

Installing Network Management Software Applications

As described in the “Overview” chapter, two classes of software must be fully functional in an LS2020 networking environment to take full advantage of the capabilities of a LightStream 2020 multiservice ATM switch (LS2020 switch).

- The Platform (chassis) Software

This software is pre-installed on the hard disk at the factory prior to shipment of the LS2020 chassis to the customer site. However, you must perform basic configuration procedures for each LS2020 switch. See the “Hardware Installation” chapter for more information.

- The Network Management Software

In contrast to platform software, the network management software application StreamView must be installed from tape and configured on the hard disk of the Sun SPARCstation used as the NMS in configuring, monitoring, and controlling LS2020 switches in your network.

StreamView requires a Sun SPARCstation running SunOS 4.1.4 (Solaris 1.1.x) with 26 MB RAM (additional 3 MB RAM for each node in the database) and 90 MB swap space. Note that StreamView does not operate under Solaris Version 2.0 or later.

This chapter presents high-level installation and configuration procedures to make StreamView operable on the NMS, regardless of whether HP OpenView is present.

Note Refer to the *LightStream 2020 Site Planning and Cabling Guide* for detailed information about the hardware and software requirements for using the NMS.

The StreamView network management software allows you to perform the following:

- Configure an LS2020 switch
- Monitor an LS2020 switch
- Generate a topological map of your LS2020 network
- Run a remote CLI on an LS2020 switch using SNMP
- Manage a network of LS2020 switches using an enterprise-specific management information base (MIB)

Table 3-1 lists the facilities provided by the network management software applications and refers you to related LS2020 documents for more detailed information.

Table 3-1 LS2020 Facilities and Related Documentation

For Information about...	See the...
Using the StreamView configurator	<i>LightStream 2020 Configuration Guide</i>
Using the CLI, and the StreamView monitor and topology map	<i>LightStream 2020 Network Operations Guide</i>
LynxOS commands	<i>LightStream 2020 NP O/S Reference Manual</i>
LS2020 SNMP management information base (MIB)	<i>LightStream 2020 Network Operations Guide</i>

Installing Network Management Software to Run Under HP OpenView

Use this procedure to install either a new version or an upgrade of the LS2020 network management software on a Sun workstation running HP OpenView. You must be running at least Version 3.3 of HP OpenView to run LS2020 management software. This procedure assumes that HP OpenView is already installed and operating properly on the Sun workstation.

Loading the Network Management Software for HP OpenView

The StreamView network management software portion of the LS2020 software includes three modules; the configurator, the monitor, and the topology map. The CLI and the LS2020 multiservice-specific MIB are packaged with all three network management software modules.

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

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

Note For an example of StreamView output generated using the HP OpenView commands, refer to Appendix A, StreamView Output Samples.

When installing the network management software, use the **ovinstall** command to:

- Check the HP OpenView installation utilities version
- Create the /usr/OV/bin/ls_bin directory
- Update several HP OpenView directories with LS2020 registration and bitmap files
- Load the enterprise-specific MIB into the /usr/OV/snmp_mibs directory and install it under HP OpenView
- Create the /usr/OV/databases/ls directory for the MIB configuration database

To load the network management software, perform the following steps:

Step 1 Log in to the NMS as root. If logging in as root is disabled, issue the following command to “user ID root:”

```
su password:<root password>
```

Step 2 Create a user account called *npadmin*, if it does not already exist.

The CLI uses the password for the npadmin account as the password for the CLI protected mode. If no npadmin account has been defined for the workstation, the CLI uses the root password as the CLI protected-mode password.

- Step 3** Ensure that the /usr/OV/bin directory is in your path (the installation procedure uses this directory). To display your path, issue the following command at the SunOS prompt:

```
echo $PATH
```

To set your path in a Bourne shell or a bash shell, issue the following command:

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

To set your path in a C shell (csh), issue the following command:

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

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

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

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

- Step 4** Insert the tape containing the LS2020 software into the Sun SPARCstation tape drive.

- Step 5** Extract the three StreamView network management modules from the tape using the **ovinstall** command. This process takes from 5 to 15 minutes to install the modules and their associated files.

To extract the StreamView configurator module, enter the following command:

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

tape drive is /dev/rst0, unless your tape drive has been configured to use a different device (for example, /dev/rst1 or /dev/rst2). The **-r** switch allows the program to overwrite an existing installation. If you specify an incorrect device in the **ovinstall** command, the installation process terminates immediately and returns the following message or its equivalent:

```
"ovinstall: cannot install product definition for LS-CONFIGURE"
```

Note When you use the **ovinstall** command to extract and install the StreamView (configurator, monitor, and topology map) network management modules, the *tape-drive* parameter may be any one of the following: /dev/rst0, /dev/rst1, or /dev/rst2, depending on which port your tape drive uses. It takes from 5 to 15 minutes to extract and install the network management software modules and associated files.

Figure 3-1 shows a typical screen display that results from execution of the **ovinstall** command to extract the StreamView configurator software.

Figure 3-1 Screen Display During StreamView Configurator Extraction

```
# ovinstall -r -p LS-CONFIGURE -- -d /dev/rstl
Path is: /usr/OV/install/tools:/usr/OV/bin:/bin:/usr/bin:/etc:/usr/ucb:/usr/etc
Installing product definition for LS-CONFIGURE.
Running command: "ovupdate -d /dev/rstl -p LS-CONFIGURE"
=====
=====
Stopping ovspmd.
Installing filesets:
    LSCFG
    LSMIN
Running command: "ovupdate -d /dev/rstl -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.
```

Note The **ovinstall** command creates a log file named */tmp/update.log*. If a problem should occur during the installation process, you can examine this file to determine what may have gone wrong. To open this file for inspection, issue the following command: **more /tmp/update.log**. An example of this file is provided in the appendix “StreamView Output Samples.”

To extract the StreamView monitor, enter the following command:

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

Figure 3-2 shows a typical screen display that results from execution of the **ovinstall** command to extract the StreamView monitor software.

Figure 3-2 Screen Display During StreamView Monitor Extraction

```
# ovinstall -r -p LS-MONITOR -- -d /dev/rstl
Path is: /usr/OV/install/tools:/usr/OV/bin:/bin:/usr/bin:/etc:/usr/ucb:/usr/etc
Installing product definition for LS-MONITOR.
Running command: "ovupdate -d /dev/rstl -p LS-MONITOR"
=====
=====
Stopping ovspmd.
Installing filesets:
    LSCFG
    LSMIN
Running command: "ovupdate -d /dev/rstl -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.
```

To extract the StreamView topology map software, enter the following:

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

Figure 3-3 shows a typical screen display that results from execution of the preceding **ovinstall** command to extract the StreamView topology map software.

Figure 3-3 Screen Display During StreamView Topology Map Extraction

```
# ovinstall -r -p LS-TOPOMAP -- -d /dev/rstl
Path is: /usr/OV/install/tools:/usr/OV/bin:/bin:/usr/bin:/etc:/usr/ucb:/usr/etc
Installing product definition for LS-TOPOMAP.
Running command: "ovupdate -d /dev/rstl -p LS-TOPOMAP"
=====
=====
Stopping ovspmd.
Installing filesets:
    LSMIN
    LSTOPOMAP
Running command: "ovupdate -d /dev/rstl -l ovi.install"
=====
=====
NOTE:    Installation completed successfully.
Beginning configuration.
Customize script for fileset LSMIN succeeded.
Customize script for fileset LSTOPOMAP succeeded.
Configuration completed successfully. Examine /tmp/update.log for details.
Restarting ovspmd.
```

Step 6 Update the HP OpenView Fields database with StreamView fields using the following command:

```
# ovw -fields
```

Step 7 Verify that the network management software modules have been properly installed using the following command:

```
# ovw -verify
```

The verify program takes less than a minute to run and prints the names of the objects that it verifies. If the verification process fails, an error message displays on the screen. In this case, call your Cisco service representative for assistance.

Step 8 Restart HP OpenView using the following command:

```
# ovw
```

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

Step 9 Check the status of HP OpenView daemons using the following command:

```
# ovstatus
```

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

```
# ovstart
```

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 using the `ovw` command.

Step 10 Execute the `xnmsnmpconf` command at the shell prompt to update variables associated with the SNMP community.

This command displays the SNMP configuration screen. When displayed, double-click on the “Default” parameters field (which contains default values in text fields). Modify the following field values to read as shown:

Port (remote)	161
Timeout	6.0
Retry	2

The default polling interval is 5 minutes, which determines how long it will be before the display indicates changes in the network. Setting the polling interval to a value less than 5 minutes causes additional SNMP traffic to be generated and is, therefore, not advised.

By default, LS2020 nodes require the use of the “write” community for SNMP **set** operations, as indicated below:

```
set community: write
```

However, you may choose to use another name for the community that has read/write privileges, or you may choose to allow SNMP **set** operations from any community.

To allow such operations, however, you must configure the HP OpenView environment appropriately using the `xnmsnmpconf` command.

Alternatively, you can change the files at the LS2020 nodes to conform to the behavior of HP OpenView.

See the *LightStream 2020 Network Operations Guide* for additional information about setting up SNMP communities in an LS2020 network.

Step 11 Verify that the `/etc/services` file contains the following lines:

```
snmp          161/udp
snmp-trap     162/udp
```

If these lines are not present in the `/etc/services` file, create them. To do so, as “user ID root,” open the `/etc/services` file with the `vi` editor:

```
# vi /etc/services
```

Insert the `snmp 161/udp` and `snmp-trap 162/udp` lines in the appropriate location in the `/etc/services` file and close the file.

The installation of the network management is now complete. The next section describes how to create a user environment for running network management software applications under HP OpenView.

Setting Up a User Environment Under HP OpenView

This section describes how to set up the StreamView applications to run under HP OpenView on the NMS. Each NMS user intending to run StreamView under HP OpenView must perform the procedures in this section.

These procedures assume that you have already installed the network management software applications on your NMS, as described in the preceding section, “Installing Network Management Software to Run Under HP OpenView.

This section provides instructions for setting up the user environment for the Bourne shell (sh and bash) and the C shell (csh). For clarity, the setup procedures for the Bourne shell and the C shell are discussed under separate headings below.

Other shells may differ in details; in the case of another shell, consult the applicable documentation for that shell.

In preparation for setting up the user environment under HP OpenView, determine the type of shell each user is using.

In an NFS environment that uses the Network Information Services (NIS) facility, enter the following command:

```
# ypmatch <username> passwd
```

In an environment that does not use the NIS facility, enter the following command:

```
# egrep <username> /etc/passwd
```

The shell can be identified from the last field of the password entry, as shown in the following example:

```
jjones:0@elQMkzZv7oF:10563:312:Jon Jones:/home/jjones:/bin/bash
```

Setting Environment Variables for Bourne Shell and Derivatives

To set up the network management software to operate under HP OpenView and the Bourne shell, perform the following procedures:

Step 1 From your home directory, edit the *.profile* file or the *.bash_profile* file that is read by the Bourne shell on login.

Add the following lines to the end of the file:

```
PATH=$PATH:/usr/OV/bin/ls_bin
export LSC_DATABASE=/usr/OV/databases/ls/configure.netdb
export LSC_CFGLOGPATH=/usr/OV/log
export LSC_CFGTCPPORT=6789
export XKEYSYMDB=<pathname>/XKeysymDB
export NMSROOT=/usr/OV/bin/ls_bin
```

Note To determine the <pathname> for XKEYSYMDB in the last line above, consult your Sun system administrator. The file XKeysymDB should be in the subdirectory lib, lib/X11, or /usr/openwin/lib under the directory containing your X Windows executables. You can use the command `find / -name XKeysymDB -print` to search for the XKeysymDB file. However, the search process may be lengthy and may disclose multiple copies of the file. Also, note the upper- and lower-case conventions in the XKeysymDB filename; this case sensitivity is critical. If XKEYSYMDB is incorrectly defined when OpenView is started, that is, no file named XKeySymDB is found where XKEYSYMDB points, error output is directed to the standard error output device (STDERR). A sample of such output is shown in the “StreamView Output Samples” appendix under the heading “Error Output When XKEYSYMDB Is Undefined.”

- Step 2** Determine whether a `UIDPATH` variable is already set in your login environment by issuing the following command:

```
% echo $UIDPATH
```

- Step 3** If the system displays a search path in Step 2, add the following line to the end of the `.profile` file or the `.bash_profile` file:

```
export UIDPATH=$UIDPATH:/usr/OV/bin/ls_bin/%U
```

Otherwise, if the system displays the message “UIDPATH: unbound variable” or displays no message, add the following line to the `.profile` file or the `.bash_profile` file:

```
export UIDPATH=/usr/OV/bin/ls_bin/%U
```

- Step 4** Determine whether an `XFILESEARCHPATH` variable is already set in your login environment by issuing the following command:

```
% echo $XFILESEARCHPATH
```

- Step 5** If the system displays a search path in Step 4, add the following line to the end of the `.profile` file or the `.bash_profile` file:

```
export XFILESEARCHPATH=$XFILESEARCHPATH:/usr/OV/%T/%N%S
```

Otherwise, if the system displays the message “XFILESEARCHPATH: unbound variable” or displays no message, check for the existence of the following directory:

```
% ls /usr/openwin/lib/app-defaults/
```

If this directory *exists*, add the following lines to the end of the `.profile` or `.bash_profile` file:

```
export XFILESEARCHPATH=/usr/openwin/lib/%T/%N%S:\n/usr/OV/%T/%N%S
```

Check for the existence of the following directory:

```
% ls /usr/lib/X11/app-defaults/
```

If the previous directory *does not* exist, but this directory *does* exist, add the following lines to the end of the `.profile` or `.bash_profile` file:

```
export XFILESEARCHPATH=/usr/lib/X11/%T/%N%S:\n/usr/OV/%T/%N%S
```

If *both* of the above directories exist, add the following lines to the end of the `.profile` or `.bash_profile` file:

```
export XFILESEARCHPATH=/usr/openwin/lib/%T/%N%S:\n/usr/lib/X11/%T/%N%S:\n/usr/OV/%T/%N%S
```

If *neither* of the above directories exists, call your network administrator or Cisco Systems Customer Support for assistance.

- Step 6** Any HPOV/NMS user logged in during the installation process should now log out and log in again to activate the new environment variables.

- Step 7** If this is a new HP OpenView user, check the user’s home directory for the existence of the `.Xdefaults` file (or its equivalent `.Xresources`). If this file contains data, proceed with Step 8.

If this file exists but contains no data, append the contents of the `/usr/OV/newconfig/xdefaults` file to the user’s `.Xdefaults` file by issuing the following command sequence:

```
% mv .Xdefaults Xdef.sav\n% cat Xdef.sav /usr/OV/newconfig/xdefaults > .Xdefaults
```

This step gives you access to the screen fonts and application colors needed for display purposes.

If you need to revert to the old *.Xdefaults* file, you can find its contents in the backup file *Xdef.sav*.

If the *.Xdefaults* file does not exist in the user's home directory, issue the following command to create it:

```
% cp /usr/OV/newconfig/xdefaults .Xdefaults
```

A sample *.Xdefaults* file is shown in the appendix "StreamView Output Samples."

Step 8 Issue the following command from the console of your NMS to start HP OpenView:

```
% ovw
```

If, after issuing the *ovw* command, the message "ovw: cannot connect to database" is returned, issue the following command:

```
% ovstatus
```

This command reports the nature of the problem, as shown below:

```
"ovstatus: ovspnd is not running; use ovstart to start ovspnd"
```

Issue the *ovstart* command from "user ID root," as shown below:

```
# ovstart
```

As an alternative, if you want to start HP OpenView and run it in background mode while keeping the current window active, issue the following command:

```
% ovw&
```

In background mode, the *ovw* process is fully usable.

Note If LS2020 applications are invoked from within HP OpenView, such applications inherit the environment and privileges of the user account from which the *ovw* start command is issued. When the StreamView configurator is invoked under HP OpenView, the access permissions for the configuration database file created by this module correspond to the privileges of the user issuing the *ovw* command.

Step 9 If the following error message appears in the parent window from which you started HP OpenView in Step 8, the *XFILESEARCHPATH* is not set correctly:

```
ovw: Xt Warning: Cannot convert string "helvr14" to type FontStruct
ovw: Xt Warning: Cannot convert string "helvr12" to type FontStruct
ovw: Xt Warning: Cannot convert string "helvr10" to type FontStruct
ovw: Xt Warning: Cannot convert string "helvr08" to type FontStruct
```

Shut down HP OpenView, revert to Step 5 above, and add *"/usr/OV/%T/%N%S"* to the *XFILESEARCHPATH*. Continue from that point with Step 6 and Step 8 to restart HP OpenView.

The first time the StreamView configurator tool (*cfg*) is executed, the database is created automatically with the name specified by *LSC_DATABASE*, taking on the extensions *.dir* and *.pag* and the file permissions of the first user.

All users who will create or modify LS2020 node configurations must be in the same UNIX group. If they are not in the same group, such users will be limited to read-only access to the database and, therefore, will not be able to update LS2020 nodes with configuration information from the global database.

For example, if the operations group has read-only access to the global database, “user ID root” should issue the following commands to ensure that the operations group has required read/write access privileges to the file *configure.netdb*:

```
su
cd /usr/OV/databases/ls
chgrp <ops-group> configure.netdb
```

Setting Environment Variables for C Shell and Derivatives

To set up network management software to operate under HP OpenView and the C shell, perform the following steps:

Step 1 From your home directory, edit the *.cshrc* file that is read by the C shell on login. Add the following lines to the end of the file:

```
setenv PATH ${PATH}:/usr/OV/bin/ls_bin
setenv LSC_DATABASE /usr/OV/databases/ls/configure.netdb
setenv LSC_CFGLOGPATH /usr/OV/log
setenv LSC_CFGTCPPORT 6789
setenv XKEYSYMDB <pathname>/XKeysymDB
setenv NMSROOT /usr/OV/bin/ls_bin
```

Note To determine the <pathname> for XKEYSYMDB in the last line above, consult your Sun system administrator. The file XKeysymDB should be in the subdirectory *lib*, *lib/X11*, or */usr/openwin/lib* under the directory containing your X Windows executables. You can use the command `find / -name XKeysymDB -print` to search for the XKeysymDB file. However, be aware that the search process may be lengthy and find multiple copies of the file. Also, note the upper- and lower-case conventions in the XKeysymDB file name; this case sensitivity is critical. If XKEYSYMDB is incorrectly defined when OpenView is started, that is, no file named XKeySymDB is found where XKEYSYMDB points, error output is directed to the standard error output device (STDERR). A sample of such output is shown in the “StreamView Output Samples” appendix under the heading “Error Output When XKEYSYMDB Is Undefined.”

Step 2 Determine whether a UIDPATH variable is already set in your login environment by issuing the following command:

```
% echo $UIDPATH
```

Step 3 If the system displays a search path in Step 2, add the following line to the end of the *.cshrc* file:

```
setenv UIDPATH ${UIDPATH}:/usr/OV/bin/ls_bin/%U
```

Otherwise, if the system displays the message “UIDPATH: Undefined variable” or displays no message, add the following line to the end of the *.cshrc* file:

```
setenv UIDPATH /usr/OV/bin/ls_bin/%U
```

Step 4 Determine whether an XFILESEARCHPATH variable is already set in your login environment by issuing the following command:

```
% echo $XFILESEARCHPATH
```

Step 5 If the system displays a search path in Step 4, add the following line to the end of the *.cshrc* file:

```
setenv XFILESEARCHPATH ${XFILESEARCHPATH}:/usr/OV/%T/%N%S
```

Otherwise, if the system displays the message “XFILESEARCHPATH: undefined variable” or displays no message, check for the existence of the following directory:

```
% ls /usr/openwin/lib/app-defaults/
```

If this directory *exists*, add the following line to the end of the *.cshrc* file:

```
setenv XFILESEARCHPATH /usr/openwin/lib/%T/%N%S:/usr/OV/%T/%N%S
```

Check for the existence of the following directory:

```
% ls /usr/lib/X11/app-defaults/
```

If the first directory *does not* exist, but this second directory *does* exist, add the following line to the end of the *.cshrc* file:

```
setenv XFILESEARCHPATH /usr/lib/X11/%T/%N%S:/usr/OV/%T/%N%S
```

If *both* of the directories exist, add the following line to the end of the *.cshrc* file:

```
setenv XFILESEARCHPATH  
/usr/openwin/lib/%T/%N%S:/usr/lib/X11/%T/%N%S:/usr/OV/%T/%N%S
```

If *neither* of the directories exist, call your network administrator or Cisco Systems Customer Support for assistance.

Step 6 Any HPOV/NMS user logged in during the installation process should now log out and log in again to activate the new environment variables.

Step 7 If this is a new HP OpenView user, check the user’s home directory for the existence of the *.Xdefaults* file (or its equivalent *.Xresources*). If this file contains data, proceed with Step 8.

If this file exists but contains no data, append the contents of the */usr/OV/newconfig/xdefaults* file to the user’s *.Xdefaults* file by issuing the following command sequence:

```
% mv .Xdefaults Xdef.sav  
% cat Xdef.sav /usr/OV/newconfig/xdefaults > .Xdefaults
```

This step gives you access to the screen fonts and application colors needed for display purposes.

If you need to revert to the old *.Xdefaults* file, you can find its contents in the backup file *Xdef.sav*.

If the *.Xdefaults* file does not exist in the user’s home directory, issue the following command to create it:

```
% cp /usr/OV/newconfig/xdefaults .Xdefaults
```

A sample *.Xdefaults* file is shown in the appendix “StreamView Output Samples.”

Step 8 Issue the following command from the console of your NMS to start HP OpenView:

```
% ovw
```

If, after issuing the *ovw* command, the message “*ovw: cannot connect to database*” is returned, issue the following command:

```
% ovstatus
```

This command reports the nature of the problem, as shown below:

```
"ovstatus: ovspnd is not running; use ovstart to start ovspnd"
```

Issue the *ovstart* command from “user ID root,” as shown below:

```
# ovstart
```

As an alternative, if you want to start HP OpenView and run it in background mode while keeping the current window active, issue the following command:

```
% ovw&
```

In background mode, the ovw process is fully usable.

Note If you invoke LS2020 applications from within HP OpenView, the applications inherit the environment and privileges of the user account from which the `ovw` start command is issued. When the StreamView configurator is invoked under HP OpenView, the access permissions for the configuration database file created by this module correspond to the privileges of the user issuing the `ovw` command.

Step 9 If the following error message appears in the parent window from which you started HP OpenView in Step 8, the `XFILESEARCHPATH` is not set correctly:

```
ovw: Xt Warning: Cannot convert string "helvr14" to type FontStruct
ovw: Xt Warning: Cannot convert string "helvr12" to type FontStruct
ovw: Xt Warning: Cannot convert string "helvr10" to type FontStruct
ovw: Xt Warning: Cannot convert string "helvr08" to type FontStruct
```

In this case, shut down HP OpenView, revert to Step 5, and add “`/usr/OV/%T/%N%S`” to the `XFILESEARCHPATH`. Continue from that point with Step 6 and Step 8 to restart HP OpenView.

The first time the StreamView configurator tool (`cfg`) is executed, the database is created automatically with the name specified by `LSC_DATABASE`. It has the extensions `.dir` and `.pag` and the file permissions of the first user.

All users who will create or modify LS2020 node configurations must be in the same UNIX group. If not, such users will be limited to read-only access to the database and, therefore, will not be able to update LS2020 nodes with configuration information from the global database.

For example, if the operations group has read-only access to the global database, “user ID root” should issue the following commands to ensure that the operations group has required read-write access privileges to the file `configure.netdb`:

```
su
cd /usr/OV/databases/ls
chgrp <ops-group> configure.netdb
```

Installing Network Management Software to Run Without HP OpenView

Use this procedure to install either a new version or an upgrade of the LS2020 StreamView network management software on a Sun workstation that is not running HP OpenView.

Loading the Network Management Software Without HP OpenView

The network management software portion of the LS2020 software includes three modules; the configurator, the monitor, and the topology map. The CLI and the LS2020 multiservice-specific MIB are packaged with all three network management software modules.

To install the StreamView network management software applications to operate stand-alone without HP OpenView, perform the following steps:

Step 1 Log in to the Sun as root.

Step 2 Create a user account called *npadmin*, if one does not already exist.

The CLI uses the password for the npadmin account as the password for the CLI protected mode. If no npadmin account is defined for the NMS, the CLI uses the root password as the CLI protected mode password.

Step 3 Back up your *ovsnmp.conf* file if you have customized your existing configuration files and you wish to preserve them for a subsequent installation or upgrade of the network management software.

For example, if you have already installed Release 2.1 of the network management software in a non-HP OpenView environment and you need to re-install the software for some reason, you should first back up any configuration files you have customized since the previous installation.

Specifically, if you have customized the file */usr/LightStream-2.1/templates/ovsnmp.conf*, you should save a backup copy of this file and restore it after the installation has been completed (see Step 7).

To back up the *ovsnmp.conf* file, change to the proper directory and copy the configuration file. For example, for LightStream 2.1 you will see the following:

```
# cd /usr/LightStream-2.1/templates
# cp -p ovsnmp.conf ovsnmp.conf.custom
```

For LightStream 2.1.1 you will see the following:

```
# cd /usr/LightStream-2.1.1/templates
# cp -p ovsnmp.conf ovsnmp.conf.custom
```

Issue the list (*ls*) command to display the existing configuration files, as shown below:

```
# ls ovsnmp.conf*
```

This command will list the following configuration files:

```
ovsnmp.conf
ovsnmp.conf.custom
```

Step 4 Change to the root directory by issuing the following command:

```
# cd /
```

Step 5 Insert the LS2020 StreamView network management software tape into the Sun workstation tape drive.

Step 6 Issue the following commands in the order shown to extract the files from tape:

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

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

Note It is important to include the letter *n* “no rewind” as the leading character in the tape drive parameter (for example, nrst0 for tape drive rst0). If you omit this character, you will not be able to read the tape.

The extraction process, which takes from 10 to 20 minutes to complete, creates the following directory structures:

```
/usr/LightStream-2.1.2
/usr/LightStream-2.1.2/bin
/usr/LightStream-2.1.2/db
/usr/LightStream-2.1.2/etc
/usr/LightStream-2.1.2/hyperhelp
/usr/LightStream-2.1.2/lib
/usr/LightStream-2.1.2/log
/usr/LightStream-2.1.2/mib
/usr/LightStream-2.1.2/templates
```

Step 7 Restore your *ovsnmp.conf* file, if necessary.

If you saved a backup copy of your *ovsnmp.conf* file in Step 3, determine whether differences exist between your backup copy of the “*ovsnmp.conf.custom*” file and the new *ovsnmp.conf* file. For LightStream 2.1 execute the following commands:

```
# cd /usr/LightStream-2.1/templates
# diff ovsnmp.conf ovsnmp.conf.custom
```

For LightStream 2.1.1 execute the following commands:

```
# cd /usr/LightStream-2.1.1/templates
# diff ovsnmp.conf ovsnmp.conf.custom
```

If no differences between these files are reported, the files are identical. On the other hand, if differences are reported, save the distribution copy of the *ovsnmp.conf* file by issuing the following command:

```
# mv ovsnmp.conf ovsnmp.conf.orig
```

Copy your custom configuration file to *ovsnmp.conf* by issuing the following command:

```
# cp ovsnmp.conf.custom ovsnmp.conf
```

The installation of the network management software is now complete. The next section describes how to set up the NMS environment for using network management software in a non-HP OpenView environment.

Setting Up a User Environment Without HP OpenView

This section describes how to set up the StreamView application to run on the NMS without HP OpenView. Each LS2020 user intending to run StreamView on the NMS without HP OpenView must complete the procedures in this section.

It is assumed that you have already installed the StreamView application on your NMS to operate without HP OpenView, as described in the preceding section, “Installing Network Management Software to Run Without HP OpenView.”

This section provides instructions for setting up the StreamView user environment for the Bourne shell (sh and bash) and the C shell (csh). For convenience and clarity, the setup procedures for these shells are described under separate headings below.

Note that other shells may differ in details; in the case of another shell, consult the appropriate shell documentation for additional information.

Setting Environment Variables for Bourne Shell and Derivatives

To set up the network management software applications to operate without HP OpenView under the Bourne shell, perform the following steps:

Step 1 Open the */etc/services* file with the vi editor:

```
vi /etc/services
```

Verify that the */etc/services* file contains the following entry:

```
snmp          161/udp
snmp-trap     162/udp
```

If this entry is not present in the */etc/services* file, create the entry and close the file.

Step 2 Determine which type of shell each user is using:

In an NFS environment using the Network Information Services (NIS) facility, enter the following command:

```
ypmatch <username> passwd
```

In an environment that does not use the NIS facility, enter the following command:

```
egrep <username> /etc/passwd
```

The last field of the output that results from either of the above commands identifies the shell in use, as shown in the following example:

```
jjones:oe1QMkzZv7oF:10563:312:Jon Jones:/home/jjones:/bin/bash
```

Step 3 Each StreamView user must define several environment variables. To do so, go to your home directory and edit the *.profile* file or the *.bash_profile* file that the Bourne shell reads on login.

Note To determine the <pathname> for XKEYSYMDB shown in the Bourne shell procedures below, consult your Sun system administrator. The file XKeysymDB should be in the subdirectory *lib*, *lib/X11*, or */usr/openwin/lib* under the directory containing your X Windows executables. You can use the command `find / -name XKeysymDB -print` to search for the XKeysymDB file. However, be aware that the search process may be lengthy and may disclose multiple copies of the file. Also, note the upper- and lower-case conventions in the XKeysymDB filename; this case sensitivity is critical. If XKEYSYMDB is incorrectly defined when OpenView is started, that is, no file named XKeySymDB is found where XKEYSYMDB points, error output is directed to the standard error output device (STDERR). A sample of such output is shown in the “StreamView Output Samples” appendix under the heading “Error Output When XKEYSYMDB Is Undefined.”

- Step 4** Determine whether a `UIDPATH` variable is already set in your login environment by entering the following command:

```
% echo $UIDPATH
```

- Step 5** If the system displays a search path in Step 4, add the following lines to the end of the `.profile` file or the `.bash_profile` file:

```
PATH=$PATH:/usr/LightStream-2.1.2/bin
export UIDPATH=$UIDPATH:/usr/LightStream-2.1.2/bin/%U
export LSC_DATABASE=/usr/LightStream-2.1.2/db/configure.netdb
export LSC_CFGLOGPATH=/usr/LightStream-2.1.2/log
export LSC_CFGTCPPORT=6789
export OVSNMP_CONF_FILE=/usr/LightStream-2.1.2/templates/ovsnmp.conf
export XKEYSYMDB=<pathname>/XKeysymDB
export NMSROOT=/usr/LightStream-2.1.2
```

After adding the data called for in this step to the appropriate file, skip to Step 7.

- Step 6** If the system displays `UIDPATH: unbound variable` or no message in response to the `echo $UIDPATH` command, add the following lines to the end of the `.profile` file or the `.bash_profile` file:

```
PATH=$PATH:/usr/LightStream-2.1.2/bin
export UIDPATH=/usr/LightStream-2.1.2/bin/%U
export LSC_DATABASE=/usr/LightStream-2.1.2/db/configure.netdb
export LSC_CFGLOGPATH=/usr/LightStream-2.1.2/log
export LSC_CFGTCPPORT=6789
export OVSNMP_CONF_FILE=/usr/LightStream-2.1.2/templates/ovsnmp.conf
export XKEYSYMDB=<pathname>/XKeysymDB
export NMSROOT=/usr/LightStream-2.1.2
```

Continue with Step 7.

- Step 7** Any Sun user logged in during the installation and configuration process should now log out and log in again to activate the new environment variables.
- Step 8** Check the user's home directory for the existence of the `.Xdefaults` file. If this file is present and contains data, skip to Step 9.

If this file exists but contains no data, append the contents of the `/usr/LightStream-2.1.2/templates/xdefaults` file to the user's `.Xdefaults` file by issuing the following commands:

```
% mv .Xdefaults Xdef.sav
% cat Xdef.sav /usr/LightStream-2.1.2/templates/xdefaults > .Xdefaults
```

This step gives you access to the screen fonts and application colors needed for display purposes.

If you need to revert to the old `.Xdefaults` file, you can find its contents in the backup file `Xdef.sav`.

If the `.Xdefaults` file does not exist in the user's home directory, issue the following command to create it:

```
% cp /usr/LightStream-2.1.2/templates/xdefaults .Xdefaults
```

A sample `.Xdefaults` file is shown in the appendix "StreamView Output Samples."

- Step 9** By default, LS2020 nodes require the use of the "write" community for SNMP `set` operations. You may choose to use another name for your community with read/write access privileges, or you may choose to allow SNMP `set` operations from any community.

If you change the community name, you must kill the `cfg_a` process for the changes to take effect. The process will be restarted the next time you download a configuration.

To kill the `cfg_a` process, you must

1. log in as root

2. At the bash prompt, type:

```
ps -ax/grep cfg_a
```

3. Find the PID number in the resulting display, type:

```
kill -9 <pid# of cfg_a>
```

Note If you change a community name in the `ovsnmp.conf` file you must also change the community name on the LS2020 node. For more information about changing community names, see the “Setup Procedures” chapter.

To configure this option in your NMS environment, edit the file `/usr/LightStream-2.1.2/templates/ovsnmp.conf`, or change the files at each LS2020 node to conform to your workstation’s behavior.

Refer to the *LightStream 2020 Network Operations Guide* for information about setting up SNMP communities in an LS2020 network. Use a text editor such as `emacs` or `vi` to modify the file `/usr/LightStream-2.1.2/templates/ovsnmp.conf`. The file itself contains instructions for formatting each entry.

Note that the first time the StreamView configurator tool (`cfg`) is executed, the database is created automatically with the name specified by `LSC_DATABASE`, with the extensions `.dir` and `.pag` and the file permissions of the first user.

All users who will create or modify LS2020 node configurations must be in the same UNIX group. If they are not in the same group, users will be limited to read-only access to the database and, therefore, will not be able to update LS2020 nodes with configuration information from the global database.

For example, if the operations group has read-only access to the global database, “user ID root” should issue the following commands to ensure that the operations group has the required read/write access privileges to the file `configure.netdb`:

```
su
cd /usr/LightStream-2.1.2/db
chgrp <ops-group> configure.netdb
```

Setting Environment Variables for C Shell and Derivatives

To set up the network management software applications to operate without HP OpenView under the C shell, perform the following steps:

Step 1 Open the `/etc/services` file with the `vi` editor:

```
vi /etc/services
```

Verify that the `/etc/services` file contains the following entry:

```
snmp          161/udp
snmp-trap     162/udp
```

If this entry is not present in the `/etc/services` file, create the entry and close the file.

Step 2 Determine which type of shell each user is using, as described below.

In an NFS environment using the Network Information Services (NIS) facility, enter the following command:

```
ypmatch <username> passwd
```

In an environment that does not use the NIS facility, enter the following command:

```
egrep <username> /etc/passwd
```

The last field of the output that results from either of the above commands identifies the shell in use, as shown in the following example:

```
jjones:oe1QMkzZv7oF:10563:312:Jon Jones:/home/jjones:/bin/csh
```

Step 3 To use StreamView, you must define several environment variables. To define these variables, go to your home directory and edit the `.cshrc` file that the C shell reads on login.

Note To determine the `<pathname>` for `XKEYSYMDB` in the procedures below, consult your Sun system administrator. The file `XKeysymDB` should be in the subdirectory `lib`, `lib/X11`, or `/usr/openwin/lib` under the directory containing your X Windows executables. You can use the command `find / -name XKeysymDB -print` to search for the `XKeysymDB` file. However, the search process may be lengthy and may disclose multiple copies of the file. Also, note the upper- and lower-case conventions in the `XKeysymDB` filename; this case sensitivity is critical. If `XKEYSYMDB` is incorrectly defined when OpenView is started, that is, no file named `XKeySymDB` is found where `XKEYSYMDB` points, error output is directed to the standard error output device (STDERR). A sample of such output is shown in the “StreamView Output Samples” appendix under the heading “Error Output When XKEYSYMDB Is Undefined.”

Step 4 Determine whether a `UIDPATH` variable is already set in your login environment by entering the following command:

```
% echo $UIDPATH
```

Step 5 If the system displays a path, add the following lines to the end of the `.cshrc` file:

```
setenv PATH ${PATH}:/usr/LightStream-2.1.2/bin
setenv UIDPATH ${UIDPATH}:/usr/LightStream-2.1.2/bin/%U
setenv LSC_DATABASE /usr/LightStream-2.1.2/db/configure.netdb
setenv LSC_CFGLOGPATH /usr/LightStream-2.1.2/log
setenv LSC_CFGTCPPORT 6789
setenv OVSUMP_CONF_FILE /usr/LightStream-2.1.2/templates/ovsnp.conf
setenv XKEYSYMDB <pathname>/XKeysymDB
setenv NMSROOT /usr/LightStream-2.1.2
```

After adding the data called for in this step to the `.cshrc` file, skip to Step 7.

Step 6 If the system displays the message `UIDPATH: Undefined variable` or no message in response to the `echo $UIDPATH` command, add the following lines to the end of the `.cshrc` file:

```
setenv PATH ${PATH}:/usr/LightStream-2.1.2/bin
setenv UIDPATH /usr/LightStream-2.1.2/bin/%U
setenv LSC_DATABASE /usr/LightStream-2.1.2/db/configure.netdb
setenv LSC_CFGLOGPATH /usr/LightStream-2.1.2/log
setenv LSC_CFGTCPPORT 6789
```

```
setenv OVSNMP_CONF_FILE /usr/LightStream-2.1.2/templates/ovsnmp.conf
setenv XKEYSYMDB <pathname>/XKeysymDB
setenv NMSROOT /usr/LightStream-2.1.2
```

Continue with Step 7.

Step 7 Any NMS user logged in during the installation and configuration process should now log out and log in again to activate the new environment variables.

Step 8 Check the user's home directory for the existence of the *.Xdefaults* file. If this file is present and contains data, skip to Step 9.

If this file exists but contains no data, append the contents of the */usr/LightStream-2.1.2/templates/xdefaults* file to the user's *.Xdefaults* file by issuing the following commands:

```
% mv .Xdefaults Xdef.sav
% cat Xdef.sav /usr/LightStream-2.1.2/templates/xdefaults > .Xdefaults
```

This step provides access to the screen fonts and application colors needed for display purposes.

If you need to revert to the old *.Xdefaults* file, you can find its contents in the backup file *Xdef.sav*.

If the *.Xdefaults* file does not exist in the user's home directory, issue the following command to create it:

```
% cp /usr/LightStream-2.1.2/templates/xdefaults .Xdefaults
```

A sample *.Xdefaults* file is shown in the appendix "StreamView Output Samples."

Step 9 By default, LS2020 nodes require the use of the "write" community for SNMP **set** operations. You may choose to use another name for your community with read/write access privileges, or you may choose to allow SNMP **set** operations from any community.

If you change the community name, you must kill the *cfg_a* process for the changes to take effect. The process will be restarted the next time you download a configuration.

To kill the *cfg_a* process, you must

1. log in as root
2. At the bash prompt, type:

```
ps -ax/grep cfg_a
```

3. Find the PID number in the resulting display, type:

```
kill -9 <pid# of cfg_a>
```

Note If you change a community name in the *ovsnmp.conf* file you must also change the community name on the LS2020 node. For more information about changing community names, refer to Chapter 4, "Setup Procedures."

To configure this option in your Sun environment, edit the file */usr/LightStream-2.1.2/templates/ovsnmp.conf*, or change the files at each LS2020 node to conform to your workstation's behavior.

Refer to the *LightStream 2020 Network Operations Guide* for information about setting up SNMP communities in an LS2020 network. Use a text editor such as emacs or vi to modify the file `/usr/LightStream-2.1.2/templates/ovsnmp.conf`. The file itself contains instructions for formatting each entry.

The first time the StreamView configurator tool (cfg) is executed, the database is created automatically with the name specified by LSC_DATABASE, taking on the extensions `.dir` and `.pag` and the file permissions of the first user.

All users who will create or modify LS2020 node configurations must be in the same UNIX group. If they are not, such users will be limited to read-only access to the database and, therefore, will not be able to update LS2020 nodes with configuration information from the global database.

For example, if the operations group has read-only access to the global database, “user ID root” should issue the following commands to ensure that the operations group has required read/write access privileges to the file `configure.netdb`:

```
su
cd /usr/LightStream-2.1.2/db
chgrp <ops-group> configure.netdb
```