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# The LightStream 2020 Release Notes for Software Release 2.1.1

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These release notes describe the new features and enhancements, upgrade procedures, and special considerations for software Release 2.1.1 of the LightStream 2020 enterprise ATM switch (LS2020 switch).

Software Release 2.1.1 is a new base release of LS2020 node software. It supersedes all prior releases and upgrades of Release 2.0 software.

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**Note** If a release earlier than Release 2.0.5 is currently running on a node that you wish to upgrade to this release, you must first upgrade the node to Release 2.0.5 software.

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## LightStream 2020 Overview

The LS2020 is a multi-service asynchronous transfer mode (ATM) switch 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.

## New Features and Enhancements

This section describes new features found in Release 2.1.1 of the LS2020 product.

- *Serial Interface Module.* This new module is a combination of the Packet Line Card and the new Serial Access Card (SAC). The serial interface module delivers 24 Mbps full duplex aggregate throughput and supports three services: Frame Relay, Frame Forwarding, and LightStream 2020 Trunking.
- *Net Timing.* This new service improves voice quality and preserves that quality by supporting redundant timing sources. With this service, LightStream 2020 switches may have as many as three net timing sources: an internal oscillator, a trunk or edge interface, or an external source.

- *StreamView*. Enhancements to StreamView enable it to support both the serial interface module and network timing synchronization.

For more information on Release 2.1.1, refer to the *LightStream 2020 System Overview* for Release 2.1.1, available on UniverCD or at Cisco's World Wide Web site at <http://www.cisco.com>.

## Software Upgrade Procedures

This section provides information about upgrading the LS2020 enterprise ATM switch to release 2.1.1 of LS2020 software. Use this upgrade procedure if you are upgrading 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 Release 2.0.5 software.
- You must have a modem in each node in which the software upgrade is to be made remotely. (For more information, refer to the section entitled "Modem Recommendations" in the *LightStream 2020 Site Planning and Cabling 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 the Release 2.1.1 software on an uninitialized disk you must create two symbolic links. Instructions for creating these links are in Appendix A of the *Update for LightStream 2020 Network Operations Guide, Release 2.1.1*.

- 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. If the names of any Cisco-provided files have been changed, the original file names should be restored.

Below is a list of the LS2020 Release 2.1.1 node software distribution diskettes.

| LS2020 Release 2.1.1 Distribution Diskettes | Version Listed on Diskette Label |
|---|----------------------------------|
| Boot Disk                                   | 2.1.1                            |
| System Disk 1                               | 2.1.1                            |
| System Disk 2                               | 2.1.1                            |
| System Disk 3                               | 2.1.1                            |
| Application Disk 1                          | 2.1.1                            |
| Application Disk 2                          | 2.1.1                            |
| Application Disk 3                          | 2.1.1                            |

| LS2020 Release 2.1.1 Distribution Diskettes | Version Listed on Diskette Label |
|---|----------------------------------|
| Application Disk 4                          | 2.1.1                            |
| Application Disk 5                          | 2.1.1                            |
| Application Disk 6                          | 2.1.1                            |
| Application Disk 7                          | 2.1.1                            |
| Diagnostic Disk 1                           | 2.1.1                            |
| Diagnostic Disk 2                           | 2.1.1                            |
| Firmware Disk 1                             | 2.1.1                            |
| Firmware Disk 2                             | 2.1.1                            |

Use the following procedures to upgrade a network to Release 2.1.1 software:

- *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.)
- *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.)
- *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.

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 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.

---

**Note** The following procedure for software installation of Release 2.1.1 causes Flash 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 Release 2.1.1 node software:

- 1** Connect to the primary NP.
- 2** Copy Release 2.1.1 Software from Floppies to Hard Disk.

In Procedure 2, Copy New Software to Remote Nodes, you use the distribution node as the source from which you copy 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 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, install the diskette sets in this order: system, application, diagnostics, firmware.

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

*bash# swinstall*

**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.**

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  |
|---|--|
| <ul style="list-style-type: none"> <li>You are logged in to the distribution node.</li> <li>No other user is logged in.</li> <li>The distribution node is running LS2020 application software.</li> </ul> | <ul style="list-style-type: none"> <li>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.)</li> <li>The remote node is running LS2020 application software.</li> </ul> |

Carry out this procedure for each node in your LS2020 network in turn. It has the following parts:

- 1 Verify Remote Command Execution
- 2 Distribute Release 2.1.1 to the Remote Node

### 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 Release 2.1.1 to the Remote Node

**Step 2** Copy Release 2.1.1 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
```

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

The **swremoteinstall** process checks disk space and copies Release 2.1.1 to *remote-node*. It should take 5 to 10 minutes, depending upon bandwidth between the nodes.

**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. 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.

---

Carry out this procedure for each node in your LS2020 network in turn. It has the following parts:

- 1 Connect to the Primary NP
- 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 NP. 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

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**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 create this situation, call Cisco Customer Support at 1-800-553-NETS (6387) or 1-800-553-2447.

**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. 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: 0xea1df68
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
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 **swinstall** or **swremoteinstall** reports 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 do 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

```

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-NETS (6387) or 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-NETS (6387) or 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-node, 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-NETS (6387) or 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 information:

- 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, do 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, do 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.

Workstation Upgrade Procedures

---

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

---

The procedures in this section tell you how to load Release 2.1.1 network management software onto your workstation from the quarter-inch tape provided with this release.

When you complete the following upgrade procedures, you will be able to run the Release 2.1.1 StreamView network management software on your Sun workstation:

- Procedure 1, Upgrading Management Software under HP OpenView
- Procedure 2, Upgrading Management Software Without HP OpenView

| For Information on ...            | See ...  |
|-----------------------------------|--|
| Running the configuration program | <i>LightStream 2020 Configuration Guide</i>      |
| Running the CLI and the monitor   | <i>LightStream 2020 Network Operations Guide</i> |
| CLI commands and the MIB          | <i>LightStream 2020 CLI Reference Manual</i>     |
| LynxOS commands                   | <i>LightStream 2020 NP O/S Reference Manual</i>  |

---

**Note** Refer to the *LightStream 2020 Site Planning and Cabling Guide* for a list of the hardware and software requirements that the network management workstation must meet

---

## Procedure 1, Upgrading Management Software under HP OpenView

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

If you installed Release 2.1 StreamView under HP OpenView, use this procedure to upgrade your installation to StreamView Release 2.1.1. You need to be running at least Version 3.3 of HP OpenView to run LS2020 management software under HP OpenView.

LS2020 software is installed under HP OpenView through use of the HP Openview OVIC utility. The installation procedure requires Version 1.4 or later of this utility. 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 management software portion of the LS2020 software is in three pieces: LS-Configure, LS-Monitor, and LS-Topomap. HP OpenView documentation refers to software packages of this kind as “products.” The CLI and the LS2020 enterprise-specific MIB are packaged with all three.

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

- Update several HP OpenView directories with LS2020 registration and bit map files
- Load the LS2020 enterprise-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 as root.

**Step 2** Ensure that `/usr/OV/bin` is in your path. The installation procedure uses this directory. 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** Insert the tape of LS2020 software into the Sun’s quarter-inch tape drive.

**Step 4** Use the HP OpenView **ovinstall** command to extract the LS-Configure software from the tape:

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

Here, `<tape-drive>` is `/dev/rst0`, unless your tape drive has been configured to use a different port (for example, `/dev/rst1` or `/dev/rst2`). The command takes 5 to 15 minutes to run. It installs the configuration utilities and associated files. The **-r** switch allows the program to overwrite an existing installation.

**Step 5** Use the HP OpenView **ovinstall** command to extract the LS-Monitor software from the tape. For example, you might enter the following command:

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

Here, *tape-drive* is, for example, /dev/rst0, /dev/rst1, or /dev/rst2, depending on which port your tape drive uses. The command 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 6** Use the HP OpenView **ovinstall** command to extract the LS-Topomap software from the tape. For example, you might enter the following command:

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

Here, *tape-drive* is, for example, /dev/rst0, /dev/rst1, or /dev/rst2, depending on which port your tape drive uses. The command 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 update the HP OpenView Fields database with StreamView fields, enter

```
# ovw -fields
```

- Step 8** To ensure that the LS2020 applications have been installed correctly, enter

```
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.)

If ovw cannot run, you must run the following command as root to start OV daemons:

```
ovstart
```

- Step 9** Each user must enter the following command to restart HP OpenView:

```
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.

---

**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 foollowing example shows the sort of output that may be expected 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 Management Software Without HP OpenView

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

If you installed Release 2.0 StreamView without HP OpenView, use this procedure to upgrade your installation to StreamView Version 2.1.1.

#### Loading the Management Software Without HP Openview

**Step 1** Log in to the Sun as root.

**Step 2** Use the following command to change to the root directory:

```
cd /
```

**Step 3** Insert the tape of LS2020 software into the Sun's quarter-inch tape drive.

**Step 4** 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
```

Here, *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 5** While logged in as root, enter the following command:

```
rm -r /usr/LightStream-2.1.1/templates/ovsnmp.conf_db
```

After you modify your environment, the LS2020 applications recreate the directory ovsnmp.conf\_db with new information.

**Step 6** For each user of StreamView applications, modify the file invoked by the shell when that user logs in to set environment variables to 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.

Software Release 2.0.0 and above require a 32-MB network processor (NP).

## Special Considerations

This section describes special considerations 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 beta customers and Cisco Systems engineers.

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

### LSCle02937 Cell Payload Scrambling Must be Enabled for OC-3 Interfaces

Cell payload scrambling was a configurable parameter for OC-3 interfaces in Release 2.0, and it should not have been. In Release 2.1.1, it can only be enabled.

During the upgrade of a network to Release 2.1.1, there may at some point be a mixture of Release 2.1.1 and Release 2.0 nodes running in the network. If there is an OC-3 trunk connecting a Release 2.1.1 node to a Release 2.0 node, and either the Admin value or the Oper value for cell payload scrambling is set to disabled on the OC-3 trunk port of the Release 2.0 node, the trunk does not come up operationally.

#### Recommended Action

For each OC-3 trunk connection, set the Admin value for cell payload scrambling to enabled on the OC-3 trunk port of the Release 2.0 node, and make sure that the Oper value also gets set to enabled.

To check these values, use SNMP commands in the CLI. For example, if your Release 2.0 trunk port is on card 3, port 0, use the **getsnmp** command as follows:

```
cli>getsnmp clclInfoAdminScramble.3000
Name: clclInfoAdminScramble.3000 Value: 1
cli>getsnmpclclInfoOperScramble.3000
Name: clclInfoOperScramble.3000 Value: 1
```

If either of these values is anything except 1, enter the following commands in protected mode:

```
*cli>set config lock                (open the database for writing)
*cli>set port 3.0 inactive          (deactivate the port)
*cli>setsnmp clclInfoAdminScramble.3000 1 (set to enabled)
*cli>set port 3.0 active            (activate the port)
*cli>set config unlock              (release the database)
```

Activating the port triggers the application of the Admin value to the Oper setting. The trunk should come up operationally.

If any OC-3 edge ports are configured with cell payload scrambling disabled, they should also be reconfigured as above.

### LSCle02186 The trunkmon Tool Has Been Withdrawn From Release 2.1

The **trunkmon** tool is no longer supported in Release 2.1.

### LSCle02935 The set port testing Command Has No Effect

The CLI **set port testing** command has no effect on the specified port. Use of this command is discouraged because improvements to the diagnostics have rendered this command unnecessary. Support for this command will be removed in a future release.

### LSCle03113 8T3 LOS (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.

## Network Management Special Considerations: The StreamView CFG Tool

### LSCle01401 Creating an Instance of a Second Network Processor Card

The StreamView Configuration tool does not permit execution of the Copy operation on a Network Processor (NP) card in order to create a second instance of the card.

#### **Recommended Action**

To create a second Network Processor card instance, select the Empty tag for the second slot and create the new card using the Add function.

### LSCle02679 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
```

### LSCle02684 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.



**LSCle02686 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.

**Network Management Special Considerations: The StreamView PVC and VLI Tools****LSCle00956 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.

**LSCle00962 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.

**LSCle02872 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.

**LSCle02919 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.

### LSCle02924 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.

### LSCle02941 StreamView PVC Tool SendUpdate Causes Sun Crash

If you run StreamView on a Sun workstation using SunOS 4.1.4 (as opposed to 4.1.3), the workstation issues a panic message when you perform a SendUpdate function with more than 15 PVCs on a single port, using the PVC StreamView tool. The message refers to the file ufs\_lockf.c.

#### Recommended Action

Obtain patch #102264-02 from Sun and install it, as follows:

- Step 1** Connect by ftp to sunsolve1.Sun.com.
- Step 2** Log in using the anonymous user id.
- Step 3** When prompted, use your login ID as a password.
- Step 4** Change directory to the patch directory, using the following command:  

```
cd pub/patches
```
- Step 5** Enter the command **binary** to make the transfer in binary mode.
- Step 6** Enter the command **get 102264-02.tar.Z** to copy the needed patch file.
- Step 7** Enter the command **ascii** to make a file transfer in ASCII mode.
- Step 8** Enter the command **get 102264.readme** to copy the readme file for the patch.
- Step 9** Follow the instructions in the readme file to rebuild the Sun kernel.
- Step 10** Reboot the workstation.

### LSCle02947 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.

**LSCle03080 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.

**LSCle03099 PVC tool ignores snmp timeout/retry settings**

The pvc, cfg, vli ignore the SNMP timeout settings which are specified in the file referred to by environment variable OVSNMP\_CONF\_FILE.

**Network Management Special Considerations: The Command Line Interface (CLI)****LSCle01068 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.

**LSCle01625 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.

**LSCle02390 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
...
```

### LSCle02634 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.

### LSCle02658 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.

### LSCle02661 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.

### LSCle02921 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.

**LSCle02922 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.

**LSCle02952 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.

**LSCle02997 FDDI Filter May Include Ethernet Frames**

The following filter expression filters Ethernet type 2 frames as well as FDDI frames:

```
11cDSAP == 0xaa
```

This might be unexpected. To exclude Ethernet frames from the filtered set, filter on the OUI field as follows:

```
(11cDSAP == 0xaa) && (OUI != 0)
```

**LSCle03032 Memory Problem with set nettime Commands**

The CLI **set nettime insert** and **set nettime delete** commands leak memory.

**Recommended Action**

To avoid the manifestations of this problem, the user should do one of the following:

- If possible, run the cli on a Sun workstation if nettime insert/delete commands are going to be used.
- If running cli natively on a 2020, exit and restart the cli after the requisite group of nettime insert/delete commands have been completed.

**LSCle03098 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.

### LSCle03101 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.

### LSCle03109 Too many CLI sessions running on an LS2020 impacts performance and may crash the system

It is possible that, if too many instances of the CLI process are active at the same time on a single LS2020 node, the node may run into a memory resource problem, possibly causing the node to crash.

#### **Recommended Action**

It is recommended that only one CLI be active on any given node at one time. This does not apply to Sun4 CLI.

## Network Management Special Considerations: The LightStream Topology Map

### LSCle02044 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.

### LSCle02657 LS2020 Domain Icon May be Hard to Find

A group of LS2020 switches and interconnecting trunks are grouped together to form a topology map domain, and the domain icon is placed in the HP OpenView New Object Holding Area. If the Holding Area contains many new objects, not all objects may be completely visible on the display. As a result, it may seem that the domain icon has disappeared.

#### **Recommended Action**

In this situation, check the entire New Objects Holding Area for the iconified domain. Reduce the height of the window. This scales all objects smaller. The domain icon should be visible at the end of the New Objects Holding Area.

## Network Management Special Considerations: The Monitor Tool

### LSCle03142 On monochrome screen, monitor crashes on startup

If a StreamView Network Management Station tool is started when the DISPLAY environment variable points to a display which does not have color capability, they might immediately crash with an XVT error. There is no known workaround.

## Other Network Management Special Considerations

### LSCle01083 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.

### LSCle01141/LSCle01540 Stopping an Unwanted Download

No function is currently provided to stop a long download.

#### **Recommended Action**

It is possible to abort downloads with the LynxOS **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.

### LSCle01355 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.

### LSCle02025 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.

### LSCle02483 Avoid Storing Database Files in the /tmp Directory

Under certain circumstances a database file cannot be saved in the /tmp directory.

#### Recommended Action

When using the configuration tool Save As function, avoid specifying the /tmp directory as the directory in which the database should be saved.

### LSCle02715 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.

### LSCle02855 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 PVC StreamView process and the currently running cfg\_a child process are both terminated.

- The PVC StreamView process can be terminated in the normal manner by selecting 'Exit' from the 'File' pulldown menu.
- 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. For more information on how to terminate this process, see the LSCle0111r1/LSCle01540 workaround in the “Network Management Special Considerations: The Monitor Tool” section.

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.

### LSCle02857 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.

### LSCle02880 Card Parameters Not Present When Card Reboots

During the course of some configuration activities, a card may reboot (intentionally) during a SendUpdate process. This occurs, for example, when the card type is changed from trunk to edge. Because the card reboots, parameters that are sensitive to whether a card is configured as a trunk or edge do not get set on the target node unless a second SendUpdate process is applied after the first.

To analyze a specific example, consider a card that is initially in edge mode, where Peak (Port) Cell Rate, a Trunk-only parameter, does not apply. When the card is re-configured to trunk mode, and a new Peak Cell Rate is entered for the card as well, the first invocation of the SendUpdate process only sends edge card parameters, because that is the initial state of the card, and trunk parameters do not apply. The card function is not known until the first configured port is set to trunk (clclInfoAdminProtocol = 1). The first Sendupdate sets the Peak Cell Rate to 0 rather than the configured value.

### **Recommended Action**

Once the card has rebooted and switched to trunk mode, a second SendUpdate process must be invoked to send the newly configured peak cell rate.

### **LSCle02927 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.

### **LSCle02943 E3 Framing Cannot be Changed from G.804**

Attempts to change framing type for E3 ports from G.804 to PLCP appear to succeed, but in fact the framing type is not changed.

### **LSCle03163 Moving BIYTS clock between Release 2 switch cards crashes T1 and E1 CEMAC cards**

If the 2020 chassis has a T1/E1 card present, as well as two Release 2 switch cards, and only one of the switch cards has a valid BITS clock source plugged in and active, then the T1/E1 card will crash when the BITS clock source is moved between the two Release 2 switch cards.

### **Recommended Action**

Always have a valid BITS clock source plugged into both Release 2 switch cards.

## Hardware and Diagnostics Special Considerations

### **LSCle01539 MS1-CP and E3-PLCP Cards Wrongly Report Receive Error Rate**

MS1-CP and E3-PLCP cards report a receive error rate of about 1/second when there are no errors. This is only a problem with the E3-PLCP card. It is not a problem with T3 or E3-G.804 card.

### **Recommended Action**

A hardware solution is in process; contact Cisco customer support.

**LSCle01956 DS3 UNI Rate Enforcement is Not Precise**

The hardware and algorithms used to limit incoming data at an ATM UNI edge can allow more data than configured. The deviation is usually less than 1%, but can be greater for very high enforcement rates (for example, greater than 1/2 of a T3).

**Recommended Action**

Allow for this deviation when configuring ATM-UNI edge ports.

**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.

**LSCle02703 FDDI Card May Fail to Come Up at System Boot Time**

When an LS2020 containing an FDDI card is booted the card may not come up completely. As far as we know, this is a very rare occurrence. The one time it occurred, the CLI **show port <port> statistics** command showed very large increments for the Octets Rcvd and Normal Packets Sent statistics.

**Recommended Action**

If, on booting a node, an FDDI card fails to come up to the point that it passes data, disable and then re-enable the card. This should clear the problem.

**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.

**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
```

## Congestion Avoidance Special Considerations

### 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. 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.

## Trap Special Considerations

### LSCle02530 - No Trap for Invalid Receive Clock

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

### LSCle02638 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.

### LSCle02913 Trap Indicates Possible Card Malfunction

An LC\_2000 vector 30 INFO trap like the following means that a parity error occurred on the specified line card:

```
(INFO) LC_card# at 8/12/95 12:24:22 EDT (8/12/95 16:24:22 GMT) Slot port#: Reason:
      CP_CRASHED -- vector 30, pri 0x0, pc 0x002043fc
```

#### Recommended Action

If this trap appears, monitor the card carefully for additional parity errors and other signs of malfunction. Consider replacing the card if additional parity error crashes occur.

### LSCle03174

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.

## Resource Allocation Special Considerations

### LSCle01369, LSCle01791 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.

## **LSCle01701 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.

## **LSCle02399 - Cell Packing Factor and LAN Traffic Profile Bandwidth Settings**

The bandwidth parameters of a traffic profile are for managing network bandwidth. When a LAN frame arrives at an LS2020 port, the software appends an 8-byte AAL5 trailer and segments the result into 48-byte cells for transmission into the ATM network. The last cell is usually partly empty (unless the result of adding the AAL5 trailer to the frame is a multiple of 48 bytes long). For example, a 64-byte Ethernet frame is segmented into two cells, with only 16 data bytes (and the 8-byte trailer) in the second cell.

Traffic profile rate enforcement applies no factor to account for cell packing when determining the number of cells worth of bandwidth to allow on the network. Therefore, the rate is divided by 384 bits per cell and that number of cells are allowed on the network. All other LAN flows are allowed a 20 percent overage to cover the inefficiencies of packing frames into cells.

The following example shows how to take into account segmentation overhead—the empty portion of the last cell—when you determine the circuit bandwidth required to support the desired throughput:

Suppose an application generates 64-byte Ethernet frames, and you want to allocate enough network resources to support 10,000 packets per second. (A 10Mb Ethernet connection can support 14,880 64-byte packets per second.) The network bandwidth required to support 10,000 packets per second is calculated as follows:

$$\begin{aligned} & (\text{desired packets per second}) * (\text{cells per packet}) * (\text{bytes per cell}) * (\text{bits per byte}) \\ &= 10000 * 2 * 48 * 8 \\ &= 7.68 \text{ Mbs} \end{aligned}$$

Compare this with the bandwidth required to support 10,000 packets per second if there were no segmentation overhead:

$$\begin{aligned} & (\text{desired packets per second}) * (\text{packet size in bytes}) * (\text{bits per byte}) \\ &= 10000 * 64 * 8 \\ &= 5.12 \text{ Mbs} \end{aligned}$$

The difference is due to what is termed a *cell packing factor*, in this case a factor of 1.5.

- With no traffic profile specified, the software uses a cell packing factor of 1.2.
- With a specified traffic profile, the software uses a cell packing factor of 1.0.

This means that you must take segmentation overhead into account when specifying the bandwidth parameters of a traffic profile.

Before establishing a circuit, the connection management software checks the available bandwidth of each segment of the circuit, including the entry port and the exit port. In order to take segmentation overhead into account, the software calculates the capacity of a LAN port as follows:

$$(\text{LAN capacity}) * 1.2$$

Due to rounding in the conversions between cells per second and bits per second, the maximum bandwidth request that can succeed is 11,999,999 bps for Ethernet (rather than 12 Mbs), and 119,999,999 bps for FDDI (rather than 120Mbs).

### LSCle02757 No More than 512 Traffic Filters Supported

If you attempt to configure more than 512 traffic filters on a given switch, the 513th filter is not configured, the switch's SNMP agent (MMA) ceases to respond to SNMP requests, and subsequent attempts to boot the switch may fail.

#### **Recommended Action**

Do not configure more than 512 traffic filters per switch.

### LSCle02864 LCC Process May Exit if there is Insufficient Memory

An LCC process requires enough memory for the circuits configured for its line card. If there is insufficient memory for an LCC process, it exits during its startup sequence.

When this occurs the following sequence of traps may appear in the MMA trap log (in /usr/tmp/mma/mma.traplog) repeatedly:

```
(INFO) NPTMM_2020 at 08/03/95 20:02:43 EDT (08/04/95 00:02:43 GMT)
      Slot 5 State Changed From DOWN To UP
(OPER) NDD_7 at 08/03/95 20:02:45 EDT (08/04/95 00:02:45 GMT)
      Line Card Control Process for l1stb5:5 exited unexpectedly (status -1).
(OPER) NDD_5 at 08/03/95 20:02:46 EDT (08/04/95 00:02:46 GMT)
```

```
Line Card lsb5:5 (8T3E3-EDGE) down (ERMP failure 0x4).
(INFO) NPTMM_2020 at 08/03/95 20:02:47 EDT (08/04/95 00:02:47 GMT)
Slot 5 State Changed From UP To DOWN
```

Concurrently, the following sequence of lines appears repeatedly in /usr/tmp/apps.log:

```
PROGRAM: lcc: (ls_main) compiled Jul 19 1995 @ 02:53:47 [pid:71]
LCC [PID 71 EIA lsb5:5]|
TRAP (FATAL) 4005: PID.71:
LCC slot 5 error 60 initializing LCC-ATM interface
ERROR [nnd.55]: Line Card Control Process for lsb5:5
exited unexpectedly (status -1).
```

### Recommended Action

Make sure that there are not too many circuits configured for the chassis, and that the sum of the cardMaxVCs parameters for the cards is not too large. The chassis maximum is 4000 circuits. Reduce the number of concurrent instances of the CLI running on the chassis. The first CLI consumes about 1.5 MB and each additional CLI consumes an additional 0.77 MB.

## LSCle02860 Limitation of Size of Multicast Groups

For R2.1, the size of a multicast group is limited as follows.

The number of ports plus the number of trunk links required to build a tree for a point-to-multipoint circuit for a multicast group must be less than 100. That is:

$$\#ports + \# trunk links < 100.$$

When this limit is exceeded, messages appear of the following form:

```
GIDD.58: ERROR (gid_pmap.c line 1979): Link_Add: Link
table(100) too small for path(100).
Failure of ir_generate_path for <chassis_id:slot>:
IR error 10: Insufficient memory
(INFO) ATMM_2090 PID=71 (<chassis_id:slot>)
```

### Recommended Action

If you build a circuit with a large number of endpoints, make sure that the sum of endpoints plus trunks in the multicast group topology is fewer than 100.

## Installation, Upgrade, and Initial Configuration Special Considerations

### 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 cksinstall ...
```

### LSCle01015 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).

### LSCle02646 swinstall NeedsFree Memory

The **swinstall** program can fail due to lack of free memory if extra processes are running.

#### Recommended Action

Make sure processes which are not needed during the installation, such as CLI, are not running.

### LSCle02863 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
```

### LSCle02869 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.

### LSCle02871 “Executable file in use” Failure of the swchgver Utility on Dual NP Systems

On dual-NP systems the **swchgver** utility may fail with the following error message:

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

This failure (reporting that the executable file is in use) is due to interference between **swchgver** and the mechanism that keeps critical files on the two NPs in synch. It is of low probability.

#### Recommended Action

Wait a moment and then invoke **swchgver** a second time.

### LSCle02874 Running the trunkconfig.cli CLI Script

The node runs the **setsnmpconfig** script at boot time to collect configuration information if the node detects that the minimum required configuration information is missing. If you configure trunks it creates a CLI script named **trunkconfig.cli** and instructs you to have the CLI run it to complete configuration of the trunks. However, before you run the **trunkconfig.cli** script, you must wait for all the trunk cards which you have configured to come up.

#### Recommended Action

Use the CLI **show card** command to determine when each trunk card is up.

## Other LS2020 Software Special Considerations

### 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.

### Changing Primary Switch Causes Chassis to Reboot

On systems with at least one Release 1 switch card (SC1), changing which switch is primary with the CLI command **set chassis primaryswitch** causes the chassis to reboot.

#### Recommended Action

If you change which switch is primary, wait for the chassis to reboot.

#### Out of Range Bit Rates Permitted on Low-Speed Card

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 low-speed cards.

##### **Recommended Action**

Do not set rates higher than 3.84 Mbits/sec per port on low-speed 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 Mbits/sec per port may work for large packets.

#### Looping of FDDI and Ethernet Ports Not Supported

In Release 2.1.1, FDDI and Ethernet ports cannot be looped.

##### **Recommended Action**

Do not attempt to loop FDDI and Ethernet ports.

#### 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.

#### LIGle00038 Defective Floppy May Cause tar Process to Hang

When attempting a **tar** operation to the floppy drive (for example **tar xvf /dev/sd1**) when the floppy disk has media errors, the software process using the device may hang, preventing future access to the floppy or to the terminal where the **tar** command was being run.

##### **Recommended Action**

If the process hangs, reboot the network processor.

#### 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. Furthermore, no error is reported.

##### **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.

### LSCle01096 An ATM UNI or Frame Forwarding Port Reports Operationally Up When Disconnected

Currently the frame forwarding and ATM-UNI interfaces use no protocol to provide a link-level reliability indication such as the LMI for FR or Trunk-Up-Down (TUD) for LS2020 trunks. The Operational Status on these ports reflects the Administrative Status of the port. The operational status does not indicate physical layer or data link layer status.

### 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.

### LSCle01560 Console Messages Regarding NP Ethernet Port

When the node NP OS kernel detects errors on the NP's Ethernet port, it may output one of the following messages:

```
oblan: ethernet transmit error (status=0xnumber): string
oblan: receive error (0xnumber): string
```

In the transmit error message, if *string* is "lost carrier", the Ethernet cable may be disconnected from the NP's Ethernet port; if it is "late collision", there is a network problem, such as noise, poor connectors, or a broken station. In the receive error message, the *string* "missed packet" may occur under extreme load. The *number* in these messages represents hardware information which may be useful to Cisco Support.

These errors appear on the console only if they occur before starting the ATM switching software on the NP (for example, while the system is being installed or during system startup). After the ATM switching software has started, these errors go only to the traplog, where they appear as KERN\_2001 traps.

#### **Recommended Action**

Verify connectivity to the NP's Ethernet port.

**LSCle02174 - 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.

**LSCle02211 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.

**LSCle02228 - 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.

**LSCle02656 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.

**LSCle02709 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.

## Resolved Problems

This section summarizes problems found in the LS2020 ATM product that have been fixed in Release 2.1.1

|            |  |
|------------|--|
| 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                               |

## Appendix A: Hardware Compatibility Table

|            |   |
|------------|---|
| 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 | OVSMP_CONF_FILE specified incorrectly in dialog box                                       |
| LSCle02901 | Reporting SWC AC over temperature limit   |
| LSCle02906 | Flash load interrupted; could not reload; had to be flooded                               |
| 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              |
| 73-1449-01  | 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               |

| Part Number  | Previous Part Number | Description                                    | Minimum Revision                                     |
|--------------|----------------------|--|--|
| 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  |
| 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               | P03  |
| 73-1440-01   | 2123258G03           | E3 G.804 medium-speed access card              | A  |
| 73-1437-01   | 2123086G01           | Packet line card                               | E (F if CEMAC or FCEMAC installed)                   |
| 73-1450-01   | 2123988G01           | Ethernet access card                           | B  |
| 73-1452-01   | 2124055G01           | FDDI access card                               | C  |
| 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 (D if ISP2 installed)                              |
| 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   |
| 73-1459-01   | 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** to display Flash checksums. The checksums for this new release are as follows:

If the Flash checksum is 0x64A2 for a Release 2 switch card, or 0x5D00 for a Release 1 switch card, then the specified switch card already has the latest Flash image.

|                    |                       |        |
|--------------------|-----------------------|--------|
| Network Processor: | Flash Image Checksum: | 0xC1DE |
| Switch Card 1:     | Flash Image Checksum: | 0x5D00 |
| Switch Card 2:     | Flash Image Checksum: | 0x64A2 |
| Low Speed Card:    | Flash Image Checksum: | 0xAB52 |
| Medium Speed Card: | Flash Image Checksum: | 0xD0A8 |
| Packet Line Card:  | Flash Image Checksum: | 0x3E06 |
| Cell Line Card:    | Flash Image Checksum: | 0x7307 |