedure.

Step 1   In the OpenView Root dialog box, shown below, double click on the IP Internet icon and an IP Internet map is displayed OpenView Root dialog bo

Step 2   From the IP Internet map, shown below, you can double click on the desired LightStream switch icon. (Click on one switch icon to start the Node or VLI configurator and two switch icons to start the PVC configurator.) The name of the selected node/s are displayed in the Name field of the first dialog box displayed.

Note   You can also skip to Step 3 and not select any icons.

Step 3   Pull down the LightStream menu on the menu bar, and click on **Node Configure**, **PVC Configure**, or **VLI Configure**. (If you didn't select any icons on the IP Internet map, then the Name field is left blank on the first screen of the configurator.)

Step 4   Select the database access mode on the pop-up dialog box that is displayed. If you select read/write, then the database is locked to other users and you can make changes to the database file. If you select read only, then the file isn't locked and you can only examine the settings in the file. If the configurator reports that someone else is using the database, see the section "Overriding a Configurator Lock" before proceeding.

Note   The configurator automatically opens the default database file (defined by the LSC_DATABASE variable that is set during installation, as specified by the procedures in the *LightStream 2020 Installation and Troubleshooting Manual*.)

Starting Without HP OpenView

To start the configurators without HP Openview, use the following procedure. See the *LightStream 2020 Installation Manual* for information on the software environment required for the Sun workstation.

Step 1   From the system prompt, type **cfg, pvc**, or **vli**.

Step 2 Select the database access mode on the pop-up dialog box that is displayed. If you select read/write, then the database is locked to other users and you can make changes to the database file. If you select read only, then the file isn't locked and you can only examine the settings in the file. If the configurator reports that someone else is using the database, "Overriding a Configurator Lock" before proceeding.

Note The configurator automatically opens the default database file (defined by the LSC_DATABASE variable that is set during installation, as specified by the procedures in the *LightStream 2020 Installation and Troubleshooting Manual*.) You can open a different file using the procedure in the section "Making a Backup Configuration File Operational."

General Configuration Procedures

This section provides a summary of how to perform functions that are frequently used during configuration with the graphical user interface provided by the configurator.

> **Note** The configurator uses standard Motif conventions for the graphical interface. See your Motif documentation for more detailed information. The following table is a summary of frequently used procedures.

Action	Procedure
Store changes to dialog box	Click on the **OK** button at the bottom of the dialog box.
Discard changes to dialog box	Click on the **Cancel** button at the bottom of the dialog box.
Return to the previous dialog box	Click on the **OK** button (any changes are stored). Click on the **Cancel** button (any changes are ignored).
Save changes to global database	Pull down the File menu on the Node Configurator dialog box, and select **Save**. Changes are written to the global database immediately and sent to the local database at the time specified by the Update Time attributes.
Enter information in a field box	Click inside the box and type the information.
Edit information in a field box	Use the left and right arrows on the right keypad to move around the field box. Double click on an entry to select it or depress the left mouse button and, keeping it down, drag it over the characters you want to select. Use the **[Back Space]** key to delete selected items or one character at a time.
Select a radio button attribute	Click on one of two (or more) radio buttons to select among mutually exclusive settings (e.g., enable/disable).
Select a check button attribute	Click on a check button to select that attribute value. (You can click on more than one check button: check buttons are used for values that aren't mutually exclusive.)
Select from an Option button list	1 Click on the arrow beside the option button to display all available selections. 2 Scroll through the list by clicking repeatedly on either the up or down arrow, or by clicking on the scroll bar and sliding it in the desired direction. 3 Click on the desired setting; the list disappears and the selected value is displayed in the option button.
Select from a list box	1 To select one entry, click once the desired entry. 2 To select multiple contiguous entries, click on the first entry, depress the mouse button and, keeping it down, drag over the entries you want to select. (In some cases, the configurator doesn't support multiple selections in a list. These are noted where appropriate.) 3 To select multiple non-contiguous entries, click on the first entry, depress the **[Control]** key and click on the other desired entries. (In some cases, the configurator doesn't support multiple selections in a list. These are noted where appropriate.)
Deselecting from a list box	Hold the **[Control]** key down and click the mouse button.
Add to a list box	1 Enter new information in field boxes or by selecting a radio or check buttons. 2 Click on the **Add** button and the entry is added to the list.
Delete an entry from a list box	1 Click on the entry to be deleted. 2 Click on the **Delete** button and the entry is immediately removed from the list.

Action	Procedure
Edit an entry in a list box	**1** Click on the entry to be edited.
	2 Enter changes and click on the **Edit** button and the list is updated with the new attributes.

Once you start the configurators, you can make entries or changes in the global configuration database. The information is not written to the global database until you perform the save operation. The information from the global database is not sent to a switch until you specify an update time.

Creating a Chassis

This section tells you how to create and configure a LightStream chassis object, starting at the Node Configurator dialog box. Use the Node Configure tool (cfg) to create a chassis object.

Note In order for the configurator to be able to access a LightStream node through IP, your network administrator must establish and maintain the /etc/hosts file on the Sun workstation running the configurators. This file correlates the LightStream node name with an IP address, and is needed for communication between the NMS and the switches. The *LightStream 2020 Administration Guide* describes how to create the /etc/hosts file.

You can create a configuration file for a node before or after it is installed. In either case, the name given to the chassis during installation should be the same name used during configuration, and the same name that is entered in the /etc/hosts file. (A chassis can be configured using the IP address as a name if the /etc/hosts file or name server is not available.)

Note This section does not recommend settings nor describe the various attributes that you can configure using this procedure. See Configuration Attributes, Expert Mode, or the online help for that type of information.

In the Node Configurator dialog box, the Chassis Name list box displays a list of all LightStream chassis that currently exist in the global database file. This does not mean that the chassis have been installed; it simply means that someone has used the configurator to create a database entry for the chassis in the global database file.

Note The **SNMP** button is not currently available for use; therefore, it is always grayed-out on the screen.

Note If you started the configurator from the IP Internet map with a chassis selected, then the name of that chassis is displayed in the Name field.

Step 1 If you are adding a new chassis, click in the `Name` field box above the list and type in a name. The name should be unique and have no more than 32 characters. (Don't use a name that begins with a number or includes quotation marks or other special characters.)

Step 2 If the chassis has not been installed yet, click in the `Chassis ID` field box and type in a unique ID number. You can use a temporary number. (Once the chassis is installed, you can use the verify function to get the actual ID number.)

Step 3 Click on the **Add** push button and the new chassis name is added to the list.

Step 4 Click on the entry in the Chassis Name list to select the chassis you are going to configure.

Step 5 If you are configuring a chassis that has already been installed, then you can use the verify function to retrieve the configuration attributes that were entered during installation (or set to default values by the software). This saves you from having to re-enter that information. The *LightStream 2020 Installation and Troubleshooting Manual* includes a procedure for setting basic configuration attributes during installation.

Step 6 Click on the **Chassis** button to reach the Chassis Configuration dialog box.

Step 7 The dialog box provides field boxes for the primary and secondary IP addresses, IP subnet mask, NP (Ethernet) IP address, NP IP subnet mask, and default router address attributes. At a minimum, you *must* set a primary IP address and subnet mask. Set any other address or mask attributes as required.

Step 8 The dialog box also contains a number of optional attributes including system contact and the location of system. Enter these as desired.

Step 9 You can also set SNMP agent attributes in this dialog box: you can set the trap filter level or enable/disable the trap log. Enter these as desired.

Step 10 To store the changes you have made in this dialog box, click on the **OK** button. This returns you the Node Configurator dialog box.

You have now created and configured a chassis object; you can go on to configure card objects, as described in the procedure that follows. You can also delete, copy or rename a chassis as described in the following sections.

Deleting a Chassis

Delete a chassis using the following procedure.

Step 1 Click on the appropriate entry in the Chassis Name list.

Step 2 Click on the **Delete** button.

Step 3 A pop-up dialog box is displayed that asks if you want to delete the chassis. Click on the **OK** button to delete the chassis. The record is deleted and the entry is removed from the Chassis Name list. (Click on the **Cancel** button if you don't want to delete the chassis.)

Note You *can't* delete a chassis that has been configured with any PVCs. You must delete the PVCs and update the switches before you can delete the chassis.

Copying a Chassis

Copy a chassis using the following procedure.

Step 1 Click on the appropriate entry in the Chassis Name list.

Step 2 Click on the **Copy** button.

Step 3 A pop-up dialog box is displayed. Enter a new chassis name and chassis ID in the field boxes provided.

Step 4 Click on the **OK** button to copy the chassis. All chassis, card, port and bridging attributes are copied to the new chassis and the entry is added to the Chassis Name list. (Click on the **Cancel** button if you don't want to copy the chassis.)

Note The PVC and VLI attributes for the chassis are *not* copied.

Step 5 Change the IP addresses for the newly created chassis.

Step 6 Rename the cards and ports, if desired. The configurator *doesn't* do this for you.

Renaming a Chassis

Rename a chassis using the following procedure.

Step 1 Click on the appropriate entry in the Chassis Name list.

Step 2 Click on the **Rename** button.

Step 3 A pop-up dialog box is displayed. Enter a new chassis name in the field box provided.

Step 4 Click on the **OK** button to rename the chassis. The new chassis name is added to the Chassis Name list and the previous one is removed. (Click on the **Cancel** button if you don't want to rename the chassis.)

Note When you rename a chassis, the PVC and VLI attributes associated with the chassis are retained. You *don't* have to re-enter them.

Creating Cards

This procedure explains how to create and configure database objects for the following kinds of LightStream cards:

- Network processors (NPs)
- Low-speed line cards (LSCs)
- Medium-speed line cards (MSCs)
- Packet line cards (PLCs)
- Cell line cards (CLCs)

(Switch cards have no configurable attributes, and thus are not offered as card type options.)

Before executing this procedure, you must create a chassis object. You start out in the Node Configurator dialog box, where the last procedure, "Creating a Chassis," ends.

Before you configure any cards, you need to know what cards are installed, their slot numbers and special (non-default) configuration attributes in order to create the configuration file. If the switch has already been installed, then you can use the **Verify** button on the Node Configurator dialog box to retrieve card configuration information from the switch. The information was entered during

installation or set to default values by the software. The *LightStream 2020 Installation and Troubleshooting Manual* includes a procedure for setting basic configuration attributes during installation.

Step 1   In the Node Configurator dialog box, click on the chassis you wish to configure cards for and then click on the **Cards** push button. The Cards Configuration dialog box (shown below) appears. The box shows the slot numbers in the LightStream chassis.

Note   The NP card normally occupies slot 1; slot 2 holds either backup NP or a line card. Slots 3 through 10 are for line cards only. Slots A and B are designated for switch cards.

Step 2   Click on the push button below the number of the slot that you want to configure. This button is either labeled Empty, or, if it has been previously configured, it is labeled with an appropriate abbreviation for the card type. Card configuration attributes are now displayed across the top of the dialog box.

Step 3   To select a card type, pull down the **Type** button and click on the desired card type. The list closes and the selected type is displayed in the **Type** option button.

Step 4   To change the administrative status of the card, click on the appropriate radio button. The default card status is up. Because you can temporarily change the status from the CLI, it's usually best to leave the status set to up in the configuration.

Step 5   You can enter a name for the card by clicking in the Name field and then typing a name. (Naming a card is optional. Choose a name with no more than 20 characters, and don't use a name that begins with a number or includes quotation marks.) The configurator provides a default name, which uses the switch name as a base, if you don't enter one.

Caution   If you are an expert user, then continue to Step 6. See Expert Mode if you are going to change these values. Otherwise, you can skip to Step 7.

Step 6   To change the maximum number of virtual circuits allowed on the card, click on the **Expert** radio button. A default value is provided for this attribute, and in most cases it is not necessary nor recommended to adjust it.   See Expert Mode for more information on this attribute if you decide to change it.

Step 7   Click on the **Add** push button and the push button below the slot number is filled in with an abbreviation for the card type that you configured, and push buttons (labeled with question marks) appear in the slot for the number of ports available for that type of line card.

You have now created and configured a card object. You can now delete, move, swap, or copy a card. These procedures are described below. You can also go on to create ports on the cards that you have configured, as described in the procedure that follows.

Deleting a Card

To delete a card and its associated ports:

Step 1   Click on the push button below the number of the card you want to delete.

Step 2   Click on the **Delete** button. The card name is removed from the button, it is labeled Empty, and any port icons are removed.

Note If any PVCs are configured for the card, then they must be deleted and the switches must be updated before you can delete the card.

Moving a Card to Another Slot

To move a card and its associated ports from one slot to another:

Step 1 Click on the push button below the number of the card you want to move.

Step 2 Click on the **Move** button and the dialog box displays the Selected Destination Slot as shown below.

Note If any PVCs are configured for the card, then they must be deleted and the switches must be updated before you can move the card.

Step 3 Click on the radio button labeled with the destination slot number and the dialog box is updated to show the card in its new slot and the old slot is labeled Empty.

Step 4 Rename the card and its ports, if desired. The configurator *doesn't* do this for you.

Swapping Cards Between Slots

To swap two cards and their associated ports between slots:

Step 1 Click on the push button below the number of one of the cards you want to exchange.

Step 2 Click on the **Swap** button and the dialog box displays the Selected Destination Slot.

Note If any PVCs are configured for the card, then they must be deleted and the switches must be updated before you can swap the card.

Step 3 Click on the radio button labeled with the destination slot number and the dialog box is updated to show the cards in their new slots.

Step 4 Rename the card and its ports, if desired. The configurator *doesn't* do this for you.

Copying a Card to Another Slot

To copy a card and its associated ports to a slot:

Step 1 Click on the push button below the number of the card you want copy.

Step 2 Click on the **Copy** button and the dialog box displays the Selected Destination Slot.

Note If any PVCs are configured for the card, then they must be deleted and the switches must be updated before you can copy the card.

Step 3   Click on the radio button labeled with the destination slot number and the dialog box is updated to show the same type of card and ports in the new slot.

Note   All port attributes are also copied to the new slot.

Step 4   Rename the card and its ports, if desired. The configurator *doesn't* do this for you.

Creating Ports

This section explains how to create and configure ports with the LightStream configurator. A port type is determined by the configuration settings and the line card module (line card and access card combination). To configure a port, first you select a card type on the Cards Configuration Manager. This gives you access to individual port attributes.

The configurator card types don't correspond directly to line module names; therefore, Table 3-1 cross-references the configurator card and port types with possible line modules for edge ports, and Table 3-2 cross-references the configurator card and port types with possible line modules for trunk ports.

Table 3-1   Configuring Edge Ports

If you want to configure this type of port	And you have this type of line module	You select this type of card in the configurator
Frame Relay/Frame Forwarding	LSC with LSAC	LS-Edge
ATM UNI over T3	MSC with T3 MSAC	T3-Edge (2 port)
	CLC with 4 port T3AC	T3-Edge (4 port)
	CLC with 8 port T3AC	T3-Edge (8 port)
ATM UNI over E3	MSC with E3 MSAC	E3-Edge (2 port)
	CLC with 4 port E3AC	E3-Edge (4 port)
	CLC with 8 port E3AC	E3-Edge (8 port)
ATM UNI over OC3-C	CLC with OC3AC SM	OC3-Edge **(1 port/2 port??)**
	CLC with OC3AC MM	OC3-Edge **(1 port/2 port??)**
FDDI LAN	PLC with FAC	FDDI
Ethernet LAN	PLC with EAC	Ethernet
	PLC with FEAC	Ethernet
Clear Channel	PLC with CEMAC	[Cemac??]

Table 3-2 Configuring Trunk Ports

If you want to configure this type of port	And you have this type of line module	You select this type of card in the configurator
T1 Trunk	LSC with LSAC	LS-Trunk
T3 Trunk	MSC with T3 MSAC	T3-Trunk (2 port)
	CLC with 4 port T3AC	T3-Trunk (4 port)
	CLC with 8 port T3AC[1]	T3-Trunk (4 port)
E3 Trunk	MSC with E3 MSAC	E3-Trunk (2 port)
	CLC with 4 port E3AC	E3-Trunk (4 port)
	CLC with 8 port E3AC[1]	E3-Trunk (4 port)
OC3 Trunk	CLC with 1 port OC3AC SM	OC3-Trunk (**1 port??**)
	CLC with 2 port OC3AC SM[2]	OC3-Trunk (**2 port??**)
	CLC with 1 port OC3AC MM	OC3-Trunk (**1 port??**)
	CLC with 2 port OC3AC MM[2]	OC3-Trunk (**2 port??**)

1. A maximum of four ports can be used when the module is configured as a trunk.
2. Only one port can be used when the module is configured as a trunk.

Before creating a port you must create at least one chassis object, and at least one card object. The card must be the type that is appropriate for the port you want to create, as indicated in the list above. (For example, if you want to create a frame relay port, you have to select LS-Edge as the card type.) This procedure assumes you are starting out in the Cards Configuration dialog box, where the last procedure, "Creating Cards," ends.

If you are configuring the switch before it has been installed, then you need to know the types of ports for each card and non-default configuration attributes in order to create the configuration file. If the switch has already been installed, then you can use the **Verify** button on the configurator dialog box to retrieve any card and port configuration information from the switch that was entered during installation and default values that were set by software.

Several conventions used by the configurator are true regardless of the type of port that you're configuring. These are

- Port number is assigned by the configurator based on the position of the **Port** push button on the Cards Configuration dialog box. Ports are assigned numbers, starting at zero, from top to bottom of the dialog box.

- The configurator creates a default name for each port, which is a concatenation of the chassis name, slot number and port number. For example, in chassis named boston, the name of the first port in the third slot would be: boston.3.0. You can give the port another name if you wish.

This procedure describes how to create trunk and edge ports. The general procedure is the same, regardless of the interface type, only the attributes vary.

The procedure begins in the Cards Configuration dialog box, configured with many of the card types described in this section.

Note You should configure port 0 on all cards, even if it is not going to be used. This is because card type is derived from the setting for lowest configured port. Configuring an unused port does not affect system operation.

Step 1 In the Cards Configuration dialog box, click on a port button that is labeled with a question mark and a port configuration dialog box appears. This dialog box displays the attributes appropriate for the type of port that you're configuring. It also provides default settings for all attributes.

Note The dialog boxes for each type of port are shown at the end of this procedure.

Step 2 You can use the default name or enter a name for the port, if you wish. (Naming ports is optional. Choose a name with no more than 20 characters, and don't use a name that begins with a number or includes quotation marks.)

Step 3 Examine the other default values and reset any that require adjustment.   Then click on the **OK** button at the bottom of the dialog box and you are returned to the Cards Configuration dialog box. If you need information on attributes, click on the **Help** button on the dialog box or refer to Configuration Attributes of this book.

You have now finished configuring the physical-level components for your switch: chassis, cards, and ports. You may now go on to configure network-level attributes (such as bridging and filtering) and internetwork-level attributes (such as PVC and VLI) as described later in this chapter.

The following subsections show all of the trunk and edge port configuration dialog boxes.

Changing Port Types

With the exception of the LSC edge ports, to change port types you have to delete the card that the port is on, create the desired card type, and then configure the ports. For instance, to change an E3 edge port to a E3 trunk port you must

- delete PVCs associated with the port and update the switches

- delete the E3 edge card

- create the E3 trunk card

- configure the E3 trunk ports

When changing between a frame relay and frame forwarding port on an LSC edge card, you must

- delete PVCs associated with the port and update the switches

- click on the appropriate radio button at the top of the Frame Relay Port Configuration or Frame Forwarding Port Configuration dialog box

- configure the ports

Edge Port Dialog Boxes

The following subsections describe the edge port dialog boxes.

LS-Edge Port-Frame Relay

At the top left of the dialog box, there are two radio buttons used to choose between frame relay and frame forwarding. Frame relay is the default setting. If you want to configure a frame forwarding port, then click on that radio button and the dialog box is changed to show frame forwarding attributes.

Configuring Bridging Attributes

If you have configured any FDDI or Ethernet ports in your network, then you can configure bridge-level and port-level spanning tree bridge attributes, custom filters for ports, and static routes for the bridge. The following sections describe each of these procedures.

Spanning Tree Bridge

Use the following procedure to change spanning tree bridge attributes.

Step 1   Click on the **Protocols** button on the Node Configurator dialog box.

Step 2   Click on the **Spanning Tree** button.

Step 3   The Spanning Tree Parameters box defines chassis-level bridging attributes. To change an attribute, click in the field box and type in a new value.

Step 4   The Interface list displays all configured bridge ports on the chassis with their default settings. If you want to change any assignments, click on a port to select it, and then type in the **Port Priority** or **Path Cost** field boxes to set those values for the port. You can also enable or disable spanning tree bridging on a per-port basis by clicking on the **STB Enable** check button.

Step 5   Click on the **Edit** button to store the changes. The parameters in the list box are updated to reflect the newly entered values.

Step 6   Repeat Step 4 and Step 5 for any other ports with default values that you wish to change.

Step 7   Store the changes you have made to this dialog box by clicking on the **OK** button. (You can also click on the **Cancel** button to discard these changes.)

Custom Filters

You can use the custom filters capability to set up multiple per-port filters on a chassis. Based on the filters applied to a port, the bridge will drop or forward incoming frames. This feature is primarily used for security. Refer to Configuration Attributes for examples of filters that you might create.

You create custom filters on a per-chassis basis. Creating a custom filter consists of defining the filter and then assigning the filter to a port or ports. You may assign multiple filters to one port and you may assign the same filter to multiple ports.

Use the following procedures to define filters, change or delete filters, and assign custom filters to a port/s. Before you can create custom filters, you must configure a chassis and at least one FDDI or Ethernet card and associated ports.

Defining a Filter

Step 1   Click on the **Custom Filters** button on the Protocols Configuration dialog box, and the Bridge Custom Filtering dialog box appears.

Step 2   In the Defining Filters box, click in the **Filter ID** field box. You can determine whether the ID in the box has already been used by comparing it to the Filter ID list located above the box. If the ID has not been used, then skip to step. If the ID has already been used, then type in the next highest unused ID.

Step 3   Create the filter expression in the Filter Expression field by entering fields, constants, and operators in the Filter Expression field box in one of the following ways:

- Click on the appropriate **Fields** or **Operators** radio button. The field or operator is immediately added to the Filter Expression field box. To enter a constant, click on the appropriate **Fields** radio button, and type in a value in the **Constant** field box. Then, click on an **Operators** radio button.   The operator, followed by the constant, is added to the Filter Expression field box.

- Click in the **Filter Expression** box and type in the fields, constants and operators.

Note   In the Filter Expression field box, you can use your **[Back Space]** key to delete characters, and the left and right arrows on the right keypad to move through the text. To select something in the Filter Expression box, you can *double* click on a constant, field or operator to select it, or you can depress the first mouse button and, while keeping it depressed, drag it past the characters you want to select. You can then delete the selected characters.

Step 1   To add the filter to the Filter ID list, click on the **Add** button and the Filter ID list is updated with the new filter. The dialog box below shows a switch that has been configured with a single custom filter: (macProto==6004). You would enter this filter as follows:

- Click on the **macProto** radio button. macProto is added to the Filter Expression box.

- Enter **6004** in the Constant field box.

- Click on the == radio button and ==6004 is added to the Filter Expression box.

- Click on the **Add** button and the Filter ID list is updated with the new filter.

Now you can assign the filter to a port, using the procedure, "Assigning a Filter." If you are not going to assign any filters right now, then you can keep the changes you have made in this dialog box by clicking on the **OK** button at the bottom of the dialog box. (You can also click on the **Cancel** button to discard these additions.)

Editing or Deleting a Filter

After you have defined a filter, you can edit or delete it. To edit or delete a filter, you work in the Defining Filters box on the left-hand side of the Bridge Custom Filtering dialog box.

Step 1   To edit an existing filter, click on the filter entry in the Filter ID list. The filter is displayed in the Filter Expression field box at the bottom of the dialog box. Change the expression in the Filter Expression field box as desired.

Note   Once you have selected a filter entry from the Filter ID list, you have to delete the values the ID and expression boxes if you want to add another filter.

Step 2   Click on the **Edit** button. The Filter ID list is updated with the changed filter.

Note   Once you have selected a filter entry from the Filter ID list, you must either click on the **Edit** or **Delete** button to deselect it.

Step 3 To delete an existing filter, click on the filter ID in the Filter ID list and then click on the **Delete** button. The filter ID is removed from the Filter ID list.

If you want to assign the changed filter to a port, use the following procedure, Assigning a Filter. If you are not going to assign any filters right now, then you can keep the changes you have made to this dialog box by clicking on the **OK** button at the bottom of the dialog box. (You can also click on the **Cancel** button to discard these changes.)

Assigning a Filter

After you have created or modified a filter, you can then assign it to a port or multiple ports. To assign a filter, you work in the Assigning Filters box on the right-hand side of the Bridge Custom Filtering dialog box.

Step 1 In the list of interfaces at the top of the box, click on the interface for which you want to assign a filter.   (Any previously assigned filters are displayed in the List of Filter IDs box.)

Step 2 If required, change the Default Action of the port from forward to block by clicking on the **Block** radio button.

Step 3 If desired, change the broadcast limit.

Step 4 At the bottom of the Assigning Filters box, click on the arrow next to the **Filter ID** option button to display the list of configured filter IDs.

Step 5 Click on the appropriate filter ID.

Step 6 Click on either the **Forward** or **Block** radio button next to the Filter ID field box to select the action that you want taken if a match is found. If no action is specified, then the opposite of the default action for the interface is used.

Step 7 Enter the priority of the filter. (Filters are executed in order of their priority setting; the lowest numerical value has the highest priority.)

Step 8 Click on the **Add** button located next to the List of Filter IDs to assign the filter to the interface. The filter is displayed in the list.

Step 9 Repeat Step 4 through Step 8 for as many filters as you want to assign to the interface.

Step 10 When you have added all the filters for the port, click on the **Apply** button at the bottom of the Assigning Filters box.   This assigns the filter/s to the selected port. Once you have clicked on the **Apply** button, the List of Filter IDs is cleared.

Step 11 Repeat Step 1 through Step 10 to assign one or more filters to other ports.

You have now defined and assigned your per-port custom filters. You can store the changes you have made to this dialog box by clicking on the **OK** button. (You can also click on the **Cancel** button to delete these changes.) Remember that these values are not written to the global database until you use perform the save operation.

Editing or Removing a Filter from a Port

After you have assigned a filter to a port, you may want to change its Action or its Priority setting, or remove it from the active filters for the port. To edit or remove a filter from a port, you work in the Assigning Filters box on the right-hand side of the Bridge Custom Filtering dialog box.

Step 1 In the list of interfaces at the top of the box, click on the interface number with the filter that you want to edit or remove. The list of applied filters is displayed below in the List of Filter IDs.

Step 2 In the List of Filter IDs, click on the desired filter.

Step 3   To edit the filter, you can change the Action or Priority setting and then click on the `Edit` button.

Step 4   To delete the filter from list of filters for the port, click on the filter entry in the List of Filter IDs and then click on the **Delete** button. The filter is removed from the list.

Step 5   To assign the edited filters to the port, click on the **Apply** button at the bottom of the box.

You can store the changes you have made to this dialog box by clicking on the **OK** button at the bottom of the dialog box. (You can also click on the **Cancel** button to delete these changes.)

Static Routes

This section describes how to create static entries in the bridge's filtering database. (This functionality is specified in IEEE 802.1d-1990.) The filtering database equates a MAC destination address with a LightStream port that can receive frames with this MAC destination address and a set of LightStream ports on which the frames should be transmitted. The bridge forwarding process uses the entries in the filtering database to determine if frames with a given MAC destination address can be forwarded to a given port or ports.   You create static routes on a per-chassis basis.

Use the following procedure to create static entries in the bridge's filtering database.

Step 1   Click on the **Static Routes** button on the Protocols Configuration dialog box.

Step 2   Enter the MAC address, receive port and transmit port addresses in the field boxes provided on the dialog box.

Step 3   Click on the **Add** button to store the route and the list box is updated with the new static route.

Step 4   To edit an existing route, click on that route in the list box. Change the desired attributes and click on the **Modify** button. The route is stored and the list box is updated to show your changes.

Step 5   To delete a route, click on that route in the list box and click on the **Delete** button.

Step 6   Store the changes you have made to this dialog box by clicking on the **OK** button. (You can also click on the **Cancel** button to delete these changes.)

You have now defined your per-port static routes. Remember that these values are not written to the global database until you use perform the save operation.

Provisioning for PVCS

You must specify the endpoints of a PVC and certain characteristics of the PVC as a part of configuration. Once you have entered this information, the LightStream switch can set up a PVC between the two endpoints.

Use the following procedure to provision for PVCs between

- two existing frame relay ports

- two existing frame forwarding ports

- two existing ATM UNI ports

The configurator allows you to provision for both ends of the PVC at the same time. You can establish many PVCs between the same ports, except for frame forwarding ports.

Note   To configure a PVC, you must have previously configured the two edge ports that it will connect.

Step 1   Start the PVC configuration tool.

Note   If you started the configurator from the IP Internet map, with the two chassis selected, then the names of those chassis are displayed in the Chassis A and Chassis B field boxes.

Step 2   Enter the desired endpoints by selecting the Name, Card and Port for Chassis A and B.

Note   You can also use All for card and port settings to verify all PVCs between the chassis. You can edit and delete PVCs when All has been selected but you can't add new ones.

Step 3   Display currently configured PVCs, using one of the following steps:

- To retrieve the settings from the local database stored in run-time memory on the nodes, click on the **Verify** button.

- To retrieve the settings from the global database, click on the **Read DB** button. All PVCs currently configured between the two endpoints in the global database are displayed.

Step 4   To provision for a new PVC, select the desired Name, Card and Port for Chassis A and B.

Note   You must configure attributes for both Chassis A and B. Chassis A attributes are for the VC from Chassis A to Chassis B. Chassis B attributes are for the VC from Chassis B to Chassis A.

Step 5   Click on the **New** button and the configurator supplies the next available DLCI or VCI number as well as the default values for the circuit. If you choose to manually enter VCI or DLCI numbers, the configurator checks to ensure that the number you use is unique for the port.

Note   VCIs are used for ATM UNI PVCs, DLCIs are used for frame relay PVCs, and no identifier is required for frame forwarding PVCs because there is only a single PVC between frame forwarding ports. In the rest of the procedure, VCI is used as an example but the same information applies to DLCIs and frame forwarding PVCs. The VCI field box label changes to DLCI for frame forwarding PVCs and is removed for frame forwarding PVCs.

Caution   If you are an expert user, then continue to Step 6. See Expert Mode if you are going to change these values. Otherwise, you can skip to Step 7.

Step 6   To change expert mode attributes, pull down the Expert Setting menu and choose to display expert settings. Default values are provided for these attributes, and in most cases it is not necessary nor recommended to adjust them.See Expert Mode for more information on these attributes if you decide to change them.

Step 7   Click on **Add** and the Existing PVCs list is updated with the new PVC.

Step 8 To copy a PVC, if you are creating many PVCs between the same endpoints with the same attribute values, use the following procedure:

- Configure the PVC that you want to copy by following Step 4 through Step 7.

- *Double* click on the PVC that you want to copy. This loads its attribute settings into the field boxes.

- Click on the **New** button. (This gives you the next available DLCI/VCI number.)

- Click on the **Add** button. The Existing PVCs list is updated to show the new PVC.

- Continue clicking **New** for as many PVCs as you wish to create.

Step 9 To edit the attributes of an existing PVC, double click on the PVC in the Existing PVCs box. (You can select multiple PVCs, with the exception of having to double click on the first entry to load the attribute settings into the field boxes so that you can edit them.) The existing attribute settings are displayed in the attribute fields. Change the attributes and click on the **Edit** button. The Existing PVCs list is updated to display your changes.

Step 10 To delete a PVC, click on the PVC (or PVCs) in the Existing PVCs list and click on the **Delete** button. This deletes the PVC and removes it from the Existing PVCs box. The configurator automatically deletes both VCs (one in each direction) that comprise the PVC.

After you have finished provisioning for PVCs, you set the Update attributes for the chassis pair. Then, in order to write the changes to the global database and enable the local database updates, you must perform the save operation.

If you don't want to save any of the information from this session, then you can click on the **Close** button; you exit from the configurator without saving any changes.

Configuring VLI Attributes

This section tells you how to configure virtual LAN internetworking (VLI) attributes for bridging ports. Use the following procedure to configure your workgroups.

Workgroups are created on a network-wide basis. Creating a workgroup consists of defining a workgroup name and ID and then assigning an interface or interfaces to the workgroup. You may assign multiple interfaces to one workgroup and you may also assign the same interface to multiple workgroups.

Note By default, all interfaces belong to the same (Default) workgroup. This enables all interfaces to initially communicate with one another. Once you assign an interface to a workgroup, that interface is then removed from the default workgroup.

Use the following procedures to create workgroups, create a list of interfaces to be assigned to a workgroup, and assign one or more interfaces to a workgroup. Before you can assign interfaces to a workgroup, you must configure a chassis and at least one FDDI or Ethernet card.

Creating a Workgroup

Step 1 Start the VLI configuration tool.

Step 2 To add a workgroup, click in the `Name` field and enter a workgroup name.

Step 3 Click in the `ID` field and enter an ID for the workgroup.

Step 4   Click on the **Add** button, and the workgroup name and ID is stored and displayed in the Workgroups list.

Step 5   To delete a workgroup, click on the appropriate name in the Workgroups list and then click on the **Delete** button. The workgroup is deleted and removed from the list.

Note   You can delete a workgroup even after it has been assigned to a interface. The configurator automatically removes the interface assignment/s when a workgroup is deleted.

Step 6   To change the workgroup name or ID, click on the entry in the Workgroups list, click in the appropriate field box and make your change. Then click on the **Edit** button. The Workgroups list is updated to show your change/s.

Now that you have defined your workgroup/s, you can create a list of the interfaces that you want to include in a workgroup and then assign the interfaces to the workgroup, using the following procedures.

If you aren't going to assign any interfaces right now, then you can save your workgroup definitions by saving and exiting the configurator. If you don't want to save any of the information from this session, then you can click on the **Close** button; you exit from the configurator without saving any changes.

Creating a List of Interfaces

In order to assign interfaces to a workgroup, you must first create a list of interfaces to be assigned. You create the list by working in the Interface Selection box on the right-hand side of the dialog box.

Step 1   To create a list of interfaces, select the interface by choosing the appropriate Chassis Name, Card, and Port from the option boxes in the Interface Selection box.

Step 2   Click on the **Add** push button, and the interface is stored and displayed in the Selected Interfaces list.

Step 3   Repeat Step 1 and Step 2 for all the interfaces you want to include in the workgroup.

Step 4   If you want to see what workgroups an interface has already been configured for, click on the interface in the Selected Interfaces list and click on the **Verify** button. The configurator gets the current configuration from the local switch's run-time memory and displays it in the workgroups summary box. You can then apply the information to the database or discard it. If you apply it, then it is saved to the configurator's temporary workspace—replacing the values that were there. If you discard it, then it is not saved and the summary box redisplays the original values.

Step 5   To delete an interface from the Selected Interfaces list, click on the interface in the list and click on the **Delete** button.

Step 6   If you want to clear the Selected Interfaces list, click on the **Clear** button.

Now that you have defined your workgroup/s and created a list of the interfaces that you want to include in a workgroup/s, you can assign the interfaces to the workgroup/s, using the following procedure.

Assigning Interfaces to a Workgroup

In order to assign interfaces to one or more workgroup, you work in the Workgroups box, the Interface Selection box, and the workgroup summary box. The workgroup summary box is located at the bottom of the dialog box. This procedure begins where the previous procedure ends: you have already created a list of interfaces in the Selected Interfaces list.

Step 1   To make assignments to a workgroup, click on the workgroup/s name in the Workgroups list.

Note   If you want to change the Interface Control Mode from the default setting, click on the **Exclude** radio button.

Step 2   Click on the **Add** button located above the workgroup summary box at the bottom of the dialog box and every interface in the Selected Interfaces list is associated with the selected workgroup/s. The workgroup summary box is updated to reflect your assignments.

Step 3   Once you have completed assigning interfaces to a workgroup, you can click on the **Clear** button to clear the Selected Interfaces list.

Step 4   After you have assigned interfaces, you can determine which interfaces belong to a certain workgroup by clicking on the workgroup name in the Workgroups list and then clicking on the **Find** button. The workgroup summary box is changed to show the interfaces associated with that workgroup. You can then add or delete interfaces from the workgroup. Click on the **Clear Find** button to restore the workgroup summary box to its original form.

Step 5   To remove an interface/s from a workgroup, select the desired workgroup/s and interface/s, and then click on the **Delete** button located above the workgroup summary box at the bottom of the dialog box. The selected workgroup will be deleted from all interfaces in the Selected Interfaces list.

Step 6   To change the interface control mode after you have set it, select the desired workgroup/s and interfaces, change the interface control mode, and click on the **Edit** button. The workgroup summary box is updated to reflect your changes.

After you have finished VLI configuration, you set the UpdateTime attributes for the chassis. Then, in order to write the changes to the global database and enable the local database updates, you must perform the save operation.

If you don't want to save any of the information from this session, then you can click on the **Close** button; you exit from the configurator without saving any changes.

Changing Interface Control Mode

The default interface control mode is Include, which should be the appropriate choice for the majority of applications. The Exclude mode should be used when you want a port to be able to communicate with all or almost all workgroups. It has the effect of excluding the port only from the specified workgroups and allowing it to communicate with all of the others. If you want to change the mode, use the following procedure.

Step 1   Select the workgroup/s in the Workgroups list.

Step 2   Select the interface/s in the Selected Interfaces list.

Step 3 Change the interface control mode by clicking on the **Exclude** (or **Include** if changing back again) radio button.

Step 4 Click on the **Edit** button and the workgroup summary box is updated with your changes.

Note The include/exclude setting is an interface-level attribute: you can't exclude a interface from some workgroups and include the same interface in other workgroups.

Database Management Operations

Exiting the Configurator

Use the following procedure to exit from any of the configurators.

Step 1 In the Node Configurator dialog box pull down the File menu and select **Exit**.

Step 2 If you select **Exit** without saving first (see the following procedure), then the configurator prompts you to Save, Discard or Cancel.

- Click on **Save** to save your changes to the database file specified when you started the configurator.

- Click on **Discard** if you want to exit the configurator without saving any changes.

- Click on **Cancel** if you want to continue the configuration session and don't want to exit from the configurator.

When the exit is complete, the configurator's dialog box is closed.

Saving or Aborting Changes

Use the following procedures to save or abort changes made to a configuration database.

Saving Changes

You can save changes periodically during your configuration session as follows:

In the Node Configurator dialog box, shown above, pull down the File menu and select **Save**. Any changes made up to that point are saved to the global database.

Note Once you save changes, you *can't* revert to the version of the database that existed before the save was performed.

Aborting Changes

You can abort changes at the database level or at the dialog box level. If you decide that you don't want to save the entire configuration file you have created, select Exit from the File menu on the menu bar on the Node Configurator dialog box. The configurator prompts you to Save, Discard or Cancel. Click on **Discard** if you want to exit the configurator without saving any changes. (If you have periodically saved your changes as described above, then the database retains any changes made before the last save.)

You can use the **Cancel** button on any dialog box to delete any changes you just made to that screen. (You save changes by clicking on the **OK** button.)

Updating a Configuration

This section explains how to set the update time attributes for the configurators. Each configurator requires you to set update time attributes. These attributes determine when the local databases will be updated and the type of update to be performed. Once you perform the save operation, as described in the preceding section, the configurator updates the local databases at the specified times.

There is no correlation between update times for the different configurators: the same node can have different update times for the node, PVC and VLI updates.

After a switch has been updated, the new configuration begins to take effect immediately; the new data is completely distributed within a few minutes. If you reload an operating node, the flow of traffic may be briefly disrupted. (Only those ports or lines whose attributes are changed by the new configuration will be affected.) If you're concerned about interrupting traffic, plan to download configurations at a time when the interruption will have the least impact.

The procedure below assumes the following:

- You have already created a configuration and saved it, as described earlier in this chapter.

- The switch to be updated has been installed with a basic configuration, as described in the *LightStream 2020 Installation and Troubleshooting Manual*.

- The workstation where the configuration program is running has network access to the switch that you wish to download. (IP connectivity to, and then indirect connection via any LightStream node, is sufficient.)

Note If you're updating new configurations that change internodal (e.g., trunk) parameters in an incompatible way, be sure to update the most distant nodes that have new trunk parameters, first. (Distant refers to the combined IP and LightStream path from the NMS to the target node.) You will lose contact with those nodes temporarily, until the intermediate nodes are downloaded with the new parameters.

Node and VLI Configuration Updates

The Update Time menu and procedure for the Node and VLI configurators are the same.

Step 1 In the first dialog box displayed by the configuration tool, pull down the SendUpdate menu from the menu bar and select **Update Time**.

Step 2 Select the chassis that you want to update from the list provided by clicking on its name. The list displays all chassis configured in the global database. (You *can't* select multiple chassis in this list.)

The list displays the timestamp of the currently configured update as well as the status of the update at the time the dialog was displayed; the status is not updated while the dialog box is being displayed. Update status can be one of the following:

- Complete: Indicates that update has been successfully completed.

- Failed: Indicates that the attempt to update the node has failed.

- No Entry: Indicates that there is no entry for update time in the global database for that node.

- In Progress: Indicates that the configuration agent is in the process of updating the switch at the time the UpdateTime dialog box is being displayed.

- Scheduled: Indicates that you have scheduled an update for some time in the future and that the global database entry for that update exists.

- Scheduling: Indicates that you have specified an update for some time in the future but you have not saved to the global database, so no entry in the global database exists yet. After you save to the global database, this changes to Scheduled.

- Clearing: Indicates that you have selected to clear the update time entry for the switch but you have not saved to the global database, so the previous entry still exists in the database. After you save to the database, this changes to No Entry.

Step 3 Set the date and time for the update. To specify an update time in the future, you can enter the date, day and time in the appropriate field boxes or click on the **Send Update Immediately After Save** button.

Step 4 Select the type of update. Accept the default, which is to send only the changed attributes, or click on the **Send all attributes** radio button to select a full update.

Step 5 Click on the **Edit** button to store these changes so that they can be written to the global database.

Step 6 Repeat this procedure for each chassis.

Step 7 To change update time attributes, click on the desired entry in the list, make your changes, and click on the **Edit** button. The list is updated to show your changes.

Step 8 Click on the **OK** button to close the dialog box. After you saved the configuration to the global database, the configurator updates each local database at the specified time and date.

PVC Configuration Updates

Step 1 In the first dialog box displayed by the configuration tool, pull down the SendUpdate menu from the menu bar and select **UpdateTime**.

Step 2 Select the chassis pair that you want to update from the list provided (Chassis A and Chassis B) by clicking on its name.

Note The list displays the selected time and status of the update.

Step 3 Set the date and time for the update. To specify an update time in the future, you can enter the date, day and time in the appropriate field boxes or click on the **Send Update Immediately After Save** button.

Step 4 Select the type of update. Accept the default, which is to send only the changed attributes, or click on the **Send all attributes** radio button to select a full update.

Step 5 Click on the **Add** button to store the update time so that it can be written to the global database.

Step 6 Repeat this procedure for each chassis pair.

Step 7 To change update time attributes for one pair, click on the desired entry in the list, make your changes, and click on the **Edit** button. The list is updated to show your changes.

Step 8 To delete an entry, click on the desired entry in the list, click on the **Clear** button, and the entry is removed from the list.

Step 9 Click on the **OK** button to close the dialog box. After you save the configuration to the global database, the configurator updates the local database on each pair of switches at the specified time and date.

Common Update Errors

This section describes how to react to three error messages commonly encountered during an update. These messages are recorded in the configurator's log files.

Use Table 3-3 to determine the cause of the error, if you get the following error message: `can't get lock on chassis` *chassis name*`... gave up.`

Note If you get this error message, then you should reschedule the update after the problem has been corrected.

Table 3-3   Responding to Can't Get Lock on Chassis Error Message

Possible Causes	Response
The SNMP set community name of the NMS does not match a community name on the switch that has read/write permission.	Determine the set community name of the NMS and the community name on switch that has read/write permission and the set community name of the NMS. Change one of them (or both, if you like) so that they are the same.
	To determine which community name has read/write permission on the switch, see Changing the Default SNMP Community Names in the *LightStream 2020 Administration Guide*. To change the name, if desired, see Procedure to Change the Default SNMP Community Names in the *LightStream 2020 Administration Guide*.
	To determine the set community name on the NMS: If you're running under HP OpenView, pull-down the Options menu and select SNMP Configuration. Change the set community name, according to your HP OpenView documentation, to match a community name on the switch that has read/write permission.
	If you're running without HP OpenView, open the ovsnmp.conf file using a text editor. Change the set community name in the file to match a community name on the switch that has read/write permission.
The chassis is being updated by another NMS or someone has locked the local database file using the CLI.	Check to determine if the local database file is locked by using the CLI **show config** command. The system reports if the database is locked or unlocked. (The CLI **show** command is described in *LightStream 2020 Command and Attribute Reference Guide*.)
	If the database has been locked through the CLI, you can unlock it using the CLI. (See How to Change Attribute Values in the *LightStream 2020 Command and Attribute Reference Guide*.)
	If the database has been locked because another NMS is updating the database, then you should wait until the update has been completed and the lock will be released.
The switch is down.	Use the **ping** command to determine if the switch is down. The **ping** command is described in Using the ping Command in the *LightStream 2020 Administration Guide*.

Use Table 3-4 to determine the cause of the error if you get the following error message: `SNMP timed out - chassis` *chassis name* `is not responding.`

Note If you get this error message, then you should reschedule the update after the problem has been corrected.

Table 3-4   **Responding to SNMP Timed Out Error Message**

Possible Causes	Response
The default values for the timeout for SNMP set commands is set too low on the NMS.	If you're running under HP OpenView, pull-down the Options menu and select SNMP Configuration. Change the timeout value to 7 seconds and the retry value to 5.
	If you're running without HP OpenView, open the ovsnmp.conf file using a text editor. Change the timeout value to 7 seconds and the retry value to 5. (These are the default settings that have been provided at installation.)
The chassis went down during the update.	Use the **ping** command to determine if the switch is down. The **ping** command is described in Using the ping Command in the *LightStream 2020 Administration Guide*.

Use Table 3-5 to determine the cause of the error, if you get the following error message: `no such item <MIB object name>.`

Note If you get this error message, then you should reschedule the update after the problem has been corrected.

Table 3-5   **Responding to No Such Item Error Message**

Possible Causes	Response
There is no software process currently registered for the object named in the error message.	In many cases, the named object is cardName.card#, which indicates that card being loaded is down. To get the card's status, use the CLI **show card status** command described in Displaying Configuration Parameters in the *LightStream 2020 Command and Attribute Reference Guide*.

Reading Log Files

The configurator creates a log file for each update of each switch. The following procedures describe how to use the configurator or UNIX utilities to display the contents of a log file.

Using the Configurator

Use the following procedure to read log files from the Node, PVC, and VLI configurators.

Step 1   Display the update time dialog box for the configurator.

Step 2   Click on the chassis or chassis pair in the list box.

Step 3   Click on the **Show Log** button.

Step 4   Click on the desired log file from the list displayed by the pop-up dialog box.

Step 5   Click on the **OK** button in the pop-up dialog box and the contents of the file are displayed.

Step 6   To display a different log file, click on the `Another Log` button and repeat Step 3 and Step 4. (If there are no other log files for the selected chassis or chassis pair, then the button is grayed-out.)

Step 7   To delete the log file, click on the **Remove Log** button. The file is deleted immediately.

Note   You can delete a log file in read/write mode or read only mode.

Step 8   To return to the dialog box, click on the **Close** button.

Using UNIX Utilities

You can use UNIX utilities such as **cat** or **more** to display the contents of a log file. See the appropriate UNIX documentation for information on using those utilities.

If you are running under HP OpenView, log files reside in the following path: /usr/OV/log. If you are running without HP OpenView, then the log files reside in /usr/LightStream-2.0/log.

In addition, the configurator creates a subdirectory for each switch. The subdirectory is named with the switch's Chassis ID: log files for a switch with the chassis ID 5144, that was created by a configurator running without HP OpenView, would be stored in /usr/LightStream-2.0/log/5144.

Log file names include the date, time, and configurator as shown in the following examples:

- Aug-25-94_14:15.cfg is a log file for the Node configurator

- Aug-25-94_14:15.pvc is a log file for the PVC configurator

- Aug-25-94_14:15.vli is a log file for the VLI configurator

You can use a UNIX utility such as **rm** to delete a log file.

Backing Up Your Database

We recommend that you keep, at a minimum, one up-to-date backup of your global configuration database on the NMS, disk space permitting. You should also make a copy of the global database on a tape or disk. See the documentation that came with your management station for information on how to copy to and restore from your backup media.

Note   If you need to restore a local database, simply update the switch from the global database.

The procedures in this section tell you how to save and reload backup configurations, and how to copy your database to another site.

Saving a Backup Configuration Database

Follow the steps below to save a backup copy of your configuration database.

Note   Backup files are intended for use as an archival mechanism. The backup files can be read and even changed using the configuration tools but cannot be used to update a switch.

Step 1   Pull down the File menu on the menu bar of the Node Configurator dialog box, and select **Save As**.

Step 2   Click in the Directories list to select a directory path. The selected path is shown in the Save File field box.

Step 3   Click in the **Save File** field box, and enter a name for your backup copy that is easy to distinguish from your operational copy.

Step 4   Click on the **OK** button and the copy is written to the hard disk with the new name.

Note   Note: Actually two files are created: one with a .pag extension and one with a .dir extension. The .pag version is the only one that appears in the Files list, but both are used by the configurator.

Step 5   To verify that the copy was created, you can pull down the File menu again, and select **Open**. The pop-up menu that appears lists all database files that exist on the hard disk. Check that the backup file you just created is listed there, and click on the **Cancel** button.

Opening a Database File

Follow the steps below to explicitly open a configuration file. You may use this procedure to open a database file that isn't specified by the LSC_DATABASE variable, for instance, a backup file.

Step 1   Pull down the File menu on the menu bar of the Node Configurator dialog box, and select **Open**..

Step 2   In the Directories list, select the correct directory by double clicking on the correct path.

Step 3   In the File list, double click on name of the backup copy you wish to open.

Step 4   Click on the **OK** button.

Step 5   Select the database access mode on the pop-up dialog box that is displayed. If you select read/write, then the database is locked to other users and you can make changes to the database file. If you select read only, then the file isn't locked and you can only examine the settings in the file. If the configurator reports that someone else is using the database, see the section "Overriding a Configurator Lock" before proceeding.

Changes you make during the configuration session are now saved to the file you have specified.

You can use the **Filter** button in the pop-up menu to search a directory for files with common strings in their names. For example, in the pop-up menu shown above, as a default the Filter field specifies a search for any files ending in .pag and displays them. You can click in the **Filter** field, change the search string, and then click on the **Filter** button to display the files.

Making a Backup Configuration File Operational

If you wish to use your backup files as your operational database files, then you can do *one* of the following:

- Change the backup file names to the default database names, configure.netdb.pag and configure.netdb.dir, using UNIX commands such as **cp** or **mv**. (First, remove the existing default database files.)

- Enter the configurator and open the backup file and the select **Save A**s from the File menu and specify the default database file name, configure.netdb.pag. This writes the contents of your backup file into the default file.

- Set the LSC_DATABASE environmental variable to define your backup file as the default database.

Copying Backup Database to Diskette

Use the following procedure to archive a backup copy of the database to a diskette.

Step 1   Create your backup files.

Step 2   To compress the files, at the system prompt, enter:

```
compress <filename>.*
```

Step 3   Insert a diskette into the disk drive attached to your Sun workstation and format the diskette by entering:

```
fdformat /dev/rfd0
```

The system responds:

```
Please hit return to start formatting floppy. [Return]
...............................................
```

You may need more than one diskette, depending on the size of the database.

Step 4   To transfer the files to the floppy, once the floppy has been formatted, enter:

```
bar cvf /dev/rfd0 <filename>*
```

The system responds:

```
a filename.dir.Z 1 blocks 1
a filename.lock.Z 1 blocks 1
a filename.pag.Z 87 blocks 1
```

Note   The size of your files in blocks may vary from that shown here.

If prompted for another diskette, remove the diskette from the drive and insert another one. If more than one diskette is required, you should number them in the order that they were made. When the copy is finished, remove the last diskette from the drive, number it, and store it in a safe place.

Step 5   To recover the files from the floppy, first change to the desired directory, by entering:

```
cd <directory name>
```

Step 6   Then, enter:

```
bar xvf /dev/rfd0
```

The system responds:

```
             x filename.dir.Z, 253 bytes, 1 tapr blocks 1
             x filename.lock.Z, 53 bytes, 1 tape blocks 1
             x filename.pag.Z, 44188 bytes, 87 tape blocks 1
```

Note The size of your files in blocks may vary from that shown here.

If prompted for the next diskette, remove the diskette from the drive and insert the next one. When you have finished retrieving the file from diskette, remove the last diskette from the drive.

Step 7 To uncompress the files, enter:

uncompress <filename>*.Z

Copying a Database to Another Site

If you want the added backup protection, you can copy the backup database to another site. The configurator does not provide this function, so you can use the **ftp** command at the system prompt to transfer the .pag and .dir backup files to another site.
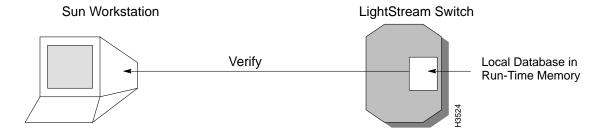
Verifying a Database

Each configurator provides a verify function. Use the verify function to

- retrieve configuration values entered at installation and default values provided by software when you're configuring a new switch that has already been installed on the network

- retrieve the configuration values that are currently running in a particular LightStream switch if you want to get values that have been changed through the CLI and store them in your global database

As shown in Figure 3-1, the verify operation retrieves the information from the NP's run-time memory. At that point, you can either save the information from the switch or discard it.

Figure 3-1   **Operation of the verify function**

Verifying Node Attributes

Use the following procedures to perform the verify function.

Step 1 Click on the name of the chassis that you want to verify in the Name list. (The list displays any chassis defined in your global database file.)

Step 2 Click on the **Verify** button on the Node Configurator dialog box. All of the configuration settings are retrieved from the switch's run-time memory. The dialog box is updated to contain a summary of differences found between the global database and the switch.

Step 3 Check the list to see the differences between the two databases.

Caution If a card is down, due to a fault or an administrative action, then only the card type, slot number and status are available to the verify function. If you save the results of the verify when a card is down, it erases all of the other card and port attribute values in the configurator's temporary workspace and you will have to reconfigure them. If you accidentally save the results of the verify, then you can either exit from the configurator without saving or you can wait until the card comes up and perform another verify. (If you exit without saving, you lose any other changes you have made during the editing session.)

Step 4 To store the settings from the local database in the configurator's temporary workspace, click on the **Apply** button. (This replaces any settings that were there.)

Step 5 If you don't want to incorporate the local settings, then click on the **Discard** button.

Step 6 If you want to replace the local settings with the global settings, then you must update the local database.

Verifying PVC Attributes

You can retrieve configuration information for PVCs between switches, cards or ports using the following procedure.

Step 1 Start PVC Configure.

Step 2 Select the names of the chassis you want to verify in the Node A and Node B Name field boxes. You can refine your search further by selecting a card and/or port under the Node A and Node B field boxes.

Step 3 To retrieve configuration values from the switch, click on the **Verify** button. The configurator gets the current configuration from the local switch's run-time memory. It displays matching PVCs in the Existing PVCs list. Any differences between the global and local database are displayed in a pop-up dialog box.

Caution If a card or port is down, due to a fault or an administrative action, then no PVCs are displayed. If you save the results of the verify when a card or port is down, it erases all of the PVC attribute values for the selected endpoints in the global database and you either have to reconfigure them or wait until the card/port comes up and perform another verify.

Step 4 To store the values from the local database in the global database, click on Save from the pop-up menu. Unlike the Node and VLI configurators, the PVC verify function writes to the global database, instead of temporary workspace, with the information from the switch. If you don't want to save the values, click on **Cancel**.

Note Cancelling the verify operation discards all the PVCs read from the switch that appear in the list box and removes the pop-up menu from the screen.

Step 5   To retrieve the settings from the global database, click on **Read DB**. The Existing PVCs list is updated to show all PVCs currently configured between the specified endpoints in the global database.

Verifying VLI Attributes

Step 1   Start VLI Configure.

Step 2   Click on the interface that you want to verify in the Selected Interfaces list.

Step 3   To retrieve configuration values from the switch, click on the **Verify** button. The configurator gets the current configuration from the local switch's run-time memory and displays it in the workgroups summary box.

Caution   If a card or port is down, due to a fault or an administrative action, then no workgroups are displayed. If you save the results of the verify when a card is down, it erases all of the workgroup attribute values for that interface in the configurator's temporary workspace and you will have to reconfigure them. If you accidentally save the results of the verify, then you can either exit from the configurator without saving or you can wait until the card/port comes up and perform another verify. (If you exit without saving, you lose any other changes you have made during the configuration session.

Step 4   To store the values from the switch in the configurator's temporary workspace, click on **Save** from the pop-up menu. This replaces any values that were in the temporary workspace with the information from the switch. (Click on **Cancel** if you don't wish to store the values.)

Overriding a Configurator Lock

When the configuration database is *locked*, the database in read-only mode. You should not edit it without investigating the reason for the lock.

A database can become locked for two reasons:

- Someone is editing the database (the most likely cause of a lock).

- The configurator exited ungracefully because of a power failure or a hardware or software problem.

When you open the database file, one of two messages is shown:

- If the database is unlocked, then you are asked which database access mode you want: read/write or read only. If you select read/write, then the database is locked to other users and you can make changes to the database file. If you select read only, then it isn't locked and you can only examine the settings in the file.

- If someone else is using the database in read/write mode or the configurator has exited ungracefully, then the configurator reports that the database is locked and gives you the current user's name. (If the configurator has exited, then it gives you the name of user who was running the configurator at the time.) At this point, you can choose to look at the database in read only mode or you can override the lock. You should only override the lock if the configurator has exited ungracefully.

Caution If another user is editing the database, do **not** override the lock or you will corrupt the database. Wait until the other user exits and the configurator will automatically remove the lock, or use the database in read only mode.

There is one lock for the database, regardless of the tool used to access the database (Node Configure, PVC Configure or VLI Configure). If someone is using the node configurator in read/write mode, then the database is reported as locked if you try to open the file with the PVC or VLI Configure.