TotalView™

Multiprocess Debugger

Installation Guide

Version 3.9.0

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About This Guide

This guide provides information about installing the TotalView™ multiprocess debugger on the following platforms:

- Digital Alpha™ with the Digital UNIX® operating system
- IBM® RS/6000™, and IBM RS/6000SP with the AIX® operating system
- QSW CS-2 with the QSW-specific Solaris operating system
- Sun SPARC® with the SunOS™ 4.1.*x* operating system (the version of the SunOS operating system that is supplied with Solaris 1.*x*)
- Sun SPARC with the SunOS 5.*x* operating system (the version of the SunOS operating system that is supplied with Solaris 2.*x*)
- SGI MIPS with the IRIX operating system, for programs compiled with the −n32 or −64 compiler options
- Intel® x86 with the SunOS 5.*x* operating system (the version of the SunOS operating system that is supplied with Solaris 2.*x*)

See the *TotalView Release Notes* for complete information about supported operating systems.

TotalView is a source-level and machine-level debugger with an easy-to-use interface (based on the X Window System) and support for debugging multiprocess and multithreaded programs. This guide is a companion to the *User's Guide*, which provides general information about using the TotalView program.

This guide assumes that you are familiar with your platform's operating system.

Supported Platforms

TotalView is available for a variety of platforms and can be used to debug programs on the native platform or on remote systems, such as parallel processors, supercomputers, or digital signal processor boards.

If TotalView is not yet available for your system configuration, please contact Etnus about porting TotalView to suit your needs:

Etnus Inc.
111 Speen Street
Framingham, MA 01701-2090
Internet E-mail: **info@etnus.com**
1-800-856-3766 in the United States
(+1) 508-875-3030 worldwide

Reporting Problems

Please contact us if you have problems installing TotalView, questions that are not answered in the product documentation or on our Web site, or suggestions for new features or improvements.

Our Internet E-Mail addresses are: **support@etnus.com**
1-800-856-3766 in the United States
(+1) 508-875-3030 worldwide

If you are reporting a problem, please include the following information:

- The **version** of TotalView
- The **platform** on which you're running TotalView
- An **example** that illustrates the problem
- A **record** of the sequence of events that led to the problem

See the *TotalView Release Notes* for complete instructions on how to report problems.

Typographical Conventions

This guide uses the following conventions to present information:

bold	An exact filename, command, or user input.
italic	In examples, indicates a variable or a value that you supply. Italic text emphasizes important words or phrases.
`typewriter`	Computer output.
Control-Z	Press the keys simultaneously; for example, hold down the Ctrl key and press the Z key.
^Z	Shorthand for Control-Z.
Esc Z	Press the first key and then the second; for example, press the Escape key and then press the Z key.
M-I	Shorthand for Meta-I. (The Meta key varies with your platform; usually it is the Alt key.)
[ ]	Optional items in command syntax descriptions.
. . .	Repetition of the previous command or input.
(G)	The keyboard equivalent for a command in parentheses; for example, **Go Group (G)**.

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CHAPTER 1:

Obtaining TotalView Software

Etnus distributes TotalView software on the Internet. You can use one of the methods described in this chapter to get a version of the TotalView multiprocess debugger for your UNIX system.

From here:

- If there is a new version of the TotalView software on your system, you can install the software now. See “Installing TotalView Software” on page 5 for details.
- If you want to get TotalView software to install, follow the instructions in this chapter.

Downloading Software from the Internet

TotalView software is stored in compressed **tar** format. The tar files that you download from the **/totalview/tv**<*version*> directory include:

- **totalview-**<*version*>**-**<*platform*>**.tar —** the binary, and related files
- **totalview-**<*version*>**-doc-pdf.tar —** product manuals compatible with Adobe® Acrobat® Reader
- **totalview-**<*version*>**-doc-ps.tar.Z —** product manuals compatible with most PostScript® printers

After you copy the distribution to your system, you can unbundle the files in a scratch directory and install the software.

Downloading from the Web

If you have access to the worldwide web, you can use your browser to download a TotalView distribution. Follow these steps:

1. Make a scratch directory on your system where you can extract TotalView files, then make that your working directory. For example:

   % **mkdir** *<directory-name>*

   % **cd** *<directory-name>*

2. Point your Web browser to **http: //www.etnus.com/**.
3. Click **Demos**. Then click **Download a TotalView Multiprocess Debugger demo**.
4. Click the latest TotalView release name that applies to your platform.
5. Follow the steps to download a complete and full-featured TotalView distribution and documentation files. As they are downloaded, save the files in your scratch directory.

From here:

- See "Unbundling Downloaded Files" on page 3 for further instructions.

Downloading using ftp

If you have Internet access, you can use the **ftp** command to get TotalView software. Follow these steps:

1. Make a scratch directory on your system where you can extract TotalView files, then make that your working directory. For example:

   % **mkdir** *<directory-name>*

   % **cd** *<directory-name>*

2. Log in with **ftp** as shown here.

   % **ftp ftp.etnus.com** (IP address 204.164.68.129)

   `Name:` **anonymous**

   `Password:` *<your E-mail address>*

   `ftp>` **binary**

   `ftp>` **cd totalview**

   `ftp>` **cd tv***<version>*

`ftp>` **get totalview-*<version>*-*<platform>*.tar** (downloads the distribution)

3. You can take one or both documentation formats.

   `ftp>` **mget *doc-pdf.tar** (to get files for use with Acrobat Reader)

   -OR-

   `ftp>` **mget *doc-ps.tar.Z** (to get files for use with a PostScript printer)

4. When you have the files you want, you can log off.

   `ftp>` **quit**

From here:

• See “Unbundling Downloaded Files” on page 3 for further instructions.

Unbundling Downloaded Files

Use the **uncompress** and **tar** commands to extract the TotalView files in the scratch directory. For example:

% **uncompress *.Z**

% **ls -l**

% **tar xvf totalview-*<version>*-*<platform>*.tar**

% **tar xvf totalview-*<version>*-doc-pdf.tar**

% **tar xvf totalview-*<version>*-doc-ps.tar**

The platform-specific README.TXT file contains important information about your release bundle and license agreement.

% **more README.TXT**

From here:

• To install and evaluate TotalView software see Chapter 2, “Installing TotalView Software,” on page 5.

Preparing to Install from a CD-ROM

If you received TotalView software on a CD-ROM, follow these steps to find the TotalView distribution for your platform.

To locate your distribution

1. Become the **root** user. Type:

   % **su root**

   `Password:` *<your-root-password>*

2. Mount the CD-ROM on, for example, **/cdrom**. The specific command to use depends on your UNIX system.

3. You no longer need to be the **root** user. Type:

   # **exit**

4. Make your current directory, the **/cdrom** directory. Type:

   % **cd /cdrom**

5. Look at the readme.txt file to find the latest version of the software that runs on your platform. Type:

   % **more readme.txt**

6. Change your directory to the directory for your platform. For example:

   % **cd totalview/tv***<version>***/***<platform>*

7. The platform-specific README.TXT file contains important information about the release files and license agreement. To view the README.TXT file, type:

   % **more README.TXT**

From here:

- To install and evaluate TotalView software see Chapter 2, “Installing TotalView Software,” on page 5.

CHAPTER 2:

Installing TotalView Software

Welcome to the world of easy debugging with the TotalView multiprocess debugger.

From here:

- If you want to get TotalView software or documentation for any supported platform, see “Obtaining TotalView Software” on page 1.
- If you want to install and evaluate TotalView software for a trial period, begin with “Obtaining a Demo License” on page 5.
- If you have a license and want to install a new version of the TotalView software, begin with “Running the Install Program” on page 6.
- If you have a demo license and have already installed TotalView, see “Installing a Demo License” on page 8.
- If you want to install a new, regular license, or change your existing license, see Chapter 3 on page 13.

Obtaining a Demo License

If you are evaluating TotalView software, follow the steps in this section to complete the installation and start using the software immediately. You need a demo license (valid for 30 days) to evaluate the TotalView multiprocess debugger.

To obtain a demo license

Send E-mail to **info@etnus.com** and request a TotalView demo license specifying the filenames that you downloaded.

From here:

- To install the software see "Running the Install Program" on page 6 for specific instructions.
- To install a replacement demo license, see "Installing a Demo License" on page 8.

Running the Install Program

If you want to install a new version of the TotalView software, follow the instructions in this section. While you wait for a demo license, you can install a complete and full-featured version of the TotalView multiprocess debugger.

Before you start the installation, consider the following:

- Review the **README.TXT** file that comes with your distribution. It contains important information about your TotalView license.
- Read the *TotalView Release Notes*. The *Release Notes* contains specific information that you may need to use your version of TotalView, for example, the operating system patches that are required for certain operating system versions.
- We recommend that you become the **root** user to complete the installation to prevent users from modifying the software after it is installed. However, you do not have to become the **root** user to install the software, and we recommend that you do *not* run TotalView as **root** until you become familiar with its powerful capabilities.
- The **Install** program prompts you to identify an installation directory where it creates two subdirectories named:

  totalview.<*version*>**/**<*platform*>

  flexlm-5.0 (license management software)

When you are prompted for an installation directory name, you can do one of the following:

- Use the name of any directory you can create. The **Install** program accepts the current directory symbol ".". If the directory you specify does not exist, the **Install** program creates it.
- Use one of the default installation directories. Depending on your UNIX system, these are the **/usr/toolworks** or **/opt/toolworks** directories.

This manual refers to the *absolute* pathname of the installation directory that you create as *<installdir>*.

- The **Install** program asks you if you want to create a symbolic link (named **totalview**) in the **/usr** or **/opt** directory. This symbolic link points to the *<installdir>***/totalview.***<version>***/***<platform>* directory.

Note: If you are not the **root** user, the **Install** program cannot create the link, so you should answer "**n**" (no) to this prompt. If for any reason the creation of the symbolic link fails, you can safely ignore messages about this problem and continue the installation by pressing **Enter**.

To start the installation

1. (Optional) On the system where you install the TotalView multiprocess debugger, type:

   % **su root**

   `Password:` *<your-root-password>*

2. From the scratch directory where you unbundled the release, or from your *<platform>* directory on the CD-ROM start the **Install** program. Type:

   # **./Install**

   Reply to queries and prompts until the **Install** program ends.

3. Become non-**root** to test the installation. Type:

   # **exit**

4. Test the installation. Start the program and list the software version. Type:

   % *<installdir>***/totalview.***<version>***/***<platform>***/bin/totalview**

The TotalView program prints its banner including its version number and a message indicating that a license file has *not* been installed. If, instead of the banner, you see a diagnostic message, refer to “Troubleshooting the Installation” on page 10.

From here do one of the following:

- Install a demo license in order to use and evaluate the software. See “Installing a Demo License” on page 8 for details.
- Obtain and install a regular license. See Chapter 3 on page 13 for more information.

Installing a Demo License

To use the TotalView multiprocess debugger, create a text file (**license.dat**) that contains the TotalView demo license text.

To create the license.dat file

1. Become the **root** user if you installed the TotalView software as the **root** user.
2. Use any plain-ASCII text editor to open a new file; then copy the TotalView license text to the new file. For example (N.B. The following is not a working demo license.):

```
## BEGIN LICENSE
INCREMENT TV/Base                      toolworks 3.900 15-sep-1999 0 \
         EC62D6259046094FDD99 \
         HOSTID=DEMO          ISSUED=12-Jun-1999 ck=195
## END LICENSE
```

3. Save the file in the **flexlm-5.0** subdirectory of your installation directory as:

   *<installdir>***/flexlm-5.0/license.dat**

4. Become non-**root** to test the license installation. Type:

   \# **exit**

Testing the Installation

To test the installation

To test the TotalView license installation, type:

% *<installdir>***/totalview.***<version>***/***<platform>***/bin/totalview**

The TotalView program prints its banner and opens its Root window. To exit the TotalView program,

1. Click the TotalView window frame to activate the window.
2. Type **q** and click **Yes**.

When operating the TotalView program, we recommend that you set your window manager focus policy to Focus Follows Mouse. Then, Step 1 above becomes: "Move the mouse pointer to the TotalView window."

The **totalview** startup script sets the environment variable **LM_LICENSE_FILE** to include the Etnus standard location of the **license.dat** file:

*<installdir>***/flexlm-5.0/license.dat**

To set the license file variable

If you choose to install the **license.dat** file in a nonstandard directory, before you can run TotalView, you must set the environment variable **LM_LICENSE_FILE** to the full pathname of the **license.dat** file. For example:

% **setenv LM_LICENSE_FILE **
*<nonstandard-dir>***/license.dat**

If **LM_LICENSE_FILE** is already set, add the pathname for **license.dat** to the list. The **LM_LICENSE_FILE** environment variable is a colon-separated list of license file pathnames. For example:

% **setenv LM_LICENSE_FILE **
*<nonstandard-dir>***/license.dat:${LM_LICENSE_FILE}**

Troubleshooting the Installation

The TotalView program starts up with the **totalview** command shell script. The script

1. Finds *<installdir>***/totalview.***<version>***/***<platform>*
2. Determines the host system type in order to set the appropriate LD_LIBRARY_PATH environment variable for loading the TotalView shared libraries from *<installdir>***/totalview.***<version>***/***<platform>***/shlib**
3. Appends the Etnus standard license file location *<installdir>***/flexlm-5.0/license.dat** to the environment variable **LM_LICENSE_FILE**
4. Executes the TotalView executable file **tvdmain**

If the TotalView program does not print its banner when you run **totalview** but instead prints one of the following diagnostic messages, please take the corresponding action shown in Table 1.

Table 1. Start-up Diagnostic Messages

Message	Action
Unable to find installation directory	Edit the **totalview** script. Set **TVROOT** to *<installdir>***/totalview.***<version>***/***<platform>*
Platform...is not supported	Log in to a system that is running on a supported platform *before* running **totalview**
A message that includes: **.../bin/tvdmain...**	Reinstall TotalView. If after reinstallation you continue to get this message, report an installation problem. See “Reporting Problems” on page iv.

From here:

- If you want to start using the TotalView multiprocess debugger immediately, see Chapter 4 on page 25 for instructions.
- If you want to download documentation or software for another platform, see Chapter 1 on page 1.

- When you are ready to order or install a regular license, see Chapter 3 on page 13.
- If you returned to this section to test a license manager installation and are ready to continue working with the license manager, see "Starting the License Manager when the System Boots" on page 21.

CHAPTER 3: Installing or Changing a Regular License

Thank you for making the TotalView multiprocess debugger part of your production environment.

From here:

- If you are installing TotalView software for the first time with a permanent license, begin with "Planning for a Regular License" on page 13.
- If you want to update an existing license, see "Ordering a Regular License" on page 15.
- If you are installing TotalView software to use an existing license, see "Accessing a Remote License Server" on page 19.
- If you want to shutdown and restart the license manager, see "Starting the License Manager Manually" on page 20.
- If you want to configure the license server for system boot activity, see "Understanding FLEXlm Software" on page 22.

Planning for a Regular License

You need a regular TotalView license when your demo license expires, or you want to change your current regular license. The TotalView multiprocess debugger depends on FLEX*lm*® license management software (the license manager) to grant or reject requests to use the TotalView multiprocess debugger.

You do *not* need to install FLEX*lm* for a demo license.

Your regular TotalView license applies to a specific FLEX*lm* license manager host (the license server) and is for a specific number of floating, concurrent user licenses. Before you install a regular license, you must choose and configure a license server.

We supply documentation in HTML format and tools for using FLEX*lm* with the TotalView distribution. Stand-alone versions of the FLEX*lm* license manager are also available for various platforms. For more information, see "Understanding FLEXlm Software" on page 22.

Choosing a License Server

It is not necessary to configure a license server until you install a regular license for the first time, or change a current, regular license. Typically, you install the license manager and TotalView software on the same system. You have an option to install the license manager separately, for example, on a centralized server or on a control workstation.

If you order a single-user license, consider designating a license server that is different from your TotalView debugging machine. Then if you ever change the system that runs the TotalView debugger, you can update your license without making other, major changes to the license server.

We recommend putting your license manager on a machine that is:

- Reliable
- Always running
- A permanent part of your local network

Note: If you now have a FLEX*lm* license manager in your network, we recommend that you do not include your TotalView software with all the other software managed by that license manager. Instead, use the steps outlined in this chapter to configure a dedicated FLEX*lm* license manager for TotalView software.

Supporting Redundancy

The FLEX*lm* license manager supports two configurations that increase server availability. You can have three license servers serving a redundant-server license. If a server goes down, users can obtain TotalView licenses from one of the other two servers.

If you support several sites interconnected on a TCP/IP network, each site can have its own server and license file. Users can configure their LM_LICENSE_FILE environment variable to include license files which reference servers at the other sites so that license service is always available.

If you choose the option to have redundant servers, you must set up each server as described in “Installing a Regular License” on page 16. In addition, when you order a regular license, include a **toolworks_hostid** for each license server. There is additional information about setting up redundant servers in the FLEX*lm* documents included in your TotalView distribution.

There is more information about license server management in “Configuring the License Server” on page 18.

Ordering a Regular License

To set up or change a regular installation, contact Etnus by phone at 1-800-856-3766 in the U.S. or (+1) 508-875-3030 worldwide, or through E-mail, **info@etnus.com**. Have available, information about:

- The platforms and operating systems where you plan to run TotalView software.
- The maximum number of concurrent users.
- For each platform, the maximum number of processors that will potentially run target processes of a single TotalView debugging session.
- The **toolworks_hostid** output from your chosen FLEX*lm* license server. (See below for an example.)

FLEX*lm* uses a host ID to uniquely identify the computer where the license server runs. The host ID becomes part of each regular license key, restricting service to the license server identified by the host ID. To get a set of regular license keys for your license server, you must include the FLEX*lm* host ID of the host computer where you plan to run the FLEX*lm* license manager.

To find a license server host ID

When you install TotalView software, the files for the FLEX*lm* license manager are automatically installed in:

*<installdir>***/flexlm-5.0**

Run **toolworks_hostid,** a utility program supplied with the FLEX*lm* license manager distribution. Do *not* rely on the UNIX **hostid** command. Instead, type:

% *<installdir>***/flexlm-5.0/bin/toolworks_hostid**

The **toolworks_hostid** command writes the host name and the FLEX*lm* host ID value to standard output, for example:

```
The host name for this machine is: fast-server
The host ID for this machine is:   08122b2cf32d
```

With your purchase order, include the **toolworks_hostid** standard output lines shown above, and mention that the license is for the TotalView multiprocess debugger. Etnus will return a license file that includes a set of regular license keys for the TotalView multiprocess debugger.

Installing a Regular License

For best security, you need super-user (**root**) privilege on the license server to perform many of the installation steps. Use any plain-ASCII text editor to copy the license file you receive from Etnus into the *<installdir>***/flexlm-5.0/license.src** file. You may copy the entire message or only the portion beginning with ## BEGIN LICENSE and ending with ## END LICENSE, *inclusive*, as shown in Figure 1.

Hostname
FLEX*lm* Host ID
Expiration Date*
Number of Users
Platform
Number of Processors
FLEX*lm* License Version

```
## BEGIN LICENSE
SERVER happy-sp2 1386310 <port-number>
DAEMON toolworks <daemon-path> <options-file>
INCREMENT TV/Base                        toolworks 3.900 1-jan-0000 20 \
        ACE2E64242992DE2EC36 ISSUED=24-Jun-1999 ck=189
INCREMENT TV/PPC-AIX                     toolworks 3.900 1-jan-0000 20 \
        BC6206D2A3A83DF53D15 ISSUED=24-Jun-1999 ck=84
INCREMENT TV/PPC-AIX/MP/32               toolworks 3.900 1-jan-0000 20 \
        0CA2B6B2A204947B9892 ISSUED=24-Jun-1999 ck=236
INCREMENT TV/PPC-AIX/PE                  toolworks 3.900 1-jan-0000 20 \
        CCD27662DEAB91FEC655 ISSUED=24-Jun-1999 ck=1
## END LICENSE
```

*A value of 0000 in the expiration date indicates a permanent license.

Figure 1. Regular License for TotalView Software

From here:

- If you are installing a regular license for the first time, see "Creating a FLEXlm User Account" on page 17.
- If you are changing a regular license, see "Configuring the License Server" on page 18.

Creating a FLEX*lm* User Account

For best security, run the FLEX*lm* license manager as a unique non-privileged (that is non-**root**) user. To do so create a non-privileged user account reserved for use by FLEX*lm*.

The steps used to create a new user account vary with operating systems and site configurations. Please refer to the documentation for your operating system, or your site's standard operating procedures for specific directions. The following string is an example of a **passwd** file record that supports the FLEX*lm* user.

flexlm:*:2000:250:FLEXlm License Manager:/nonexistent:/bin/sh

Note that this account must have the following properties:

- The password is set to '*' because interactive access is not required
- There is a unique user ID (the string **2000** is an example only)
- There is a unique group ID (the string **250** is an example only)
- The login shell is **/bin/sh**

The user name does not have to be **flexlm**. Any unique name will do. However, to avoid confusion, the remainder of these instructions refer to this account as the FLEX*lm* user.

From here:

- Follow the instructions in "Configuring the License Server" on page 18.

Configuring the License Server

When you have a new or updated regular license installed in the **license.src** file, you then configure the license server in order to perform any of the following functions:

- Activate a regular license for the first time
- Change a regular license in order to:
  - Add users to your license
  - Use TotalView on a new platform
  - Add or upgrade TotalView features
  - Move the license to a new system

A license configuration script creates the **license.dat**, **license.opt**, **license.client**, and **license.log** files in the **flexlm-5.0** directory, and puts the **toolworks_init** script in the **flexlm-5.0/bin** directory.

To run the Configure_License script

1. Become the **root** user, type:

   % **su**

   `Password:` <*your-root-password*>

2. Run **Configure_License** from the **flexlm-5.0** directory:

   # **cd /usr/local/toolworks/flexlm-5.0**

   # **./bin/Configure_License**

The script creates the following configuration files:

license.dat	The primary license configuration file contains the basic server setup parameters and the license keys stored in **license.src**.
license.opt	An optional site administration file that allows you to fine-tune the behavior of the license manager. A default version of this file is included in the license manager distribution.

license.client	An alternate version of **license.dat.** Copy it to TotalView or installations that use this license server (see "Accessing a Remote License Server" on page 19).
license.log	The default license server log file. The license server writes status and error messages to this file.
toolworks_init	The recommended start-up script for starting the license server.

From here:

- Continue with "Accessing a Remote License Server" on page 19.

Accessing a Remote License Server

When you start TotalView it must be able to find the **license.dat** file in the **flexlm-5.0** directory. If TotalView and the active license manager are all installed on the same host, then you have already created the **license.dat** file in the correct location and you can skip to "Starting the License Manager Manually" on page 20.

If you have installed TotalView on a different computer from the license server, you will need to supply a **license.dat** file for each TotalView installation. The recommended technique is to copy the **license.client** file from the license server to **flexlm-5.0/license.dat** in each TotalView installation. If you are installing TotalView to use an existing license server, this is the only license setup step needed.

The format for this type of **license.dat** file (the **license.client** file) is:

> **SERVER** <*host-name*> <*host-id*> <*port-number*>
> **USE_SERVER**

For example:

> **SERVER fast-server 08122b2cf32d 7127**
> **USE_SERVER**

All lines in the license file after the **USE_SERVER** line are ignored.

Starting the License Manager Manually

The recommended method of starting or stopping the license manager is to use the **toolworks_init** start-up script. This script starts the license manager with the correct arguments and using the correct FLEX*lm* user ID. If the license manager software is installed in **/usr/local/toolworks**, the commands to start the license manager are:

% **su**

`Password:` *<your-root-password>*

cd /usr/local/toolworks/flexlm-5.0

./bin/toolworks_init start

Although the start-up script should be run as super-user (**root**), the license manager will be started using the FLEX*lm* user ID.

If the license manager starts successfully, the UNIX **ps** command shows that the primary license manager daemon, **lmgrd**, is running. Depending on how many shared licenses are currently in use, the **ps** command may show one or more instances of the vendor-specific license daemon **toolworks**.

Stopping the License Manager

Manually stopping the license manager is very similar to starting it. If the license manager software is installed in **/usr/local/toolworks**, the commands to stop the license manager are:

% **su**

`Password:` *<your-root-password>*

cd /usr/local/toolworks/flexlm-5.0

./bin/toolworks_init stop

Testing the License Manager

To verify that the license manager has been installed correctly, you should manually start the license manager and then as *non*-**root** try running the products that you have licensed, to test that they start correctly (i.e., that they are able to check out the needed licenses as expected).

After the license manager starts, become non-**root** and set the license file variable and test the license installation as described in “Testing the Installation” on page 9.

If you experience problems, you may be able to recover by looking at information from the following:

- The log file: **flexlm-5.0/license.log** contains status and error messages from the license server **lmgrd**
- The command **flexlm-5.0/**<*platform*>**/bin/lmstat** lists license manager activity. For example, to list the number of licenses that are currently checked out on a **sun5** platform, type:

  % **cd /usr/local/toolworks/flexlm-5.0**

  % **./sun5/bin/lmstat -a -c ./license.dat**

Starting the License Manager when the System Boots

If you want to automatically start the license manager when the license server boots, add the **toolworks_init** command (see “Starting the License Manager Manually” on page 20) to the appropriate system start-up file. On most systems, you also should automatically stop the license manager when the system is shut down to single-user mode.

You can accomplish this system-file editing on all supported systems (except SunOS 4) by running a shell script, **Configure_Autostart**. **Configure_Autostart** must be run in super-user (**root**) mode. For example, if the license manager software is installed in the **/usr/local/toolworks** directory, the commands to run **Configure_Autostart** are:

% **su**

`Password:` <*your-root-password*>

cd /usr/local/toolworks/flexlm-5.0

./bin/Configure_Autostart

Configure_Autostart prompts you with some configuration questions and then make the required changes.

On SunOS 4, you must edit **/etc/rc.local** to add a start-up command. This command example assumes the license manager software is installed in **/usr/toolworks**:

```
# start Etnus ToolWorks License Manager
if [ -f /usr/toolworks/flexlm-5.0/bin/toolworks_init ]; then
   /usr/toolworks/flexlm-5.0/bin/toolworks_init start
fi
```

Edit the host system initialization scripts to start the license manager at system boot time. This is optional but recommended.

Understanding FLEX*lm* Software

Etnus supplies a stand-alone version of the FLEX*lm* license manager version 5.0 for use with its products on a variety of UNIX platforms. The currently supported platforms are listed in Table 2.

Table 2. FLEX*lm* 5.0 Supported Platforms

Platform Name	Hardware Architecture	Operating System
alpha	Alpha	Digital UNIX 3.2D
hp800	PA-RISC 1.0 & 1.1	HP-UX 8
mips64-irix6	MIPS64	IRIX 6.2
rs6000	RS/6000	AIX 4.1.2
sun4	SPARC	SunOS 4.1.4 (Solaris 1.1.2)
sun5	SPARC	SunOS 5.5.1 (Solaris 2.5.1)
sun5-x86	i386	SunOS 5.6 (Solaris 2.6)

Platform Name

The platform name is a short abbreviation used to identify each platform in this manual and in the installation of the FLEX*lm* software itself.

OS Version

The operating system versions listed in Table 2 are the minimum recommended versions for FLEX*lm* software.

Distribution Files

The stand-alone FLEX*lm* license manager is distributed as a set of compressed tar files. The available distribution files are listed in Table 3.

Table 3. Stand-alone FLEX*lm* License Manager Distribution Files

Distribution Name	File Size	Description
flexlm-5.0-alpha.tar.Z	0.8 MB	FLEX*lm* license manager for Digital UNIX
flexlm-5.0-hp800.tar.Z	0.6 MB	FLEX*lm* license manager for HP-UX
flexlm-5.0-mips64-irix6.tar.Z	0.7 MB	FLEX*lm* license manager for IRIX 6
flexlm-5.0-rs6000.tar.Z	0.6 MB	FLEX*lm* license manager for RS/6000 AIX
flexlm-5.0-sun4.tar.Z	0.6 MB	FLEX*lm* license manager for SPARC SunOS 4
flexlm-5.0-sun5.tar.Z	0.7 MB	FLEX*lm* license manager for SPARC SunOS 5
flexlm-5.0-sun5-x86.tar.Z	0.6 MB	FLEX*lm* license manager for i386 SunOS 5.6

Unpacking the Distribution

Unpack the FLEX*lm* tar files using the **uncompress** and **tar** commands. Before using tar to unpack the distribution, you should set your working directory to be the desired installation location. For best security, you should unpack the archive as super-user (**root**).

By default, the **tar** command creates a directory, **toolworks** and copies the FLEX*lm* files into that directory. For example, to install the FLEX*lm* files for the **sun4** platform (SPARC SunOS 4) into the directory **/usr/local/toolworks**:

```
% su
Password: <your-root-password>
```

\# **cd /usr/local**

\# **uncompress < /home/bob/flexlm-5.0-sun4.tar.Z | tar xpf -**

These commands will create the directory **/usr/local/toolworks** and will copy the files needed to run the FLEX*lm* license manager on SunOS 4 into a subdirectory, **flexlm-5.0**. The installed files are identical to those supplied with TotalView.

These instructions provide only basic information on installing the FLEX*lm* license manager. For more information please see:

Man Pages
UNIX man pages for the FLEX*lm* license manager and various support utilities that are installed in the **flexlm-5.0/man** directory.

User Guide
The *FLEX*lm *End-User Manual* is installed in HTML format in **flexlm-5.0/doc/flexuser**. You should be able to view this guide using any standard HTML viewer or browser.

GLOBEtrotter Web Site
FLEX*lm* is a product of GLOBEtrotter Software Incorporated. Their Web site at **www.globetrotter.com** contains additional information about FLEX*lm* as well as additional utilities which you may find useful for license server management.

CHAPTER 4:
Getting Started with TotalView

If you have not previously used the TotalView multiprocess debugger, you can use the instructions in this chapter to get up and running quickly. Of course, you should refer to the Totalview multiprocess debugger *User's Guide* for a complete explanation of the program's features and functions.

Configuring Your Environment

Add TotalView directories to your system's environment variables and on some systems mount the **/proc** directory.

Setting Environment Variables

If you installed the software as the **root** user, and **/opt/toolworks** is the default installation directory for your UNIX platform as seen in the **Install** program, and the **Install** program created the links (Refer to "Running the Install Program" on page 6 for details.), include these path names in the following colon-separated path environment variables:

Table 4. TotalView Environment Variable Settings for Root Installations

Environment Variable	Path name
PATH	**/opt/totalview/bin**
MANPATH	**/opt/totalview/man**
LD_LIBRARY_PATH *(not on IBM RS/6000)*	**/opt/totalview/lib**
LM_LICENSE_FILE	*<nonstandard-dir>***/license.dat**

If you did not install as the **root** user, or the **Install** program failed to create the **/opt/totalview** or **/usr/totalview** link include the following path names in the colon-separated environment variables:

Table 5. TotalView Environment Variable Settings for User Installations

Environment Variable	Path name
PATH	*<installdir>***/totalview.***<version>***/***<platform>***/bin**
MANPATH	*<installdir>***/totalview.***<version>***/***<platform>***/man**
LD_LIBRARY_PATH *(not on IBM RS/6000)*	*<installdir>***/totalview.***<version>***/***<platform>***/lib**
LM_LICENSE_FILE	*<nonstandard-dir>***/license.dat**

Mounting the /proc Directory

On some systems, you mount the **/proc** directory if it is not currently mounted. If you use any of the following systems, determine if the **/proc** directory is mounted.

- Digital UNIX
- SunOS 5.x, (SPARC, Intel x86, and CS-2)
- IRIX

To list the **/proc** directory type:

```
% ls /proc
```

The **/proc** directory is mounted if the **ls** command prints a list of numbers. However, if you see an error message, or no message at all, then the **/proc** directory is probably not mounted on your filesystem. Your system administrator can mount the **/proc** directory. See the *User's Guide* for more information.

Compiling Programs

Compile the program you want to debug with the appropriate options and libraries. Note the following important compiler command-line options:

- *Do* include the **–g** option on the compiler command line.
- Do *not* use the **–O** option to compile programs.
- The TotalView multiprocess debugger can attach a process created by calls to **fork()** and **execve()** if you link with the **dbfork** library.

Refer to the *User's Guide* for complete information for your platform.

Starting the TotalView Multiprocess Debugger

We recommend that you do not run TotalView as **root** until you become familiar with its powerful capabilities.

To start TotalView software, type the command and the name of an executable file, for example:

% **totalview my_program**

The command syntax for the TotalView multiprocess debugger is:

totalview [*filename* [*corefile*]] [*options*]

where *filename* is the executable file to be debugged. See the *User's Guide* for a complete list of command options.

Using the Graphical User Interface

Use mouse buttons to work with the TotalView graphical user interface.

- Use the **left** button to select objects. For example, selecting a line number next to a source line inserts a breakpoint, and selecting the value displayed for a variable allows you to change the value.
- Use the **middle** button to view pop-up command menus. You can find keyboard accelerators for common actions in pop-up menus. For example, **g**=go, **h**=halt, and **s**=step.
- Use the **right** mouse button to *dive* into many objects on the screen. For example, when you dive into a variable name, you bring up the value of the variable. When you dive into a pointer to a structure, TotalView breaks out the structure into its components. When you dive into a subroutine name, you bring up the source for the subroutine.

  To *undive*, click on the  icon in the upper right-hand corner of the window.

For more information about the TotalView multiprocess debugger, type **Control-?** in any window for online help, and to read the man pages, type **man totalview** and **man tvdsvr**.

From here:

- To obtain documentation for the TotalView multiprocess debugger, see “Obtaining TotalView Software” on page 1.
- If you have a demo license and you want to obtain a regular license, turn to Chapter 3 on page 13.

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