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LightStream 2020 Release Notes for Software Release 2.1(1.93)

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These release notes describe the enhancements, software upgrade procedures, and special considerations for controlled Software Release 2.1(1.93) of the LightStream 2020 multiservice ATM switch (LS2020 switch).

Software Release 2.1(1.93) is a controlled base release of LS2020 node software. It supersedes all prior releases and upgrades of Release 2.0 and Release 2.1 software.

Note Software Release 2.1(1.93) completely replaces Software Release 2.1.1 with a full set of installation diskettes. These release notes include the entire contents of Release Notes 2.1.1 and includes information about special considerations and resolved problems fixed in Software Release 2.1(1.1), 2.1(1.2), 2.1(1.3), 2.1(1.91), and 2.1(1.92).

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LightStream 2020 Overview

The LS2020 multiservice asynchronous transfer mode (ATM) switch is designed for campus backbone, wide area network (WAN), and public edge switch deployment. It is well suited for business-critical applications requiring data, voice, and video, by supporting Ethernet, Fiber Distributed Data Interface (FDDI), ATM, Frame Relay, and circuit emulation interfaces. It provides the connectivity, flexibility, and performance required by the most demanding networks, and its redundant power supplies, switching fabrics, and network processors help to ensure high reliability.

For customers who see ATM technology as the foundation of networks of the future, but are concerned about preserving investments in existing network infrastructures, the LS2020 provides Ethernet and FDDI switching that can be easily migrated to ATM at any time.

The advanced traffic and buffer management of the LS2020 node provides complete control over bandwidth allocation, Quality-of-Service (QoS), and congestion avoidance for networks in service today, while providing a growth path as networks increase in size and complexity.

Enhancements

There are no new enhancements for Software Release 2.1(1.93).

This section discusses the enhancements and changes in functionality for Software Release 2.1(1.91) and Software Release 2.1(1.1) as well as new features for Release 2.1.1.

Software Release 2.1(1.91) Enhancements

This section describes the Hot Standby Routing Protocol (HSRP) Enhancement for LS2020 FDDI cards for Software Release 2.1(1.91).

Hot Standby Routing Protocol (HSRP) Enhancement for LS2020 FDDI cards

In previous releases, the HSRP protocol did not work properly in a configuration where the LS2020 is operating as a bridge between 2 AGS+ or 7000 series FDDI routers.

Cisco AGS+ and 7000 series routers execute HSRP for the purposes of quickly recognizing and recovering from a router problem in a network. The HSRP protocol will define routers as either "active" or "standby", assign a priority, and establish a preempt strategy. Throughout this process, routers may change their MAC addresses relative to their HSRP assignments. Currently, Cisco AGS+ and 7000 series routers bring a FDDI port up and down in order to change a MAC address.

The LS2020, operating as a bridge, performs Spanning Tree (802.1) for all active LAN ports. Each time a port is brought down, the LS2020 initiates the Spanning Tree learn process and blocks traffic for a period of time. This blocking period disallows these routers from establishing an HSRP relationship. As the HSRP initialization process continues, the FDDI ports on both the HSRP routers and LS2020 continue to go up and down.The HSRP Enhancement corrects this interoperability issue.

Implementation of lsLanPortHsrpDelay MIB variable

An HSRP MIB variable has been added to the LS2020 private MIB. When the variable is set, the LS2020 FDDI line card will delay initiation of the Spanning Tree learn operation for a period of milliseconds after a FDDI link down state has been detected. The delay time will be programmable via the HSRP MIB variable. This delay will allow the FDDI ring to come back up, allowing neighboring HSRP routers to initialize properly. The LS2020 will not re-initialize Spanning Tree for that port if the ring comes back up within the delay period. In all cases, the FDDI up/down state transition will be reported to the LS2020 trap log. If FDDI port stays down longer than programmed delay time, the LS2020 will go through normal Spanning Tree re-initialization for that port.

Using lsLanPortHsrpDelay MIB variable

The HSRP private MIB variable allows the user to set a delay period for an LS2020 FDDI port. The characteristics of the MIB variable are listed below:

MIB Variable Name: lsLanPortHsrpDelay

Data Type: Integer

Default Value: 0 (no delay, for non-HSRP configurations)

Range: 0 thru 2000. Value indicates the number

of milliseconds to delay invoking the

Spanning Tree Learn operation after a

link down is detected.

Configuration: Per port

Error Checking: Value must be in valid range. Variable

only applicable to FDDI ports.

The MIB variable can be set via cli in the following manner.

*cli> getsnmp lsLanPortHsrpDelay.8200

Name: lsLanPortHsrpDelay.8200   Value: 0

*cli> set config lock

*cli> setsnmp lsLanPortHsrpDelay.8200 2000

Name: lsLanPortHsrpDelay.8200   Value: 2000

*cli> set config unlock

*cli> getsnmp lsLanPortHsrpDelay.8200

Name: lsLanPortHsrpDelay.8200   Value: 2000

This command sequence will program a 2000 millisecond (2 second) delay for FDDI port 8.0. If a FDDI port 8.0 goes down, the port has 2 seconds to come back up before the Spanning Tree Learn operation is invoked. If port 8.0 returns to an up state within the 2 second period, Spanning Tree for that port will not be re-initialized.

Note   Our lab testing showed that Cisco AGS+ and Cisco 7000 routers require the lsLanPortHsrpDelay to be set to 2000 milliseconds (2 seconds).The lsLanPortHsrpDelay must be set for every LS2020 FDDI port which interfaces with Cisco AGS+ and Cisco 7000 routers running HSRP.

Software Release 2.1 (1.1) Enhancements

This section describes the following enhancements to Software Release 2.1(1.1):

- Configurable Maximum Flows per (LAN) card

- Custom Filter Action DROP

- Configurable ARP Spoofing per Port

- Configurable Flow Timeout per Card

Configurable Maximum Flows per (LAN) Card

In all previous releases, the maximum number of flows used in atmm/lcm initialization is 1200. This new enhancement allows configuration of "max-flows" for a line card. The default number continues to be 1200; the total number of flows available for each chassis is 10,000. The chassis maximum of

10,000 flows can be divided among all the LAN (FDDI and Ethernet) line cards in the chassis. For example, if there are 3 line cards in a chassis, the 10,000 flows could be divided by assigning each of the two cards a maximum of 4,000 flows and the remaining card 2,000 flows (4000+4000+2000=10000).

Note Although there is no restriction on the number of flows in a network, there is a restriction on the number of MAC addresses supported a network.

Implementation of Configurable Maximum Flows per Card

A new MIB object, **cardMaxLanFlows,** controls the maximum number of flows allocated to an "ecc_lan" process for a line card. This MIB object is accessed by the Card-Index and controls the amount of flow resources allocated to the line card process on the NP. Changing this MIB object for individual cards is useful in a network configuration where LAN segments are loaded unevenly. When cardMaxLanFlows is set to a number different than that currently in use, ECC records this value in shared-memory, gracefully shuts down, and exits.When a new ECC is automatically created, it uses the previously recorded number. If the cardMaxLanFlows is recorded in the MMA database, ECC is notified by an SNMP set command for the new value.

Using cardMaxLanFlows

This release of software provides SNMP get/set support for the new MIB object cardMaxLanFlows. To display or set the maximum number of flows assigned to a line card, use the CLI commands *getsnmp* and *setsnmp*. Use the CLI command *set config* to save new values in the MMA database. For example, to display the current value and assign a new value, 4000, for line card 6:

> *cli> getsnmp cardMaxLanFlows.6
>
> Name: cardMaxLanFlows.6   Value: 1200
>
> *cli> set config lock
>
> *cli> setsnmp cardMaxLanFlows.6 4000
>
> Name: cardMaxLanFlows.6   Value: 4000
>
> *cli> set config unlock

4000 is now recorded in the database for card 6.

Note The line card will restart and may be unavailable for several minutes.

> *cli> getsnmp cardMaxLanFlows.6
>
> Name: cardMaxLanFlows.6   Value: 4000

If the value is changed without first locking the database, expect a sequence similar to the following. In this sequence, the line card reboot is triggered by the new value but the database value is used when the line card is re-initialized. Note the failed *getsnmp* command while the line card is rebooting.

*cli> setsnmp cardMaxLanFlows.6 5500

5

Name: cardMaxLanFlows.6   Value: 5500

*cli> getsnmp cardMaxLanFlows.6

Error in response to request - No such variable name.

(The object may really not exist, or, if you did a "set/setsnmp/define",

 you may want to check your SNMP <community> string.)

*cli> getsnmp cardMaxLanFlows.6

Name: cardMaxLanFlows.6   Value: 4000

Limitations of Configurable Maximum Flows

— When ecc terminates itself, it will interrupt all current active flows and connections.

— The interruption in service is about 3 minutes.

— The system is limited by the total amount of free memory. If the max-flows requested is too high and the available memory is too low, the new ecc may not be able to work or even start.

— If a value for cardMaxLanFlows.<card> is recorded in the mma-database (by a previous "set config lock" command), this value is always used. This means that you must change it by:

*cli> set config lock

*cli> setsnmp cardMaxLanFlows.<card> <desired-max-flows>

*cli> set config unlock

.... wait until a new ecc for <card> comes up and then verify:

*cli> getsnmp cardMaxLanFlows.<card>

— When the terminating ecc is highly loaded, the new ecc will create a high load on the system when establishing all previous flows and connections.

Custom Filter Action DROP

In previous releases of software, custom filter actions were defined as either **Block** or **Forward**. Release 2.1(1.1) introduces a new action that can be applied to bridge, ip, or ipx custom filters: **Drop**, an alternative resource allocation for action Block. When a block filter is defined, a flow is used to program the line card hardware for each unique (mac source, mac dest, level 3) occurrence of a packet matching that filter. The next time that unique occurrence of a packet is seen at the line card, it is removed (blocked) from the LS2020 network. If the same packet matches a filter action of Drop (rather than Block), the packet is removed from the LS2020 network at the time of the filter match logic on the NP, and no flow resources are used. The trade-off of using Drop rather than Block is a higher CPU utilization on the NP rather than a consumption of flow resources to program the line card. In some networks, it may be desirable to use a combination of Block and Drop filters to obtain the most efficient use of flows and CPU.

Implementation of Filter Action Drop

The action Drop can be assigned for any custom filter when that custom filter is assigned to a port. Furthermore, the Drop action can be assigned for any port default filter action. For more information regarding Custom Filters, see the *LS2020 Network Operations Guide*. For more information regarding CLI commands to define filters and their assignment for LAN ports, see the *LS2020 CLI Reference Manual*.

Using Filter Action Drop

This release of software provides CLI support for the new filter action Drop. If you want to drop all AppleTalk packets on a port, define a bridge filter that matches all AppleTalk packets and assign the action Drop for that port's use of the filter. For example:

> *cli> define bflt 40 (macDst == 00:dd:00:00:00:00)
>
> *cli> show bflt 40
>
> bflt 40: (macDst == 00:dd:00:00:00:00)
>
> *cli> show port 4.1 bflt-def
>
> Default Bridge Filter action is FORWARD
>
> *cli> set port 4.1 bflt 40 ?
>
> One of 'forward', 'block', 'drop' or 'delete'
>
> *cli> set port 4.1 bflt 40 drop 10
>
> *cli> show port 4.1 bflt
>
> BRIDGE Filter number 40:
>
> ------------------
>
>   priority 10
>
>   action   drop
>
> Multicast Group ID 0
>
> Traffic Profile ID 0
>
>   matches 0
>
> Default Bridge Filter action is FORWARD

Limitations of Custom Filter Action Drop

Because a packet matching a filter with an action of Drop is processed by the NP, the CPU utilization of the NP may become stressed if too much processing is required. In that case, use the action Block to program the line card hardware to recognize and remove the packet from the network.

Configurable ARP Spoofing per Port

Software Release 2.1(1.1) allows the LS2020 ARP spoofing to be disabled on a per-port basis. There are two scenarios when the ARP spoofing function does not produce the desired result. First, when a router connected to the bridged LAN is providing a proxy-ARP service between virtual subnets implemented on the bridged LAN. Second, if the LS2020 network is used to create multiple non-overlapping, bridged domains, it is possible to configure multiple hosts with the same IP address.

Note It is highly recommended that you turn off ARP spoofing when the LS2020 is attached to routers.

Implementation of Configurable ARP Spoofing per Port

A new MIB object, **lsLanPortArpProxy**, can be configured by SNMP get/set processing for each LAN port (FDDI, Ethernet) on the chassis running this release of software. By default, each port is enabled for ARP Spoofing, identifiable by the port's lsLanPortArpProxy having a value of 1. A value of 2 written to the port's lsLanPortArpProxy will disable ARP Spoofing on that port.

When a port participates in ARP Spoofing, MAC/IP addresses learned on that port are recorded as an entry in the arp cache table. Two functions result from that entry. First, if an arp request matching the IP address of the cache entry is received from outside the LS2020 network, the LS2020 will respond with a Proxy ARP reply. Second, the LS2020 arp refresh function will be active on that port. Arp refresh in Release 2.1(1.1) ages the entries in the arp cache table every 6 minutes. At the expiration of the 6 minute age, the LS2020 transmits a unicast arp request out of the interface where the entry was learned.

When a port disables arp spoofing, MAC/IP addresses are not learned on that port. Consequently, no arp cache table entries are recorded for MAC/IP addresses on that port. Without entries in the arp cache table, the LS2020 will not Proxy reply to arp requests for addresses on that port. Nor will the LS2020 transmit refresh arp requests out of that port.

Using Configurable ARP Spoofing per Port

Use SNMP get/set commands to display and set the arp spoofing value for a LAN port in the LS2020 network. To write a new value to the SNMP database, use the CLI command set config to first lock the database for writing. For example, the following sequence of CLI commands queries a port's participating in arp spoofing, and changes that port's behavior to disable arp spoofing.

> *cli> getsnmp lsLanPortArpProxy.4102
>
> Name: lsLanPortArpProxy.4102 Value: 1
>
> *cli> set config lock
>
> *cli> setsnmp lsLanPortArpProxy.4102 2
>
> Name: lsLanPortArpProxy.4102 Value: 2
>
> *cli> set config unlock
>
> *cli> getsnmp lsLanPortArpProxy.4102
>
> Name: lsLanPortArpProxy.4102 Value: 2

Note the change of behavior for the port that disabled arp spoofing. For any arp cache table entries that were learned from that port while arp spoofing was enabled, the next refresh age will age-out those entries. While those entries remain in the cache, it is possible that a Proxy Reply for that entry will be generated and transmitted out of a port that is enabled for arp spoofing.

Configurable Flow Timeout per Card

The default life of a flow established in the LS2020 network is 5 minutes. A LAN flow is terminated after five consecutive minutes of inactivity. Because some network implementations may depend on a several-packet exchange for each flow, flow resources would be more efficiently used if the flow timeout were less than 5 minutes. In this release, the flow timeout is configurable per LAN card in the LS2020.

Implementation of Configurable Flow Timeout

The MIB object, **debugLsCardInactivityTimer**, can be accessed by SNMP get/set commands to change the timeout age of flows on a LAN card in the LS2020 network. Units of measurement are in seconds. When the timeout age of flows is changed, the new value participates in algorithmic processing on the line card. The actual age timeout depends on the number of flows being serviced on that line card. As such, there is a variance in the actual timeout age of each flow. Use the following guidelines:

— The lowest value is 100 seconds (1 minute, 40 seconds).

— The highest usable value is 300 seconds (5 minutes).

— The variance for actual timeout age is not expected to exceed 2 times the value of the object.

Using Configurable Flow Timeout Per Port

The following sequence of CLI getsnmp/setsnmp commands show retrieving and setting the flow timeout age for an FDDI card. Remember to use the CLI command *set config* to lock the SNMP database previous to modifying the value; otherwise, the last value written to the database is used the next time the card is initialized.

> *cli> gets debugLsCardInactivityTimer.4
>
> Name: debugLsCardInactivityTimer.4 Value: 300
>
> *cli> set config lock
>
> *cli> sets debugLsCardInactivityTimer.4 100
>
> Name: debugLsCardInactivityTimer.4 Value: 100
>
> *cli> set config unlock
>
> *cli> gets debugLsCardInactivityTimer.4
>
> Name: debugLsCardInactivityTimer.4 Value: 100

Limitations of debugLsCardInactivityTimer

The variance of actual flow timeout aging shown in the following sample of measurements for a line card with 2 flows established and a configured timeout age of 100 seconds. For this measurement, the same test was repeated 7 times.

> Test........Age at Timeout
>
> 1.................1:45
>
> 2.................3:00
>
> 3.................1:15
>
> 4.................1:50
>
> 5.................1:50
>
> 6.................2:25
>
> 7.................3:00

Release 2.1 (1.1) Changes in Functionality

This section describes changes in functionality found in Software Release 2.1(1.1).

- *ARP Refresh Age*. In previous releases of software, the ARP Refresh age was implemented as a 5 minute value. Release 2.1(1.1) has changed this age from 5 to 6 minutes.

- *ARP Refresh Requests*. In previous releases of software, ARP requests (transmitted at each arp refresh age) were transmitted as broadcast packets and sent out each LAN port. In Release 2.1(1.1), an arp request is sent only to the interface from which the MAC/IP address has been learned. If a port has arp spoofing disabled, no arp refresh request is transmitted for that interface.

Software Upgrade Procedures

This section provides information for upgrading the LightStream 2020 switch to Software Release 2.1(1.91). Use this software upgrade procedure to upgrade software on an LS2020 node that has already been installed and is running. For this release to be installed:

- The network processor must have 32 MB of memory

- You must be running at least Software Release 2.0.5

- You must have a modem in each node to allow remote software upgrades. (For more information, see the *LightStream 2020 Site Planning and Cabling Guide*.)

Note   To prevent isolating a node during this upgrade, you must have a modem connected to the SC2(s) of that node. For more information regarding compatible modems, see the *LS2020 Site Planning and Cable Guide*.

- You may want to review Appendix A: Hardware Compatibility Table. This table specifies the minimum hardware revision levels required by this version of the LightStream 2020 software.

Do NOT use these procedures if:

- You are installing a network processor with an uninitialized disk. In that case, use the installation procedures given in the *LightStream 2020 Network Operations Guide.*

  To install Software Release 2.1(1.1) on an uninitialized disk you must create two symbolic links. Use the ln command to create the symbolic links:

```
ln -s /usr/app/dist/base-2.1.1/config/mma.communities /usr/app/base-2.1.1/config/mma.communities
ln-s /usr/app/dist/base-2.1.1/config/mma.trap_communities /usr/app/base-2.1.1/config/mma.trap_communities
```

- You are upgrading the network management software running on a Sun workstation. In that case, use the procedures described in the section "Workstation Upgrade Procedures."

- You are installing the network management software on a Sun workstation for the first time. In that case, refer to the section entitled "Installing StreamView Software" in the *LightStream 2020 Installation Guide*.

Caution   The LS2020 NP is a special-purpose communications processor. It should not be used as a general-purpose UNIX host. If any files have been copied or placed on the disk (especially in the root partition), they should be removed before upgrading the software to Release 2.1(1.93). If the names of any files provided by Cisco have been changed, the original file names should be restored.

Below is a list of the LS2020 Software Release 2.1(1.93) node distribution diskettes.

LS2020 Software Release 2.1(1.93) Distribution Diskettes	**Version Listed on Diskette Label**
Boot Disk	2.1(1.93)
System Disk 1	2.1(1.93)
System Disk 2	2.1(1.93)
System Disk 3	2.1(1.93)
Application Disk 1	2.1(1.93)
Application Disk 2	2.1(1.93)
Application Disk 3	2.1(1.93)
Application Disk 4	2.1(1.93)
Application Disk 5	2.1(1.93)
Application Disk 6	2.1(1.93)
Diagnostic Disk 1	2.1(1.93)
Diagnostic Disk 2	2.1(1.93)
Diagnostic Disk 3	2.1(1.93)
Firmware Disk 1	2.1(1.93)
Firmware Disk 2	2.1(1.93)

Use the following procedures to upgrade a network to Software Release 2.1(1.93):

- *Procedure 1, Copy New Software to the Distribution Node.* Use the **swinstall** command to copy the new software from the installation diskettes to the node being used as the software distribution node. (If **swinstall** reports insufficient disk space, you will be directed to perform *Special Procedure A, Freeing Up Disk Space.* If **swinstall** reports insufficient memory, you will be directed to perform *Special Procedure F, Freeing Up Memory on an NP.*)

- *Procedure 2, Copy New Software to Remote Nodes.* Use the **swremoteinstall** command to copy the new software from the distribution node to other nodes in the LS2020 network. (If **swremoteinstall** reports that there is not enough disk space, you will be directed to perform *Special Procedure A, Freeing Up Disk Space.* If **swremoteinstall** reports insufficient memory, you will be directed to perform *Special Procedure F, Freeing Up Memory on an NP.*)

- *Procedure 3, Change the Running Software Version.* Use the **swchgver** command to change the version of software running on each node after you copy the new software to the node.(If **swchgver** reports insufficient memory, you will be directed to perform *Special Procedure F, Freeing Up Memory on an NP.*)

In addition, you may need to perform one of these procedures:

- *Special Procedure A, Freeing Up Disk Space.* If the **swinstall** command or the **swremoteinstall** command reports that you do not have enough disk space, delete files associated with obsolete releases of software.

- *Special Procedure B, Falling Back to the Prior Version.* You can fall back to the prior version of software if you wish to for any reason.

- *Special Procedure C, Verifying Connection to Backup NP.* Use this procedure if the **swchgver** command fails to contact the backup NP on a redundant system.

- *Special Procedure D, Getting rsh to Work on a Remote Node.* If the **swremoteinstall** command (which uses the **rsh** command) reports that it does not have permission to copy the files to the remote node, this section describes some of the common causes and how to correct them.

- *Special Procedure E, Backing Up the Distribution Diskettes.* You may wish to back up the distribution diskettes.

- *Special Procedure F, Freeing Up Memory on an NP.* Use this procedure when there is insufficient memory to run a software installation procedure on an NP.

Note   The following installation procedure for Software Release 2.1(1.93) causesFlash memory to be reloaded. The Flash reload time depends on your system configuration. Also, you must explicitly reload the Switch Card(s) Flash memory according to the installation procedure.

Procedure 1, Copy New Software to the Distribution Node

With this procedure, you copy the new software to a local LS2020 node from the distribution disk set. This local node is referred to as the distribution node. To perform this procedure, use a terminal connected to the console port of the distribution node. Only the person doing the installation should be logged on to the system.

Perform the following steps to upgrade the distribution node (or any local node) to Software Release 2.1(1.93) node software:

Step 1   Connect to the primary NP.

Step 2   Copy Software Release 2.1(1.93) from floppies to hard disk.

In Procedure 2, Copy New Software to Remote Nodes, you use the distribution node as the source for copying the software to other nodes in the network.

Note   If for any reason you discontinue installation of this release after you have started loading software, you should delete this release using Special Procedure A, Freeing Up Disk Space. This minimizes the impact of the interrupted installation on future installations. When you resume installation of this release, you must restart at the beginning of this procedure.

Connect to the Primary NP

Step 1   Enter '. (backquote plus dot, that is, left single quote plus period).

Step 2   At the TCS HUB prompt, use the **connect** command to connect to the NP in slot 1:

TCS HUB <<A>> **connect 1**

You may need to press **Return** a second time after typing the **connect** command in order to get a prompt from the NP.

A prompt should appear asking for a user login name:

```
user name:
```

Note If someone using the machine before you has not logged out, your prompt may be different. If this occurs, log out and log back in as root.

Step 3 Log in as root. The bash prompt appears (with # indicating a root login):

```
user name: root
password:
bash#
```

If your system has only one NP, go to Step 6 now.

Step 4 On a system with redundant NPs, verify that you are connected to the primary NP (the active NP), as follows:

- At the bash prompt, enter the **cli** command to start the CLI:

  ```
  bash# cli
  ```

- At the CLI prompt, enter the **show chassis** command.

- Determine whether you are connected to the primary NP or the backup NP by examining the entries for "Slot of Primary NP" and "Slot of This NP.".

Are you connected to the primary or backup NP?	If the two entries identify the same NP number, you are connected to the primary NP (the active NP). Since you connected to slot 1 in Step 1, above, the following is true:
	primary= 1 *backup*= 2
	Make a note of this. Use the value 1 where you see the parameter name "primary" in later procedures.
	If the two entries do not identify the same NP number, you are connected to the backup NP. Since you connected to slot 1 in Step 1 above, the following is true:
	primary = 2 *backup* = 1
	Make a note of this. Use the value 2 where you see the parameter name "primary" in Step 5, below, and in other procedures.

- Use the exit or quit command to exit from the CLI.

If you are connected to the primary NP, go to Step 6 now.

Step 5 If you are connected to the backup NP, disconnect from it and connect to the primary NP (the active NP):

- Enter '**.** (backquote plus dot, that is, left single quote plus period) to return to the TCS HUB.

- Connect to the slot of the primary NP by typing the following command:

  ```
  TCS HUB<<A>> connect primary
  ```

- If necessary, log in to the NP as root.

Copy Release 2.1(1.93) Software from Floppies to Hard Disk

Step 6   Determine which floppy disk drive is appropriate to use for the upgrade. NP slot 1 is connected to the bottom disk drive, and NP slot 2 is connected to the top disk drive.

The boot disk is not used in this upgrade procedure. You will run the **swinstall** utility once for each diskette set. If you are currently running any version from Version 2.0.5 through 2.1(1.1), install the diskette sets in this order: system, application, diagnostics, firmware.

Step 7   Enter the **swinstall** command at the bash prompt:

```
bash# swinstall
```

Note   If the swinstall program reports that there is insufficient disk space for the installation, go to *Special Procedure A, Freeing Up Disk Space*, before continuing. If the **swinstall** program reports insufficient memory, go to *Special Procedure F, Freeing Up Memory on an NP*.

When the program prompts you for a diskette, insert the first diskette (of the diskette set that you are currently installing) into the appropriate drive and press **Return**. Repeat as the program prompts you for more diskettes in the current set.

Step 8   Repeat Step 7 for each diskette set, following the order given under Step 6.

Procedure 2, Copy New Software to Remote Nodes

With this procedure you distribute new software from the distribution node to other LS2020 nodes. Carry out this procedure for *all* remote nodes before going to Procedure 3, Change the Running Software Version.

You can upgrade software directly from the distribution diskettes on each node in your LS2020 network. To do this, carry out Procedure 1, Copy New Software to the Distribution Node, and Procedure 3, Change the Running Software Version, on each node in the network.

Before proceeding, make sure that the following is true:

Distribution Node	Remote Node
• You are logged in to the distribution node.	• You are able to establish an rsh connection and a modem connection at each remote site. (You do not need not to be physically located at the remote node site.)
• No other user is logged in.	
• The distribution node is running LS2020 application software.	• The remote node is running LS2020 application software.

Perform the following steps for each node in your LS2020 network:

Step 1   Verify the remote command execution

Step 2   Distribute Software Release 2.1(1.93) to remote nodes

Verify Remote Command Execution

Verify that it is possible to execute commands on the remote node from the distribution node:

Step 1   On the distribution node, execute the following command:

```
bash# rsh remote-node hostname
```

Enter the name of the remote node in place of *remote-node*.

If the command succeeds, it prints the name of remote-node. Continue to Step 2.

If this is the first time you have upgraded, this step is likely to fail. If the command fails, it prints one of the following messages:

```
hostname: unknown host
hostname: Connection timed out
Permission denied.
```

If the command fails, refer to Special Procedure D, Getting rsh to Work on a Remote Node.

Distribute Software Release 2.1(1.93) to Remote Nodes

Step 2 Copy Software Release 2.1(1.93) files to *remote-node*. In a window running a login on *distribution-node*, execute the following command:

```
bash# swremoteinstall -h remote-node 2.1.1.1
```

Enter the name of the remote node in place of *remote-node*.

The **swremoteinstall** process checks disk space and copies Software Release 2.1(1.93) to the *remote-node*. It should take 5 to 10 minutes, depending upon bandwidth between the nodes.

Note If the swremoteinstall program reports there is not enough disk space for the installation, connect to the remote node through a modem port or Telnet connection and follow *Special Procedure A, Freeing Up Disk Space* on the remote node. If the **swremoteinstall** program reports insufficient memory, go to *Special Procedure F, Freeing Up Memory on an NP*. Then repeat Step 2.

Procedure 3, Change the Running Software Version

With this procedure you activate the software that has been copied to the node, and the node begins running the new LS2020 application software.

Note Carry out this procedure for all remote nodes before carrying out this procedure on the distribution node.

Perform the following steps for each node in your LS2020 network:

Step 1 Connect to the Primary NP

Step 2 Change the Running Software Version

Connect to the Primary NP

Step 1 Connect to the TCS hub on the node. Use a console terminal if you are on site. Use a dial-in modem to connect to a remote node.

Caution   Do not use a network connection such as Telnet to connect to the node for purposes of changing the running software version. During the procedure, a card may be reset, breaking your Telnet connection and interrupting the change process.

Step 2   Enter **'.** (backquote plus dot, that is, left single quote plus period).

Step 3   At the TCS HUB prompt, use the **connect** command to connect to the NP in slot 1s:

```
TCS HUB <<A>> connect 1
```

The user name prompt should appear. Log in as root. The bash prompt appears (with # indicating a root login).

```
user name: root
password:
bash#
```

After you type the **connect** command, you may need to press **Return** a second time in order to get a prompt from the NP.

If someone using the machine before you has not logged out of a session, your prompt may be different. Attempt to get back to a bash prompt and log out.

If your system has only one NP, go to Step 6 now.

Step 4   On a system with redundant NPs, verify that you are connected to the primary NP (the active NP), as follows:

- At the bash prompt, enter the **cli** command to start the CLI:

  ```
  bash# cli
  ```

- At the CLI prompt, enter the **show chassis** command.

- Determine whether you are connected to the primary NP or the backup NP by examining the entries for "Slot of Primary NP" and "Slot of This NP."

Are you connected to the primary or backup NP?	If the two entries identify the same NP number, you are connected to the primary NP (the active NP). Since you connected to slot 1 in Step 1, above, the following is true:
	primary= 1 *backup*= 2
	Make a note of this. Use the value 1 where you see the parameter name "primary" in later procedures.
	If the two entries do not identify the same NP number, you are connected to the backup NP. Since you connected to slot 1 in Step 3 above, the following is true:
	primary = 2 *backup* = 1
	Make a note of this. Use the value 2 where you see the parameter name "primary" in Step 5, below, and in other procedures.

- Use the **exit** or **quit** command to exit from the CLI.

Step 5   If the two entries identify the same NP number, you are connected to the primary If you are connected to the backup NP, disconnect from it and connect to the primary NP:

- Enter **'.** (backquote plus dot, that is, left single quote plus period) to return to the TCS HUB.

- Connect to the slot of the primary NP (the active NP) by typing the following command:

  ```
  TCS HUB<<A>> connect primary
  ```

  Substitute 1 or 2 in place of *primary*, as explained above.

- If necessary, log in to the NP as root.

Change the Running Software Version

Note The **swchgver** program usually takes about a minute to run. However, it can take up to 2.5 hours if it loads program images into Flash memory on all the cards (about 15 minutes per card for 10 cards). A card's fault light comes on and stays on for the duration of loading of Flash on that card.

Step 6 Use the **swchgver** program to run the software that you have just installed:

```
bash# swchgver
```

The **swchgver** program produces the following results:

- Flash memory is reloaded (if appropriate).

- The newly installed software is made the active version (on both NPs in a redundant system).

- The network processor (NP) is rebooted, so that the above changes take effect (both NPs in a redundant system).

- The line cards reload their software images.

Caution Do not interrupt the loading of Flash memory, particularly on an NP. A card with partially loaded Flash cannot complete its boot sequence until Flash is reloaded. If you dial in, you must remain dialed in until the process has comepleted. If this situation should occur, call Cisco Customer Support at 1-800-553-2447.

Note If the **swremoteinstall** program reports insufficient memory, you will be directed to perform *Special Procedure F, Freeing Up Memory on an NP*. Then repeat Step 6.

Step 7 On a redundant NP system, the swchgver program automatically copies the new software from the primary NP (the currently active NP) to the backup NP. This copy may fail, for example, if the other NP is not running application software. If the copy fails, use one of the options listed below.

- If the following error message displays, refer to *Special Procedure C, Verifying Connection to Backup NP*:

  ```
  WARNING: This is a dual NP system where the current NP is
  unable to contact the backup NP".
  Thus, swchgver run on this NP will not interact with the
  ```

```
                        backup NP in the expected way to ensure that each NP is
                        running a consistent software release.
                        To run swchgver anyway, you must explicitly specify all desired
                        swchgver options.  Typical choices might be
                            swchgver <#ver> -force -nordist
                        or
                            swchgver <#ver> -force -nordist -nolinecardreset -noflashupdate

                        Failed to execute "rsh other-np /bin/true".
                        This is possibly due to an invalid /.rhosts file on the backup
                        NP.  Please check the /.rhosts file on the backup NP and make
                        sure it contains the line "other-np root".
```

- The following error message is due to interference between swchgver and the mechanism that keeps critical files on the two NPs in synch. You are unlikely to receive this message. However, if this message appears, wait a moment and then invoke the swchgver program a second time.

```
bash# swchgver
swchgver: checking backup NP /dev/sd0b disk space for 2.1.0
       (/usr/app)
/bin/rsh: Executable file in use
swchgver: Error: attempt to contact other-np failed.
bash#
```

- Have someone who is physically at the node site install the software on the other NP as though it were a new NP/disk addition. For more information, refer to Appendix A in the *LightStream 2020 Network Operations Guide*.

Example Output from a Successful Upgrade

The following is an example of the output that results when this upgrade procedure is carried out with the console trap level set to info:

```
bash# swchgver
Checking and downloading FLASH memory for all function cards
Checking and downloading files for standby network processor.
Rebooting standby network processor.
....
Forcing reset of line cards

==> (OPER) NDD_5 at 10/20/94 18:11:24 EDT (10/20/94 22:11:24 GMT)
       Line Card lsnode8:3 (LS-EDGE) down (ERMP failure 0x401).

==> (GENERIC) at 10/20/94 18:11:28 EDT (10/20/94 22:11:28 GMT)
Link Down Trap at 10/20/94 18:11:28 EDT (10/20/94 22:11:28 GMT)
       Port 3002

==> (GENERIC) at 10/20/94 18:11:28 EDT (10/20/94 22:11:28 GMT)
Link Down Trap at 10/20/94 18:11:28 EDT (10/20/94 22:11:28 GMT)
       Port 3003

==> (GENERIC) at 10/20/94 18:11:28 EDT (10/20/94 22:11:28 GMT)
Link Down Trap at 10/20/94 18:11:28 EDT (10/20/94 22:11:28 GMT)
       Port 3004
==> (GENERIC) at 10/20/94 18:11:28 EDT (10/20/94 22:11:28 GMT)
Link Down Trap at 10/20/94 18:11:28 EDT (10/20/94 22:11:28 GMT)
       Port 3005

Rebooting the network processor

NP040 POST Version 0.225 Feb 21, 1995
4Meg Bit value = 1
```

```
Configuring Main Memory for 32 Megabytes
Clearing memory (32 Megabytes)...

booting: drive:0, partition:0, kernel:"lynx.os", flags:0x4308
Resetting SCSI bus
Kernel linked for 0xea010000
LOAD AT 0x10000
        483328+49152+262504[+62736+51815]
TOTAL SIZE: 909536 at 0x1001c
START AT 0x10020
NP memory size: 32 MB
ILACC: EEPROM enet addr:8:0:8:0:14:6f, Silicon Rev:0x5, IB:0xea1dfce0
Old-style NP detected
virtual console: IB: 0xea1dfe68
NCR 53C710: Chip Revision: 0x2, IB: 0xec18e000

LynxOS/68040-MVME167 Version 2.1.0
Copyright 1992 Lynx Real-Time Systems Inc.
All rights reserved.

LynxOS release 2.1.0, level 1: NP-LynxOS #107: compiled Apr 17 1995 14:50:57

LynxOS Startup: ma
fsck /dev/sd0a
(all sizes and block numbers in decimal)
(file system creation time is Mon Apr 11 08:57:19 1994)
checking used files
recovering orphaned files
making free block list
making free inode list
40518 free blocks 3314 free inodes
fsck /dev/sd0b
(all sizes and block numbers in decimal)
(file system creation time is Mon Apr 11 08:57:52 1994)
checking used files
recovering orphaned files
making free block list
making free inode list
17838 free blocks 3426 free inodes

fsck /dev/sd0c
(all sizes and block numbers in decimal)
(file system creation time is Mon Apr 11 08:58:25 1994)
checking used files
recovering orphaned files
making free block list
making free inode list
8645 free blocks 3534 free inodes

fsck /dev/sd0d
(all sizes and block numbers in decimal)
(file system creation time is Mon Apr 11 08:58:58 1994)
checking used files
recovering orphaned files
making free block list
making free inode list
26597 free blocks 3601 free inodes

Mounting all filesystems
Starting VM system ... Virtual Memory Engaged!
inetd started
Starting crond ...
Initializing the switch hardware interface ...
Using switch A, cards are NOT synchronized, fast cutover is supported
PCP version: 0x410, CMP version: 0x12, FSU version 0x109
```

```
Starting the switch software
LightStream 2020 Version 2.1(1.2)
Copyright 1993 LightStream Corp.  All rights reserved.
Portions copyright 1992 by Lynx Real-Time Systems Inc., 1983 by the Regents
of the University of California, 1988 and 1990 by Paul Vixie, and 1991 by
SNMP Research Inc.

This software contains unpublished proprietary and trade secret information
of LightStream Corp.

LightStream 2020 Software provided to the U.S. Government is subject to the
notices on the software and on the LightStream user documentation copyright
page.
PROGRAM: cbuf: (ls2_0) compiled Apr 26 1995 @ 21:49:18 [pid:48]

user name:
```

Special Procedures

Special Procedure A, Freeing Up Disk Space

Use this procedure if the **swinstall** or **swremoteinstall** programs report that there is insufficient disk space.

Identify Files to Delete

Step 1   Log in on the target node as root.

Step 2   Identify the software to remove. To do this, enter the command **swdelete** with no argument, as in the following example:

```
bash# swdelete
Usage: swdelete version -f
            version:       version of software to delete (e.g. 2.0.0)
               -f:             remove even if currently running version
                             WARNING: deleting currently running version also
                                      deletes current configuration data
Description:
  Deletes the indicated release, first checking to make sure
  that the release is not currently in use.
  (For an update release, both the update and the underlying
   major release are in use.)
    VERSIONS ON DISK
                           2.0.7
                           2.0.8
                           2.1.0
CURRENTLY RUNNING VERSIONS:
                           2.1.0
bash#
```

If you attempt to delete the running version of software, the following message appears:

```
swdelete: Will not remove current running system (2.1.0) and
          configuration data.
```

Delete Obsolete Version Files

Step 3   Use the **swdelete** command to delete obsolete version files:

```
bash# swdelete 2.0.7
Deleting version 2.0.7
bash#
```

Caution Do not delete the currently running software versions (2.1.0 in the example shown in Step 2, above).

Return to the section that referred you to this procedure.

Special Procedure B, Falling Back to the Prior Version

Use this procedure if you wish to revert to the prior version of software.

Step 1 Log into the LS2020 node as root if you have not already done so.

Step 2 Use Procedure 3, Change the Running Software Version, to revert to the prior version, giving the earlier version number as the argument of the **swchgver** command. For example, if the prior version is 2.0.8, enter the command as follows:

```
LSnode:1# swchgver 2.0.8
```

The LS2020 configuration information, when downloaded from the NMS, is stored with the current release. When you upgrade to a new release, that information is copied forward to initialize the new release's configuration. When falling back to a previous release, the configuration will match the last time that software release was operational, which may not reflect the current configuration.

Note The fallback procedure does not reload old Flash versions in cards.

Return to the section that referred you here.

Special Procedure C, Verifying Connection to Backup NP

Use this procedure to verify that the primary NP can communicate with the other NP. To perform this procedure, use a terminal connected to the console port of a chassis that has redundant NPs.

Note Do not use this procedure if the other NP is rebooting. During reboot, the other NP will not be accessible for a period of several minutes.

Step 1 If you are not already connected to the slot of the primary NP, connect to the primary NP. Do this by typing ‘. (backquote plus dot, that is, left single quote plus period) to connect to the TCS hub, and entering the following command (substituting the slot number of the primary NP for *primary*):

```
TCS HUB<<A>> connect primary
```

Step 2 If you are not already logged in to the primary NP as root, log in to the primary NP as root.

Step 3 If there is a redundant NP in this chassis, verify that the other NP is functioning as backup. Enter the following command:

```
bash# rsh other-np /bin/true
```

Three different results are possible:

- No error message

```
bash# rsh other-np /bin/true
bash#
```

This result indicates success. The other NP is up and accessible. Return to the section that referred you to this special procedure.

- Connection timed out (the timeout takes about 75 seconds)

```
bash# rsh other-np /bin/true
other-np: connection timed out
bash#
```

This result indicates that the backup NP is not up. Go to Step 4.

- Permission denied

```
bash# rsh other-np /bin/true
Permission denied.
bash#
```

This result indicates that the backup NP is up, but not accessible due to a permissions mismatch. Go to Step 4.

Step 4 If you receive the error message `connection timed out`, reset the other NP using these steps:

- Return to the TCS by typing '. (backquote plus dot, that is, left single quote plus period).

- Reset the backup NP by typing the following (substituting the slot number of the backup NP for *backup*):

```
TCS HUB<<A>>reset backup
```

- Connect to the backup NP by typing the following (substituting the slot number of the backup NP for *backup*):

```
TCS HUB<<A>>connect backup
```

- Monitor the reboot, looking for the following two trap messages:

```
==> (OPER) NDD_2 at mm/dd/yy/ hh:mm:ss <time-zone> (mm/dd/yy hh:mm:ss GMT)
     Network Processor <node_name:slot> becoming backup np

==> (GENERIC) at mm/dd/yy/ hh:mm:ss <time-zone> (mm/dd/yy hh:mm:ss GMT)
     Cold Start Trap at mm/dd/yy hh:mm:ss <time-zone> (mm/dd/yy hh:mm:ss GMT)
```

You may have to wait about 5 minutes for these traps to appear.

- Reconnect to the primary NP. Repeat Step 3. If the same failure occurs, call Cisco Customer Support at 1-800-553-2447.

Step 5 You may receive the following error message:

```
Permission denied.
```

The message indicates the rsh permissions on the backup NP are incorrect.

- Log in to the backup NP as root using rsh.

```
bash# rsh other-np
login root vt100
password:
.
.
.
bash#
```

- Verify that the file "/.rhosts" contains the line "other-np root". If this line is missing, add it with the following command:

```
bash# cp /.rhosts /.rhosts.bak
bash# echo "other-np root" >>/.rhosts
```

Note Enter the redirect operator twice, with no space (>>). If you enter it once (>) you will overwrite the existing file rather than appending to it. If you make a mistake, enter the command **cp /.rhosts.bak /.rhosts** to recover the original file.

- Log out of the backup NP. That leaves you connected to the primary NP again. Repeat Step 3. If the same failure occurs, call Cisco Customer Support at 1-800-553-2447.

Special Procedure D, Getting rsh to Work on a Remote Node

Use this procedure if the **rsh** command reports an error message:

Step 1 On the distribution node, examine the file /etc/hosts to verify that there is an entry for *remote-node* in it. You can use the **grep** command for this:

```
bash# grep remote-node /usr/etc/hosts
```

If there is an entry for remote-note, go to Step 3.

Step 2 If there is no entry for *remote-node,* create a backup copy of the /usr/etc/hosts file and then create an entry for *remote-node* in /usr/etc/hosts:

```
bash# cp /usr/etc/hosts /usr/etc/hosts.bak
bash# echo "Primary_IP_address remote-node" >> /usr/etc/hosts
```

Enter the name of the remote node in place of *remote-node*, and enter the IP address of the remote node in place of *Primary_IP_address*. You can use the vi editor in place of the **echo** command. See the *LightStream 2020 NP O/S Reference Manual* for information about the vi editor.

Note Enter the redirect operator twice, with no space (>>). If you enter it once (>) you will overwrite the existing file rather than appending to it. If you make a mistake, enter the command **cp /usr/etc/hosts.bak /usr/etc/hosts** to recover the original file.

Repeat Step 1.

Note If you see the error message "Connection Timed Out," the remote node or a link to it is down. Refer to the chapter entitled "Troubleshooting Procedures" in the *LightStream 2020 Network Operations Guide.* When the problem is corrected, repeat Step 1. If you see the error message "Permission Denied" or any other message, proceed with this procedure.

Step 3 Make a Telnet connection to *remotenode* and log in.

Step 4 Verify that the .rhosts file is a read-only file for group and world:

```
bash# ls -l /.rhosts
-rw-r--r--   1 root          71 Aug  1 14:54 /.rhosts
```

If any value other than -rw-r--r-- appears at the beginning of the **ls** output, enter:

```
bash# chmod 644 /.rhosts
```

Step 5 Examine the file /.rhosts to see if it includes an entry for *distribution-node*. Use the following command (enter the name of the distribution node in place of *distribution-node*):

```
bash# grep distribution-node /.rhosts
```

Step 6 If the entry for *distribution-node* is not displayed, edit the file /.rhosts, adding to it a line consisting of the name of the distribution node followed by the word root (enter the name of the distribution node in place of *distribution-node*):

```
bash# cp /.rhosts /.rhosts.bak
bash# echo "distribution-node root" >> /.rhosts
```

You can also use the vi editor in place of the **echo** command, if you wish. See the *LightStream 2020 NP O/S Reference Manual* for information about the vi editor.

Note Enter the redirect operator twice, with no space (>>). If you enter it once (>) you will overwrite the existing file rather than appending to it. If you make a mistake, enter the command **cp /.rhosts.bak /.rhosts** to recover the original file.

Step 7 On the remote node, examine the file /usr/etc/hosts to verify that there is an entry for *distribution-node* in it. Use the **grep** command for this (enter the name of the distribution node in place of *distribution-node*):

```
bash# grep distribution-node /usr/etc/hosts
```

Step 8 If there is no entry for *distribution-node*, create one as follows:

```
bash# cp /usr/etc/hosts /usr/etc/hosts.bak
bash# echo "Primary_IP_address distribution-node" >> /usr/etc/hosts
```

Enter the IP address of the distribution node in place of *Primary_IP_address*, and the name of the distribution node in place of *distribution-node*. You may use the vi editor in place of the **echo** command. See the *LightStream 2020 NP O/S Reference Manual* for information about the vi editor.

Note Enter the redirect operator twice, with no space (>>). If you enter it once (>) you will overwrite the existing file rather than appending to it. If you make a mistake, enter the command **cp /usr/etc/hosts.bak /usr/etc/hosts** to recover the original file.

Step 9 Log out of the remote node and repeat Step 1.

If the test in fails again, contact Cisco Customer Support at 1-800-553-2447.

Special Procedure E, Backing Up the Distribution Diskettes

If you are concerned about how carefully your diskettes may be handled and stored, you may wish to back up the software distribution diskettes before proceeding with the upgrade.

Requirements for the Procedure

In this procedure, you must have access to a PC running DOS 5.0 and supporting at least one 1.44-MB floppy disk drive. You must also have at least 15 blank, DOS-formatted 1.44-MB diskettes.

You should also be aware of the following:

- With the **/v** option, the **diskcopy** command verifies that the copy is correct. If you wish to use the **diskcomp** command redundantly to verify that the copy is correct, refer to your DOS documentation for that command.

- Do not use the **dir** command to verify the contents of the diskette. There is no FAT (the DOS file allocation table) on LS2020 distribution diskettes, so there can be none on your backup diskettes. Consequently, if you enter **dir a:** or **dir b:**, you see a read error message issued by DOS.

If Your PC Has Two 1.44-MB Floppy Disk Drives

For each LS2020 software distribution diskette, perform the following:

Step 1 Insert the distribution diskette in the floppy disk drive. In the examples shown here, we assume this is disk drive A.

Step 2 Insert the blank, formatted diskette in the second 1.44 Mb disk drive. In the examples shown here, we assume this is disk drive B.

Step 3 Enter the following command at the DOS prompt:

```
C:\> diskcopy a: b: /v
```

The program copies the data from the distribution diskette in drive A to the backup diskette in drive B.

If Your PC Has Just One 1.44-MB Floppy Disk Drive

For each LS2020 software distribution diskette, perform the following:

Step 1 Insert the distribution diskette in the floppy disk drive. In the example shown here, we assume this is disk drive A.

Step 2 Enter the following command at the DOS prompt:

```
C:\> diskcopy a: a: /v
```

The program reads a portion of the disk contents into memory. When it prompts you to do so, remove the distribution diskette and insert a blank, formatted diskette into the floppy disk drive.

Step 3 The program copies the data from memory onto the diskette. When it prompts you to do so, remove the backup diskette and insert the distribution diskette into the floppy disk drive.

Step 4 Alternate and Step 3 in response to program prompts until the disk copy is complete.

Special Procedure F, Freeing Up Memory on an NP

Use this procedure when there is insufficient memory to run a software installation procedure on an NP.

Step 1   Log into the target NP. For swinstall this is the local system. For swremoteinstall this is the host you are downloading to - you should telnet to that host. For swchgver, you will need to telnet from the primary NP to "other-np", the name used on the primary to refer to the backup NP.

Step 2   Type "ps -ax" to determine which processes are running and how much memory needs to be freed. The amount of free memory is displayed in the last line of output. Each software procedure requires a different amount of memory to run to completion (see the related Note below). Here is a list of memory requirements for this release:

```
swinstall - 1650KB
swremoteinstall -  1000KB
swchgver -  1500KB
```

If this amount of memory is now free you can continue with the original software update procedure. If not, take the actions described in sections 3, 4, and 5 below, checking the amount of memory after each change until enough memory has been freed.

Note   The check for available memory is performed within the installation script and therefore underestimates the amount of free memory available. In this release, this can be solved by freeing up 500KB more than requested by swinstall, swremoteinstall, or swchgvr. The adjusted amount of memory for each procedure is: swinstall 2150KB, swremoteinstall 1500KB, swchgvr 2000KB.

Step 3   If there is too little memory free and if "ps -ax" reported that the "cli" process was active, then the CLI process must be stopped. Ideally, you can determine who is runing cli and have them quit the tool. If this is not possible then cli can be forcibly removed with the command "kill -9 <pid>", where <pid> is the process id for the cli as reported by the cli command. Continue with step 2.

Step 4   If there are no active cli processes it is possible that a number of different users have logged onto the NP using telnet. Determine this with the who command. Ideally there are only one or two users logged into the node, depending on whether you are connected through the hub/console port or are logged in through telnet. This is an example of running who on an NP:

```
root       ttyp0     Unknown-HostName   Sun Jul 14 15:04:55
fldsup     ttyp1     191.254.254.254    Mon Jul 15 09:07:34
hewey      ttyp3     191.254.254.253    Mon Jul 15 09:07:34
dewey      ttyp4     191.254.254.255    Mon Jul 15 09:00:34
lewey      ttyp5     191.254.254.254    Mon Jul 15 09:05:34
```

In this case, asking hewey, dewey, and lewey to log out will free up some space. In general all users not involved with the software installation should log out.

Step 5   As a last resort, memory can be freed by deactivating a line card, thus freeing up it's resources. To do this use the CLI "set card x inactive" command on the target NP, where X is the card number to deactivate. IMPORTANT: If you deactivate a line card before software installation you will need to activate that line card once the software installation procedure is finished. Otherwise, the card will remain inactive, even following a reboot of the chassis.

Workstation Upgrade Procedures

The procedures in this section explain how to install Software Release 2.1(1.93) network management software onto your Sun workstation from the tape provided with this release.

Note If you are installing the StreamView software on a workstation for the first time, do not use these instructions. Refer instead to Chapter 3 of the *LightStream 2020 Installation Guide*.

When you complete the following upgrade procedures, you will be able to run the Software Release 2.1(1.93) StreamView network management software on your Sun workstation:

- Procedure 1, Upgrading Network Management Software Under HP OpenView

- Procedure 2, Upgrading Network Management Software Without HP OpenView

For Information on …	See …
Running the configuration program	*LightStream 2020 Configuration Guide*
Running the CLI and the monitor	*LightStream 2020 Network Operations Guide*
CLI commands and the MIB	*LightStream 2020 CLI Reference Manual*
LynxOS commands	*LightStream 2020 NP O/S Reference Manual*

Note Refer to the *LightStream 2020 Site Planning and Cabling Guide* for a list of NMS hardware and software requirements.

Procedure 1, Upgrading Network Management Software Under HP OpenView

If you are installing the LS2020 network management software without HP OpenView, go to *Procedure 2, Upgrading Network Management Software Without HP OpenView*.

If you installed an earlier version of StreamView under HP OpenView, use this procedure to upgrade your installation to Software Release 2.1(1.93). You need to be running at least Version 3.3 of HP OpenView to run LS2020 management software under HP OpenView.

This LS2020 StreamView installation requires the HP OpenView OVIC utility version 1.4 or later. To verify the version number, execute the following command at the shell prompt on your Sun SPARC station:

```
cat /usr/OV/install/system/OVIC/ovindex
```

Release 1.4 is indicated by the line `cid: ov1.4` in this file.

Loading the Management Software for HP OpenView

The StreamView network management software portion of the LS2020 software includes three modules: LS-Configure, LS-Monitor, and LS-Topomap. HP OpenView documentation refers to software packages of this kind as "products." The CLI and the LS2020 multiservice-specific MIB are packaged with all three.

In this procedure, you will use the **ovinstall** command to:

- Update several HP OpenView directories with LS2020 registration and bit map files

- Load the LS2020 multiservice-specific MIB into the directory /usr/OV/snmp_mibs, and install it under HP OpenView

The steps of the procedure are as follows:

Step 1 Log in to the Sun workstation as root.

Step 2 Ensure that /usr/OV/bin is in your path. The directory is used during the installation. To display your path, use the command **echo $PATH** at the SunOS prompt. In a Bourne shell or a bash shell, set your path as follows:

```
PATH=$PATH:/usr/OV/bin
```

In a csh shell, set your path as follows:

```
setenv PATH ${PATH}:/usr/OV/bin
```

Step 3 Perform a system backup. Cisco recommends that you save a backup copy of your disk to tape before beginning the upgrade procedure.

Note Cisco recommends that you save a copy of the StreamView executables to restore your previous version if necessary.

```
cd /usr/OV/bin
ls -ls | grep ls                  # Called ls_bin in
                                  # which all StreamView executables are found.
mv ls_bin ls_bin.bak              # Move the directory to a new name. The
                                  # installation will create a new directory
                                  #called ls_bin.
                                  # If you later wish to fall back to the
                                  # earlier release, you can move the
                                  # directory by typing:
                                  # "mv ls_bin.bak ls_bin"
```

Step 4 Insert the LS2020 software tape into the Sun's tape drive.

Step 5 To extract the LS-Configure software from the tape, enter the following command:

```
ovinstall -r -p LS-CONFIGURE -- -d tape-drive
```

t*ape drive* is /dev/rst0, unless your tape drive has been configured to use a different device (for example, /dev/rst1 or /dev/rst2). This process takes 5 to 15 minutes to install the configuration utility and associated files. The **-r** switch allows the program to overwrite an existing installation.

Step 6 To extract the LS-Monitor software from the tape, enter the following command:

```
ovinstall -r -p LS-MONITOR -- -d tape-drive
```

t*ape-drive* is the same device specified in Step 5. This process takes 5 to 15 minutes to run. It installs the monitor utility and associated files. The **-r** switch allows the program to overwrite an existing installation.

Step 7 To extract the LS-Topomap software from the tape, enter the following command:

```
ovinstall -r -p LS-TOPOMAP -- -d tape-drive
```

t*ape-drive* is the same device specified in Step 5. This process takes 5 to 15 minutes to run. It installs the topology map utility and associated files. The **-r** switch allows the program to overwrite an existing installation.

Step 8 To update the HP OpenView Fields database with StreamView fields, enter the following command:

```
# ovw -fields
```

Step 9 To ensure that the LS2020 StreamView network management software modules have been installed correctly, enter the following command:

```
# ovw -verify
```

This program takes less than a minute to run and prints the names of the objects it verifies. (If the verification fails, you will see a message on the screen. Call your Cisco service representative for assistance.)

Step 10 To restart HP OpenView, each user must enter the following command:

```
# ovw
```

If you wish to use the parent window for other purposes while HP OpenView is running, you may run this command in the background (type **&** at the end of the command line). If you need help, refer to the HP OpenView documentation.

If **ovw** reports the error "Cannot connect to database", enter the **ovstart** command from the "user ID root" to start OV daemons.

Step 11 To check the status of HP OpenView daemons, enter the following command:

```
# ovstatus
```

If the **ovstatus** command returns the message "ovstatus: ovspnd is not running; use ovstart to start ovspnd", enter the **ovstart** command from the "user ID root" to start OV daemons.

Note LS2020 applications inherit the privileges of the user account from which HP OpenView was started. For example, the access permissions for the database file created by the LS2020 configurator correspond to the access rights of the user who started HP OpenView with the ovw command.

Example Output from a Successful Upgrade

The following example shows the output you may expect to see when you install the HP OpenView version of the LS2020 network management software:

```
sun# ovinstall -r -p LS-CONFIGURE -- -d /dev/rst1
Installing product definition for LS-CONFIGURE.
Running command: "ovupdate -d /dev/rst1 -p LS-CONFIGURE"
===================================
===================================
Installing filesets:
        LSCFG
        LSMIN
Running command: "ovupdate -d /dev/rst1 -l ovi.install"
===================================
===================================
NOTE:    Installation completed successfully.
Beginning configuration.
Customize script for fileset LSCFG succeeded.
```

```
        Customize script for fileset LSMIN succeeded.
        Customize script for fileset OVIC succeeded.
        Configuration completed successfully.  Examine /tmp/update.log for
        details.
        Restarting ovspmd.
        sun# ovinstall -r -p LS-MONITOR -- -d /dev/rst1
        Installing product definition for LS-MONITOR.
        Running command: "ovupdate -d /dev/rst1 -p LS-MONITOR"
        ===================================
        ===================================
        Stopping ovspmd.
        Installing filesets:
                LSMIN
                LSMONITOR
        Running command: "ovupdate -d /dev/rst1 -l ovi.install"
        ===================================
        ===================================
        NOTE:    Installation completed successfully.
        Beginning configuration.
        Customize script for fileset LSMIN succeeded.
        Customize script for fileset LSMONITOR succeeded.
        Customize script for fileset OVIC succeeded.
        Configuration completed successfully.  Examine /tmp/update.log for
        details.
        Restarting ovspmd.
        sun# ovinstall -r -p LS-TOPOMAP -- -d /dev/rst1
        Installing product definition for LS-TOPOMAP.
        Running command: "ovupdate -d /dev/rst1 -p LS-TOPOMAP"
        ===================================
        ===================================
        Stopping ovspmd.
        Installing filesets:
                LSMIN
                LSTOPOMAP
        Running command: "ovupdate -d /dev/rst1 -l ovi.install"
        ===================================
        ===================================
        NOTE:    Installation completed successfully.
        Beginning configuration.
        Customize script for fileset LSMIN succeeded.
        Customize script for fileset LSTOPOMAP succeeded.
        Customize script for fileset OVIC succeeded.
        Configuration completed successfully.  Examine /tmp/update.log for
        details.
        Restarting ovspmd.

        sun#
```

To re-examine this output and other information in the update log, use the following command:

```
sun# cat /tmp/update.log
```

Procedure 2, Upgrading Network Management Software Without HP OpenView

If you are installing the LS2020 management software with HP OpenView, go to Procedure 1, Upgrading Network Management Software Under HP OpenView

If you installed another version of StreamView without HP OpenView, use this procedure to upgrade your installation to Software Release 2.1(1.93).

Loading the Management Software Without HP Openview

Step 1 Log in to the Sun workstation as root.

Step 2 Change to the /usr directory:

```
cd /usr
ls -ls LightStream*              # This returns a directory name such as
                                 # "LightStream-2.1.1", which is your current running
                                 # version. The release will be installed over the
                                 # old release. To maintain a disk backup of the
                                 # current running executables:
cd /usr/LightStream-2.1.1
```

Step 3 Make a backup copy of your current StreamView executable directory.

```
mv bin bin-2.1.1                 # This will be our fallback directory
cd /
```

Step 4 Insert the LS2020 software tape into the Sun workstation's tape drive.

Step 5 Enter the following commands in the order shown to extract the files from the tape:

```
mt -f tape-drive rew
mt -f tape-drive fsf 4
tar xvpf tape-drive
```

tape-drive is /dev/nrst0, unless your tape drive has been configured to use a different port (for example, /dev/nrst1 or /dev/nrst2).

Note It is important to include the letter *n* before the tape drive designation (that is, nrst0 for device rst0). The **n** means "no rewind;" if you omit the *n*, you will not be able to read from the tape.

The extraction of files from the tape takes 10 to 20 minutes. This procedure creates the following directory structure:

```
/usr/LightStream-2.1.1
/usr/LightStream-2.1.1/bin
/usr/LightStream-2.1.1/db
/usr/LightStream-2.1.1/log
/usr/LightStream-2.1.1/mib
/usr/LightStream-2.1.1/templates
```

Step 6 For each user of StreamView applications, modify the file invoked by the shell when that user logs in to set the environment variables to a new value:

```
UIDPATH=/usr/LightStream-2.1.1/bin/%U:$UIDPATH
LSC_DATABASE=/usr/LightStream-2.1.1/db/configure.netdb
LSC_CFGLOGPATH=/usr/LightStream-2.1.1/log
OVSNMP_CONF_FILE=/usr/LightStream-2.1.1/templates/ovsnmp.conf
PATH=$PATH:/usr/LightStream-2.1.1/bin
```

Step 7 Instruct each user to log out and log in again to incorporate the new parameter values.

Fallback to the Previous Software Version

This procedure provides instructions to fall back to a previous software version.
If you are running StreamView from /usr/OV, and you wish to fall back to the previous release, enter the following information:

```
cd /usr/LightStream-2.1.1/bin
ls -ls | grep bin                # Find all files containing "bin" in the name.
                                 # This should return your backup executable
                                 # directory, for example, bin-2.1.1. Move
                                 # the directory back over the new directory.
mv bin-2.1.1 bin                 # This restores your prior release executables.
```

Special Considerations

This section describes the special considerations that apply to this release of the LS2020 multiservice ATM switch. These special considerations are drawn from reports of hands-on experience with the product by LS2020 customers and Cisco Systems engineers.

Most of the special considerations here are provided with an LS2020 defect number. If you contact Cisco Systems about a special consideration, please refer to it by its case number.

Special Considerations are listed by their defect number in the following subsections:

- Congestion Avoidance

- Firmware

- Hardware and Diagnostics

- Installation, Upgrade, and Initial Configuration

- Internetworking

- Network Management

- Other

- Platform

- Resource Allocation

- Traps

Congestion Avoidance

Congestion Avoidance (CA) Not Enforced for Point-to-Multipoint Circuits

Traffic entering the network on point-to-multipoint circuits is not throttled at entry ports when congestion starts to build within the network. A consequence of this is that CA more severely throttles unicast traffic at entry ports. The effect is to give multicast traffic priority over the unicast traffic.

Switch Bandwidth is Not Taken Into Account for Call Admission

Switch bandwidth is not taken into account in call admission decisions. Each line card has a 200 Mbs path (called its switch path) into the node switch. The cards are designed so that all port cards can run at line rate without overrunning the card switch path when all circuits through the ports are

unicast circuits. Prior to the introduction of the Release 2.1 multicast feature it was unnecessary to take switch bandwidth into account in making call admission decisions because it was not possible to overcommit the card switch path.

When a multicast circuit branches at a node, incoming data is replicated for each branch at the card's switch path. Because Release 2.1 call admission does not take card switch path bandwidth into account, the following abnormal behavior is possible:

- A multicast circuit can be established that cannot possibly carry the requested bandwidth. Consider, for example, a 40 Mbs guaranteed circuit over an FDDI LAN interface branching to five other FDDI LAN interfaces (requiring 240 Mbs to the switch). This circuit would drop cells at the card switch path when attempting to carry sustained traffic at the allocated rate.

- The 200 Mbs switch path can become a congestion point if its bandwidth is overallocated; that is, if each individual circuit fits but they all do not fit together. Unlike trunks and exit ports, the card switch path is not protected by the CA mechanism. Therefore, the onset of congestion on the switch path does not force drops at the entry edges to eliminate the congestion. As a result, individual cells from packets would be dropped at the congested card switch path.

- When there is congestion on a card switch path, there is no mechanism to drop best effort traffic ahead of insured traffic. The cell CLP bit, the XCLP bit, and cell transfer priority are all ignored in the identification of cells to drop. This affects Unicast insured traffic as well as multicast insured traffic. No impact is likely on guaranteed traffic and higher priority traffic (such as CBR) in an operational setting.

These limitations will be addressed in a future release.

LSCle02064 LAN Packet Flooding Performance

A LS2020 node can flood between 70 and 100 packets per second (depending on the node and network configuration) by means of its general purpose flooding mechanism.

Recommended Action

If higher packet flooding performance is required, configure a multicast group for the flooding. With adequate network capacity the LS2020 multicast feature can support flooding at up to LAN port rates.

Firmware

There are no firmware special considerations for Software Release 2.1(1.91).

Hardware and Diagnostics

LSCle02440 8-Port T3 Card Does Not Report Loss of Signal (LOS)

The hardware is unable to report LOS because of the line interface unit (LIU) chip used in the T3 card's front end circuitry. The LIU chip has a very sensitive receiver capable of detecting signals down to 35mV. This allows the card to detect signals over long distances or very poor grade coaxial cables.

Because of this receiver sensitivity, the LIU picks up noise when there is no signal on the line, and continuously resets the LOS detection circuit, with the result that LOS status is never reliably set.

A newer version of the LIU device will be available in the November timeframe. Until then when the hardware detects a loss of frame (LOF) condition, a LOS condition will also be reported.

LSCle02741 Diagnostics May Fail Test 70 on a Medium-Speed Line Card

The diagnostics software does not set the card up properly for this test, and it fails intermittently.

Recommended Action

Either deselect test 70 when running the diagnostics on a medium-speed line card, or ignore failures of test 70.

LSCle03113 8t3 Loss of signal is unreliable for nettime line failure detection

The transwitch ART on the 8t3 card cannot accurately detect loss of signal. Therefore, do not use a 8t3 port as a nettime source until the new revision of the transwitch ART arrives.

LSCle03233 Flash Installation May Fail on Linecards that Fail POST

When upgrading flash (for instance, when inserting a spare card into a running system), the **fcload -flash** command may fail if the card is failing its power-on self test. The following fragment displays such a sequence:

```
fcload: (ls2_1_1) compiled Dec 13 1995 @ 22:14:26 [version 1.82.2.3]
...
fcload: slot 3: NOTE: post failed.
fcload: slot 3: begin load of flash image (/usr/fware/flash_clc1.rec) through switch
[WARNING: DO NOT INTERRUPT]
fcload: slot 3: putting card into TESTING mode for flash upgrade.
fcload: slot 3: waiting for remote SWACC loader to initialize:.Failed
fcload: SWACC loader on slot 3 failed to run
fcload: slot 3: failed to load "/usr/fware/flash_clc1.rec" via the switch flash
fcload: slot 3: disabling switch interface...
```

Recommended Action

Load the card using the -t switch (to force the load to occur over the TCS channel):

```
fcload -s <slot_number> -flash -force -t
```

Installation, Upgrade, and Initial Configuration

LSCle00645 The ckswinstall Utility Can Give False Errors

When the ckswinstall utility is applied to update distributions, it may give false error messages.

- The **ckswinstall** utility reports false permission mismatches on directories under /usr/app.

- When using **ckswinstall** to verify an update distribution (for instance 2.0.8), **ckswinstall** only verifies the software in the update. On a system running an update, most of the software in use is from the original release, so **ckswinstall** should also be run on that original release (for example, 2.0.7). When running **ckswinstall** on the underlying release, false errors are reported against software that was upgraded as part of the update.

Recommended Action

Ignore these messages.

LSCle00710 Procedure for Checking Software on the Backup NP

When verifying a software installation using the **ckswinstall** utility on a redundant-NP system, the software installation on each of the two NPs must be checked explicitly.

Step 1   Run **ckswinstall** on the current primary NP.

Step 2   Run **ckswinstall** on the current backup NP.

```
LSnode:2#  rsh other-np ckswinstall ...
```

LSCIe01015 Fallback from swchgver Does Not Copy Configuration Files Back

LS2020 configuration information is stored on disk as part of a specific release. When a new release is installed, configuration information from an old release is copied forward to the new release as part of the installation process. Configuration information, however, is not automatically copied between releases when **swchgver** is used to change the current release.

For instance, if a node is upgraded to run new software, configuration changes are made, and then the node is downgraded to a previous release, the node is running with the configuration information that was cached at the time of the upgrade, which does not include the subsequent changes.

Recommended Action

After falling back to an old version, download the current configuration to the node from the NMS.

Alternatively, before falling back to an old version, copy the files in /usr/app/base-*newrel*/config to /usr/app/base-*oldrel*/config before the fallback (replace *newrel* and *oldrel* with the appropriate release numbers, such as 2.1.1 and 2.0.8).

LSCIe02863 The setsnmpconfig Script May Fail if Configuration Database is Locked

When a switch is booted, if it detects that the minimum required configuration information is missing, it runs the **setsnmpconfig** script and prompts you for configuration information. If you supply the minimum node configuration information, and later discover that this information is not in the configuration database, it may be because the configuration database lock was set when **setsnmpconfig** was started.

Recommended Action

While logged in as root, use the following commands to delete the configuration database lock and run **setsnmpconfig** manually:

```
LSNode:1# rm /usr/app/base/config/configure.netdb.lock
LSNode:1# setsnmpconfig
```

LSCIe02869   Cannot Execute swinstall After it Fails Once Due to Disk Read Error

The **swinstall** utility fails if the /mnt mount is in use. This may come about because of a disk read error in a previous invocation of **swinstall**. For example, due to a media error.

Recommended Action

Unmount the floppy drive with the command **umount /mnt**, and then run swinstall again.

Internetworking

LSCIe00461 Unable to get information about an FDDI port

The "show port <fddi port> " displays only partial information about an FDDI port.

Recommended Action

Check your SNMP <community> string

Network Management: The StreamView CFG Tool

LSCIe01625 Use the CLI to Set IP Addresses to 0.0.0.0

In certain operational circumstances it may be desirable to set one or more of the IP addresses associated with the chassis and the network processor to a value of 0.0.0.0. Logically, this changes the status of the specified IP address to "not set". In Release 2.1, the StreamView CFG tool does not allow you to assign a value of 0.0.0.0 to an IP address.

Recommended Action

Use the CLI to set a chassis or network processor IP address to a value of 0.0.0.0.

LSCIe02679 Use Leading Zeros when Specifying MAC Addresses

Under some circumstances, the StreamView CFG tool requires Media Access Control (MAC) addresses to be specified with leading zeros, so that, for example, a MAC address such as the following is not accepted:

```
1:2:3:4:5:6
```

Recommended Action

When using the CFG tool, specify a leading zero in any MAC address field whose value is in the range 0x00 - 0x0F, as in the following example:

```
01:02:03:04:05:06
```

LSCIe02684 Modifying Line Card MIB Objects While the Card is Down

It is not possible to use the Send All operation of the CFG tool to change the administrative status of a card from down to up while simultaneously changing other MIB variables associated with the card.

While the administrative status of a line card is down, no Line Card Control (LCC) process is associated with that card. As a result, certain MIB objects defined for the card are not available to the SNMP agent. When the Send All operation is used to update the configuration of a line card, the SNMP agent rejects some of the SNMP set operations normally forwarded to the LCC process associated with the card. Such rejections cause the overall Send All operation to fail, and the administrative status of the card remains down.

Recommended Action

Step 1 Enable the card by setting the administrative status to active. (Use either the CFG tool or the CLI command **set card** *card#* **active**.) If you use the configurator, make sure that this is the only card parameter that is changed at this time.

Step 2 Download the change in administrative status through the "Send Changes Only" operation.

Step 3 Wait for the card to come up. You may monitor the status of the card through the CLI or via the configure "Verify/Discard" operation.

Step 4 Continue the configuration operation once the card has come up.

LSCIe02686 Value in Chassis Name Field May be Inaccurate

Under certain circumstances, the value displayed in the Chassis Name field of the StreamView CFG tool may be inaccurate. For example, this may happen if a switch icon has been renamed using OpenView facilities, and is then selected in the StreamView topology map, and the configuration tool is started from the Topology map tool (in order to configure the selected switch).

Recommended Action

Use StreamView rather than HP OpenView to rename icons.

Start the configuration tool and select the chassis you wish to configure from the list of switches shown rather than from the topology map.

LSCIe04808 CFG Segmentation Fault When Changing Databases

Under some unusual circumstances CFG may cause segmentation fault when you try to open a new database without saving the current one. The series of events are as follows:

1. From the main window, select file --> Open

2. A dialog box appears prompting you to save changes to the current database, select --> Save

3. When prompted to slect a database to open, select --> Cancel

This is when a sementaion fault may occur.

Recommended Action

Use SAVE or DISCARD buttons to close the dialog box depending upon whether you want to save or discard your changes to the current database

Network Management: The StreamView PVC and VLI Tools

LSCIe00956 StreamView PVC Tool Has No Save As File Menu Item

The PVC and VLI configuration tools do not support a Save As function.

Recommended Action

To create copies of the database, use the Save As option of CFG. Do not copy the .dir and .pag files with UNIX shell commands.

LSCIe00962 Deleted DLCIs May Not Be Reused Prior to Configuration Download

In the Release 2.1 PVC tool, under certain circumstances it is not possible to reuse the data link connection identifier (DLCI) previously assigned to a deleted frame relay circuit, even though the modified configuration has been successfully downloaded to the switch.

Recommended Action

Flush the current in-memory database image maintained by the PVC tool by selecting the Read DB button, then add the new circuit using the deleted DLCI.

LSCIe02872 Use Update: Send All to Update VLI Information

In the StreamView VLI tool, the Update: Send Changes Only operation does not work. The button has been deactivated.

Recommended Action

To update the VLI configuration of a switch, use the Update: Send All operation. This is the only active option.

LSCIe02919 Verify May Report Changes in Default Secondary Scale Value

Following a Verify operation, the StreamView PVC tool may report a difference in the value of the secondary scale factor associated with a PVC, when in fact it is unchanged from the default value. The chassis reports the actual (default) percentage of the maximum rate, but the database reports the internal value as "default."

Recommended Action

If the secondary scale has not been modified, ignore the reported difference. The chassis value is written to the database when you apply the change.

LSCIe02924 Number of Virtual Circuits (VCs) Not Compared to Configured Card Maximum

The StreamView PVC tool does not verify that the number of circuits configured on a port falls within the configured number of circuits (MaxVCs) that may be configured on the port. Configuring a greater number of circuits than the allowed value results in a failure to establish some of the configured circuits when the configuration is downloaded to the switch. The same is true for frame relay circuits and the per-port Max Supported VCs value.

Recommended Action

To help ensure that all circuits configured through a port are set up, the number of circuits configured must not exceed the number of VCs allowed through the card or port.

- For a port operating in frame relay service, the maximum number of circuits which may be configured on a port is set by the value of the frDlcmiMaxSupportedPVCs management information base (MIB) object, which corresponds to the CFG port field Max Supported VCs.

- For a port operating in UNI service, the maximum number of circuits which may be configured on a port is set by the value of the cardMaxVCs MIB object, or the expert mode field Max VCs.

- The aggregate number of circuits on all ports on a card may not exceed the value of the cardMaxVCs MIB object in all service cases.

LSCIe02947 Cancelling a Verify Operation and Executing a Save Operation May Cause PVC to Exit

Under certain circumstances, if you perform the following sequence of actions with the StreamView PVC tool, it may report an internal error and then exit:

1 Start a Verify operation against two switches.

2 Cancel the running Verify operation with the Cancel button.

3 Schedule a download to a switch.

4 Initiate the download by executing the Save operation.

Recommended Action

Avoid cancelling a running Verify operation. If you have cancelled a Verify operation and want to download a configuration next, execute the Read DB operation before starting the download.

LSCIe02855 The Clear Button Does Not Terminate an Update

In the PVC configurator, you select the option to update a node with new information from the database as follows:

1   Enter the appropriate parameters in the 'SendUpdate...Update Time' menubar pulldown menu.

2   Select 'Save' from the 'File' pulldown menu.

Once you do this, the update process (to the node) becomes essentially irrevocable, unless the currently running cfg_a child process is terminated.

- The "cfg_a" child process, which is the independent process that actually performs the node update, can be terminated by using the Unix **ps** command to determine its Process ID number (PID), followed by a Unix **kill** command on that PID number.

Do *not* misconstrue the Clear button on the Update Time Screen as an alternative method by which you can abort a pending node update. The Clear button has no bearing on the process of updating a node configuration from the global database. It is simply used to clear an entry from the scrollable list box of user-defined chassis-pair entries on the 'SendUpdate...Update Time' screen.

LSCIe02857 Default Parameter Values Represented as "Unconfigured"

When a node is updated with a new PVC (particularly a virtual channel identifier (VCI) PVC), with most of the PVC values left blank, accepting default values, subsequent Verify operations may show something like the following:

```
Attribute Differences - Database  /  Switch
---------------------------------------------
Circuit chicago7.4.0,1-chicago7.4.1,1
Source IR/TD           unconfigured  109
Source Insured Burst   unconfigured  128
Source MR/MD           unconfigured  96000
Source Max. Burst      unconfigured  128
Dest. IR/TD            unconfigured  109
Dest. Insured Burst    unconfigured  128
Dest MR/MD             unconfigured  96000
Dest Max. Burst        unconfigured  128
```

The "unconfigured" value under the "Database" column is a reminder that these values were left blank, when the PVC was sent to the node during a SendUpdate operation.

LSCIe02927 StreamView CFG: Deleted Filter Assignments may not be Reassigned

Under highly unusual circumstances, if a filter assignment or a PVC has been deleted from a port, but a download operation has not been performed, it may not be possible to reassign a filter to that port using the same filter ID, or a PVC using the same PVC identifier (DLCI or VCI number).

Recommended Action

In general, there is no need to delete a filter assignment and then reassign the filter. If you wish to modify a filter assignment, you may do so using the filter assignment Edit operation. However, if you do encounter this problem, perform a download after deleting the filter assignment. This allows the filter to be reassigned.

If you must reuse the identifier of a deleted filter assignment or PVC, download the switch configuration before you assign the identifier to a new object of the same type.

LSCIe03080 Verifying PVCs on a node that has no PVCs configured can hang the node's NP

When using the PVC StreamView GUI Tool to verify the state of PVC's on a target node that doesn't have any PVC's defined, it is possible that an SNMP timeout may (incorrectly) occur. This is a result of the excessive amount of time it takes the LS2020 to "walk" through empty PVC MIB tables.

Recommended Action

The problem can usually be ameliorated by defining at least one PVC on the target node (using either PVC StreamView or the CLI) before verifying the state of PVCs.

Network Management: The Command Line Interface (CLI)

LSCIe01068 Rate Statistics for Ports are Inaccurate

The Rate information produced by the CLI when displaying port statistics is not accurate.

Recommended Action

Increasing the interval between displays of the statistics increases the rate accuracy. Very short intervals have a small baseline, so that the brief delay between request and retrieval of statistics can significantly skew results. By waiting 10-20 seconds between display requests, the baseline increases, the delays become less significant (a smaller percentage of the baseline), and the rates become much more accurate.

LSCIe02390 Turning Off tty Output Paging

By default, the LS2020 CLI uses a functional equivalent of the UNIX **more** command to meter multiline terminal output.

Recommended Action

You may disable **more**-style output metering by specifying the **-nomore** switch on the command line when you start the CLI, as follows:

```
LSNode:2# cli -nomore
...
```

LSCIe02634 The CLI May Falsely Report No Filters Defined or No Multicast Groups Defined

Under certain circumstances, such as when a high SNMP processing load is placed on the LS2020 SNMP agent, the LS2020 CLI **show bflt**, **show ipflt**, and **show ipxflt** commands may report that no filters exist, or the **show mcast** command may report that no multicast groups exist. This is due to the CLI failing to receive a response to an SNMP request associated with the command.

Recommended Action

Usually, failure to receive a response to an SNMP request is indicated by a message saying "No response - try again", or "Request timed out". When such a message appears in conjunction with a message that no filters or multicast groups exist, disregard the messages and repeat the **show** command.

LSCIe02658 Multicast Groups: Non-LAN Ports are Accepted as Destination Endpoints by CLI

The Release 2.1 CLI tool permits you to define a multicast group containing one or more destination endpoints which are not local area network (LAN) service (for example, Ethernet or FDDI) ports.

Recommended Action

While it is possible to define a multicast group containing non-LAN ports, the LS2020 signalling and ATM management facilities will not establish a multicast connection branch terminating at a destination port other than a LAN service port. Therefore there is no danger that multicast LAN traffic will be accidentally delivered to a device attached to a frame relay, frame forwarding, ATM UNI, or circuit emulation edge interface.

LSCIe02661 CLI May Fail to Identify MIB Version If Started Too Soon

If, during the course of a node reboot, the CLI is started prematurely, such that certain MIB objects are not yet available because the processes that have registered for them have not completely booted up yet, then it is likely that CLI will display the following error message at start-up time:

```
Unable to determine MIB version...
```

Recommended Action

Exit the CLI and wait until a self-directed ping responds with success before restarting the CLI.

LSCIe02921 The show card Command Does not Differentiate Between T3 and E3 Access Cards

The CLI **show card** display does not distinguish between T3 and E3 rate access cards. The display identifies E3 access cards and ports as of type T3. The correct port type is displayed by the CLI **show port** command.

Recommended Action

To resolve the ambiguity, use the CLI **show port** command to display the status of a port thought to be an E3-rate port.

LSCIe02922 Setting Port Peak Cell Rate

The syntax of the command **set card** *cardno* **peak-cell-rate** *cell-rate* may suggest that one is setting the aggregate rate for all ports on the specified card. In fact, this command sets the per-port peak cell rate for each port on the specified card. The syntax of this command will be made unambiguous in a future release.

LSCIe02952 Delete Filter Operation May Report "Invalid Filter"

Under unusual circumstances, the CLI may report that a filter being deleted is invalid, even though the filter is deleted successfully.

Recommended Action

Use the **show bflt**, **show ipflt**, or **show ipxflt** command to verify that a filter exists and is valid before you delete it. After you delete the filter, use the same command to verify that it has been deleted.

LSCIe04682 CLI Continues to "Request timed out - retrying" Message

Under certain circumstances the SNMP agent (MMA) may not respond to SNMP requests from CLI. If the user issued "set config lock" or "set config unlock" command during this time, CLI will keep trying to execute the command. It will not respond to the input from the keyboard until MMA resumes responding.

Recommended Action

The CLI process must be terminated using the UNIX (LynxOS) kill command.From another window issue a "ps -ax|grep cli" command to find the CLI process ID. To terminate the processs issue a "kill -9 <cli-pid>" command, where cli-pid is the process ID from the ps command. If two or more CLI's are running at the same time it may be difficult to determine which one needs to be killed. You may need to kill all of them.

The CLI can be restarted. Once the MMA resumes responding you can start using the "set config lock" and "set config unlock" commands again.

LSCIe04881 Authentication failure with non-standard mma community

When ^C is typed during a cli session in which a nonstandard mma.community file is used (one which has no "public" and "write" community), the cli reports loss of communications and mma reports access violation even though the community name is valid.

Recommended Action

LightStream comes with a default set of SNMP community names, found in the file /usr/app/base/config/mma.communities. This file allows any IP source address to do snmp gets using the community name "public" and sets using the community name "write". If operators wish to use community names other than those defaults, the mma.communities file must be modified to utilize the new community names, and the mma process must be reset to reread the new mma.communities file, using the command "kill -hup <mmapid>". <mmapid> can be obtained by "ps ax | grep mma". The PID in the first field is the mma PID.

The default mma.community names allow access from any host IP address by specifying the special IP address 0.0.0.0. In order to restrict SNMP access to other LightStream chassis, or specific hosts such as NMS workstations, the mma.communities file must contain:

1. a common selected community name for all hosts in the communications group, together with the local loopback IP address 127.0.0.1 and access permission

2. community name with the local host LAN IP address

3. community name with each remote LAN IP address

4. community name with each remote Switch IP address from which SNMP gets or sets will be done.

For example:

ingroup 127.0.0.1 write   #Loopback address

ingroup 172.27.42.12 write   #Local LAN address

ingroup 172.27.42.15 write   #Remote node1 LAN address

ingroup 172.27.210.15 write   #Remote node1 switch address

ingroup 172.27.42.16 write   #Remote node2 LAN address

ingroup 172.27.210.16 write   #Remote node2 switch address

ingroup 171.69.204.53 write   #Remote NMS workstation address

Separate read access community names will have to follow the same requirements.

Network Management: The LightStream Topology Map

LSCIe02044 Adding Switches to an Existing Topology Map Domain

The StreamView topology map tool may not allow you to add a LS2020 switch to an existing LS2020 domain.

Recommended Action

To include a switch in a domain, you must recreate the domain. Delete the original domain, then select all icons desired for the domain (including the switch that is to be added), and recreate the domain.

LSCIe04558 Large Output Queue Length Indicator Trips in the Topology Map Tool

The LS2020 topology map application performs a vaildation of ifoutQlen and reports errors if its value is beyond legal limits. For the LSC trunk. OC3, and 4port/8 port T3/E3 cards it may report errors erroneously.

Recommended Action

Any error reports with ifoutQlen values less thatn 100 should be ignored.

Network Management: Other

LSCIe01083 Use HP OpenView Release 3.3 or Later

Use HP OpenView Release 3.3 or later to manage your LS2020 network.

If you are using HP OpenView to manage your LS2020 network, it is strongly recommended that you use Version 3.3 or greater in order to avoid certain problems with the tool which may have an adverse effect on LS2020 simple network management protocol (SNMP) agent and system performance. Before Release 3.3, HP OpenView formats SNMP requests into a single buffer which can exceed the SNMP maximum of 484 bytes if a data collection has more than 20 variables.

Recommended Action

If you have HPOV Release 3.2 or earlier, when you set up data collection using HP OpenView, limit the size of collections to less than 20 variables.

LSCIe01141/LSCIe01540 Stopping an Unwanted Download

No function is currently provided to stop a long download.

Recommended Action

It is possible to abort downloads with the SunOS **kill** command. Log in as root to the network management system (NMS) station and use the command **ps ax** to find the process ID (PID) of each cfg_a process. Do not kill the cfg_a process with the lowest PID, it is the parent cfg_a process. Any cfg_a process with a higher PID is a child process, which you may kill. If more than one download is in process, they can be distinguished only by remembering the order in which the downloads were invoked (one with a lower PID was invoked earlier, and one with a higher PID was invoked later). However, even when the correct process is killed the results can be unpredictable, because some part of the configuration might have been downloaded and some not. It may be better to wait for a download to terminate normally.

LSCIe01355 Specify Valid UNIX File Names With File Operations

Under certain circumstances while using the StreamView Save As operation, it may be possible to specify strings containing white space and nonprintable characters as file names.

While such file name strings may be accepted by the tools, they do not form valid UNIX file names. Creation of files so named may fail, or files so named may be difficult to manipulate later using standard UNIX mechanisms.

Recommended Action

When working with the StreamView tool set, do not use white space characters, non-printing characters, or control characters in file names.

LSCIe02025 Prompt to Save Changes Displayed Prior to Exit

Under certain circumstances, after you have asked to exit the StreamView Configuration tool, it displays a dialog box inquiring whether you wish to save changes to the database, even when no changes have been made to the database since the last save.

Recommended Action

If you are certain that no changes have been made since the last save operation, you may provide a negative response to the prompt. However, saving the database again is harmless.

LSCIe02715 Network Management Station May be Attached to a PLC Port

Network operations on the LS2020 NP are available from three connection sources:

- The test and control system (TCS) modem and console ports

- The NP Ethernet port

- A port on a packet line card (PLC)

Connections through TCS and the NP Ethernet port are well described in the documentation for this release. Connection through a PLC port is not.

Recommended Action

An NMS connected to a port on a PLC is able to connect to an NP in the network if two configuration tasks are performed:

Step 1   Configure the IP address of the NM workstation.

Step 2   Enable the NP Traffic Filter on that port to forward connection requests to the NP.

The IP address of the NMS must be configured with a unique host number on the same network as the LS2020 Chassis IP network. For instance, if the Chassis IP address in an LS2020 network is configured as network address 123.45.6.0, the NMS must also have 123.45.6.0 as the network portion of its IP address. Secondly, if host addresses 1–10 are configured for Primary and Secondary NP Chassis IP addresses in the LS2020 network, the NMS must be configured with a host address other than in the range 1–10, for example, 123.45.6.11.

The default configuration of each PLC port in this release is to block all traffic intended for an NP. The LS2020 private MIB variable that defines the action (forward or block) for PLC port traffic with an NP as its destination is lsLanPortNpTrafficFilter. The values to which this variable can be set are 1 (forward) and 2 (block). This release provides two ways of setting lsLanPortNpTrafficFilter:

- By using the CLI **set port** *c.p* **npdeliver** command

- By configuring and downloading the port attribute "forward" from StreamView

Use the following CLI command to set port 1 of Ethernet card 6 to forward received traffic destined for an NP in the network:

```
cli> set config lock
cli> set port 6.1 np-deliver forward
cli> set config unlock
```

Use the following CLI command to set that port to block the same traffic:

```
cli> set config lock
cli> set port 6.1 np-deliver block
cli> set config unlock
```

The StreamView **cfg** program can also be used to control whether a PLC port forwards or blocks traffic destined for an NP. In the Port Configuration window, configure the NP Traffic parameter by selecting either the Forward or Block button, and then saving the configuration.

LSCle02769 No ifPhysAddress Object from ifTable Entry for NP Interfaces

The instance of the ifTable for the Network Processor (NP) does not provide an instance of the ifPhysAddress object.

Recommended Action

LSCle01802 UNIX DBM Used for Configuration Database

A cosmetic problem appears to make a database appear larger than it is. The disk space used by the database files is much smaller. Some UNIX utilities (e.g. cp, ls-l) get confused and do not work properly.

Recommended Action

Use the "Save as" feature of CFG to copy a database file. Use the "Compress" feaure of the CFG to compress the database before you tar it to the tape.

Other

Loss of Carriage Return or Echo

A terminal may lose carriage return or echo functionality.

Recommended Action

Execute the bash **tset** command to restore the lost property. Do this by entering the **tset** command at the bash prompt and pressing Return. Note that when you enter the command, the text does not appear on the screen.

Out of Range Bit Rates Permitted on Low-Speed Cards (LS1)

With the **set port** *c.p* **dte-bitrate** command, values as high as 6,000,000 bps are available, but values over 3,840,000 bps are not supported on LS1 cards.

Recommended Action

Do not set rates higher than 3.84-Mbps per port on LS1 cards. With the **set port** *c.p* **dce-bitrate** command, the values 4000 and 5376 (Kbits) are available but not supported. Rates higher than 3.84-Mbps per port may work for large packets.

No Error Checking with setsnmp

The CLI **setsnmp** command allows you to directly modify variables in the MIB. However, this command does not validate its arguments and does not prevent you from setting a MIB variable to an inappropriate value.

Recommended Action

The preferred approach is to use high-level CLI **set** commands to change MIB variables and avoid **setsnmp** unless specifically instructed otherwise. These commands give the CLI enough context to validate the new value for the variable before changing the MIB.

LSCle00404 FDDI PATH Configuration Table is Not Supported

The RFC 1512 fddimibPATHConfigTable MIB object is not implemented.

LSCle00711 Periodic rdist to the Secondary NP Does not Check for Available Disk Space

On a redundant NP system, an automatic mechanism updates software and configuration information from the current primary NP to the current secondary NP. If the current secondary NP runs out of disk space, the secondary NP is not kept consistent with the primary NP.

Recommended Action

Establish a regular maintenance procedure of checking disk space availability on both NPs.

LSCle00720 FDDI Path Test Feature is Not Supported

The command **set port** *c*.*p* **fddi smt station path test** has no effect.

LSCle00961 Cannot Connect to Backup NP in Diagnostic Mode

You cannot load NP diagnostics and then connect to the backup NP.

Recommended Action

Use the CLI **test** command to run network processor (NP) diagnostics. The **test** command may be used on any card except the active NP. (The command **test -m** is not supported on the backup NP.)

LSCle01044 STP - External Bridge Loops and LS2020 VLI Functionality

The presence of external bridge loops may result in loss of LS2020 VLI functionality.

Recommended Action

When configuring LS2020 switches with external topology loops, configure the bridge priority for the switches such that one of them will become the spanning tree root.

LSCle01318 OC-3 Card Continuously Bounced When Connected to SONET MUX

When an OC-3c port was connected to a SONET multiplexor with internal clocking the connection continuously bounced.

Recommended Action

When connecting an OC-3c port configured for internal clocking to a SONET multiplexor, a clocking type of external for the LS2020 port should normally be used (rather than the default of internal). Use of internal clocking may prevent the port from operating correctly.

LSCIe02174 - Loopback - ATM-UNI Status Wrongly Reported Up

When set to remote loopback, the correct operational status for an ATM UNI port should be DOWN, but the reported status is UP. This is because the operational status of the ATM UNI interface does not take into account the physical layer indications.

LSCIe02211 DSX1 Statistics Tables Not Implemented

The current, interval, and total tables of the DSX1 MIB (RFC 1406) are not supported for CEMAC cards in Release 2.1.

LSCIe02228 - Old cardMaxVCs Value is Retained After Card Swap

The cardMaxVCs parameter applies to the card slot. As a result, when a card of one type replaces a card of another type, the value of cardMaxVCs set for the first card may be inappropriate for its replacement.

Recommended Action

When you replace a card with a card of another type, verify that the value set in cardMaxVCs is appropriate for the new card type, and change it if necessary. From the CFG tool, delete the original card type and add the new type. Use the Sendupdate Changes only operation to send the new configuration to the chassis.

LSCIe02656 IP Filtering Not Supported for 802.3 (SNAP) Encapsulated IP Frames

Custom filters do not work for 802.3 encapsulated IP frames.

Recommended Action

Do not attempt to filter 802.3 (SNAP) encapsulated IP frames.

LSCIe02709 dot1dStpPortEnable Not Set When LAN Port is Down

When a LAN port is operationally down (unplugged), attempts to set the dot1dStpPortEnable object for the port appear to succeed but in fact have no affect.

Recommended Action

Do not attempt to set the dot1dStpPortEnable object when a LAN port is operationally down.

Platform

LSCIe01719 No indication that flow not started on FR PVS

The PVC appears to be up when setting up a frame relay PVC across two ports.

Recommended Action

If you suspect that data is blocked on a PVC, but e4h PVC displays as being active, check the local and remote LMI status. The LMI status must be active for data flow to be enabled. This feature can be disabled using the "FrProvMi Compliance" MIB variable.

LSCIe01924 Phantom packets created on Internetworking cards

The line card appeared to be sending packets to the NPs unrecognized VCs for multiple ports although these ports were either disconnected or connected to a repeater with no other devices.

Recommended Action

LSCIe02904 Cards which are down are reported as up

When available memory is low, cards fail to reload, however card status is reported as up.

Recommended Action

This cn be caused by the following three known factors:

1 The number of VCs allocated through card MaxVCs can use too much memory.

2 Too many CLI processes may be running. It is receommended that CLI be run remotely when memory is low.

3 There may be too many users logged in.

LSCIe03048 System reboots - leaves no trace of why

If the system reboots, it displays the reason for the reboot on the console port. If these messages are not saved, there is no other way to determine what happened.

Recommended Action

Set up a device to capture the messages displayed to the console port.

LSCIe03098 Non-operational, non-LAN edge ports reported as operational

Non-operational, non-LAN edge ports reported as operational.

Recommended Action

If an edge port is not a LAN port, note the following three things about it:

1 For the card on which the port resides, all output in the "Oper Stat" column output by the cli command "show card" might be wrong and should be ignored.

2 The "Oper Status:" output by the cli command "show port" might be wrong and should be ignored.

3 The MIB object ifOperStatus for that port might contain an incorrect value and should be ignored.

LSCIe03101 Getsnmp displays some values as strange characters instead of a hex number

Walking the dot1dTpFdpAddress mib variable will produce some garbage values. These garbage values are for addresses not in use by the system.

LSCIe04433 TCS race condition - reset followed by status

When issuing "set card 7 active" the TCS slave is reset and does not respond to TCS messages, requests until fully initialized.

Recommended Action

Retry.

LSCIe04474 leafgen or trunk lcc consumes all mbuffs, resulting in system halt

The system has run out of mbufs. When ndd notices this condition, it forces the TCS watchdog NMI to reset the NP.

LSCIe04553 Erroneous trap may cause LCs to be reloaded unnecessarily

There are confusing errors during swchgvr. Trap NPTMM_9 is sometimes reported because the switch application tries to load software onto the line card while its flash is being updated by swchgvr. The following trap may be issued:

```
(OPER) NPTMM_9 at 04/05/96 17:18:38 CST (04/05/96 23:18:38 GMT)
Card 3 Download Failed More Than 2 Times; New Download Is Not Initiated
```

Recommended Action

Ignore this trap during the swchgvr procedure.

LSCIe04574 swchgver drops into the kernel debugger

Issuing "swchgver 2.0.8 -noflashupdate -nolinecardreset" on the primary NP of sqat45 (redundant configuration), caused the NP to crash and drop into the kernel debugger.

Recommended Action

LSCIe04644 CA delayed after "best effort" buffer is filled

Sometimes the congestion avoidance mechanism can take several minutes to allow excess traffic to be admitted following extended periods of congestion.

LSCIe04692 Large pastes to telnetd (with no carriage return) hangs system

Large pastes to a telnet session put the LS2020 into a state where simple commands issued anywhere will hang.

Recommended Action

Logging out of the telnet session may eliminate this situation.

LSCIe04704 GIDD consumes all mbufs, resulting in system halt

There is a design limitation on the LS2020 when running certain applications.

Recommended Action

To avoid this situation, you should consult the LAN Design Guide on the web.

Note We understand this behavior and are currently working to resolve this special consideration in a future release.

LSCle04734 LMI dropping on LSC, returns after 90 seconds

> **Recommended Action**

LSCle04754 Defining the snapProto filter to a port does not provide the expected results

> When setting the snapProto filter to a port, packets could not be transmitted because the snapProto is different than the packet sent.

> **Recommended Action**

LSCle04755 SWUD failure on FDDI card - 8000 flows, single card

> There is a design limitation on the LS2020 when running certain applications.

> **Recommended Action**

> To avoid this situation, you should consult the LAN Design Guide on the web.

> **Note** We understand this behavior and are currently working to resolve this special consideration in a future release.

LSCle04769 ERROR [ndd. 72] : ERMP channel - when timing out MAX or flows

> The LS2020 Ethernet card crashed when microhubs are dual attached.

> **Recommended Action**

> To avoid this situation, you should consult the LAN Design Guide on the web.

> **Note** We understand this behavior and are currently working to resolve this special consideration in a future release.

LSCle04811 Inefficient use of available resources

> If a trunk reaches the limit imposed on it by card MaxVC, it continues to advertise its available bandwidth. This can cause VCs to be attempted across the trunk, but consistently fail.

> **Recommended Action**

> Reduce the amont of data bandwidth available to that trunk so that no bandwidth will be advertised.

LSCle04807 lan port multicast/bflt assignments deleted from the database after reboot

> Currently under continued investigation is a problem that could cause filter assignments to be erased from the mma database during system initialization. Configurations which include a high number of ecc_lan processes (4FDDI cards) in conjuncture with multiple lcc processes (OC-3 trunk cards) could possibly lose filter associations to ecc_lan ports.

Recommended Action

The current workaround involves the creation of a cli script that should be executed once all of the cards have been activated with ports enabled. The cli script should contain the asssignment of the defined filters to the targeted card/port. Execution of this script will guarantee the associateion of all filters with targeted ports.

LSCIe04856 LSC port goes up and down during data testing

Recommended Action

Resource Allocation

LSCIe01369, Restrict MIB Variable Polling to 20 per Second or Less

The rate at which the LS2020 SNMP agent processes SNMP requests is currently limited to approximately 20 requests per second. For optimum system and SNMP monitoring performance, you should seek to limit the rate at which SNMP requests are delivered to the agent to 20 requests per second or less.

Note that SNMP requests may be originated by an external NM System (such as HP OpenView), the StreamView tool set, the LS2020 CLI, and the LS2020 collector utility.

The NP software does not throttle excess traffic from external SNMP devices. This can consume CPU resources and can cause spanning tree timeouts and other timeouts, degrading system performance. When this happens, you must reduce the SNMP traffic from the external device.

Recommended Action

To reduce the SNMP request rate, you might reduce the number of variables being tracked, increase the polling interval, reduce the number of concurrent network management processes that are requesting data, or delete unused collections defined and running on the switch.

LSCIe01701 PVC Setup can Deadlock when Resources Do Not Allow Creation of All Configured PVCs

In Release 2.1, PVCs are implemented as two unidirectional circuits, rather than as a single bi-directional circuit. The LS2020 at each end of the circuit establishes the transmit circuit for the PVC from its end.

In a situation where there is insufficient bandwidth between two nodes it is possible for several PVCs to get stuck in a half-open state. For example, suppose there is sufficient bandwidth between LS2020 A and LS2020 B to support one PVC (PVC 1 or PVC 2, but not both). It could happen that PVC 1 between A and B has its A-to-B circuit established, but not its B-to-A circuit, and that PVC 2 has its B-to-A circuit established, but not its A-to-B circuit. PVC 1 and 2 will stay in this state indefinitely because there is insufficient bandwidth between A and B to support the additional unidirectional circuits required to fully establish PVC 1 and PVC 2.

This does not occur in a network with sufficient capacity to support the PVCs configured for it. However, it could become a problem if trunks fail, so that existing PVCs need to be re-routed, and there is insufficient trunk bandwidth in the trunk-reduced network to support all of the PVCs.

Recommended Action

To recover from this state to the point that the trunk-reduced network supports the PVCs capacity permits (as opposed to far fewer, due bandwidth wasted by half-open circuits), do the following: make a priority list of PVCs, and temporarily disable low-priority PVCs. After the high-priority PVCs have been reestablished, re-enable the low priority ones. When the failed trunks are restored and lost network capacity is recovered, the LS2020s will reestablish the remaining low-priority PVCs.

Traps

LSCIe02530 - No Trap for Invalid Receive Clock

The T3 access card does not send traps to report that it has an invalid receive clock.

LSCIe02638 Trap nptmm_2010 Reported When Line Card is Removed or Reset

Whenever a board is removed or reset the following benign INFO trap may be reported:

```
(INFO) NPTMM_2010 at <local date time> (<GMT date time>)
     ERROR: Slot <n> TCS Action Register 23
     Read Error (UNIX error 15: Address fault detected)
```

Recommended Action

Ignore this trap.

LSCIe03174

While running swchgver, if Flash memory on a line card requires an upgrade, the swchgver program brings the line card down to load Flash. While the line card is down, a trap similar to the following one may appear:

```
==> (OPER) NPTMM_9 at 12/04/95 14:13:50 CST (12/04/95 20:13:50 GMT)
Card 6 Download Failed More Than 2 Times; New Download Is Not Initiated
```

This trap appears because the ND process detects that the card is down and attempts to reload it. The ND process issues the trap if it tries and fails to load the card twice before the Flash upgrade is complete and the card comes back up. After the Flash upgrade is complete and the card comes back up, the card is reloaded.

Recommended Action

Ignore this trap.

Operator snmp Trap

The ecc_lan process indicates a failure to initialize the ATMM subsystem because of a lack of memory resources. The card type can be either Ethernet or FDDI. The slot is controlled by the reporting ecc_lan process.

Recommended Action

Increase memory resources when initializing the ATMM subsystem.

Resolved Problems

This section summarizes problems fixed in Release 2.1(1.91)

Installation, Upgrade, and Initial Configuration

LSCle00645	Ckswinstall utility can give false errors
LSCle02646	swinstall needs free memory
LSCle02871	"Executable file in use" Failure of the swchgver Utility on Dual NP Systems
LSCle02874	running the ttrunkconfig.cli CLI script

Firmware

LSCle02875	Cannot load switch flash into SB.
LSCle-3046	Flash problems on 4 different cards - flash erased
LSCle03210	Large number of OAM cells cause card to crash

Hardware

LSCle01098	lstb7 crashed - watchdog fired - nd core dumped
LSCle01539	MS1-CP and E3-PLCP cards wrongly report a receive error rate
LSCle01956	DS3 UNI rate enforcement is not precise

Internetworking

LSCle02703	FDDI traffic stopping - line card in a stuck state
LSCle03244	Ethernet card goes into an inaccessible state while test is running
LSCle03936	Too slow while responding for Keyboard inputs and comma
LSCle04078	FDDI cards crash (ermp 0x401) after pps reduced from 100K to 0.
LSCle04121	No packets forwarded after stations switch ports - fddis crash
LSCle04224	Ethernet card crashes while building many flows
LSCle04276	IOS HSRP fails if routers are connected through 2020 FDDI
LSCle04911	Enhancement to allow Hot Standby Routing Protocol (HSRP) to operate on redundant FDDI ports

Network Management

LSCle01791	HPOV data collection shows NP, causes link up/down in network staging LynxOS 2.1
LSCle01792	"Save" causes spurious "Waiting for download to complete" dialog SunOS 4.1

LSCle02020	Database locking scheme is inadequate SunOS 4.1
LSCle02225	Default max vcs for 8t3 trunk card is too low. LynxOS 2.1
LSCle02483	Avoid storing database files in the /tmp directory
LSCle02526	Cannot perform a download to more than one chassis at a time LynxOS 2.1
LSCle02657	LS2020 domain icon is hard to find
LSCle02705	When multiple PVCs are deleted getting dialog box that they are not SunOS 4.1
LSCle02880	Card params are not resent
LSCle02941	StreamView PC tool send updat e command causes the SunOS to crash
LSCle02943	E3 framing cannot be changed from G.804
LSCle02997	FDDI filter may include Ethernet frames
LSCle03032	Memory problem with set nettime command
LSCle03049	lstb8 config ccache loop causes mma infinite loop and watchdog reboot LynxOS 2.1
LSCle03099	PVC tool ignores snmp timeout/retry settings
LSCle03109	Too many CLI sessions running
LSCle03142	StreamView tools usually crash on start-up on monochrome X terminal SunOS 4.1
*LSCle03259	Opening a ndw database on Solaris locks up the workstation
*LSCle03260	Clicking multi groups or assign filter buttons on Solaris causes crash
*LSCle03268	Attempting to delete group member is causing crash on Solaris 2
*LSCle03276	Saving a database file on HPUX hangs the node configurator
*LSCle03292	In vli, running verify on port never comes back
*LSCle03322	cfg_a core dumping
LSCle03327	Editing a defined bridge filter causes seg fault
LSCle03329	cfg_a causing cfg to core dump
LSCle03538	Set config lock; lose part of cfg data when reboot NP LynxOS 2.1
LSCle03648	cfg doesn't use hourglass cursor when it should. SunOS 4.1
LSCle03734	mma.communities file; no public line; can't see MIB vars LynxOS 2.1
LSCle03840	Database conversion tool outputs an abnormally large converted database SunOS 4.1
LSCle04018	Set config lock stopping VCI creating, CLI reports general error LynxOS 2.1
LSCle04027	Need public 0.0.0.0 read in mma.communities in R2.1.1 LynxOS 2.1
LSCle04064	After reboot CLI fails to show card specific data LynxOS 2.1
LSCle04119	Cannot open and convert a 2.1.0 database with StreamView 2.1.1 SunOS 4.1
LSCle04205	MMA crashed when a disable Ethernet card was done from TCS hub LynxOS 2.1
LSCle04277	Setting LSCcard inactive/active causes NP reset LynxOS 2.1
LSCle04400	Showing incorrect peak-port cell rate for E3 trunk card in CFG GUI tool SunOS 4.1
LSCle04407	CiscoView requires PDUs larger than 484 octets. LynxOS 2.1
LSCle04423	All ports on lsc trunk go down, have to reset card
LSCle04432	CLI tells "lost network communications" on only sqatb13. LynxOS 2.1
LSCle04463	Segmentation fault. LynxOS 2.1
LSCle04486	CLI gives segmentation fault (core dumped) when when viewing port info of FDDI SunOS 4.1
LSCle04505	CLI crash on start-upn if in write protected directory SunOS 4.1

LSCle04557	Allows more than 2 CLIs, card doesn't come up, not enough memory
LSCle04585	NetTime dialog, attempt to add port clock yields XVT error SunOS 4.1
LSCle04696	set snmp hostname from one node to another fails

Network Management - Solaris and/or HP-UX

Other

LSCle00038	Defective floppy may cause tar process to hang
LSCle01560	Console messages regarding NP Ethernet port
LSCle04764	Frame forwarding service is unable to come up SNA/SDLC IBM AS400

Platform

LSCle00825	NP crash, due to "panic: kernel protection fault"
LSCle01011	Not robust under stress of resource shortage
LSCle01325	lstb5 crashed due to NMI watchdog reset
LSCle02428	NPCA_1006 - Unexpected ATMM - Edge Indication Event
LSCle02341	Apparent failure of NPs switch transmit path
LSCle02415	OC3 card crashed during circuit rerouting
LSCle02671	lstb5 crashed - out of mbufs
LSCle02712	lstb5 crashed - switch up/down failure on NPs own slot
LSCle02735	NP hard crash, tight loop, for unknown reason
LSCle02797	Long atmm paths cause the lcc to core dump
LSCle02864	Line card control process exited unexpectedly
LSCle02866	tb8 crashed into kernel debugger during installation
LSCle02937	Cell payload scrambling must be enabled for OC3 interfaces
LSCle02975	Reboot - NP claiming to be primary after reboot
LSCle02976	ndud_src.h switch up/down fails on own slot
LSCle03064	Node database lost during trunk rerouting
LSCle03110	There is no mechanism to limit card MaxVCs < 4000 per system
LSCle03145	lstb5 crashed due to TCS NMI
LSCle03198	System crash: switch card crashed on lstb4
LSCle03201	Rebooting a node lstb4 doesn't come back to multiuser
LSCle03211	System crashed during circuit rerouting
LSCle03239	Lynx kernel switch drivers do not compile
LSCle03601	6 systems do not load flash during swchgver
LSCle03602	gid exits unexpectedly exits, cards go down, system reboots

LSCle03661	sqadt24 with ~3200 VCs - not enough memory to run CLI
LSCle03678	LCC process crashes on Plc1 (8-sac is access) when Frm_rly test starts
LSCle03738	cpumon has % utilization of ~97% for over an hour
LSCle03829	STP move B->F moved 4000 flows between LS2020s
LSCle03903	8SAC drops 50% of 3Mbps load with clock rate of 6Mbps
LSCle03905	NP lost Vpp/Vcc, cured by power cycling the node (SJ)
LSCle04039	Observed that a port could not lock in frequency to its PLC/Ethernet keeps rebooting
LSCle04057	1 line card crashing in sqadt11
LSCle04234	ndd FATAL ERROR: Eciting after switch up/down failure
LSCle04313	VCC core dumps after trunk up/down problem on backup NP
LSCle04324	PLC/Ethernet keeps rebooting
LSCle04325	Primary goes down, backup cuts over and vcc core dumps
LSCle04807	lan port mcast/bflt assignments deleted from database after reboot

Resource Allocation

LSCle02399	Cell packing factor and LAN traffic profile bandwidth settings
LSCle02757	No more than 512 traffic filters supported
LSCle02864	LCC process may exit if there is insufficient memory
LSCle02860	Limitation of size of multicast groups

Traps

LSCle02913	Trap indicates possible card malfunction

This section summarizes problems fixed in Release 2.1(1.3)

LSCle04507	Bandwidth not freed for multicast traffic if destination port refuses connection

This section summarizes problems fixed in Release 2.1(1.2)

LSCle02538	ecc_fddi doCreateFalow: atmmCreateFlow failed -- No flow resources
LSCle02913	MS1 card crashed during weekend load test.
LSCle03296	system reboots: ermp: ignore_event() for rmc
LSCle03537	fddi card up/down;pgetframelength() in a do loop; fddi smt/sif fram
LSCle03681	With Proxy Arp disabled, NP cannot ping to devices attached to the external network.
LSCle03737	With bad switch card, *Switch A* did not cut over to *Switch B*
LSCle03770	fddi card crash on lstb5

LSCle03810	Small fddi packets can crash card while creating flows
LSCle03940	FDDI card restart due to infinite loop; attempting to free an SMT buffer
LSCle03988	FDDI card CP_HUNG, Stuck in module GetConnectedResources
LSCle04099	NPCC hung in semaphore lock
LSCle04134	FDDI Card experiences spurious level 1 interrupts
LSCle04168	LSC cards drop CLP cells when over subscribing the trunk
LSCle04231	gdb enable causes line card crash
LSCle04316	8SAC trunking does not work with RS-449 and X.21 physical interfaces
LSCle04339	E3 card clock rate violates spec which requires 20ppm from norm
LSCle04347	MA bits set to 000 instead of 010 for ATM (E3/G832)
LSCle04390	Enhancement Request to handle hard flow limit of 10,000 per chassis
LSCle04431	A race in closing causes either a crash or hang of NP

This section summarizes problems fixed in Release 2.1(1.1) and in Release 2.1.1

LSCle02854	FDDI card crashes when flooded with illegal broadcast source address
LSCle03015	Multicast test failed due to b/w problem at destination port
LSCle03138	Broadcast Rate Limit worked in Release 2.0.9 but is broken in Release 2.1
LSCle03162	Ethernet ports go down periodically (2 ports)
LSCle03224	Need the ability to turn off the proxy ARP feature
LSCle03236	Links to mma.trap_communities and mma.communities are not installed by Freshdisk procedure
LSCle03237	Cannot configure IR<MR on port 1 of 4-Port T3 Card - causes CP crash
LSCle03282	IP to mac cache, 5 min arp timeout, broadcast all ports, despite wgrp
LSCle03313	Max flows of 1200 per card are not enough
LSCle03363	Customer request: filter action to drop but not block
LSCle03463	ECC abnormal exit leaves flows queued, restarted ECC does not clean up
LSCle03492	Hangdumpter CP crash on FDDI SIF frame processing
LSCle03525	The backup NP becomes isolated after swchgver to another 2.1.1 version
LSCle03554	Hangdumper stack trace needs to be improved

LSCle00255	Service Time screen timestamps time reduced by 1 sec each reload
LSCle00283	MONITOR does not provide online help
LSCle01393	Allocated bandwidth totals not checked for card ports
LSCle01550	Call Setup retry Period and Call Setup Backoff Adj. missing
LSCle01801	Network Processor intermittently loses its name, IP addresses, and IP routing information.
LSCle01808	NDD unnecessarily slows down system startup
LSCle01959	Verify reports DB-deleted filter/tprof/multicast as existing
LSCle02508	Need to have a trap indicating that operator set a port inactive
LSCle02537	No help for spanning tree parameters
LSCle02551	CFG should issue message when SAVE target is different from LSC_DATABASE

LSCle02552	CFG_A should indicate name of database (& mod. time), when it downloads
LSCle02641	B46423 Solaris 2 (SunOS 5.3) cfg fails immediately
LSCle02648	INSTALL: Flash validation gives bogus traps during post-2.1.0 installs
LSCle02666	LS2020 FDDI drops some packets from rings with isolated JK symbols
LSCle02687	cbrpvc circuits do not display correctly when the cli cannot find node
LSCle02706	Platform has asked for another re-design of T3/E3 port dialogue boxes
LSCle02737	cfg not enforcing 512 filter per node limit
LSCle02790	System FLASH programming enhancements
LSCle02820	Cannot verify PVC set up origin and dest. on same port, sme vci#
LSCle02837	Chassis ID displayed in hex rather than decimal format
LSCle02870	Rename chassis and sendupdate changes only does not send sysName
LSCle02877	Flash load failures need to be more pronounced.
LSCle02894	OVSNMP_CONF_FILE specified incorrectly in dialog box
LSCle02901	Reporting SWC AC over temperature limit
LSCle02906	Flash load interrupted; could not reload; had to be floaded
LSCle02918	CLC card crashed during cutover from sw-b to sw-a.
LSCle02926	FDDI card crashed during circuit reroute testing.
LSCle02965	cfg_a: "send all" does not send cardMaxVCs for T3 Edge card
LSCle02973	Interrupting data flow on one CEMAC port causes all other ports on that card to stream 1s
LSCle02980	E3 type cards, after the first port, not always verified correctly
LSCle02987	4/8T3AC data loopback tests failed intermittently.
LSCle03184	NPP multicast circuits not built to backup NP.

Appendix A: Hardware Compatibility Table

The following table specifies the minimum hardware revision levels required by this version of the LightStream 2020 software. The part number and revision level can be found on each piece of hardware. You can also learn them by using the bash command **sysver -a**. Information in this table is subject to change; for further information, contact Cisco customer support.

Part Number	Previous Part Number	Description	Minimum Revision
73-1430-01	2121973G01	Midplane	P01
73-1430-04	N/A	Midplane 2	A0
73-1449-01	2123864G01	Release 2 switch card	F
73-1428-01	2121701G01	Network processor	K
73-1428-02	2121701G01	Network processor	A0
73-1431-01	2121992G01	Network processor access card	PB
73-1432-01	2122002G01	Low-speed line card	G (must have rev I if TCS slave is less than rev C0)
73-1433-01	2122007G01	Low-speed access card	C

Part Number	Previous Part Number	Description	Minimum Revision
800-00408-01	2222718G01	V.35 fantail (for low-speed or serial cards)	P01
800-00408-02	N/A	V.35 fantail (for low-speed or serial cards)	A0
800-00410-01	2222807G01	RS-449 fantail (for low-speed or serial cards)	P01
800-00410-02	N/A	RS-449 fantail (for low-speed or serial cards)	A0
800-00414-01	2223856G01	X.21 fantail (for low-speed or serial cards)	A
73-1434-01	2122009G01	Medium-speed line card	I
73-1560-01	N/A	Medium-speed line card 2	A
N/A	2122012G01	T3 medium-speed access card	A
N/A	2122012G02	E3 medium-speed access card	B
73-1438-01	2123258G01	T3 medium-speed access card	A
73-1439-01	2123258G02	E3 PLCP medium-speed access card	03
73-1440-01	2123258G03	E3 G.804 medium-speed access card	B
73-1437-01	2123086G01	Packet line card	E (F if CEMAC installed)
73-1437-02	N/A	Packet line card	H0
73-1450-01	2123988G01	Ethernet access card	B
73-1452-01	2124055G01	FDDI access card	C
73-1452-02	N/A	FDDI access card	A0
73-1441-01	2123263G01	Cell line card, 2 TSUs (for 2-port OC3AC)	G
73-1442-01	2123263G02	Cell line card, 1 TSU (for 1-port OC3AC)	C
73-1443-02	2123864G01	8-port T3 access card	A0
73-1444-01	2123265G01	Single-mode, 2-port OC-3c access card	D
73-1445-01	2123265G02	Multimode, 2-port OC3 access card	C
73-1446-01	2123265G03	Single-mode, 1-port OC3 access card	A
73-1447-01	2123265G04	Multimode, 1-port OC3 access card	A
73-1451-01	2124026G01	8-port serial access card	A0
73-1451-02	N/A	8-port serial access card	A0
73-1459-01	2170057G01	T1 circuit emulation access card	B
73-1460-02	N/A	E1 circuit emulation access card	A0
73-1465-01	N/A	8-port fiber ethernet access card	A0
73-1528-01	N/A	8-port E3 access card	A0
73-1529-02	N/A	4-port E3 access card	A0
73-1555-02	N/A	4-port T3 access card	A0
73-1680-01	N/A	Packet line card	A0
800-00463-01	N/A	E1 BNC fantail	A0
800-00551-01	N/A	E1 SMZ fantail	A0

Appendix B: Flash Memory Image Checksum Values

Every time you install a card in a slot of the system, you must verify that it has the correct Flash memory checksum, and upgrade Flash if necessary. The procedure for doing this is given in the *LightStream 2020 Hardware Reference and Troubleshooting Guide*. Use the bash command **sysver -a|more** to display Flash checksums. The checksums for this new release are as follows:

If the Flash checksum is 0x5B13 for a Release 2 switch card, or 0x50CA for a Release 1 switch card, then the specified switch card already has the latest Flash image.

```
Network Processor:       Flash Image Checksum:  0xF682
Switch Card 1:           Flash Image Checksum:  0x50CA
Switch Card 2:           Flash Image Checksum:  0x5B13
Low Speed Card:          Flash Image Checksum:  0x08AC
Medium Speed Card:       Flash Image Checksum:  0x6120
Packet Line Card:        Flash Image Checksum:  0x1E11
Cell Line Card:          Flash Image Checksum:  0x9F08
```

Appendix C: Software Diagnostic Versions

The following diagnostic versions are used in this release.

```
diag_np1_aout            Version 1.575
diag_ls1.aout            Version 0.720
diag_ms1.aout            Version 1.495
diag_clc1.aout           Version 1.505
diag_plc1.aout           Version 2.005
sys_np1.aout             Version 1.460
```