APPENDIX C

Flash Loading

This appendix explains how to load new software into the flash EPROMs on the cards in a LightStream 2020 enterprise ATM switch. Flash memory contains card initialization software, power-on self tests, and the SWACC loader, which loads software from the hard disk into the card when the card powers up.

Whenever you install a new line card, switch card, or network processor (NP) in a LightStream 2020 switch, do the following:

- Use the "Verifying Flash" procedure in this appendix to determine whether the content of the new card's flash is up to date.
- If the new card's flash is not up to date, reload it as described in the section "Reloading Flash".

Verifying Flash

After installing a new card, follow these instructions to find out whether the content of the card's flash memory is up to date.

Step 1 Log in to the primary NP as root.

Step 2 To display the flash checksums of all the cards in the chassis, type:

bash# **sysver -a | more**

Step 3 Refer to your *LightStream 2020 Release Notes* for a list of the correct checksums for your software version.

Step 4 If the checksum displayed for the new card matches the one listed in the release notes, stop here–the flash is up to date. If the checksum does not match, use the appropriate procedure from the section "Reloading Flash", below, to load an up-to-date flash image into the card.

Reloading Flash

This section contains two flash reloading procedures:

- "Reloading Flash on a Line Card or NP"
- "Reloading Flash on a Switch Card"

Reloading Flash on a Line Card or NP

If the "Verifying Flash" procedure reveals that you have out-of-date flash contents on an NP or line card, follow this procedure to reload flash on that card.

Step 1 Warn anyone who relies on this LightStream 2020 system that it's about to go out of service. (The outage will probably last only a few minutes.)

Step 2 If you have not already done so, log into the primary NP as root.

Step 3 Type the following command to load the new image into flash memory:

LSnode:2# **fcload -s** *<slot#>* **-flash -force**

<slot#> represents the slot number of the card with the incorrect flash checksum.

Step 4 Once flash is reloaded, you must reboot the system to initiate operation with the new flash, as follows:

— Type the following command to halt the system:

```
LSnode:2# reboot -n
```

Note If your system has two NPs, you must issue the command **reboot -n** to each one. After rebooting one NP, type **'.** to display a TCS hub prompt, then type **connect** *<slot#>* to connect to the other NP, then type **reboot -n**.

— Turn off the chassis power, wait 30 seconds, and turn the power back on.

— If you wish to watch the boot process, type **'.** to display a TCS hub prompt, then reconnect to the NP by typing **connect 1** or **connect 2**.

Step 5 Repeat the "Verifying Flash" procedure at the beginning of this appendix. If the card still has an incorrect flash checksum, contact your customer support representative.

Reloading Flash on a Switch Card

If the "Verifying Flash" procedure at the beginning of this appendix reveals that you have out-of-date flash contents on a switch card, follow this procedure to reload flash on that card.

Step 1 Warn anyone who relies on this LightStream 2020 system that it's about to go out of service. (The outage will probably last only a few minutes.)

Step 2 Connect to the NP and log in as root.

Step 3 At the prompt, enter the following command to shut down LynxOS:

```
LSnode:2# reboot -n
```

Note If your system has two NPs, you must issue the command **reboot -n** to each one. After rebooting one NP, type **'.** to display a TCS hub prompt, then type **connect** *<slot#>* to connect to the other NP, then type **reboot -n**.

Step 4 The following display appears (if the display does not appear, press **[Return]).**

**** LynxOS [rebooted by /bin/reboot] is down ****

Memory autosizing ... (32 Megabytes) ... Done
Clearing memory (32 Megabytes)... Done

NP1POST Version 0.220 Nov 23 1994

NP1 POST Summary
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0 Tests Failed

Network Processor bootstrap (version 1.3: Sep 13 1993)
1 - Boot ATM switch application
2 - Begin full installation with boot from floppy disk
Boot from floppy (read-only, single-user) for an installation from scratch
3 - List contents of hard disk root directory
4 - List contents of floppy disk root directory
5 - Boot system single-user
6 - Escape to full set of bootstrap options
Allows specification of drive, application, and boot options
7 - Extended help
Give somewhat more information about options
Option>

Step 5 At the menu's Option prompt, enter **6**:

Option> **6**

Step 6 The system displays the following message. Enter the string shown below at the `Boot:` prompt to load the system monitor, which you will use to load flash into the switch card. Note that the 0 in (sd0b) is a zero.

Network Processor bootstrap (version 1.3: Sep 13 1993)
Enter "help" for documentation on extended bootstrap options
Default: (sd0a)lynx.os
Boot: **`(sd0b)diag/sys_np1.aout`**

Step 7 When the system monitor finishes loading, an identifying message and a prompt appears, as shown below.

```
 ****************************************
 * System Diagnostic Debug Monitor      *
 * Revision 1.305 (Oct 10 1994)         *
 * Type  'help'  or  '?'  for help      *
 ****************************************
System Monitor->
```

Step 8 To load flash into the switch card, enter one of the following commands. The first is for the switch card in slot A, the second for slot B. (Again, the 0 in (sd0b) is a zero.)

```
System Monitor-> fload sa (sd0b)fware/flash_sc1.rec
System Monitor-> fload sb (sd0b)fware/flash_sc1.rec
Reading.........(160638 bytes)
Erasing.......
Loading.............................................
.................................................
.................................................
.................................................
.................................................
.............................................
Load Statistics
Data bytes     = 57102
Overhead bytes = 28608
Messages sent  = 1788
S-records      = 3570
System Monitor-
```

The words Erasing and Loading, and the dots that show system activity after those words, appear only for the secondary switch. The process takes about 2 minutes.

Step 9 Next, you will encounter one of the following:

— If you see the `System Monitor->` prompt, the flash load has completed successfully. Proceed to Step 10.

— If you see the following error message, repeat Step 8:

```
flash failed to erase or is not erased
ACTION_FLASH=0x45
```

— If you do not see the error message above, but the `System Monitor->` prompt does not reappear, the flash load has failed. Do the following:

- Disconnect from the NP by typing `‘.` (backquote-dot) to access the TCS hub.
- Reset the NP by typing **reset** <*slot#*> at the TCS hub prompt.
- Reconnect to the same NP by typing **connect** <*slot#*> at the TCS hub prompt. You’ll see a display that mentions memory autosizing and NP1 POST.
- Press **[Return]** when the following prompt appears:

  ```
  System will boot in 5 seconds: hit <RETURN> to interrupt.
  ```

  This prompt is repeated once a second, giving you more than one opportunity to press the **[Return]** key and prevent a reboot. When you press **[Return]**, the boot menu appears:

  ```
  Network Processor bootstrap (version 1.3: Sep 13 1993)
          1 - Boot ATM switch application
          2 - Begin full installation with boot from floppy disk
                  Boot from floppy (read-only, single-user) for an
                  installation from scratch
          3 - List contents of hard disk root directory
          4 - List contents of floppy disk root directory
          5 - Boot system single-user
          6 - Escape to full set of bootstrap options
               Allows specification of drive, application, and boot options
          7 - Extended help
                  Give somewhat more information about options
  Option>
  ```

- Return to Step 5 and repeat this procedure from that point.

Step 10 Once flash is loaded, you must reboot the system to initiate operation with the new flash, as follows:

— Type the following command to halt the system:

```
LSnode:2# reboot -n
```

Note If your system has two NPs, you must issue the command **reboot -n** to each one. After rebooting one NP, type `'.` to display a TCS hub prompt, then type **connect** <*slot#*> to connect to the other NP, then type **reboot -n**.

— Turn off the chassis power, wait 30 seconds, and turn the power back on.

— If you wish to watch the boot process, type `'.` to display a TCS hub prompt, then reconnect to the NP by typing **connect 1** or **connect 2**.

Step 11 Repeat the "Verifying Flash" procedure at the beginning of this appendix. If the card still has an incorrect flash checksum, contact your customer support representative.