TotalView Installation and Licensing Guide

Version 2023.4
November, 2023

PERFORCE

TotalView

ACKNOWLEDGMENTS

TotalView by Perforce
http://totalview.io

Contents

Introduction

The TotalView debugger can be installed and run on a number of hardware platforms. (See the TotalView Platform Guide on the TotalView website for specifics.)

TotalView is licensed through either Flexera's FlexNet Publisher, FlexNet Embedded, or Reprise's RLM licensing software, depending on the platform on which it is installed and other factors.

This guide is organized to lead a new customer from an evaluation of TotalView through the installation of the final, fully-licensed product. It also includes the procedure to renew or update a license, install a license server, and other license-related tasks.

Installation Overview

TotalView Distribution

TotalView is available as a download, usually via a provided link. The download includes these files:

1. The TotalView distribution (a tar file or a graphical installer, depending on the platform)

2. The TotalView documentation distribution

3. The Release Notes for that particular release

4. An md5sum file, containing the md5sums of the distribution files for verification that they have been transferred without error.

Once the distribution has been unpacked, run the installer, which will confirm which files are to be installed as it executes.

NOTE: The macOS platform and the TotalView Student product use only the graphical installer. Linux x86-64 users may install via either the tarball or the graphical installer. All other platforms install via a tar ball.

TotalView Installation and Directory Hierarchy

TotalView can be installed either locally to an individual user's system, or on a shared file system for access by multiple users.

The first step is to unpack the files from the distribution. For example, on linux-x86-64, the distribution is typically a tar file, which should be untarred into any location, such as a scratch area. From there, install the distribution by running the `./Install` script, which will guide you through the process. For graphical installs, just launch the installer and follow the prompts.

Determine the installation directory (typically `/opt` or `/usr`, but a local install might be in a user's home directory). At that point, the install script creates the installation directory, with a top level of **toolworks**.

Table 1: Initial installation directory hierarchy

<installdir>		
toolworks/		
	license/[1]	
	totalview.*<version>*/	
		bin/ toolworks_hostid
	memoryscape.<version>/ (optional)	

1. The directory "license" refers to either a single directory named "license" or directories named "FNE_license" and "FNP_license." This is version specific: Versions 2023.4 and later install a single directory named license; prior releases installed directories FNP_license and FNE_license.

- More than one version of TotalView can be installed in the **toolworks** directory. For multiple installations, you may not want to create the links when prompted by the install script, but instead, develop a simple script that allows your own links to each version.

- The directory `memoryscape.`*<version>* is installed only if you choose to install it when prompted.

TotalView Licensing

A license is necessary to run TotalView.

Evaluation licenses

When evaluating TotaView, you are provided a demo license, which you will copy into the **license** directory:

- **For TotalView 2023.4 and later**: copy to **.../toolworks/license**.

- **For releases prior to 2023.4**: copy to either **.../toolworks/FNP_license** or **.../toolworks/FNE_license**, depending on the license technology (most often FlexNet Publisher).

Permanent or subscription licenses

To receive any license other than an evaluation license, provide a host ID:

- **For TotalView for HPC**, the host ID is from the machine hosting the license server; this may be either an external machine configured to be a license server, or a machine hosting both the license server and running TotalView, depending on your system.

- **For Developer / Developer for HPC**, the host ID will always be the machine running TotalView itself.

To find the host ID, run the provided script **toolworks_hostid** on the system which will host the generated license. Provide the output of the script to the licensing department so that you can receive a permanent or subscription license. This license will contain the host ID information in an encrypted form and will work only on the system for which it was created.

License server software

A license server is required only for TotalView for HPC. To set up a license server, install the license server software specific to your license type on the machine (or machines, in the case of a failover setup) that will host the license server.

> **NOTE:** A license server is ***not*** required for an evaluation distribution or for TotalView Developer / Developer for HPC.

You will have received either Flexera's FlexNet Publisher, FlexNet Embedded, or Reprise's RLM license from Perforce Licensing.

The installed files include license server software for multiple platforms:

Table 2: License server directory hierarchy

<installdir>

toolworks/
license_tech-*<version>*/[1]
bin/
darwin-arm64/
darwin-x86/
doc/
license.opt.src
linux-arm64/
linux-powerle/
linux-x86-64/
README.TXT
sun5/
VERSION

1. license_tech is either reprise, flexlm, or flexnetls, for RLM, FNP, or FNE respectively. Note that the platform directories installed depend on the license technology.

The **bin** directory contains multiple scripts to facilitate license configuration and installation.

Evaluation Installations

A TotalView evaluation includes all the features of a fully-licensed version of TotalView, but with a time-limited "demo" license.

Installing an evaluation version entails:

- Unpacking the tar file and installing TotalView

- Verifying your license by running the **toolworks_licensetype** utility. You will have received a demo license which you will copy into the license directory.

- Installing the evaluation license

- Testing TotalView

Installing TotalView

> **NOTE:** The macOS uses a graphical installer. See macOS Installations.

Unpack the Tar Ball

Download the tar file version for your platform 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.

Install 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, then start the **Install** program by entering:

   ```
   ./Install
   ```

   This runs the installer script in interactive mode in which you are prompted with options or to provide information. For detail on using this command, type `./Install -help`. If you use any of the options described by the help, 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. The directory must already exist; if not, the program requests a new location.

   If you do not enter a name, the installation directory will either be `/usr/` or `/opt/`, depending on the system.

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

5. **Choose the components to install**

   If you are installing TotalView for multiple platforms in a common NFS directory, 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**.

   At this point, the **Install** program has created a **toolworks** directory with these subdirectories:

   - **license**

   - **memoryscape.*<version>*** (*optional*)

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

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 entering:

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

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

   TotalView requires a valid license to debug a program. To install your demo license, see Reprise (RLM) Demo License Installation.

FlexNet Publisher (FNP) Demo License Installation

FlexNet Publisher (FNP) style licensing uses text license files that 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/totalview.<version>/bin/toolworks_licensetype <licensefile>
```

The utility should report "FlexNet Publisher (FNP)". If it reports "FlexNet Embedded (FNE)" see FlexNet Embedded (FNE) Demo License Installation.

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

> **NOTE:** Versions prior to 2023.4 will have a **.../toolworks/FNP_license** directory, rather than **.../toolworks/license**.

Before you can use TotalView, place the demo license file into the `license` 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 the name **license.demo**, 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 `license` directory.

   ```
   cp <licensefile> <installdir>/toolworks/license
   ```

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 file in the *<installdir>*`/toolworks/license` directory, 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>/<licensefile>
```

If a **LM_LICENSE_FILE** environment variable already exists, add the pathname for the license file 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>/<licensefile>:${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

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/totalview.<version>/bin/toolworks_licensetype <licensefile>
```

The utility should report "FlexNet Embedded (FNE)". If it reports "FlexNet Publisher (FNP)," see FlexNet Publisher (FNP) Demo License Installation.

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

> **NOTE:** Versions prior to 2023.4 will have a **.../toolworks/FNE_license** directory, rather than **.../toolworks/license**.

Before you can use TotalView, place the demo license file, **license_demo.bin** into the *<installdir>*/toolworks/license 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 license directory.

   ```
   cp license_demo.bin <installdir>/toolworks/license
   ```

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/license directory, 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.

Reprise (RLM) Demo License Installation

Reprise (RLM) style licensing uses text license files that are typically named **license_.demo.lic** or **license.lic**.

Before starting the license file installation, first verify that your license is a Reprise (RLM) demo file by running the **toolworks_licensetype** utility:

```
<installdir>/toolworks/totalview.<version>/bin/toolworks_licensetype <licensefile>
```
The utility should report "Reprise (RLM) TotalView Evaluation license detected."

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

Before you can use TotalView, place the demo license file into the `license` 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 the name **license_demo.lic**, 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 `license` directory.

   ```
   cp <licensefile> <installdir>/toolworks/license
   ```
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 file in the *<installdir>*`/toolworks/license` directory, set your **RLM_LICENSE** environment variable to the file's full pathname. The following example shows the bash shell style syntax for setting **RLM_LICENSE**.

```
export RLM_LICENSE=<nonstandard-dir>/<licensefile>
```
If a **RLM_LICENSE** environment variable already exists, add the pathname for the license file to this variable's declaration. Notice that the **RLM_LICENSE** variable contains a colon-separated list of license file pathnames. For example:

```
export RLM_LICENSE=<nonstandard-dir>/<licensefile>:${RLM_LICENSE}
```
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 with no license error dialogs.

Transitioning to a Licensed Install

The procedure for transitioning from a demo license to a licensed TotalView product differs depending on the TotalView product.

> **NOTE:** To get a permanent/subscription license, TotalView needs to be installed. If you have completed an evaluation, you may already have it installed; if not, see Installing TotalView.

Summary of the licensing process

- Determine the host ID for your machine and provide it to the licensing team to receive a permanent or subscription license.

  Note: For TotalView Developer and Developer for HPC, the individual machine's host ID is used; for TotalView for HPC, this host ID will be for the license server.

- Confirm your license by running the utility **toolworks_licensetype**, which should report an FNP, FNE, or RLM license and the TotalView product that you have.

- Install the license, either on an individual machine or set up a license server, if your product requires one. (Only TotalView for HPC requires a license server.)

For detail, see:

- Developer / Developer for HPC Licensing

  The equivalent of the previous product TotalView Individual

- TotalView for HPC Licensing

  The equivalent of the previous products TotalView Team or Team Plus

- TotalView Student

NOTE: Installations for HPE Cray and macOS may require different or additional procedures. See the Appendix for more detail.

Installing TotalView

Most TotalView installers are provided as tar bundles, although installing on the macOS requires a graphical installer, and a graphical installer is also available for Linux x86 64-bit.

If you already have installed TotalView, skip this chapter, and move on to licensing:

- For TotalView for Developer, see Developer / Developer for HPC Licensing on page 45.

- For TotalView for HPC, see TotalView for HPC Licensing on page 20.

Using a Graphical Installer

All installations on a macOS platform are via a graphical installer, and a graphical installer is also available on Linux x86 64-bit.

If you are using a graphical installer, the UI will prompt you as needed. Skip the step "Set Up License Key" unless you are installing the product using a Student license (See TotalView Student.) All other products will install licenses in the normal way (See Next Steps.)

Using a Tar Ball

This discussion describes how to install a new version of TotalView from a tar ball.

Unpack the Tar Ball

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
```

Install 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, then start the **Install** program by entering:

   ```
   ./Install
   ```

   This runs the installer script in interactive mode in which you are prompted with options or to provide information. For detail on using this command, type `./Install -help`. If you use any of the options described by the help, 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. The directory must already exist; if not, the program requests a new location.

   If you do not enter a name, the installation directory defaults to either `/usr/` or `/opt/`, depending on the system.

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

5. **Choose the components to install**

   If you are installing TotalView for multiple platforms in a common NFS directory, 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**.

   At this point, the **Install** program has created a **toolworks** directory with these subdirectories:

   - **license**

   - **memoryscape.*<version>*** *(optional)*

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

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 entering:

   <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 server, it displays an "RLM license error: No license for product (-1)" message. If this occurs, confirm that you installed the license.

   For Linux x86-64 and Linux PowerLE: TotalView's user interface requires `libxkbcommon` and `libXcomposite` to be installed; these are typically included as part of a desktop graphical environment.

Next Steps

After installation, license your product:

- For TotalView for Developer, see Developer / Developer for HPC Licensing on page 45.

- For TotalView for HPC, see TotalView for HPC Licensing on page 20.

TotalView for HPC Licensing

Overview

> **NOTE:** If you have not yet installed TotalView or wish to reinstall, see Installing TotalView on page 17. To renew or update an existing license, see Updating or Renewing a License.

TotalView for HPC installations require a license server. You may have installed TotalView on the machine that will host the license server, or on a client machine that will point to the license server:

- **For the machine hosting the license server**:

  - The license server will be installed and configured in an additional directory created by the license server software installation, not by the TotalView installation.

  - The license will be either a FlexNet Publisher (FNP), FlexNet Embedded (FNE), or a Reprise (RLM) style license.

    See Install a TotalView for HPC License Server.

- **For a client machine pointing to the license server** for its licensing information, either install a license server pointer file in the **license** directory created by the TotalView installer, or set an environment variable.

  > **NOTE:** **Versions prior to 2023.4** will have a **.../toolworks/FNP_license** or **.../toolworks/FNE_license**, rather than **.../toolworks/license**.

  Set the environment variable to point to the license as follows:

  - **RLM_LICENSE** for a RLM style license

  - **LM_LICENSE_FILE** for an FNP style license

  - **TV_LICENSE_FILE** for an FNE style license.

You do not need to install a license server; instead, whomever administers the license server will need to provide you with a license.

- **For an FNP style license**, see Point TotalView Client Installations to the FNP License Server.

- **For an FNE style license**, see Point TotalView Client Installations to the FNE License Server.

- **For an RLM style license**, see Point TotalView Client Installations to the RLM License Server

Install a TotalView for HPC License Server

A license server is required for TotalView for HPC. Depending on your platform and license type, you will either download and install the FNP, FNE, or RLM licensing server bundle:

- **FNP: most platforms**. All platforms except Linux ARM64 and Linux PowerLE. See Installing a FlexNet Publisher (FNP) License Server.

- **FNE: Linux ARM64 and Linux PowerLE**. These platforms *require* FNE licenses. See Installing a FlexNet Embedded (FNE) License Server.

- **RLM: New license technology available with the 2023.4 release,** to be used by all new customers or those renewing: See Installing a Reprise (RLM) License Server.

To understand the considerations when choosing a license server, see Choosing a License Server.

Choosing a License Server

You will need to install the license server the first time you install a permanent/subscription license. In some cases, the license server and TotalView reside on the same system. However, you can install them on different systems, as long as the license server system is a platform that TotalView supports.

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

> **NOTE:** The license server must be installed on a supported platform. In particular, because TotalView doesn't run on Windows, a license server cannot be on a Windows system. See the TotalView Platform Guide for specifics.

If you already have a license server in your network, you should not include your TotalView license with the other licenses managed by that license server. If you must combine license servers, consult the FNP, FNE, or RLM documentation.

Failover Protection

All licensing types optionally provide failover protection to ensure that users are not interrupted in the event of a license server failure. This is provided through the designation of a failover server.

- **FNP**: See Installing a FlexNet Publisher (FNP) License Server on page 24

- **FNE**: See Installing an FNE Failover Server on page 38

- **RLM**: See Installing a Reprise (RLM) License Server on page 39.

Installing a FlexNet Publisher (FNP) License Server

A TotalView FNP license server must be hosted on a platform that TotalView supports. (For platform support specifics, see the *FlexNet Publisher License Administration Guide* PDF included in the distribution under *<installdir>*/ `toolworks/flexlm-`*<version>*`/doc`.).

Installation Procedure

1. Install the FNP Software

2. Generate a Host ID for the FNP License Server

3. Verify Your FNP License Type and Product

4. Configure the FNP License Server

5. Point TotalView Client Installations to the FNP License Server

FNP License Server Prerequisites

To install an FNP license server:

1. The license server must be installed on a platform supported by TotalView.

2. A dedicated unprivileged user account is recommended on the system that hosts the license server.

Installing the FNP License Server

1. Install the FNP Software

The FlexNet Publisher license server tar bundle **flexlm-*<version>*.tar** is available for download on the TotalView website at https://totalview.io/success/downloads.

> **NOTE:** For served license renewal, skip this section and see FNP License Renewal.

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

   To install the FNP license server software, unpack the FlexNet Publisher tar bundle onto the machine that will host the license server, then run the Install script from the resulting directory:

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

2. **Run the Install script using sudo** (optional but recommended)

```
sudo ./Install
```

This runs Install in interactive mode in which you are prompted with options or to provide information.

- Choose an installation directory, e.g., `/opt`.

- At the prompt, select the components to install.

    Choose to install the license common files and the relevant license platform files for your license server. (The tar ball includes license server software for multiple platforms.)

Once the Install script completes, you should have a flexlm-*version* directory under *installdir*`/toolworks`.

2. Generate a Host ID for the FNP License Server

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

installdir`/toolworks/flexlm-`*version*`/bin/toolworks_hostid`

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

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

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

Be aware that a host ID is returned for just FNP when invoking **toolworks_hostid** from the `flexlm-`*version* directory. Running **toolworks_hostid** under the *installdir*`/toolworks/totalview.`*version* directory generates a host ID for both FNP and FNE on platforms running FNP.

Note: Depending on the TotalView version, an RLM host ID might also be generated.

If **toolworks_hostid** returns multiple FlexNet host IDs, select a *persistent* host ID, i.e., one for a device that is always part of the system when the license server software is running. The license server host ID is derived from the physical MAC address of a network interface card, and the host ID chosen must be a persistent address.

Send the host ID to the TotalView license team, license@perforce.com, who will then send you a permanent/subscription license.

3. Verify Your FNP License Type and Product

After receiving your license, you can verify your license type and product by running the utility **toolworks_licensetype** and provide as input the license file:

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

The script returns the license type (either RLM, FNP, or FNE), the product, and whether a license server is required. For example:

```
FlexNet Publisher (FNP) TotalView for HPC license(s) detected
These licenses are counted.  A license server is required.
For license setup help refer to TotalView for HPC > FlexNet Publisher (FNP)
in the TotalView Installation Guide.
```

4. Configure the FNP License Server

1. **Create a file named `license.src` in your** *<installdir>*/**toolworks/flexlm-***<version>* **directory**

   - Change to the `flexlm-`*<version>* directory on the license server
     `cd` *<installdir>*`/toolworks/flexlm-`*<version>*

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

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

2. **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 FNP License Server Prerequisites.

   While not required, it's recommended to have a dedicated, *unprivileged* user account to run the license server. Note that the login shell should be `/bin/sh`.

3. **Run the** *<installdir>*/**toolworks/flexlm-***<version>*/**bin/Configure_License script on the license server, to create the following files**:

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

   - *<installdir>*/`toolworks/flexlm-`*<version>*/**license.opt**

> **NOTE:** If you already have a `license.opt` file, the script prompts whether you want to overwrite it. Answer "n" to preserve your existing file. If you answer "y", a new file is created, but your existing file is saved as `license.opt.old`.

- *<installdir>*/`toolworks/flexlm-`*<version>*/**license.client**

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

5. Point TotalView Client Installations to the FNP License Server

Each client machine that will run TotalView needs access to a license. 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 server are not running on the same machine, you will need to place a `license.dat` file on each additional installation. Copy the *<installdir>*/`toolworks/flexlm-`*<version>*/`license.client` file from the license server into the *<installdir>*/`toolworks/license` directory on each client machine and rename that file `license.dat`.

As an alternative, you can specify the full path to the `license.dat` file in your `LM_LICENSE_FILE` environment variable, using the format *<port>*@*<host>*.

For example (bash):

```
LM_LICENSE_FILE=7137@licserver
export LM_LICENSE_FILE
```

Starting and Stopping an FNP License Server

Starting the FNP License Server

Run the following command to start the license server.

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

NOTE: Note that `toolworks_init` was generated by the **Configure_License** script in 4. Configure the RLM License Server.

You can check that the license server started by viewing its log, created after running `toolworks_init start` at:

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

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**.

Stopping the FNP License Server

To stop the license server:

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

Autostarting the License Server

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

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

Configure_Autostart prompts you for some configuration questions and then makes changes to the specified startup files.

FNP License Three-Server Redundant Triad

If you require FNP license failover support, you can set it up in one of two ways: one method implements a three-server redundant setup; the other requires two or more license servers or uncounted licenses to be available in a search list. For detail, see the "Ensuring License Availability" chapter in the *FlexNet Publisher License Administration Guide* located in the directory *<installdir>*`/toolworks/flexlm-<version>/doc`.

NOTE: In most (if not all) cases, the three-server redundant setup is recommended over the search list because using the search list requires that your purchased license tokens be split between the servers in the list, limiting the number of processes you can run on a given server.

Three-Server redundant configuration

A three-server redundant setup includes three servers: one acts as the master, which serves the licenses. If it fails, one of the two secondary servers takes over as master. At any given time, two of the three machines (a quorum) must be up and available.

When creating this configuration, send the output of **toolworks_hostid** for each of the three servers to the licensing department. Licensing will create and send you a key that encrypts the **hostid**s of all three servers in the triad. Add these three server lines to your **license.dat** file, then install the **license.dat** file on each of the three license servers.

Installing a FlexNet Embedded (FNE) License Server

FNE License Server Types

The TotalView FNE license server is 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 an FNE Failover Server.) The procedure for installing either type is basically the same.

Installation Procedure

1. Install the FNE License Server

2. Generate a Host ID for Each FNE License Server

3. Verify Your FNE License Type and Product

4. Configure the FNE License Server

5. Point TotalView Client Installations to the FNE License Server

FNE License Server Prerequisites

To install an FNE license server:

1. The user/administrator must have **sudo** or root privileges

2. 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. Java requirements:

   - 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.

     Be sure to set this variable *two levels up* from the `java` executable, i.e., just above the `bin` directory. For example, for a `java` executable in `/path/to/bin/java`, set **JAVA_HOME** or **JRE_HOME** to the directory `/path/to`.

4. A dedicated unprivileged user account is recommended for the Linux-x86-64 system that hosts the license server. See **Create a dedicated unprivileged user account** on page 33.

Installing an FNE License Server

1. Install the FNE License Server

The FlexNet Embedded server is available as a separate installation tar bundle, available for download on the TotalView website at https://totalview.io/success/downloads.

NOTE: For served license renewal, skip this section and see FNE License Renewal.

---

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>*`/toolworks`.

2. Generate a Host ID for Each FNE License Server

Generate a host ID for the license server and failover server, if relevant.

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. If **toolworks_hostid** returns multiple FlexNet host IDs, select a *persistent* host ID, i.e., one for a device that is always part of the system when the license server software is running. The license server host ID is derived from the physical MAC address of a network interface card, and the host ID chosen must be a persistent address.

Send the host ID to the TotalView license team, license@perforce.com, who will then send you a permanent/subscription license to use when configuring each host

3. Verify Your FNE License Type and Product

After receiving your license, you can verify your license type and product by running the utility **toolworks_licensetype** and provide as input the license file:

<installdir>`/toolworks/totalview.`*<version>*`/bin/toolworks_licensetype <licensefile>`

The script returns the license type (either RLM, FNP, or FNE), the product, and whether a license server is required. For example:

```
FlexNet Embedded (FNE) TotalView for HPC license(s) detected
These licenses are counted.  A license server is required.
For license setup help refer to TotalView for HPC > FlexNet Embedded (FNE)
in the TotalView Installation Guide.
```

4. Configure the FNE License Server

1. **Install the license file on the license server system**

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

2. **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 FNE License Server Prerequisites on page 31.

   While not required, it's recommended to have a dedicated, *unprivileged* user account to run the license server.

3. **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 FNE License Server Prerequisites or during Step 2. Note that this script will create a user account if you don't already have one.

- (*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.

5. Point TotalView Client Installations to the FNE License Server

Each client machine that will run TotalView needs access to a license.

- On each client machine, 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 file in the **license** directory.

   To do this, create a file **tv_license_file** that contains just the *<port>*@*<host>* string, such as `7137@lic-server`. Place this file in *<installdir>*`/toolworks/license/`.

Starting and Stopping an FNE License Server

An FNE server is configured by default to autostart when the server reboots. In most scenarios, you won't need to explicitly stop or start the server. You can, however, manually start or stop the server if you need to, or disable its autostart.

Disabling Autostart for an FNE License Server

To disable an FNE server's autostart configuration, run the following script as **root**:

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

To re-enable autostart, run:

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

Manually Starting or Stopping an FNE License Server

Run the following command to manually start the license server.

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

NOTE: Note that `toolworks_init` was generated by the **Configure_License** script in 4. Configure the FNE License Server.

To stop the license server:

```
<installdir>/toolworks/flexnetls-<version>/bin/toolworks_init stop
```

Managing FNE License Access with Model Definitions

The license models feature available with the FlexNet Embedded license server supports defining allow and block lists based on a host ID, using a *model definition*.

Model definitions use the EBNF syntax (Extended Backus–Naur form). For detail, see the *FlexNet Embedded License Server Administration Guide* located in the installation directory at *<installdir>*`toolworks/flexnetls-`*<version>*`/doc/`.

Creating and Managing FNE License Model Definitions

You can create either an allow list, which defines host IDs allowed to receive a license, or a block list, which blocks specific host IDs, and allows all others.

> **NOTE:** For TotalView, provide usernames for the host ID field, rather than machine identifiers, because TotalView grants licenses based on the username sent as a secondary host ID. For example, `bjones`, rather than `0050569b0d74`.

1. **Create a model definition file**

   The following example creates a simple allow list with three engineering team members:

   ```
   model "engTeam" {
     on hostid("bjones",
               "schang",
               "msingh") {
       use "default"
       accept
     }
   on any() {
       deny
     }
   }
   ```

   Fields:

   - **model**: The model definition name, as a string.

   - **hostid**: The individual's user ID

   - **use "default"**: Uses the default license partition. Note that only one partition, the default, is supported in TotalView.

   - **accept**: Accepts all identified hostids.

- **on any () deny**: Denies a license request for any requests that do not match the defined hostids.

To create a block list, switch the `deny` and `accept` keywords and move `use "default"` under on `any()`:

```
model "engTeam" {
  on hostid("bjones",
            "schang",
            "msingh") {
    deny
  }
on any() {
    use "default"
    accept
  }
}
```

2. **Load the file into the license server**

    a. Change to the flexnetls directory:

    ```
    cd <installdir>/toolworks/flexnetls-<version>/linux-x86-64/bin/
    ```

    b. Load the file:

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

    where `model_allow.model` is the model definitions filename. Note that the prefix "`.model`" is not required; it can be anything you choose.

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

- To see the active model definition:

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

- To delete the active model definition:

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

Installing an FNE 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 License Server

For Step 3, 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 FNE 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
```

Uninstalling an FNE License Server

TotalView provides a script to remove an FNE license server, **fneuninstall**, located in *<installdir>*/`toolworks/` `flexnetls-`*<version>*/`bin`. The script first stops and disables the license server, if it is running.

As the root user (or using **sudo**), run the script as below, assuming the FNE server is installed in its default location under /`usr`:

```
cd /usr/toolworks/flexnetls-<version>
./fneuninstall /usr
```

The script **fneuninstall** assumes that you have installed FNE using the default location, including the FNE program and data files. If you chose an alternate location when running **Configure_License**, you'll need to remove these files manually after running this script.

If you have installed FNE on a backup, or failover, server, run this script on that server as well.

Installing a Reprise (RLM) License Server

A TotalView RLM license server must be hosted on a platform that TotalView supports. (For platform support specifics, see the *RLM License Administration* PDF included in the distribution under *<installdir>*/`toolworks/` `reprise-`*<version>*/`doc`.).

Installation Procedure

1. Install the RLM Software

2. Generate a Host ID for the RLM License Server

3. Verify Your RLM License and Product

4. Configure the RLM License Server

5. Point TotalView Client Installations to the RLM License Server

RLM License Server Prerequisites

To install an RLM license server:

1. The license server must be installed on a platform supported by TotalView.

2. A dedicated unprivileged user account is recommended on the system that hosts the license server.

Installing the RLM License Server

1. Install the RLM Software

The RLM license server tar bundle **reprise-*<version>*.tar** is available for download on the TotalView website at https://totalview.io/success/downloads.

> **NOTE:** For served license renewal, skip this section and see Updating or Renewing a License.

1. **Unpack your TotalView RLM distribution on the license server system**

   To install the RLM license server software, unpack the RLM tar bundle onto the machine that will host the license server, then run the Install script from the resulting directory:

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

2. **Run the Install script using sudo** (optional but recommended)

   ```
   sudo ./Install
   ```

   This runs Install in interactive mode in which you are prompted with options or to provide information.

   - Choose an installation directory, e.g., `/opt`.

   - At the prompt, select the components to install.

     Choose to install the license common files and the relevant license platform files for your license server. (The tar ball includes license server software for multiple platforms.)

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

2. Generate a Host ID for the RLM License Server

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

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

> **NOTE:** Do *not* use the UNIX **hostid** command, as it may not return the proper host ID for RLM.

This script writes the host name and one or more RLM 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
```

Be aware that a host ID is returned for just RLM when invoking **toolworks_hostid** from the `reprise-`*<version>* directory. Running **toolworks_hostid** under the *<installdir>*`/toolworks/totalview.`*<version>* directory might also return a FlexNet Publisher and/or FlexNet Embedded host ID. If so, you can ignore those.

If **toolworks_hostid** returns multiple RLM host IDs, select a *persistent* host ID, i.e., one for a device that is always part of the system when the license server software is running. The license server host ID is derived from the physical MAC address of a network interface card, and the host ID chosen must be a persistent address.

Send the host ID to the TotalView license team, license@perforce.com, who will then send you a permanent/subscription license.

3. Verify Your RLM License and Product

After receiving your license, you can verify your license and product by running the utility **toolworks_licensetype** and provide as input the license file:

<installdir>`/toolworks/totalview.`*<version>*`/bin/toolworks_licensetype <licensefile>`

The script returns the license type, the product, and whether a license server is required. For example:

```
Reprise (RLM) TotalView for HPC license(s) detected
These licenses are counted.  A license server is required.
For license setup help refer to TotalView for HPC > Reprise (RLM)
in the TotalView Installation and Licensing Guide.
```

4. Configure the RLM License Server

1. **Create a file named `license.src` in your** *<installdir>*/**toolworks/reprise-***<version>* **directory**

   - Change to the `reprise-`*<version>* directory on the license server
     `cd` *<installdir>*`/toolworks/reprise-`*<version>*

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

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

2. **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 RLM License Server Prerequisites.

While not required, it's recommended to have a dedicated, *unprivileged* user account to run the license server. Note that the login shell should be `/bin/sh`.

3. **Run the** *<installdir>*/**`toolworks/reprise-`***<version>***/bin/Configure_License script on the license server, to create the following files**:

   - *<installdir>*/`toolworks/reprise-`*<version>*/**license.lic**

   - *<installdir>*/`toolworks/reprise-`*<version>*/**license.opt**

   > **NOTE:** If you already have a `license.opt` file, the script prompts whether you want to overwrite it. Answer "n" to preserve your existing file. If you answer "y", a new file is created, but your existing file is saved as `license.opt.old`.

   - *<installdir>*/`toolworks/reprise-`*<version>*/**license.client**

   - *<installdir>*/`toolworks/reprise-`*<version>*/bin/**toolworks_init**

5. Point TotalView Client Installations to the RLM License Server

Each client machine that will run TotalView needs access to a license. 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 server are not running on the same machine, you will need to place a `license.lic` file on each additional installation. Copy the *<installdir>*/`toolworks/reprise-`*<version>*/`license.client` file from the license server into the *<installdir>*/`toolworks/license` directory on each client machine and rename that file `license.lic`.

As an alternative, you can specify the full path to the `license.lic` file in your **RLM_LICENSE** environment variable, using the format *<port>*@*<host>*.

For example (bash):

```
RLM_LICENSE=7147@licserver
export RLM_LICENSE
```

Starting and Stopping the RLM License Server

Starting the License Server

Run the following command to start the license server.

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

> **NOTE:** Note that `toolworks_init` was generated by the **Configure_License** script in 4. Configure the RLM License Server.

You can check that the license server started by viewing its log, created after running `toolworks_init start` at:

```
<installdir>/toolworks/reprise-<version>/license.log
```

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**.

Stopping the License Server

To stop the license server:

```
<installdir>/toolworks/reprise-<version>/bin/toolworks_init stop
```

Autostarting the License Server

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

```
<installdir>/toolworks/reprise-<version>/bin/Configure_Autostart
```

Configure_Autostart prompts you for some configuration questions and then makes changes to the specified startup files.

RLM License Failover Protection

If you require RLM license failover support, you can set it up in one of two ways: one method implements a primary/backup server setup; the other requires two or more license servers or uncounted licenses to be available in a search list. For detail, see *RLM License Administration* located in the directory *<installdir>*`/toolworks/reprise-<version>/doc`.

> **NOTE:** In most (if not all) cases, the primary/backup server setup is recommended over the search list because using the search list requires that your purchased license tokens be split between the servers in the list, limiting the number of processes you can run on a given server.

Primary/backup server configuration

A primary/backup failover server setup includes two servers: the primary license server serves the licenses. If it fails, one of the backup servers takes over.

When creating this configuration, send the output of **toolworks_hostid** for each of the two servers to the licensing department.

Developer / Developer for HPC Licensing

TotalView Developer and Developer for HPC installations:

- Do not need a license server

- May have either a FlexNet Publisher (FNP), FlexNet Embedded (FNE), or Reprise (RLM) style license

NOTE: If you have not yet installed TotalView or wish to reinstall, see Installing TotalView on page 17.

The licensing process includes:

1. Identifying the license host ID and providing it to the licensing team to receive your license

2. Verifying your license type by running the script **toolworks_licensetype**.

3. Copying the license to the default location, or using a custom location.

To renew or update an existing license, see Updating or Renewing a License on page 51.

Find the Host ID

When you installed TotalView, in most cases, the installer places the **toolworks_hostid** script in *<installdir>/*`toolworks/totalview.`*<version>*`/bin`. For graphical installers, a **toolworks** directory may not be created; in this case, the license directory will be directly under *<installdir>*.

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

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

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

This script writes the host name and one or more 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: 0050569b1835
The FlexNet Publisher host ID for this machine is: 0050569b1835
The Reprise host ID for this machine is: 0050569b1835
```

To receive a license, copy and paste this information and email it to license@perforce.com along with the purchase order number.

Verify Your License Type and Product

After receiving your license, you can verify your license type and product by running the utility **toolworks_licensetype** and provide as input the license file:

<installdir>`/toolworks/totalview.`*<version>*`/bin/toolworks_licensetype <licensefile>`

The script returns the license type, the product, and whether a license server is required. For example:

```
Reprise (RLM) TotalView Developer / Developer for HPC license detected
These licenses are uncounted.  A license server is NOT required.
For license setup help refer to TotalView Developer / Developer for HPC > Reprise
 (RLM)
in the TotalView Installation and Licensing Guide.
```

- For an FNP style license, see FNP: Install a New Developer / Developer for HPC License.

- For an FNE style license, see FNE: Install a New Developer / Developer for HPC License.

- For an RLM style license, see Install a New Developer / Developer for HPC License.

Install a New Developer / Developer for HPC License

If you installed TotalView as the **root** user, become the **root** user again to install the license file. If you used **sudo** to install TotalView, use **sudo** here.

Installing the license file consists of simply copying the provided license to the directory where TotalView expects to find it. To use a custom directory, additional configuration is required.

After installing the license, you can test that the license file is working:

1. Launch TotalView:

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

2. Test a program, for example:

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

TotalView should come up with no licensing dialogs.

FNP: Install a New Developer / Developer for HPC License

The FNP license you have received is typically named **license.dat**. Install this in either the default location or a custom location.

Install Option 1: Install FNP license file in the default location

Place the license file into the `toolworks/license` directory of your TotalView installation.

> **NOTE:** **Versions prior to 2023.4** will have a **.../toolworks/FNP_license** directory, rather than **.../toolworks/license.**

```
cp <licensefile> <installdir>/toolworks/license
```
where *<installdir>* is the top-level directory where you performed the TotalView installation.

Install Option 2: Install FNP license file in a custom location

To use a custom licensing directory:

1. Set the **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>/<licensefile>
   ```
   If a **LM_LICENSE_FILE** environment variable already exists, add the pathname for the license file 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>/<licensefile>:${LM_LICENSE_FILE}
   ```

2. Copy the license file into the custom directory.

   ```
   cp <licensefile> <path-to-custom-dir>
   ```

FNE: Install a New Developer / Developer for HPC License

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

Place the license file into the `license` directory of your TotalView installation.

```
cp <licensefile>  <installdir>/toolworks/license
```

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

> **NOTE:** Versions prior to 2023.4 will have a **.../toolworks/FNE_license** directory, rather than **.../toolworks/license**.

Install Option 2: Install FNE license file in a custom location

1. Set the variable **TV_LICENSE_FILE**, by either:

   - Setting 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

   - Creating a file, which avoids having to set up the **TV_LICENSE_FILE** environment variable for each user. Name this file **tv_license_file** and place it in the `license` directory. This file should contain the full path to the node-locked license file, which will be used if **TV_LICENSE_FILE** is not set. For example, this file:

     ```
     installdir/toolworks/license/tv_license_file
     ```
     could contain:

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

2. Copy the license file to the custom location.
   ```
   cp license.bin <path-to-custom-location>
   ```

RLM: Install a New Developer / Developer for HPC License

The license you have received is typically named **license.lic**. Install this in either the default location or a custom location.

Install Option 1: Install the license file in the default location

Place the license file into the `toolworks/license` directory of your TotalView installation.

```
cp <licensefile> <installdir>/toolworks/license
```

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

> **NOTE:**   When using a graphical installer, a **toolworks** directory may not be created; in this case, the
> license directory will be directly under the installation directory.

Install Option 2: Install the license file in a custom location

To use a custom licensing directory:

1. Set the **RLM_LICENSE** environment variable to the file's full pathname. The following example shows the
   bash shell style syntax for setting **RLM_LICENSE**.

   ```
   export RLM_LICENSE=<nonstandard-dir>/<licensefile>
   ```
   If a **RLM_LICENSE** environment variable already exists, add the pathname for the license file to this variable's
   declaration. Notice that the **RLM_LICENSE** variable contains a colon-separated list of license file pathnames.
   For example:

   ```
   export RLM_LICENSE=<nonstandard-dir>/<licensefile>:${RLM_LICENSE}
   ```

2. Copy the license file into the custom directory.

   ```
   cp <licensefile> <path-to-custom-dir>
   ```

TotalView Student

Install TotalView Student via a graphical installer downloaded from the Perforce TotalView downloads page.

You will receive an entitlement code via email which you will use during the installation process.

Installing TotalView Student

1. Download the installer from https://totalview.io/success/downloads.

   Use the dropdown controls near the top of the page to select the student installer for your platform, along with a documentation tar bundle and an MD5 checksum file. Online links to the change log and release notes for the current version are also available.

   The graphical installer is available for Linux and macOS.

   - For **Linux**, the installer is a `.run` file to be invoked from the command line in a terminal window.

   - For **macOS**, the installer is a `.dmg` file.

2. Run the installer, which installs TotalView and retrieves a node-locked student license file from Perforce. Internet connectivity is required to retrieve the student license file.

   Provide the entitlement code when prompted. The installer automatically determines your machine's host ID, verifies the entitlement code, generates a student license file, and installs it on your machine.

   > **NOTE:** The macOS ARM (M1/M2) platforms don't support FNP, so the above internet license retrieval system does not apply.

   The installed files provide the same functionality as that in purchased instances of TotalView. It is the license file that differentiates between products.

Updating or Renewing a License

Updating or renewing a license generally entails just overwriting an existing license with a new license file, although updating a served license requires running a script.

- FNP License Renewal

- FNE License Renewal

- RLM License Renewal

FNP License Renewal

> **NOTE:** Versions prior to 2023.4 will have a **.../toolworks/FNP_license** directory, rather than **.../toolworks/license**.

TotalView Developer / Developer for HPC FNP License Renewal

You will have received a new `license.dat` file via email. Place this file in the same location as your existing `license.dat` file, allowing it to overwrite the older file.

TotalView for HPC FNP License Renewal

For served licenses used by TotalView for HPC, license renewal includes running the script **toolworks_lmreread** to reload the license.dat file.

If you are currently using TotalView, you need to update your existing the *<installdir>*/`toolworks/flexlm-`*<version>*/`license.dat` file after you receive a new one. You do not need to create a new *<installdir>*/`toolworks/flexlm-`*<version>*/`license.src` file, nor do you need to rerun the **Configure_License** script (used by TotalView for HPC only) unless you have deleted or changed the location of the `flexlm-`*<version>* directory.

To update your `license.dat` file:

1. Back up your existing *<installdir>*/`toolworks/flexlm-`*<version>*/`license.dat` file. For example,
   ```
   cp <installdir>/toolworks/flexlm-<version>/license.dat <installdir>/toolworks/flexlm-<version>/license.dat.bak
   ```

2. Using a text editor, edit the `license.dat` file and append the new TotalView license keys you have received to the end of the `license.dat` file.

3. Direct the license server to reread your `license.dat` file:
   ```
   <installdir>/toolworks/flexlm-<version>/bin/toolworks_lmreread
   ```

Deleting Older FNP 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.

The host and license information 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 host ID of the license server.

- The FlexNet `INCREMENT` lines that contain the now invalid license.

Here is how to remove an invalid license:

1. Locate the machine that corresponds with the **host ID** for the invalid license. Since hostnames are dynamic, you can use the *<installdir>*/`toolworks/flexlm-`*<version>*/bin/**toolworks_hostid** script to validate the host ID of the license server.

    The FlexNet host ID 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 `license.dat` file. For example:

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

5. Using a text editor, edit the *<installdir>*/`toolworks/flexlm-`*<version>*/`license.dat` file to delete the - `INCREMENT` line. Save this file.

6. If other license keys still exist in the `license.dat` file, run **toolworks_lmreread** so the license server can evaluate the `license.dat` and verify that these licenses still work. If they do, you can delete the `license.dat.bak` temporary backup file.

    To reread your `license.dat` file:

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

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

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

FNE License Renewal

> **NOTE:** Versions prior to **2023.4** will have a **.../toolworks/FNE_license** directory, rather than **.../toolworks/license.**

TotalView Developer / Developer for HPC FNE License Renewal

You will have received a new **license.bin**, generally as an attachment to an email. Place this file into your *<installdir>*`/toolworks/license` directory, overwriting your existing **license.bin** file.

TotalView for HPC FNE License Renewal

For served license renewals, replace your **license.bin** file and also run the script **toolworks_reload**.

1. Replace the existing **license.bin** in the `flexnetls-`*<version>* directory under *<installdir>*`/toolworks` on the Linux-x86-64 system with the new TotalView-provided updated **license.bin**.

2. Load the new **license.bin**, like so:

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

RLM License Renewal

TotalView Developer / Developer for HPC RLM License Renewal

You will have received a new `license.lic` file via email. Place this file in the same location as your existing `license.lic` file, allowing it to overwrite the older file.

TotalView for HPC RLM License Renewal

To renew a TotalView for HPC license:

1. Overwrite the existing logical `LICENSE` lines in your `license.lic` file with the updated license.

   NOTE: You may wish to first back up your existing license file.

   Using a text editor, edit the `license.lic` file to replace the previous `LICENSE` lines *for the specific feature provided in the license* with the new TotalView license keys you have received.

   If you have multiple licenses in `license.lic,` take care to replace only the new one. Each individual license starts with the word `LICENSE`.

2. Run the script **toolworks_rlmreread** to reload the `license.lic` file.
   <installdir>`/toolworks/reprise-`*<version>*`/bin/toolworks_rlmreread`

NOTE: If you have older, invalid license keys, remove them from your system to ensure compliance with the Perforce Permanent License Agreement.

Update License Software

> **NOTE:** Updating the FlexNet or RLM license software is relevant only to TotalView for HPC which uses a served license.

Your TotalView license is implemented by either FlexNet or RLM which is built into TotalView.

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

If your TotalView release does include a newer FlexNet or RLM version than that which is currently installed on your system, you'll need to first update FlexNet or RLM on your system before either updating your license or installing a new version of TotalView.

- Updating FlexNet for FNP
- Updating FlexNet for FNE
- Updating RLM

Updating FlexNet for FNP

To update FlextNet:

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 to install 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.

Updating FlexNet for FNE

To update FlexNet for an FNE style license, stop and then completely uninstall the existing FNE server. Then install the upgraded FNE license server version.

> **NOTE:** For FNE, the existing FNE server must be uninstalled and deleted before upgrading FlexNet and installing the new version.

1. Uninstall the existing FNE Server: Uninstalling an FNE License Server

2. Install the new FNE license server: Installing a FlexNet Embedded (FNE) License Server

Updating RLM

To update RLM:

1. Stop the currently running license server:

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

2. Open `<installdir>/toolworks/reprise-<oldversion>/license.lic`, and note the license server manager daemon's TCP/IP port number. This is the last field on the HOST line (for example: "7147").

3. Next, follow the steps to install a new license. When the **Configure_License** script asks for the RLM daemon's TCP/IP port number, enter the port number as noted above.

Appendix

OS-Specific Installation Info

HPE Cray Installations

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 by Cray.

Installing on HPE Cray

The HPE 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 HPE Cray systems, 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.

macOS Installations

The macOS installer is a DMG graphical installer.

Prerequisites

Installing TotalView on the macOS comes with some prerequisites.

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

2. *Optional*: Enable developer mode:

   Enter: `DevToolsSecurity -enable`.

3. *Optional*: Remove the authorization prompt:

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

4. **Classic UI only**

   The TotalView classic UI requires that XQuartz be installed on the machine where TotalView is running. Note that the classic UI is supported only on Apple x86-based systems.

The installer should not result in any errors. If errors occur, see Troubleshooting macOS Installations in the *Reference Guide* for information.

Running Multiple Displays

If you are running TotalView on multiple displays, you may wish 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.

Installing on macOS

Download the macOS DMG graphical installer from TotalView's download page, choosing "Apple macOS - Intel" or "Apple macOS - ARM64" from the **Platform** dropdown, and then either **TotalView** or **TotalView Student/ Individual**.

Select the **Download** button to download the installer.

Double click the `.dmg` file and follow the installer prompts. Choose a location for the install or accept the default, which is `Applications/Perforce/totalview.<version>`.

The Setup License Key screen

The installation includes an optional step to install a local license by providing an entitlement code. This step is applicable only to TotalView Student licenses. (See TotalView Student.)

> **NOTE:** When installing a non-student product, uncheck "Install new license," then select either **For-ward** or **Next** at the Setup License Key screen to skip this step.

For detail on installing a non-student TotalView license, see either TotalView for HPC Licensing or Developer / Developer for HPC Licensing.

Index