

TotalView Installation Guide

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Installing TotalView

NOTE: TotalView has introduced a newly developed, modern interface for the TotalView debugger. This UI includes the full power of the Classic TotalView debugging engine, but does not yet support all its features. To use these features, simply run the `totalview` executable with the `-classicui` argument to launch the original UI.

License Types

TotalView uses two permanent types of license models, depending on product platform and features. When you receive your license file, you will be notified if it is a **FlexNet Publisher (FNP)** or **FlexNet Embedded (FNE)** style license.

FNP license files typically have file extension `.dat`, while FNE style licenses have `.bin` file extensions. To validate the license type, you can also run the utility `toolworks_licensetype` and provide as input the license file:

```
toolworks_licensetype <licensefile>
```

Installation Process

The installation has two main steps:

- Installing the distribution files
- Installing and activating the license

How to proceed with the installation depends on your situation:

- **You have a demo license:** If you are installing TotalView to use with a demo license, just follow the procedures in [Installing a Demo License](#). If you decide to purchase a permanent TotalView license, you will proceed on to the other chapters at that time.
- **You are installing TotalView for the first time with a permanent license:** Depending on the license type, which will be either FlexNet Publisher (FNP) or FlexNet Embedded (FNE), follow the installation steps in the appropriate chapters for your license type. The email with your permanent license will specify the type of license.

- **You already have TotalView and are installing this new version:** Depending on the license type, follow either the FNP or FNE installation steps in the appropriate chapters. When you get to the point of installing the permanent license, skip to the section *Installing License Keys*, which explains how to install your new license, since you should already have a license server installed.

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

See [TotalView's Support page](#) for information on how to contact support.

To determine whether your TotalView license is valid for this release, see [Is My License Valid for this Release?](#)

Installing TotalView

Download the tar file version of the installation and use the **tar** command to extract TotalView. For example:

```
tar xvf totalview <version_platform>.tar
tar xvf totalview.<version>-doc.tar
```

Before you can debug a program with TotalView, you must obtain a license. You can obtain one by filling in the form located at <https://totalview.io/free-trial>.

This section describes how you install a new version of TotalView. Before starting, you should read the *Release Notes* on the [TotalView documentation](#) web page. In addition, some operating systems may need to be patched. For more information, see the *Classic TotalView Platforms and System Requirements* guide.

Here is the procedure for installing TotalView:

1. **(Optional) Become the root user**

Go to the system on which you are installing TotalView and become the root user:

```
su root
```

In some circumstances, you'll want to use the **sudo** command instead of **su**. If you use the **sudo** command, you'll be typing `sudo ./Install` instead of `./Install` in step 2.

Installing TotalView as the **root** user prevents users from modifying the software. However, you should not run TotalView as **root**.

2. **Start the Install program**

Go to the directory containing the files extracted from the downloaded tar file and then start the **Install** program by typing:

```
./Install
```

For information on using this command, type `./Install -help`. If you use any of the options described in the displayed information, the installation procedure is no longer interactive.

3. **Accept the license terms**

To view the license terms, select **?**. You must accept the license terms to continue the installation.

4. **Choose an installation directory**

The **Install** program asks that you name an installation directory. If the directory you specify does not exist, the program requests a new location, effectively meaning the directory you specify must already exist.

If you do not enter a name, the installation directory will either be `/usr/toolworks` or `/opt/toolworks`, depending on the system. Type a period "." to place TotalView in your current directory.

This manual refers to the installation directory's pathname as *<installdir>*.

The **Install** program then creates a **toolworks** directory and places two subdirectories within it:

- `totalview.<version>`. This is where **Install** places TotalView.

- `flexlm-<version>`

or

- `flexnetls-<version>`

This is where **Install** places the licensing software.

5. Choose the components to install

If you are installing TotalView for multiple platforms in a common NFS directory, you need to install the common components only once.

6. Create a symbolic link (optional)

You can create a symbolic link (named **totalview**) to this installation directory. If you are not the root user, **Install** may be unable to create the link, so you should respond “n” (no) to the prompt. If **Install** cannot create the link, you can ignore its complaints and continue installing TotalView by pressing **Enter**.

7. Exit from root (optional)

If you became root using **su**, exit from root after **Install** concludes by typing:

```
exit
```

8. Test the installation

Test if TotalView was successfully installed by typing:

```
<installdir>/toolworks/totalview.<version>/bin/totalview
```

TotalView prints information that includes a version number to the console, and the user interface launches.

If you try to debug a target program and TotalView cannot find a valid license file or cannot contact the license manager, it displays a "No license file found" message. If this occurs, confirm that you installed the license.

You may need to set the `LM_LICENSE_FILE` (for a FlexNet Publisher style license) or `TV_LICENSE_FILE` (for a FlexNet Embedded style license) environment variable. (These variables are described in the next step.)

Cray XT Installation

Install TotalView where it is visible from your Linux login nodes. Do not install TotalView on your compute nodes. TotalView communicates with these nodes using a library created Cray.

Installing

The Cray distribution is an rpm file, and so you need to run **rpm** to install it.

Before installing, if you know you want to install the package as the default version, first set the environment variable `CRAY_INSTALL_DEFAULT` as follows:

```
export CRAY_INSTALL_DEFAULT=1
```

Note that you do not need to make this decision upfront. You can install TotalView first, and if you decide later to make this package the default you can execute the following:

```
/opt/cray/admin-pe/set_default_files/set_default_totalview_<version>  
/opt/cray/admin-pe/set_default_files/set_default_totalview-support_<version>
```

To install TotalView on Cray systems, you should run the **rpm** command as follows:

Linux x86_64

```
rpm -ivh totalview-<version>.x86_64.rpm
```

Linux ARM64

```
rpm -ivh totalview-<version>.aarch64.rpm
```

Then Install the license.

About the Install

In contrast to the standard TotalView installation, the Cray installation doesn't prompt for a location in which to install TotalView, as it knows where to install files.

The **rpm** application places the Cray bulk launching system and other support modules within the installation directory.

TotalView on Cray systems uses **totalview-support** product components to provide essential interface components that allow TotalView to execute in Cray environments. Included within **totalview-support** are the **totalview-mem-debug** module, a configuration file, and a set of bulk launcher executables.

The bulk launcher is a paired set of executables that use ALPS to scalably launch the TotalView Debugger Server (**tvdsvr**) executable on compute nodes.

Mac OS X Installations

Installing TotalView on a Mac comes with some prerequisites.

Installation Prerequisites

1. Install [XQuartz](#).

TotalView requires that XQuartz be installed on the machine where TotalView is running.

2. Make sure every user who might need to debug is in the `_developer` group.

3. *Optional:* Enable developer mode:

Enter: `DevToolsSecurity -enable`.

4. *Optional:* Remove the authorization prompt:

Enter: `sudo security authorizationdb write system.privilege.taskport allow`.

Running the install script should not yield any errors. If errors occur, see [Troubleshooting Mac OS X Installations](#) in the *Reference Guide* for information.

Running Multiple Displays

If you are running TotalView on multiple displays, it is recommended to uncheck **Displays have separate Spaces** under the **Mission Control** preference. This avoids potential display problems in which the TotalView UI could appear partially out of the display.

Configuring Your Environment

Before you can begin using TotalView, you must add TotalView to your [PATH](#) variable. On some systems, you may need to mount the [/proc](#) directory.

Installing a Demo License

NOTE: Depending on the type of TotalView product and features you have, you will receive either a FlexNet Publisher (FNP) style demo license or FlexNet Embedded (FNE) style demo license. FNP licenses are typically named **license.demo** and FNE licenses are **license_demo.bin**.

The **toolworks_licensetype** utility can be used to confirm the type of license you have. The instructions here will guide you through license installation and verify the type of license you are installing.

FlexNet Publisher (FNP) Demo License Installation

FlexNet Publisher (FNP) style licensing uses text license files and are typically named **license.demo** or **license.dat**.

Before starting the license file installation, first verify that your license file is a FlexNet Publisher style license by running the `toolworks_licensetype` utility:

```
<installdir>/toolworks/flexlm-<version>/bin/toolworks_licensetype license.demo
```

or

```
<installdir>/toolworks/flexnetls-<version>/bin/toolworks_licensetype license.demo
```

The utility should report "FlexNet Publisher (FNP)". If it reports "FlexNet Embedded (FNE)" skip to [FlexNet Embedded \(FNE\) Demo License Installation](#).

Install Option 1: Install license file in the default location in your TotalView installation.

Before you can use TotalView, you must place the demo license file, **license.demo**, into the `flexlm-<version>` directory of your TotalView installation. This license file was attached to the email message confirming your download request. If your email system did not retain this name, rename it after you save it to disk.

1. **Become root user (optional).**

If you installed TotalView as the **root** user, become the **root** user again. If you used **sudo** to install TotalView, use **sudo** in the following step.

2. **Copy the license file.**

Copy the license file to the `flexlm-<version>` directory.

```
cp license.demo <installdir>/toolworks/flexlm-<version>
```

where `<installdir>` is the top-level directory where you performed the TotalView installation.

Install Option 2: Install license file in a custom location

If you do not want to install the `license.demo` file in the `<installdir>/toolworks/flexlm-<version>` directory, you must set your **LM_LICENSE_FILE** environment variable to the file's full pathname. The following example shows the bash shell style syntax for setting **LM_LICENSE_FILE**.

```
export LM_LICENSE_FILE=<nonstandard-dir>/license.demo
```

If a **LM_LICENSE_FILE** environment variable already exists, add the pathname for **license.demo** to this variable's declaration. Notice that the **LM_LICENSE_FILE** variable contains a colon-separated list of license file pathnames. For example:

```
export LM_LICENSE_FILE=<nonstandard-dir>/license.demo:${LM_LICENSE_FILE}
```

Test that TotalView can use the license file

Enter:

```
<installdir>/toolworks/totalview.<version>/bin/totalview \  
<installdir>/toolworks/totalview.<version>/<platform>/examples/wave
```

TotalView should come up without any license error dialogs.

FlexNet Embedded (FNE) Demo License Installation

NOTE: FNE demo licenses are essentially buffer-style but are not node-locked to a single machine.

FlexNet Embedded (FNE) style licensing uses binary license files typically named **license_demo.bin** or **license.bin**.

Before starting the license file installation, first verify that your license file is a FlexNet Embedded style license by running the **toolworks_licensetype** utility:

```
<installdir>/toolworks/flexlm-<version>/bin/toolworks_licensetype license_demo
```

or

```
<installdir>/toolworks/flexnetls-<version>/bin/toolworks_licensetype license_demo.bin
```

The utility should report "FlexNet Embedded (FNE)". If it reports "FlexNet Publisher (FNP)," see [FlexNet Publisher \(FNP\) Demo License Installation](#) on page 9.

Install Option 1: Install license file in the default location within your TotalView installation.

NOTE: Option 1 is supported only on Linux ARM64 and Linux PowerLE. For other platforms, use Option 2.

Before you can use TotalView, you must place the demo license file, **license_demo.bin** into the **flexnetls-<version>** directory of your TotalView installation. This license file was attached to the email message confirming your download request. If your email system did not retain this name, rename it after you save it to disk.

1. **Become root user (optional).**

If you installed TotalView as the **root** user, become the **root** user again. If you used **sudo** to install TotalView, use **sudo** in the following step.

2. **Copy the license file.**

Copy the license file to the **flexnetls-<version>** directory.

```
cp license_demo.bin <installdir>/toolworks/flexnetls-<version>
```

where **<installdir>** is the top-level directory where you performed the TotalView installation

Install Option 2: Install license file in a custom location

If you do not want to install the license_demo.bin file in the `<installdir>/toolworks/flexnetls-<version>` directory, you must set your **TV_LICENSE_FILE** environment variable to the file's full pathname. The following example shows the bash shell style syntax for setting **TV_LICENSE_FILE**.

```
export TV_LICENSE_FILE=<nonstandard-dir>/license_demo.bin
```

Test that TotalView can use the license file

Enter:

```
<installdir>/toolworks/totalview.<version>/bin/totalview \  
  <installdir>/toolworks/totalview.<version>/<platform>/examples/wave
```

TotalView should come up without any license error dialogs.

Installing a FlexNet Publisher (FNP) License

NOTE: These license setup instructions are for FlexNet Publisher (FNP). You can validate the license type by running the utility `toolworks_licensetype`, providing as input the license file, e.g.,

```
toolworks_licensetype <licensefile>
```

If your license has a `.dat` extension or `toolworks_licensetype` reports it is a FlexNet Publisher (FNP) license, proceed with this chapter.

If you have a FlexNet Embedded style license, see chapter [Installing a Flex-Net Embedded \(FNE\) License](#).

The procedure to install a license differs, depending on whether the installation is for a new TotalView install or updating an existing TotalView install.

- For a demo TotalView install, see [Installing a Demo License](#).
- For a new TotalView install, see [Installing a New License](#).
- For an existing TotalView install, see [Updating an Existing License](#).

NOTE: If you encounter problems using the setup steps in this chapter, see [Installing or Changing a Regular FlexNet Publisher \(FNP\) License](#) for more detailed instructions.

Updating an Existing License

Your TotalView license is implemented by FlexNet which is built into TotalView.

New releases of TotalView may infrequently incorporate updated FlexNet versions. Consult the TotalView release notes to determine if a FlexNet update has been applied.

If your TotalView release does include a newer FlexNet version than that which is currently installed on your system, choose the [FlexNet Update](#) installation option.

Otherwise, complete the steps in the [No FlexNet Update](#) section.

FlexNet Update

1. Stop the currently running license server:

```
<installdir>/toolworks/flexlm-<oldversion>/bin/toolworks_init stop
```

2. Open `<installdir>/toolworks/flexlm-<oldversion>/license.dat`, and note the license server manager daemon's TCP/IP port number. This is the last field on the SERVER line (for example: "7127").
3. Next, follow the steps in [Installing a New License](#). When the `Configure_License` script asks for the license server manager daemon's TCP/IP port number, enter the port number as noted above.

No FlexNet Update

1. Modify your `license.dat` file by adding the new license key(s) provided, and removing the TotalView license key(s) that are duplicate (licenses with the same entitlement code) or being replaced and are therefore no longer valid.
2. Run the `toolworks_lmread` script so the running license server will reread your modified `license.dat` file:

```
<installdir>/toolworks/flexlm-<version>/bin/toolworks_lmread
```

This completes the license install. No further setup is necessary.

Installing a New License

If you have a new TotalView install, this section describes the basics of installing your license.

1. Create a `license.src` file containing the TotalView license key(s) provided.
2. Run the `Configure_License` script to generate the `license.dat`, configuration files, and initialization scripts:

```
<installdir>/toolworks/flexlm-<version>/bin/Configure_License
```

3. Start the license server by running the command `toolworks_init start`:

```
<installdir>/toolworks/flexlm-<version>/bin/toolworks_init start
```

Installing a Flex-Net Embedded (FNE) License

NOTE: These license setup instructions are for FlexNet Embedded (FNE) style licenses. Depending on the type of TotalView product purchased, you may be issued a FlexNet Publisher (FNP) style license or an FNE license. FNE licenses typically have the file extension **.bin** and FNP style licenses have the file extension **.dat**. You can validate the license type by running the utility **toolworks_licensetype**, providing as input the license file, e.g.,

```
toolworks_licensetype <licensefile>
```

If your license has a **.bin** extension or **toolworks_licensetype** reports it is a FNE license, proceed with this chapter. For an FNP style license, see [Installing a FlexNet Publisher \(FNP\) License](#) on page 13.

Note that FNE licenses are *required* for Linux PowerLE and ARM64. Other platforms can use FNE but do not require it.

Unlike TotalView's other licensing type, FlexNet Publisher (FNP), FNE licenses can be served either by an FNE license server or installed locally on the system on which TotalView will run, called buffer-style.

NOTE: For a demo FNE license, see [Installing a Demo License](#).

See [Prerequisites](#) on page 17, then choose either:

- [Installing a FlexNet Embedded \(FNE\) Node-Locked License](#) on page 18
- [Installing a FlexNet Embedded \(FNE\) License Server](#) on page 21

To uninstall, see [Uninstalling an FNE License Server](#) on page 29.

Prerequisites

1. To install an FNE style license for TotalView, the user/administrator must have **sudo** or root privileges if an FNE license server is being set up.
2. To install a served license, the license server must be installed on a Linux-x86-64 system. (For platform support specifics, see “Requirements for the Local License Server” in the *FNE License Server Administration Guide* PDF included in the distribution).

The host running TotalView will use TCP/IP to contact and check out licenses from the FNE license server running as a Linux service on the chosen x86 64-bit machine.

3. A dedicated unprivileged user account is needed on the Linux-x86-64 system that hosts the license server. See **Create a dedicated unprivileged user account** on page 23.

Installing a FlexNet Embedded (FNE) Node-Locked License

Single-system, node-locked licenses do not need a license server.

NOTE: This chapter provides FlexNet Embedded (FNE) license installation instructions. You can validate the license type by running the utility `toolworks_licensetype`, providing as input the license file, e.g.,

```
toolworks_licensetype <licensefile>
```

If your license has a `.dat` extension or `toolworks_licensetype` reports it is a FlexNet Publisher (FNP) license, see [Installing a FlexNet Publisher \(FNP\) License](#) on page 13.

To view license details, see **Help > About TotalView**.

NOTE: Both node-locked and served FNE licenses are distributed with the `.bin` extension, since they are binary files.

For a **TotalView Developer** license, follow the instructions here to install your node-locked license.

For **TotalView Team and Team Plus**, follow the served license instructions in [Installing a Flex-Net Embedded \(FNE\) License Server](#) on page 21.

For a demo TotalView install, see [Installing a Demo License](#).

License Location

- **For Linux ARM64 and Linux PowerLE**, TotalView automatically finds the license in the default directory `<installdir>/toolworks/flexnetls-<version>` of your TotalView installation, although you can install the license file in a non-default directory if you wish, then set the variable `TV_LICENSE_FILE` to point to it.
- **For all other platforms**, copy the license to the directory of your choice, then set the `TV_LICENSE_FILE` variable to its location.

Setting the TV_LICENSE_FILE environment variable

- Set your `TV_LICENSE_FILE` environment variable to the file's full pathname. For example:

```
$ TV_LICENSE_FILE=/home/jdoe/license.bin
$ export TV_LICENSE_FILE
```

- Or, create a hidden file to avoid having to set up the `TV_LICENSE_FILE` environment variable for each user. Name this file `.tvlicensefile` and place it in the platform-specific lib directory for the current TotalView version. This file should contain the full path to the node-locked license, which will be used if `TV_LICENSE_FILE` is not set. For example, this file:

```
path-to-toolworks/totalview.<version>/<platform>/lib/.tvlicensefile
```

would contain:

```
/usr/local/licenses/totalview/license.bin.
```

License Installation

The license file is attached to the email message confirming your download request or is sent to you from Support. It should be named either `license.bin` or `license_demo.bin`. If your email system didn't retain this name, rename it after you save it to disk.

1. Install the license file

Use the same privileges as your TotalView installation. If you used either `sudo` or the root user, use `sudo` or the root user, respectively.

- Copy the license file to the flexnetls-version directory (or to a custom location as discussed in [License Location](#)):

```
cp license.bin <installdir>/toolworks/flexnetls-<version>
```

or

- `cp license_demo.bin <installdir>/toolworks/flexnetls-<version>`

2. Test that the license file is working

Launch TotalView:

```
<installdir>/toolworks/totalview.<version>/bin/totalview
```

Test a program, for example:

```
<installdir>/toolworks/totalview.<version>/<platform>/examples/wave
```

TotalView should come up with no licensing dialogs.

Renewing a Node-Locked License

Replace the old license with the new license as described in [Install the license file](#). Then, [Test that the license file is working](#).

Installing a FlexNet Embedded (FNE) License Server

For served licenses, you must install a license server on an x86 64-bit RedHat Enterprise Linux or CentOS version 6 or 7 system. In addition, the license file must reside on the *same system*.

NOTE: This chapter provides FlexNet Embedded (FNE) license installation instructions. You can validate the license type by running the utility `toolworks_licensetype`, providing as input the license file, e.g.,

```
toolworks_licensetype <licensefile>
```

If your license has a `.dat` extension or `toolworks_licensetype` reports it is a FlexNet Publisher (FNP) license, see [Installing a FlexNet Publisher \(FNP\) License](#) on page 13.

NOTE: Both node-locked and served FNE licenses are distributed with the `.bin` extension, since they are binary files.

For TotalView Team and Team Plus, follow the served license instructions here.

For a **TotalView Developer license**, see [Installing a FlexNet Embedded \(FNE\) Node-Locked License](#) on page 18 to install your node-locked license.

FlexNet Embedded License Server Requirements

The FlexNet Embedded license server requires versions 6 or 7 of either RedHat Enterprise Linux or CentOS, running on x86 64-bit hardware.

Java Prerequisites

The FlexNet Embedded license server requires Java and the following Java prerequisites:

- Oracle JRE 1.8 or OpenJDK 1.8
- The `JAVA_HOME` (or `JRE_HOME`) environment variable on your system set to the path for your default JDK (or JRE) installation. Ensure that this path does not include a trailing character, such as a slash or space.

FNE License Server Types

The TotalView FNE license server is typically hosted on a single Linux x86 64-bit host machine. (For platform support specifics, see “Requirements for the Local License Server” in the *FNE License Server Administration Guide* PDF included in the distribution).

However, there is a provision for failover protection using a backup host, which ensures that users are not interrupted in the event of server failure. (See [Installing a Failover Server](#).) The procedure for installing either type is basically the same.

Installation Procedure

- 1. Install the FNE Server
- 2. Generate a Host ID for Each License Server
- 3. Configure Hosts to Use the FNE Server

1. Install the FNE Server

The FlexNet Embedded server is available as a separate installation tar bundle, available for download in the TotalView_FlexNet_Embedded folder from the TotalView FTP download area identified in the instructions you received.

NOTE: For served license renewal, skip this section and see [Renewing a Served License](#) on page 26.

1. **Unpack your TotalView FlexNet Embedded distribution on the Linux license server system**

To install the FNE license server software, unpack the FlexNet Embedded tar bundle onto the Linux x86 64-bit machine that will host the license server, then run the Install script from the resulting directory:

```
tar xvf flexnetls-<version>.tar -C ~
cd ~/flexnetls-<version>
```

2. **Run the Install script using sudo** (required)

```
sudo ./Install
```

- Choose an installation directory, e.g., `/opt`.
- At the prompt, select the components to install: just the FNE server files (**flexnetls-server.tar.Z**).

Once the Install script completes, you should have a `flexnetls-<version>` directory under `<installdir>/tools-works`.

3. Install the license file on the license server system

Place your Perforce-provided FNE license file, `license.bin` into the `flexnetls-<version>` directory.

4. Create a dedicated unprivileged user account

NOTE: Skip this step if you already created the user as a prerequisite to installing and running the license server as discussed in [Prerequisites](#) on page 17.

The Linux-x86-64 system must have a dedicated, *unprivileged* user account to run the license server. Note that:

- The default user account name is "*flexnetls*" but you can rename it if you wish.
- The account must be a dedicated account in order to run the FNE license server.
- The account must be unprivileged.
- The login shell should be `/bin/sh`.

5. Run the **Configure_License** script using `sudo`

```
cd /opt/toolworks/flexnetls-<version>  
sudo bin/Configure_License
```

This script is interactive and prompts you while it runs. These are the possible options:

- Create/provide a username, created as a prerequisite in [Prerequisites](#) or during [Step 4](#).
- *(Optional)* Define a program files directory where the license server service will be installed.
- *(Optional)* Define a data files directory for trusted storage and log files.
- Identify an available listening port (e.g., 7137).
- *(Optional)* Customize FNE server policy settings.
- *(Optional)* View the automatic license server startup script.

2. Generate a Host ID for Each License Server

Generate a host ID for each server on which you will run a license server.

When you install TotalView or the FlexNet Embedded Server package, the installer places the files for the FlexNet Embedded license manager in `<installdir>/toolworks/flexnetls-<version>`.

To obtain host information, run the **toolworks_hostid** script, as follows:

```
<installdir>/toolworks/flexnetls-<version>/bin/toolworks_hostid
```

NOTE: Do *not* use the UNIX **hostid** command, as it will not return the proper host ID for FNE.

This script writes the host name and one or more FlexNet Embedded host ID values to standard output, for example:

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

Generate host IDs for each server and send them to the TotalView license team, license@perforce.com. They will use them to complete your order and send you a permanent license key to use when configuring each host.

3. Configure Hosts to Use the FNE Server

Each host that will run TotalView needs to set up a license file.

- Set the environment variable **TV_LICENSE_FILE** to point to the FNE license server using the format `<port>@<host>`.

For example:

```
TV_LICENSE_FILE=7137@licserver
export TV_LICENSE_FILE
```

- Alternatively, to avoid having to set up the **TV_LICENSE_FILE** environment variable for each user, place the `<port>@<host>` string in a hidden file in the platform-specific lib directory.

To do this, create file **.tvlicensefile** that contains just the `<port>@<host>` string, such as `7137@licserver`. Place this file in `/<installdir>/toolworks/totalview.<version>/<platform>/lib/.tvlicensefile`.

Installing a Failover Server

TotalView's FNE license technology supports a failover license server configuration to provide a robust license server availability solution. This creates a primary/failover FNE license server pair for a complete FNE failover setup/configuration.

The procedure to install a failover license server is the same as installing a regular license server, with a few small differences:

- **1. Install the FNE Server**

For [Step 5](#), the provided configure script is **Configure_Backup_Server** rather than **Configure_License**:

```
cd /opt/toolworks/flexnetls-<version>  
sudo bin/Configure_Backup_Server
```

NOTE: The primary and failover servers *must* have the same assigned port.

- **2. Generate a Host ID for Each License Server**

For a proper failover setup, you must generate a host ID for both the primary *and* failover license servers.

- **3. Configure Hosts to Use the FNE failover setup.**

In the case of a failover setup, the **TV_LICENSE_FILE** environment variable points to the failover host *pair* using the format `<port>@<primarylicserver>:<backuplicserver>`, for example:

```
TV_LICENSE_FILE=7137@licserver:failoverserver  
export TV_LICENSE_FILE
```

Renewing a Served License

1. Replace the existing license.bin in the flexnetls-*<version>* directory under *<installdir>/toolworks* on the Linux-x86-64 system with the new Perforce-provided updated **license.bin**.
2. Load the new **license.bin**, like so:

```
<installdir>/toolworks/flexnetls-version/bin/toolworks_reload
```

License Reservation

The license reservation feature available with the FlexNet Embedded license server allows the license server administrator at a customer's enterprise to control the distribution of the server's license pool. With no reservations defined, the license server distributes licenses on a first-come-first-served basis to client devices requesting them. However, with the use of reservations, the server can preallocate a certain number of TotalView licenses from the pool to specific entities (for example, client devices or users) to help ensure that these entities have access to the licenses they need.

For TotalView licenses, the server can preallocate licenses for users belonging to particular Linux/Unix group. The license server administrator can choose to preallocate the entire pool of licenses, a portion of the licenses, or none of the licenses. Any unreserved license remains in the shared pool of licenses and is available on a first-come, first-served basis. The default reservation group for TotalView licenses is *totalview_user* group and is controlled by the **TV::fne_reservation_group_name** variable, defined in the `.tvdrac` file.

Managing License Reservations

1. From the FNE install directory on a Linux-x86-64 machine, run the FNE Administration tool to generate a template JSON file.

```
cd /<installation_dir>/toolworks/flexnetls-<version>/linux-x86-64/bin/
./flexnetlsadmin.sh -server http://<SERVER>:<PORT>/api/1.0/instances/~
-reservations -genjson <file>
```

2. Modify the JSON file to set up reservations for a particular Unix group, which is *totalview_user* by default.

The following example creates a reservation file with eight "TotalView_Team" and eight CUDA licenses for user group *totalview_user*. Assuming that you have a pool of 10 TotalView_Team and 10 CUDA licenses, this leaves two "TotalView_Team" and two CUDA licenses in a shared, unrestricted pool.

```
{
  "name": "totalview",
  "reservations": [
    {
      "hostId": {
        "value": "totalview_user",
        "type": "STRING"
      },
      "reservationEntries": [
        {
          "featureName": "TotalView_Team",
          "featureVersion": "2020.1227",
          "featureCount": 8
        },
        {
          "featureName": "CUDA",
```

```

        "featureVersion": "2020.1227",
        "featureCount": 8
    }
  ]
}

```

- The **name** property, defined as “totalview” in this example, is optional. If included, its value can be anything.
- **HostID** value/type:

value: The reservation group name, set in the state variable **TV::fne_reservation_group_name**. This must be a valid entry for the type.

type: STRING
- **featureName:** The value of “Name” in your license, for instance “License=(Name=CUDA...)” From a shell, use `printbin` to get a text version of `license.bin`, which identifies the **Name**.
- **featureVersion:** The license version, also defined in `license.bin`, and visible using `printbin`.

NOTE: Note that the value entered here need not exactly correspond to the version in the license; however, it cannot be a later version; it must be either an *earlier* (lower) version or match the version in the license.

- **featureCount:** The number of licenses for each group.

3. Load the reservation file into the server.

```
sudo ./flexnetlsadmin.sh -server http://<SERVER>:<PORT>/api/1.0/instances/~
-reservations -load reservations.json
```

where `reservations.json` is the reservation filename.

Once reservations are loaded into the server, you can check on or delete them:

- To check reservations:

```
./flexnetlsadmin.sh -server http://<SERVER>:<PORT>/api/1.0/instances/~
-reservations
```

or, to return more detail:

```
./flexnetlsadmin.sh -server http://<SERVER>:<PORT>/api/1.0/instances/~
-reservations -group
```

- To delete reservation groups:

```
./flexnetlsadmin.sh -server http://<SERVER>:<PORT>/api/1.0/instances/~
-reservations -delete --group groupID
```


Uninstalling an FNE License Server

As the root user (or using **sudo**), perform the following steps to first stop, then remove the running server from the system:

1. Change to the directory `/install/path/toolworks/flexnetls-<version>`.
2. Issue the command: `bin/toolworks_init stop`.
3. Delete the `/opt/flexnetls/toolworks` directory.
4. Delete the `/etc/init.d/flexnetls-toolworks` and `/etc/default/flexnetls-toolworks` files.
5. Optionally, delete the trusted storage and/or log files in the `/var/opt/flexnetls/toolworks` directory.
6. Delete the `/install/path/toolworks/flexnetls-<version>` directory.

Installing or Changing a Regular FlexNet Publisher (FNP) License

This chapter describes the procedure for installing or changing a regular FlexNet Publisher (FNP) style license.

- To install TotalView software for the first time with a permanent license, see [Planning for a Regular License](#) on page 32.
- To create a *FlexNet* user account, see [Creating a FlexNet User Account](#) on page 34.
- To install TotalView software and use an existing license, see [Accessing a License Server](#) on page 36.
- To shutdown and restart the license manager, see [Starting the License Manager Manually](#) on page 37.

To determine if your license is valid for the release you are installing, see [Is My License Valid for this Release?](#) on page 31.

Is My License Valid for this Release?

To be valid, the maintenance date for your license must be later than the official release date. You can find the maintenance date for your TotalView installation in:

```
<installdir>/toolworks/flexlm-<version>/license.dat
```

Open the file in a text editor and look for a line like this:

```
INCREMENT TotalView_Team toolworks 2020.1231 permanent 20 \
```

The example above indicates a permanent 20 token team license where the maintenance expires December 31, 2020. It will always be valid to run TotalView versions released before the maintenance expiration date of December 31, 2020, but a "license too old" message will result if you attempt to use it with a version of TotalView released after December 31, 2020.

Planning for a Regular License

TotalView uses the FlexNet® license management software to grant or reject requests to use TotalView.

FlexNet was formerly known as FLEXLM, so the string '`flexlm`' still appears in the TotalView product, mainly in code and directory paths.

You do *not* need to install FlexNet if you are using an evaluation license. That is, you only need the information in this chapter after you purchase TotalView and have received your regular license.

Your regular license is associated with a FlexNet license manager host (the license server) and is for a specific number of concurrent licenses or tokens, depending upon the version you purchased.

Perforce provides tools and PDF documentation for using FlexNet.

Choosing a License Server

You will need to install the FlexNet license server the first time you install a regular license. In some cases, the license manager and TotalView reside on the same system. However, you can install them on different systems. The TotalView tar file includes license server software for the platform TotalView runs on. See "[Installing FlexNet Standalone](#)" if your license server's platform differs from that of TotalView.

The license manager should reside on a machine that is reliable, always running, and a permanent part of your local network. And, most importantly, it is accessible. For example, do not place it on the other side of your firewall.

If you already have a FlexNet license manager in your network, you should not include your TotalView license with the other licenses managed by that license manager. If you must combine license managers, consult the FlexNet documentation.

The TCP/IP port number used for the Perforce license manager daemon must be unique and not used elsewhere. You can find port numbers that other FlexNet license managers use in their license files.

Finding a License Server Host ID

When you install TotalView, the installer placed the files for the FlexNet license manager in `<installdir>/toolworks/flexlm-<version>`.

To obtain host information, run the `toolworks_hostid` script, as follows:

```
<installdir>/toolworks/flexlm-<version>/bin/toolworks_hostid
```

Do *not* use the UNIX **hostid** command.

This script writes the host name and one or more FlexNet host ID values to standard output; for example:

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

After sending us this information and completing your order we'll send you a permanent license key.

Creating a FlexNet User Account

While you can run the FlexNet license manager as **root**, you should run it as a unique non-privileged (that is, non-**root**) user. Do this by creating a user account reserved for FlexNet's use. You may need to refer to your operating system's documentation or your site's operating procedures for information on creating this account. The user name does not have to be `flexnet`. Any unique name will do.

The account from which the license manager is run must have the following properties:

- The password is set to `*` because interactive access is not required.
- There is a unique user ID.
- There is a unique group ID.
- The login shell is `/bin/sh`.

Installing your Permanent License

This procedure is described in [Installing FlexNet Publisher License Keys](#).

Accessing a License Server

When you start TotalView, it must be able to find the `license.dat` file. If TotalView and the active license manager are installed on the same host and you place the `license.dat` file in its default location in the `flexlm-<version>` directory, you can skip to the next section, [Starting the License Manager Manually](#) on page 37.

If you are installing TotalView and the license server on different machines, you can place a `license.dat` file within each installation. Do this by copying the `license.client` file from the license server to `flexlm-<version>/license.dat` in each installation. If you are using an existing license server, this is all that you have to do.

The format for the `license.client` file is:

```
SERVER host-name host-id port-number  
USE_SERVER
```

For example:

```
SERVER fast-server 08122b2cf32d 7127  
USE_SERVER
```

FlexNet ignores all lines after `USE_SERVER`.

Starting the License Manager Manually

You can start or stop the license manager by using the **toolworks_init** script. (This script is created by the **Configure_License** script when you install the license.) If, for example, the license manager software is installed in `/usr/toolworks`, the following commands start the license manager. Before entering these commands, use the **su** shell command to become the **root** user.

In some environments, you'll need to use the **sudo** command. If you use this command, you'll type something like **sudo./toolworks_init start**. Also, before you run this program, make sure that you have write permission to this directory.

```
cd /usr/toolworks/flexlm-<version>/bin
./toolworks_init start
```

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

Check that the license manager started. Do this by examining the following file:

```
/usr/toolworks/flexlm-<version>/license.log
```

Stopping the License Manager

The way you stop the license manager is very similar to the way you started it. If the license manager software resides in `/usr/toolworks`, the following commands stop the license manager. (Before entering these commands, use the **su** shell command to become the **root** user or use the **sudo** command to directly invoke the following program.)

```
cd /usr/toolworks/flexlm-<version>/bin
./toolworks_init stop
```

Testing the License Manager

To verify that you installed the license manager correctly, manually start it and then run TotalView—don't do this as **root**. After the license manager starts, set the license file variable and test the license installation:

```
<installdir>/toolworks/totalview.<version>/bin/totalview
<installdir>/toolworks/totalview.<version>/platform/examples/wave
```

TotalView should come up without any licensing dialogs. If not, you should:

- Look at the `flexlm-<version>/license.log` log file. This file contains status and error messages from the **lmgrd** license server.

- Use the `flexlm-<version>/platform/bin/lmstat` command, which lists license manager activity. For example, to list the number of licenses that are currently checked out on a **sun5** platform, enter:

```
cd /usr/toolworks/flexlm-<version>/sun5/bin  
./lmstat -a -c ../../license.dat
```

Starting the License Manager When the System Boots

Most of our customers want the license manager to automatically start when the license server boots. Do this by adding the **toolworks_init** command (see [Starting the License Manager Manually](#) on page 37) to the appropriate system start-up file. (Ask your system manager where this should go.) On most systems, you should also automatically stop the license manager when the system shuts down to single-user mode.

You can edit your startup files by running the **Configure_Autostart** shell script, which must be run as **root**. For example, if the license manager software is in the `/usr/toolworks` directory, run **Configure_Autostart** using the following commands. (Before entering these commands, use the **su** shell command to become the root user or use the **sudo** command to directly invoke the following program.)

```
cd /usr/toolworks/flexlm-<version>/bin
./Configure_Autostart
```

Configure_Autostart prompts you with some configuration questions and then makes its changes.

Installing FlexNet Standalone

The TotalView tar file includes license server software for the platform TotalView runs on. If your license server's platform differs from that of TotalView, contact techsupport@roguewave.com to obtain a tar file containing the files for your license server's platform.

Use the **tar** command to extract the files from the FlexNet standalone tar file. For example:

```
tar xvf flexlm-<version>.tar
```

Starting the Install Program

Here is the procedure for installing FlexNet:

1. (Optional) Become the root user on the system where you will install the license server software:

```
su root
```

We recommend that you become the root user when installing FlexNet as this prevents users from modifying the software after you install it.

On some systems, you will use the **sudo** command. In this case, you would invoke the **Install** program in step 2 by typing `sudo ./Install`.

1. From the directory containing the unbundled files, start the **Install** program:

```
./Install
```

For information on using this command, type `./Install -help`. If you use any of the options displayed by this command, the software is non-interactively installed.

2. The **Install** program asks you to accept the license terms. You can respond **Yes** to accept, **No** to decline, or **?** to view the license terms. You must accept the license terms to continue the installation.
3. The **Install** program asks that you name an installation directory. If the directory you specify does not exist, the program requests a new location, effectively meaning the directory you specify must already exist. The **Install** program then creates a `toolworks` directory and places the `flexlm-<version>` directory within it. Type a period "." if you want **Install** to place FlexNet in your current directory.

If you do not enter a name, the installation directory is either `/usr/toolworks` or `/opt/toolworks`—this is system dependent.

1. You are then asked which components you wish to install. You should install the license common files and the license platform files for your license server.
2. If you became root to install FlexNet, use the **exit** command.

More FlexNet Information

These instructions provide only basic information on installing the FlexNet license manager. For more information, see:

User Guide

A PDF version of the FlexNet Publisher License Administration Guide is installed at `flexlm-<version>/doc/fnp_LicAdmin.pdf`.

Flexera Software Web Site

FlexNet is a product of Flexera Software. The web site at <https://www.flexerasoftware.com/monetize/products/flexnet-operations.html> contains additional information about FlexNet.

Installing FlexNet Publisher License Keys

This chapter describes the procedure for installing or changing a regular FlexNet Publisher (FNP) style license.

The topics in this chapter are:

- [Step 1: Locating the FlexNet License Server Directory](#) on page 43
- [Step 2: Deleting Older License Keys](#) on page 44
- [Step 3: Adding New License Keys](#) on page 45
- [Step 4: Starting and Stopping the License Server](#) on page 47
- [Step 5: Configuring TotalView to Use the License Server](#) on page 48
- [Reporting Problems with License Installation](#) on page 49

You must install the FlexNet version license management software on the machine you have selected as your license server. FlexNet is included in the TotalView distribution and can be installed by the installation script.

Step 1: Locating the FlexNet License Server Directory

Locate the `flexlm-<version>` directory. This directory should be located in the directory `<installdir>/toolworks`.

The default values for `<installdir>` are `/usr` and `/opt` depending on your platform.

Set the **FLEXLM** environment variable to:

```
<installdir>/toolworks/flexlm-<version>
```

For example:

```
setenv FLEXLM /usr/toolworks/flexlm-<version>
```

The **FLEXLM** environment variable is only used during this installation process. The license management daemons do not use or need it.

Step 2: Deleting Older License Keys

If you received new license keys because you moved your server or traded in existing license keys, the older license keys are no longer valid and must be removed in order for you to be in compliance with the Perforce Permanent License Agreement.

If you do not need to remove previous license keys, skip to [Step 3: Adding New License Keys](#) on page 45.

The host information and license key information for the license keys that you need to remove are included in the email we sent you. For each of these license keys, that email listed:

- The `hostname` of the license server.
- The `hostid` of the license server.
- The FlexNet `INCREMENT` lines that contain the now invalid license key.

Here is how to remove an invalid license key:

1. Locate the machine that corresponds with the `hostid` for the invalid key. Since hostnames are dynamic, you can use the `${FLEXLM}/bin/toolworks_hostid` script to validate the `hostid` of the license server.
The FlexNet `hostid` is unique for each license server regardless of `hostname` and IP address changes.
2. Locate the `<installdir>/toolworks/flexlm-<version>` directory on the license server.
3. If necessary, become the root user.
4. Make a temporary backup of the existing `${FLEXLM}/license.dat` file. For example:

```
cp ${FLEXLM}/license.dat ${FLEXLM}/license.dat.bak
```
5. Using a text editor, edit the `${FLEXLM}/license.dat` file to delete the `-INCREMENT` line. Save this file.
6. If other license keys still exist in the `license.dat` file, tell the license server to reread the `license.dat` and verify that these licenses still work. If they do, you can delete the `license.dat.bak` temporary backup file.

Use the following command to tell the license server to reread your `license.dat` file:

```
${FLEXLM}/bin/toolworks_lmreread
```

If no license keys remain in the `license.dat` file, use the following command to stop the license server:

```
${FLEXLM}/bin/toolworks_init stop
```


Step 3: Adding New License Keys

This step describes how to create or update the `license.dat` file that the license manager uses to allow access to TotalView.

If your license server is already serving one or more TotalView licenses (that is, the file `${FLEXLM}/license.dat` already exists), go to [Revising Your license.dat File](#) on page 46.

Adding a New license.dat File

The `Configure_License` script, which is located in the `${FLEXLM}/bin` directory, creates the `license.dat` file and the `toolworks_init` script. `Configure_License` needs to read the `license.src` file. This file, which you will create, contains TotalView license keys.

Here is the procedure for creating this `license.src` file:

1. Change to the `flexlm-<version>` directory on the license server

```
cd ${FLEXLM}
```

2. Copy and paste the new Perforce license keys — this is the information that you received through email — into a file named `license.src` in the `<installdir>flexlm-<version>` directory.

The text in your `license.src` file is derived from your host information, number of license keys, and license configurations.

3. Run the `${FLEXLM}/bin/Configure_License` script on the license server. The script creates the following files:

- `${FLEXLM}/license.dat`
- `${FLEXLM}/license.opt`

NOTE: If you already have a `license.opt` file the script asks whether you want to overwrite it. Answer “n” to preserve your existing file with its named users. If you answer “y”, a new file without named users is created, but your existing file is saved as `license.opt.old`.

- `${FLEXLM}/license.client`
- `${FLEXLM}/license.log`

- `${FLEXLM}/bin/toolworks_init`

Revising Your license.dat File

If you are currently using TotalView, you need to revise your `${FLEXLM}/license.dat` file. You do not need to create a new `${FLEXLM}/license.src` file nor do you need to rerun the **Configure_License** script unless you have deleted or changed the location of the `flexlm-<version>` directory.

If the `${FLEXLM}/license.dat` file does not exist, you will need to follow the procedure described in [Adding a New license.dat File](#) on page 45 at the beginning of this topic. Since Perforce does not resupply all of your license keys when there is a license change, you will need to combine the license keys that you already have with the newly delivered keys.

Here is the procedure for revising your existing `license.dat` file:

1. Back up your existing `${FLEXLM}/license.dat` file. For example,

```
cp ${FLEXLM}/license.dat ${FLEXLM}/license.dat.bak
```

2. Using a text editor, edit the `${FLEXLM}/license.dat` file and append the new TotalView license keys delivered in this email message to the end of the `${FLEXLM}/license.dat` file.

3. Tell the license server to reread your `license.dat` file:

```
${FLEXLM}/bin/toolworks_lmreread
```

Step 4: Starting and Stopping the License Server

Run the following command as **root** to start the license server.

```
${FLEXLM}/bin/toolworks_init start
```

As an alternative, you can run the commands within this section as an argument to the **sudo** command.

If you configured your license server to run as a non-privileged user, the initialization script ensures that the license management daemons are started and run under the non-privileged user even if you run the script as **root**.

To stop the license manager, become **root**, and then use the following command:

```
${FLEXLM}/bin/toolworks_init stop
```

If you would like the license manager to automatically start when the system is booted, run the following script as **root**:

```
${FLEXLM}/bin/Configure_Autostart
```

Step 5: Configuring TotalView to Use the License Server

TotalView must be able to find the `${FLEXLM}/license.dat` file. If you are running TotalView and the license server in the installation directory on the same machine, you can skip this step.

If TotalView and the license manager are not running on the same machine, you will need to place a `${FLEXLM}/license.dat` file on each additional installation. Copy the `${FLEXLM}/license.client` file from the license server into the `flexlm-<version>` directory on each remote machine and rename that file to `license.dat`.

As an alternative, you can specify the full path to the `license.dat` file in your `LM_LICENSE_FILE` environment variable. A client-style `license.dat` has the following form:

```
SERVER hostname hostid port-number  
USE_SERVER
```

Reporting Problems with License Installation

If you have difficulties installing your license keys, please send email to techsupport@roguewave.com and include the following:

- Your `license.dat` file.
- Your `license.src` file (if applicable).
- The license delivery email.
- The `license.log` file created when you attempted to start the license manager and TotalView.
- The text displayed in your window when you tried to start the license manager.
- The text displayed in your window when you tried to start TotalView.

Uninstalling TotalView

The Three-Step Removal Process

NOTE: These steps remove a FlexNet Publisher (FNP) license server. For FlexNet Embedded (FNE), see [Installing a Flex-Net Embedded \(FNE\) License](#).

To remove or uninstall TotalView:

1. If the license server is running, stop it. If the license manager software is installed in **/usr/toolworks**, the following commands stop the license manager. Before entering these commands, you may need to use the **su** shell command to become the **root** user or use the **sudo** command to directly invoke the following program.

```
cd /usr/toolworks/flexlm-version/bin
./toolworks_init stop
```

2. Remove the installation directory. The default location is

```
/usr/toolworks
```

If you have more than one version of TotalView, just remove what you don't want. If you are just removing a version, you do not need to stop the license manager.

3. The home directories of all TotalView users have a **.totalview** subdirectory. Remove it.

If you're not interested in using TotalView after trying it, we'd really appreciate you sending email to techsupport@roguewave.com and letting us know why.

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