

ProTune™
Installation Guide
Version 1.5



MERCURY INTERACTIVE

ProTune Installation Guide, Version 1.5

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Before You Install

Welcome to ProTune, Mercury Interactive's tool for Tuning in Production testing. This guide describes everything you need to know to install ProTune. It describes the ProTune package contents, the required system configuration, registration and backup procedures, and how to run the setup programs.

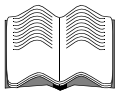
Before you begin to install ProTune, review the following pre-installation procedures.

Checking Your ProTune Package

Make sure that your ProTune package contains the items described below. If any items are missing or damaged, contact Mercury Interactive or your local distributor.

CD-ROMS

Your ProTune package includes a Windows CD-ROM and a UNIX CD-ROM containing the ProTune program and associated files.



Documentation

ProTune is supplied with a set of documentation that describes how to:

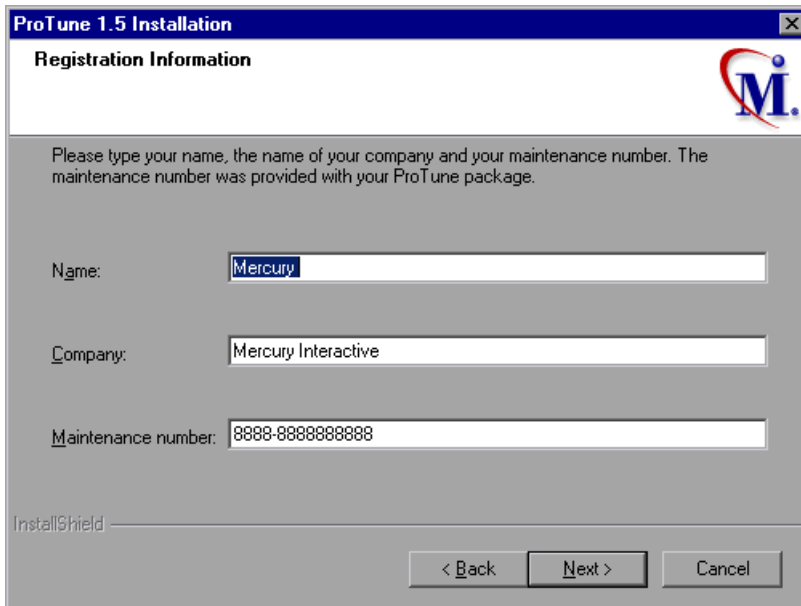
- install ProTune
- create virtual user scripts
- use the ProTune Console
- analyze the results

Registering Your Copy of ProTune

Register your copy of ProTune to become a licensed user with all rights and privileges. Registered users have access to technical support and information on all Mercury Interactive products. You will also be eligible for updates and upgrades.

To register your copy of ProTune, fill out the Mercury Interactive Software Registration card.

- If you are in the USA, fill out the USA Owners portion of the card. Send the card to the Sunnyvale, California address printed on the card. No postage is necessary.
- If you are outside the United States, fill out the Non-USA portion of the registration card and send it to the appropriate international address. Affix postage to the card before mailing.
- Remember to notify Mercury Interactive or your local representative if you move to a new address, so that you can continue to receive product information and updates.



The screenshot shows a Windows-style dialog box titled "ProTune 1.5 Installation" with a sub-header "Registration Information" and the Mercury Interactive logo. The dialog contains a text prompt: "Please type your name, the name of your company and your maintenance number. The maintenance number was provided with your ProTune package." Below this are three input fields: "Name:" with the value "Mercury", "Company:" with the value "Mercury Interactive", and "Maintenance number:" with the value "8888-8888888888". At the bottom left is the "InstallShield" logo, and at the bottom right are three buttons: "< Back", "Next >", and "Cancel".

Note: You can also register your copy of ProTune on Mercury Interactive's Customer Support site: <http://support.mercuryinteractive.com>.

Where To Go From Here?

Your ProTune CD-ROMs include all the files that you need to install ProTune. Your actual setup procedure will differ depending on the environment that you will be testing using ProTune:

- ▶ If your environment consists of **only Windows-based** machines (i.e. the Console and all the Vusers will run on Windows-based machines), follow the setup procedure described in Part I of this guide.
- ▶ If your environment consists of **both Windows-based and UNIX-based** machines, follow the setup procedures described in Part I and Part II of this guide.

| If your testing environment is... | See |
|--|--------------------|
| Windows only | Part I |
| Windows and Unix | Part I and Part II |

Terminology

| | |
|-------------------------------|---|
| Vuser | A virtual user—a ProTune-created user that emulates a human user. |
| Load Generator machine | The workstation used to host the ProTune Vusers. |
| Console machine | The machine used to host the ProTune Console. |
| Vuser Group | A collection of Vusers with common characteristics, such as the machine on which they run, or the client that they use. |

Typographical Conventions

This book uses the following typographical conventions:

| | |
|-------------------|--|
| 1, 2, 3 | Bold numbers indicate steps in a procedure. |
| ▶ | Bullets indicate options and features. |
| > | The greater than sign separates menu levels (for example, File > Open). |
| Stone Sans | The Stone Sans font indicates names of interface elements on which you perform actions (for example, “Click the Run button.”). |
| Bold | Bold text indicates method or function names |
| <i>Italics</i> | <i>Italic</i> text indicates method or function arguments, file names or paths, and book titles. |
| Arial | The Arial font is used for examples and text that is to be typed literally. |
| <> | Angle brackets enclose a part of a file path or URL address that may vary from user to user (for example, < <i>Product installation folder</i> >\bin). |
| [] | Square brackets enclose optional arguments. |

{ }

Curly brackets indicate that one of the enclosed values must be assigned to the current argument.

...

In a line of syntax, an ellipsis indicates that more items of the same format may be included.

Part I

Windows Installation

1

Introducing the ProTune Installation

Your ProTune compact disk includes a setup program that guides you through the process of installing ProTune's components.

You can install the ProTune Console, the virtual user components, or both.

System Requirements

In order to successfully run ProTune, you need the following minimum system configuration.

| Requirement | Console with Monitors | Virtual User Generator | Virtual Users | Analysis Module |
|----------------------------|---|---|---|---|
| Computer/ Processor | Pentium 350 MHZ or higher | Pentium 350 MHZ or higher | Pentium 1 GHz or higher | Pentium 350 MHZ or higher |
| Operating System | Windows NT® service pack 6a Windows 2000 including service packs 2 and 3 Windows XP Professional including service pack 1 | Windows NT® service pack 6a Windows 2000 including service packs 2 and 3 Windows XP Professional including service pack 1 | Windows NT® service pack 6a Windows 2000 including service packs 2 and 3 Windows XP Professional including service pack 1 | Windows NT® service pack 6a Windows 2000 including service packs 2 and 3 Windows XP Professional including service pack 1 |

| Requirement | Console with Monitors | Virtual Vuser Generator | Virtual Users | Analysis Module |
|----------------------|-------------------------------------|-------------------------------------|---|--|
| Memory | 128 MB or more | 128 MB or more | At least 1 MB RAM for non-multithreaded Vuser or at least 512 KB multi-threaded Vuser | 128 MB or more |
| Swap Space | Two times the total physical memory | Two times the total physical memory | Two times the total physical memory | Two times the total physical memory |
| Screen Resolution | 1024*768 or higher | | | |
| Screen Colors | 64K or higher | | | |
| Free Hard Disk Space | Installation: 300 MB | Installation: 300 MB | Installation: 130 MB | Installation: 100 MB |
| Browser | IE 5.0 sp2 or higher | IE 5.0 sp2 or higher | N/A | IE 4.x or higher Netscape Navigator 4.x or higher |
| MSXML | Version 3 service pack 2 | Version 3 service pack 2 | Version 3 service pack 2 | Version 3 service pack 2 |

Note: Refer to <http://www.mercuryinteractive.com/products/ProTune/technical/> for the most updated installation requirements.

2

Installing ProTune on Your Computer

You can install the Console, virtual user components, or both. In addition, you can choose to install the full ProTune configuration, a load generator configuration, or a custom configuration. Choosing custom configuration lets you specify which ProTune components to install.

Installation

Note: You must log on as an NT Administrator when performing an installation on Windows NT 4.0 or higher.

To install ProTune on your computer:

- 1** Insert the ProTune CD-ROM into a CD-ROM drive. If you are installing from a network drive, connect to that CD-ROM drive.
- 2** Click **Start**, and select **Run**.
- 3** Type the location that you are installing from, followed by *setup.exe*. For example, if your CD-ROM drive letter is M, type:

```
m:\win32\setup.exe
```

- 4** The initial ProTune Installation window appears.

Load Generator installs only the components needed for running virtual users to generate load. Use this option for machines that are used only to generate load and not to control Vusers.

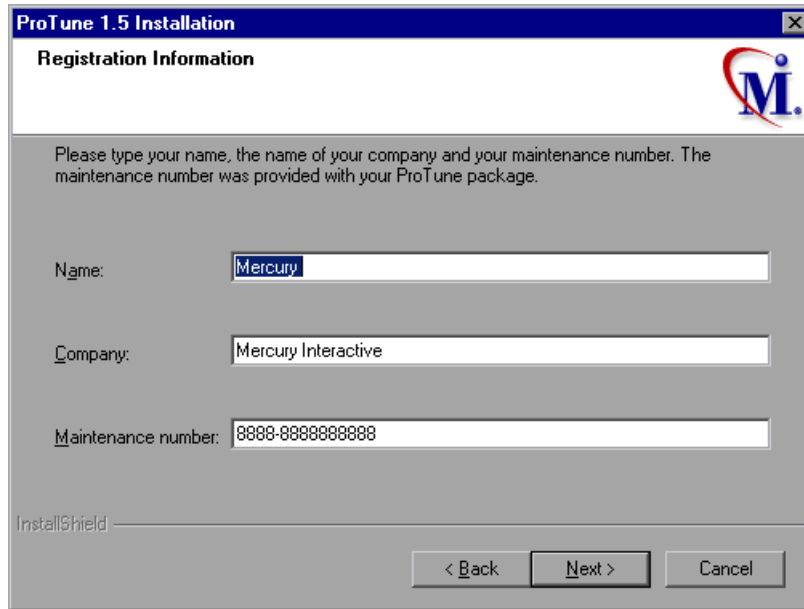
MI Listener installs the components needed on the MI Listener machine used in running Vusers over a firewall and monitoring over a firewall. For more information about working with firewalls, refer to the *ProTune Console User's Guide*.

Tuner Agent is an application that runs on the host that you want to tune, and allows you to tune the host remotely.

Click on **ProTune Full Installation**.



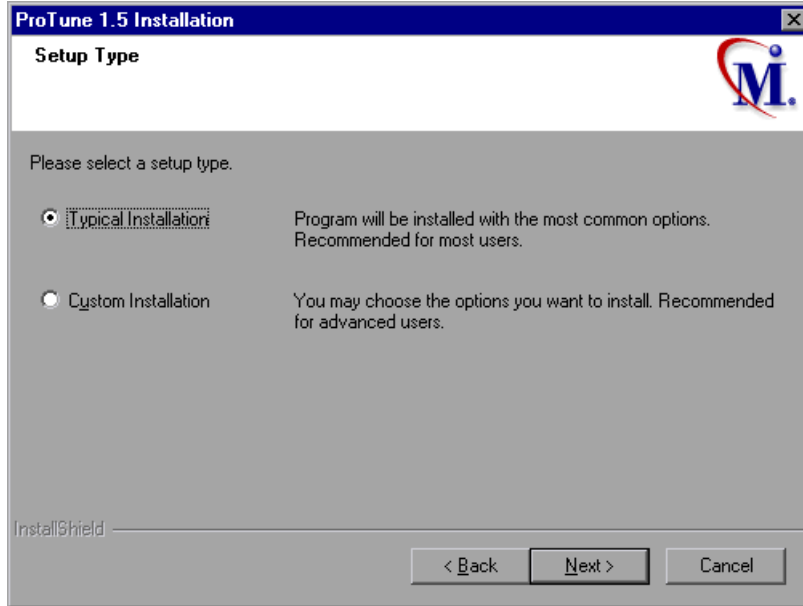
- 5 The InstallShield Wizard begins and displays the software licensing agreement. Read the agreement and click **Yes** to accept it and to display the Registration Information dialog box.



The screenshot shows a dialog box titled "ProTune 1.5 Installation" with a sub-header "Registration Information". The dialog contains a logo for Mercury Interactive (a stylized 'M' with a red arc) in the top right corner. Below the logo, there is a text prompt: "Please type your name, the name of your company and your maintenance number. The maintenance number was provided with your ProTune package." There are three input fields: "Name:" with the text "Mercury", "Company:" with the text "Mercury Interactive", and "Maintenance number:" with the text "8888-8888888888". At the bottom left, it says "InstallShield". At the bottom right, there are three buttons: "< Back", "Next >", and "Cancel".

- 6 In the Registration Information dialog box, type your name, the name of your company, and your ProTune maintenance number. You can find the maintenance number in the maintenance pack shipped with ProTune. Click **Next**.

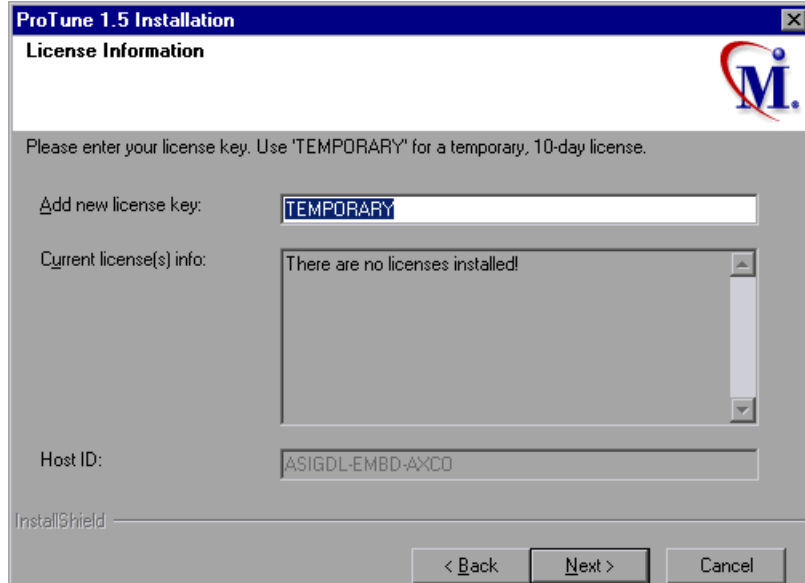
7 The Setup Type dialog box displays two setup options.



8 Select the type of installation that you want.

Typical Installation installs all commonly-used ProTune components, including the ProTune Console, Virtual User (including GUI) components, and online documentation. Use this option for the main tuning machine.

Custom Installation lets you install all the ProTune components, or select the components that you want to install. For details, see "Custom Installation Options," on page 15.

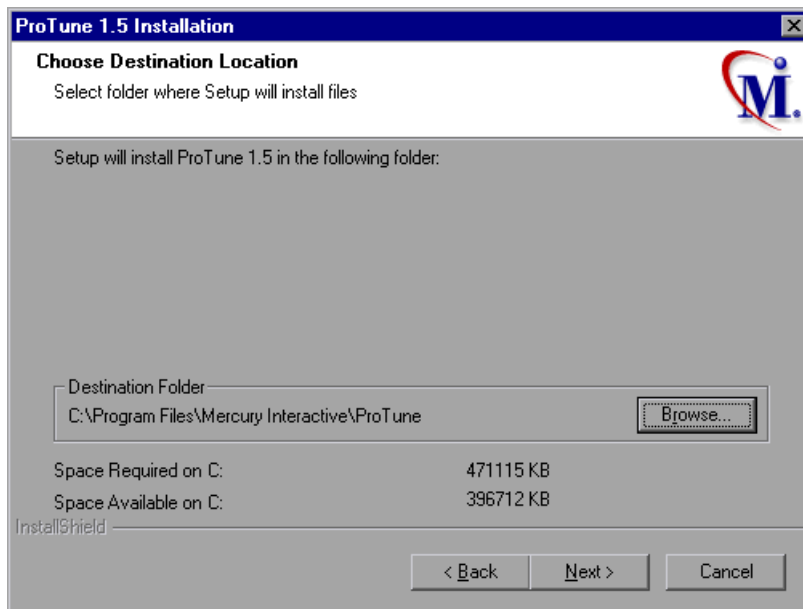
9 Click **Next** to display the License Information

- 10** Enter the ProTune license code from your license agreement. If you are evaluating ProTune or waiting for a permanent license key, enter the license key 'TEMPORARY'. This will let you use up to 20 topology elements for a period of 7 days.

Click **Next**.

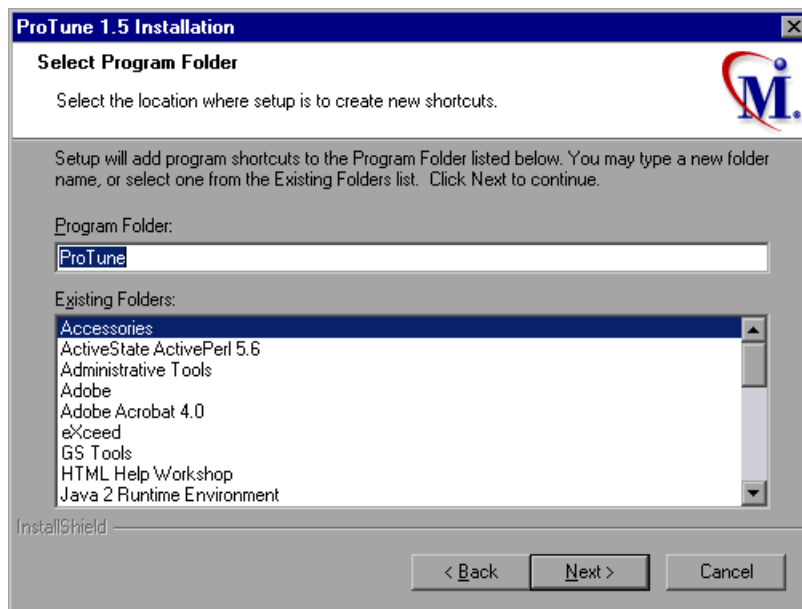
If you have a temporary license, ProTune issues a reminder indicating that you have 10 days to evaluate the product. Click **OK**.

- 11 In the Choose Destination Location dialog box, choose the location where you want to install ProTune. To select a different location, click **Browse**, choose a folder, and click **OK**.



Click **Next**.

- 12** In the Select Program Folder dialog box, specify a program folder, or accept the default folder, *ProTune*.

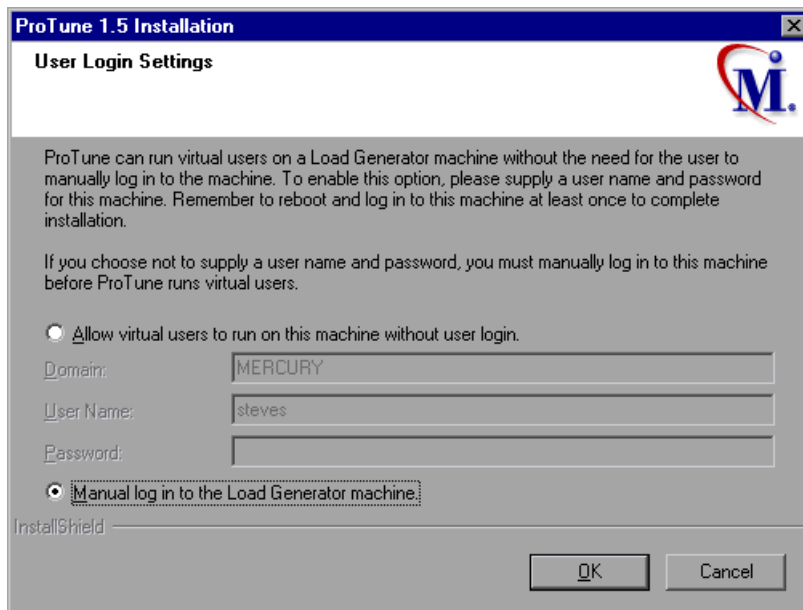


Click **Next**.

- 13 If you installed ProTune's online documentation, a message tells you to run the Acrobat Reader setup after the ProTune setup is complete. You use the Acrobat Reader to view the ProTune online documentation. To install Acrobat Reader select **Start > Programs > ProTune > Documentation > Acrobat Reader Setup.**

Note: The Acrobat Reader setup installs the Acrobat 5.05 Reader. If you already have this version of the Acrobat Reader installed, it is not necessary to run the Acrobat Reader setup.

- 14 Click **OK** to continue with the setup procedure.
- 15 In the User Login Settings dialog box, select a user login setting.



Select one of the following user login settings:

Allow virtual users to run on this machine without user login: ProTune will automatically log in to the network from the Load Generator machine, so

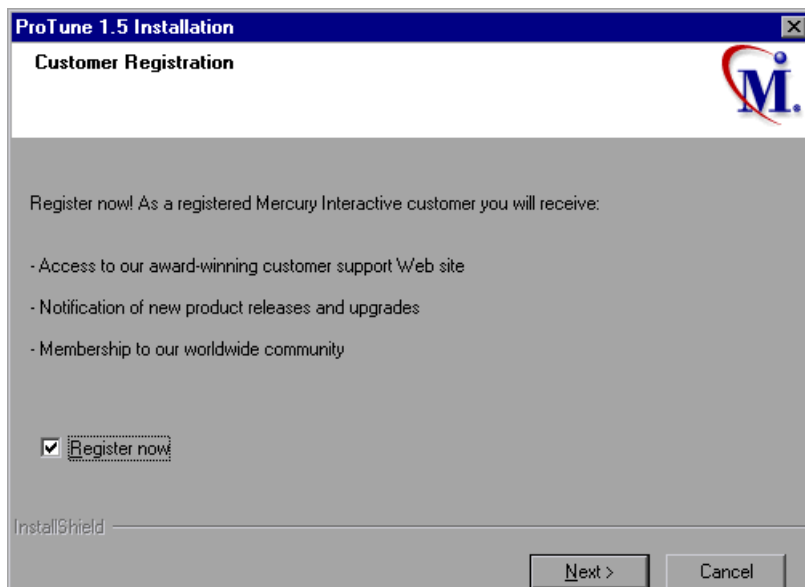
the virtual users can run without any manual intervention. Enter the network domain where the user machine resides, a user name, and password. Note that you must have administrator privileges.

Note: You must boot and log in to the system at least once after ProTune installation before the automatic login can work.

Manual log in to the Load Generator machine: The user must manually log into the network from the Load Generator machine for each session of running Vusers.

Click **OK**.

- 16** In the Registration Information dialog box appears, click **Next** to complete the installation.



- 17** The setup program prompts you to restart your computer. You can delay restarting your computer until a later point.

Note: The following message may appear the first time you log on after a full ProTune installation: "HCL Inetd CPLInquire cpl 8af40c". This message relates to the HCL (Hummingbird Communications Ltd.) Inetd service, when Inetd is installed as a Windows NT service. Please close the message box and continue to start your computer.

The ProTune installation is now complete.

Completing the ProTune Installation Process

To complete the ProTune installation process:

- ▶ Select **Start > Programs > ProTune > Readme** to see what's new in ProTune, and any last-minute limitations.
- ▶ To install the Adobe Acrobat Reader 5.05, select **Start > Programs > ProTune > Documentation > Acrobat Reader Setup**.
- ▶ If your version of ProTune is supplied with a plug and you have not already installed the plug, do so now by inserting it into the parallel port.
- ▶ To create Vuser scripts for **Baan**, you need to specify the correct application server in the Baan user file:

The user file, u[username], is located under the Baan installation folder in bse/lib/user. Add the following line to the beginning of the user file:

```
std_program:ottstpteststand
```

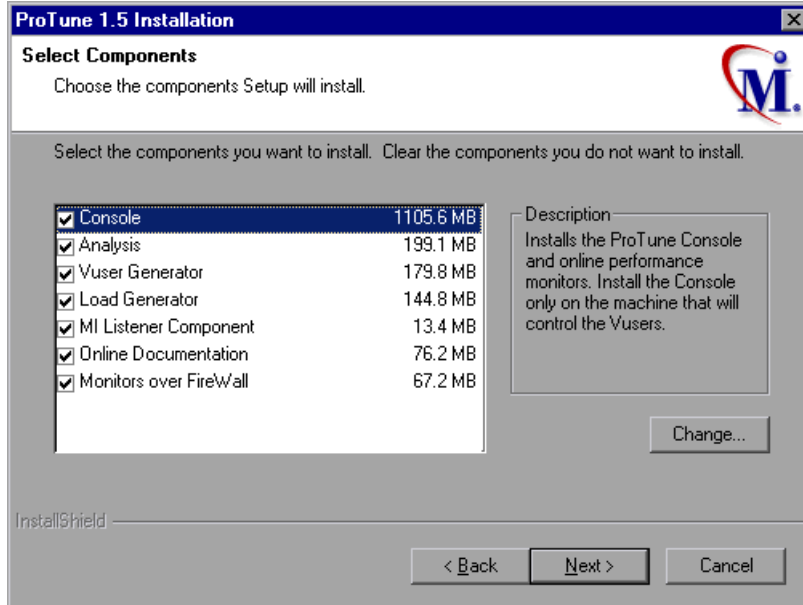
This tells ProTune to use the Test Standard Program when recording and running Vusers.

- ▶ To start ProTune, select **Start > Programs > ProTune > Console**.

Custom Installation Options

If you choose to perform a Custom installation of ProTune, the setup program allows you to select the ProTune components that you want to install. You can install the following ProTune components:

- **Console:** Controls the tuning session. Includes the online performance monitors. Install the Console only on the machine that will control the Vusers.
- **Analysis:** Graphs and reports for analyzing the performance.
- **Vuser Generator:** ProTune's tool for creating virtual user (Vuser) scripts, through recording. Vuser scripts emulate users without a graphical user interface by using direct function calls.
- **Load Generator:** The components for running virtual users (including Windows-based GUI Vusers) to generate load. Note: You must have WinRunner installed to run GUI Vusers.
- **MI Listener Component:** Components for the MI Listener machine used in running Vusers and monitoring over the firewall. For more information, refer to the Using Firewalls chapter of the *ProTune Console User's Guide*.
- **Monitors over FireWall:** Components on the agent machine for monitoring over the firewall. For more information, refer to the Using Firewalls chapter of the *ProTune Console User's Guide*.
- **Online Documentation:** All user guides in Acrobat format.



Clear the check boxes next to the components that you do not want to install, and select the check boxes next to the components that you want to install.

Click **Next** to proceed with the installation process.

3

Adding ProTune Components

After you install ProTune, you can run the setup program at any time to add ProTune components, such as samples, the Virtual User Generator, or the online documentation.

To add components:

- 1 Insert the ProTune CD-ROM into a CD-ROM drive.
- 2 Click the **Start** button, and select **Run**.
- 3 Type the location that you are installing from, followed by *setup.exe*. For example, if your CD-ROM letter is M, type:

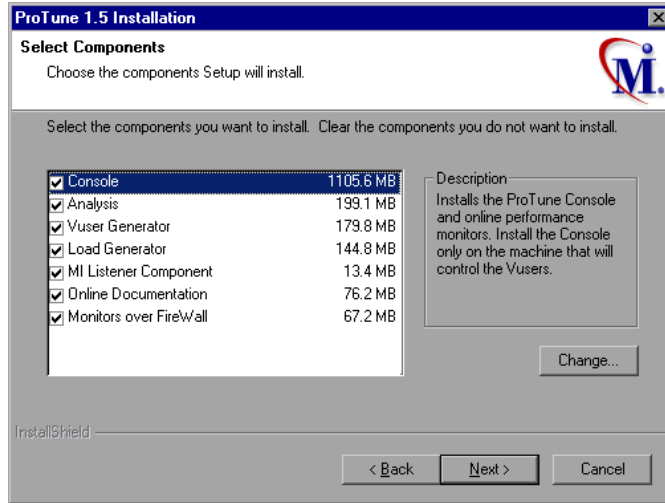
```
m:\win32\setup.exe
```

Click **OK**.

- 4 Select **ProTune Full Installation** on the initial ProTune Installation window.
- 5 The Installshield Wizard begins and displays the software licensing agreement. Read the agreement and click **Yes** to accept it. The ProTune setup program starts.
- 6 In the Registration Information dialog box, type your name, the name of your company, and your ProTune maintenance number. You can find the maintenance number in the maintenance pack shipped with ProTune. Click **Next**.

7 Click **Custom Installation**, and then click **Next**.

Select the ProTune components that you want to add. Clear the check boxes next to the options that you do not want to add. Click **Next**.



8 The Adding Components process continues through the same steps as the initial installation starting from the License Information dialog.

9 Depending on which components you added, the setup program either prompts you to restart your computer or informs you that the setup is complete. You can delay restarting the computer until a later time.

4

Viewing and Modifying a License

You can modify your license at any time directly from the ProTune interface. This chapter describes:

- Viewing License Information
- Modifying a License
- Troubleshooting

Normally, you enter your license code during installation. The setup program prompts you for a license code. If you do not have your license code at the time of installation, you can use the temporary license by typing 'TEMPORARY' in the license key box. This grants you a 10-day license for 20 topology elements and 25 Vusers for any type of protocol. Contact Mercury Interactive Customer Support to obtain your permanent license key.

This chapter describes how to enter a license code if you did not enter it during installation, and how to upgrade an existing license.

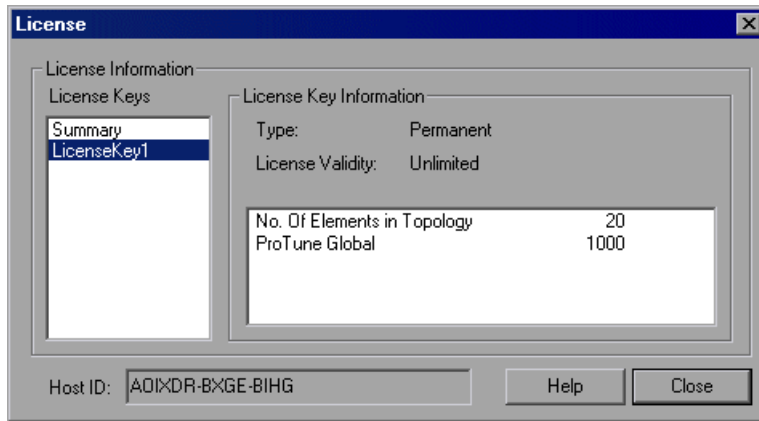
Viewing License Information

You can only view license information from the ProTune Console, not from the Virtual User Generator.

To view the current license information:

- 1** In the Console, choose **Help > About ProTune**, and click **License Info**. The License dialog box opens, displaying the license information.

- 2 Scroll through the License Keys box to determine the scope of your current license.



The license is defined for the number of elements in the topology and the number of Vusers.

The License Keys box lists all the available license keys.

The License Key Information box displays the license type and validity for the item selected in the License Keys box. Select **Summary** in the License Keys box to view the information for all your license keys. Select a specific key to view only the details for that key.

The following types of licenses are available:

- **Permanent:** The license never expires.
- **Time Limited:** The license is limited by a start date and an expiration date.
- **Temporary:** The license is granted for a pre-defined number of days after product installation.
- **Plugged:** The license requires a dongle.

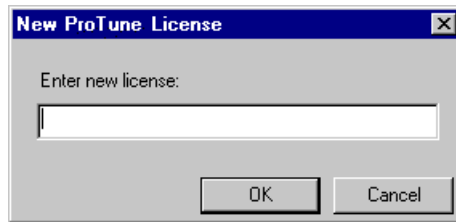
The Host ID box displays an ID for a specific machine. To receive a license key for a specific machine, contact Mercury Interactive's Customer Support.

Modifying a License

You can only modify license information from the ProTune Console, not from the Virtual User Generator.

To modify the current license information:

- 1** In the Console, choose **Help > About ProTune**. The About ProTune window opens.
- 2** Click the **New License** button. The New ProTune License dialog box opens.



- 3** Enter the new license number exactly as it was given to you. Click **OK**. If your license is limited for a specific amount of time, ProTune issues a message accordingly.
- 4** Click **OK** to close the About ProTune window.

Troubleshooting

If you have temporary license key, contact Mercury Interactive Customer Support to obtain a permanent license key.

If ProTune does not accept your license key, perform the following checks:

► Make sure you typed in the license code exactly as it was given to you. Your license code is case sensitive.

► If your ProTune license requires that you use a plug when running ProTune, and a message is issued stating that a plug is not installed, perform the following:

Login as Administrator.

Run `<protune_directory>/bin/hinstall.exe/i`.

Reboot the machine.

► If you receive a “permission denied” error message during Console start-up, you must grant “Full Control” permission for the Registry's HKEY_LOCAL_MACHINE key and in the WINNT folder (folder where Windows is installed):

To add Registry permissions:

- 1 Run `regedt32` to modify the registry.
- 2 Select the HKEY_LOCAL_MACHINE key.
- 3 Select **Security > Permissions**.
- 4 Add “Full Control” permission to the user that is running the Console.
- 5 Turn on the **Replace Permission on the Existing Subkeys** flag.
- 6 Click **OK**.

To add permissions on an NTFS file system:

- 1** Select the <System Drive>:\WinNT folder.
- 2** Invoke **Properties**.
- 3** Select the **Security** tab.
- 4** Click **Permissions**.
- 5** Add “Full Control” permission for the user.
- 6** Turn on the **Replace Permissions on Subdirectories** flag.
- 7** Click **OK**.

Part II

Installing UNIX Load Generators

5

Introducing the UNIX Installation

You can install ProTune load generators on UNIX computers and use them to run virtual users. The UNIX virtual users interact with the ProTune Console, installed on a Windows machine. Refer to Part I of this Installation Guide for information about installing the ProTune Console on a Windows machine. This chapter discusses the installation steps and system requirements for the ProTune UNIX Virtual User components.

UNIX Installation Steps

This guide describes the installation of ProTune load generators on all of the supported UNIX platforms. When a section applies only to a specific platform, it is explicitly stated.

The main steps of the installation process are:

- ▶ Installing the program files
- ▶ Setting the environment

Once you complete the installation, refer to the additional documentation for details on working with ProTune.

Setting the Environment

Since ProTune virtual users emulate an actual user of your system, the environment on the virtual user machine must be configured for the user to run correctly. The environment variables are defined in the `.cshrc` file for cshell users, and the `.profile` file for Bourne and kshell users.

- The installation process determines the platform upon which the Vuser is running, and prepares a script to modify the `.cshrc` file for cshell users. Bourne and kshell users should manually modify the `.profile` file. Refer to Chapter 8, “Verifying Your Installation” for sample `.cshrc` and `.profile` files.
- The ProTune installation process helps you set the environment variable to indicate the location of the ProTune bin directory and any DLLs used by the underlying protocol. This environment variable is called `LIBPATH` on AIX, `SHLIB_PATH` on HP/UX, and `LD_LIBRARY_PATH` on Solaris and Linux.

System Requirements

Your actual memory requirements may vary, depending on your configuration. Note that the installation procedure uses additional memory which becomes free after the installation. To ensure a smooth installation of the UNIX components, it is recommended that you make sure there is sufficient storage space, process entries, swap space, etc. in the disk partition where you intend to install the ProTune load generator.

The following table describes the system requirements for each platform supported by Mercury Interactive for ProTune UNIX Vusers.

| Platform | Hardware | Version |
|----------|--------------------------|-----------------------|
| Solaris | Ultra Sparc | Solaris 2.8 or higher |
| HP | HP 9000 series 700, 800, | HP-UX 11.x or higher |
| IBM | IBM RS/6000 | AIX 4.3.3 or higher |
| Linux | PC i486 | Red Hat 7.3 |

Note that ProTune supports all X Servers.

Note: Refer to <http://www.mercuryinteractive.com/products/protune/technical/> for the most updated installation requirements.

System Resources

The following describes the system resources required for each platform or operating system. The actual resources may vary depending on the number of Vuser licenses purchased.

The resources for Vusers listed below apply to each virtual user. If you want to use the load generator to run multiple virtual users, you must multiply the figure by the number of virtual users.

| | |
|---|---|
| Disk Space required for program installation | 22 MB (34 for Linux) |
| Memory Space each Vuser if run as thread | 300 KB (at least). This amount may vary, depending on the operating system and platform, and does not include the memory used by the process. |
| Memory Space each Vuser if run as process | 1.5 MB (2.5 MB for Solaris) |
| Swap Space | approximately 1:7 memory/swap ration |
| Free Process Entries each Vuser if run as process | 1 |
| File Descriptors each Vuser if run as thread | 2 (see below) |

The **Memory Space** above describes a general C-Vuser type. Other types may take up more memory space. For example, each Web Vuser uses at least 500 KB.

A Load Generator additionally uses the following **File Descriptor** resources:

- ▶ 14 file descriptors for the ProTune launch service
- ▶ 20 file descriptors for the ProTune agent
- ▶ 30 file descriptors for each Vuser driver. By default, there is a driver for every 50 Vusers.

For example, to compute the number of file descriptors used in running 100 threaded Vusers the Load Generator requires:

| | |
|-----|---|
| 14 | for ProTune launcher |
| 20 | for ProTune agent |
| 60 | for 2 drivers (30 x 2, each one drives 50 Vusers) |
| 200 | for 100 Vusers (each Vuser requires 2) |

Total: 294 File Descriptors

If Vusers are run as processes instead of threads, one driver is run per Vuser. Therefore, each Vuser requires 30 file descriptors.

You can increase the number of file descriptors, process entries, and amount of swap space by configuring the kernel, as described in this chapter.

Note: Most operating systems using ProTune 1.5 or higher have sufficient default file descriptors, process entries, and swap space, and rarely require reconfiguration.

Increasing Process Entries

Each Vuser requires several free process entries. To increase the number of process entries on your system, you must reconfigure the kernel.

Solaris 2.6

The following section describes how to reconfigure the kernel for Solaris operating systems.

- 1 Locate the */etc/system* file.
- 2 Set the maximum number of processes in the system file. Type:

```
set max_nprocs=number (e.g.712)
```

- 3 Execute the touch/reconfigure command. Type:

```
touch /reconfigure
```

- 4 Reboot the machine.

HP-UX

The following section describes how to reconfigure the kernel for HP platforms.

- 1 Login as root.
- 2 Invoke the *sam* tool to reconfigure the kernel. Type:

```
sam &
```

- 3 Select Kernel Configuration>Configurable Parameters.
- 4 Set the following parameters to the desired values:

nproc: The number of simultaneous processes—(# of Vusers * 2) + 200

maxuser: The number of maximum users—DB + RTE Vusers + 20

maxuprc: The number of processes per user—# of Vusers * 2

- 5 Reboot the machine.

IBM

The following section describes how to reconfigure the kernel for IBM platforms using the AIX operating system.

- 1 Display the current settings. Type:

```
lsattr -EHI sys0
```

- 2 Increase the maximum number of process entries per user. Type:

```
chdev -l sys0 -a maxuprocs = number (e.g.500)
```

- 3 Set the *nproc*, *maxusers* parameters to the desired values.

Linux

The following section describes how to reconfigure the kernel for Linux platforms.

- 1 Locate the */etc/security/limits.conf* file.
- 2 Set the maximum number of processes in the limits file. Type:

```
hard nproc 8192
```

- 3 Reboot the machine.

Increasing File Descriptors

Each Vuser requires from 6 (non-GUI Vusers) to 27 (GUI Vusers) file descriptor entries. The procedure to increase the number of file descriptors differs between platforms and shells.

All Platforms

In these examples, the number of descriptors is increased to the maximum of 1024.

- 1 For sh and ksh users, type:

```
ulimit -n 1024
```

- 2 For csh users type:

```
limit descriptors 1024
```

Solaris

The following section describes some alternate procedures to increase file descriptors on Solaris operating systems. In these examples, the number of descriptors is increased to the maximum of 1024.

- 1 Use the *adb* command to increase file descriptors (all shells). Note that 400 HEX is the equivalent to decimal 1024. In the following example, *kernel* is the name of the kernel file, e.g., *kernel/unix*.

```
adb -w -k /kernel/dev/mem
rlimits+28?W 400
rlimits+28/W 400
```

- 2 You can also increase the maximum number of file processes by reconfiguring the kernel.

Login as root and set the *rlim_fd_max* parameter inside the */etc/system* file by typing:

```
set rlim_fd_max=1024
```

Save the file and reconfigure the system by typing:

```
touch /reconfigure.
```

After reconfiguring the system, reboot the machine.

HP-UX

The following section describes how to increase file descriptors for HP platforms.

- 1 Login as root.
- 2 Invoke the *sam* tool to reconfigure the kernel. Type:

```
sam &
```

- 3 Select Kernel Configuration > Configurable Parameters.
- 4 Set the *maxfiles* parameters to the desired values. This is the equivalent to file descriptors on Sun platforms.

maxfiles: The number of files open at a given time, typically set to 60. Change it to 500 -1024.

- 5 Reboot the machine.

Linux

The following section describes some alternate procedures to increase file descriptors on Linux operating systems. In these examples, the number of descriptors is increased to the maximum of 8192.

- 1 Add the following line to the */etc/security/limits.conf* file:

```
hard nfile 8192
```

- 2 Add the following line to the */etc/sysctl.conf* file.

```
fs.file-max = 8192
```

- 3 Reboot the machine.

Increasing Swap Space

Each Vuser requires swap space ranging from 200 KB to 4 MB. Before adding space to your system configuration, you should determine your paging requirements. For environments running programs with very large memory requirements, it is recommended to have paging space of four times the physical memory. If you do not have enough paging space, certain processes may be killed, and others will be unable to start.

Solaris

The following section describes how to increase swap space for machines running Solaris.

- 1 List the available paging areas. Type:

```
swap -l
```

- 2 Display the available swap space. Type:

```
swap -s
```

- 3 Create a new paging file. Type:

```
mkfile size path (e.g. mkfile 50m /extra/page_1)
```

- 4 Add the page file to the existing configuration. Type:

```
/usr/etc/swapon -a /extra/page_1 0 102400
```

- 5 Enable all swap areas listed in the filesystem configuration. Type:

```
/usr/etc/swapon -a
```

IBM

The following section describes how to increase swap space for machines running the AIX Operating System.

- 1 List the available paging areas. Type:

```
lsps -a
```

- 2 Display the available swap space. Type:

```
swap -s
```

- 3 Create a new paging file, using a value one quarter the size of the actual file size. For example, to create 200 MB of paging space in the chemvg volume group, type:

```
mkps -a -n -s 50 chemvg
```

- 4 To increase the size of an existing paging file, type:

```
chps -s number paging_file
```

(e.g. `chps -s 10 page_01` adds 40 MB to `page_01`).

- 5 Add the page file to the existing configuration. Type:

```
swapon paging_area (e.g. swapon /dev/paging_01)
```

- 6 Enable all swap areas listed in the file system configuration file `/etc/swapspaces`. Type:

```
swapon -a
```

6

Installing Load Generators on UNIX

ProTune is installed using the installation media provided with the ProTune distribution package. The installation uses a Java Runtime Environment (JRE).

The following sections describe installing the ProTune UNIX components from a UNIX CD-ROM device. If a UNIX machine with a CD-ROM device is not available, you can copy the UNIX components from the CD into a directory on your PC, and transfer them to a UNIX directory via ftp or an NFS mounting at a later stage.

Checking your Environment

- Verify that a CD-ROM device is attached to your local or remote machine.
- Find out which device driver is available for use with this drive. The device driver is usually located in the */dev* directory of the machine to which the drive is attached. Consult your system administrator for the name of your device.

Installing Load Generators on Multiple Platforms

In order to run ProTune load generators on multiple UNIX platforms, you need to install a separate version of the ProTune load generators, in a separate directory, for each platform. The installation directories must be accessible to all the platforms. At the end of installation, follow the instructions at the end of this chapter for modifying the environment variables to indicate the ProTune installation directories.

For example, in order to install ProTune load generators on a site that has both Solaris and IBM machines, you could use the following directories:

- ▶ For ProTune Solaris: */tools/mercury/sol/protune*
- ▶ For ProTune IBM: */tools/mercury/ibm/protune*

If you intend to run multi-platform session steps, both directories should be NFS mounted. The Solaris machine should access the IBM installation directory and vice versa.

Running the Installation Program

Before you begin the installation program, make sure you see the install script, *install.sh* from the CD. Note that most operating systems require you to mount the CD-ROM drive to a local directory. For information for mounting a CD-ROM on IBM, see “Preparing to Install from a CD-ROM (IBM only)” on page 43.

There are two installation modes, UI (or AWT) mode and console mode.

- ▶ To run the installation in UI mode, make sure that the DISPLAY environment variable is properly configured.
- ▶ To run the installation in console mode, add the `-console` parameter to the command line. For example:

```
install.sh -console
```

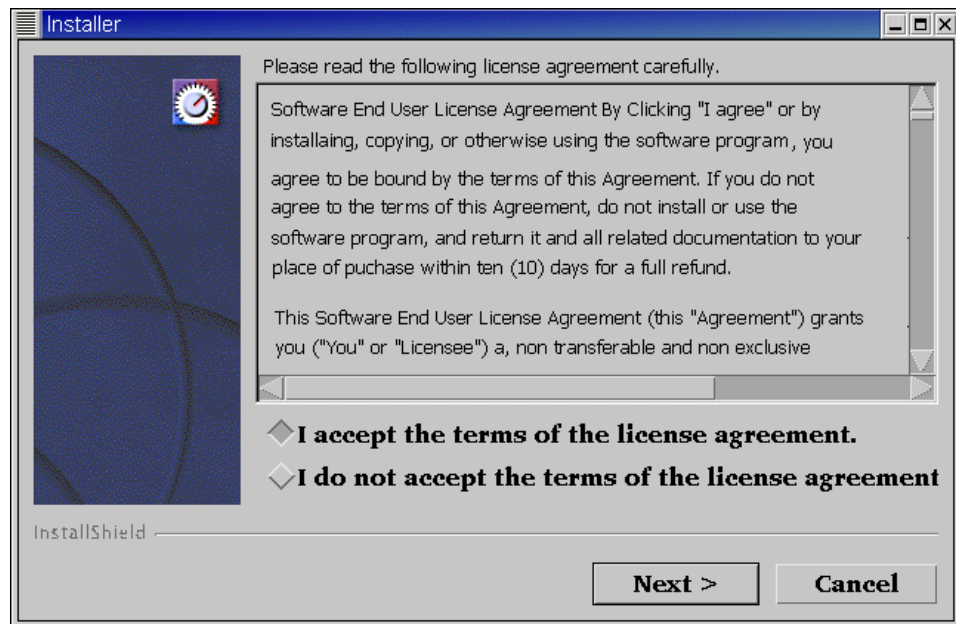

To run the ProTune installation program:

Note: The instructions below are for the UI mode.

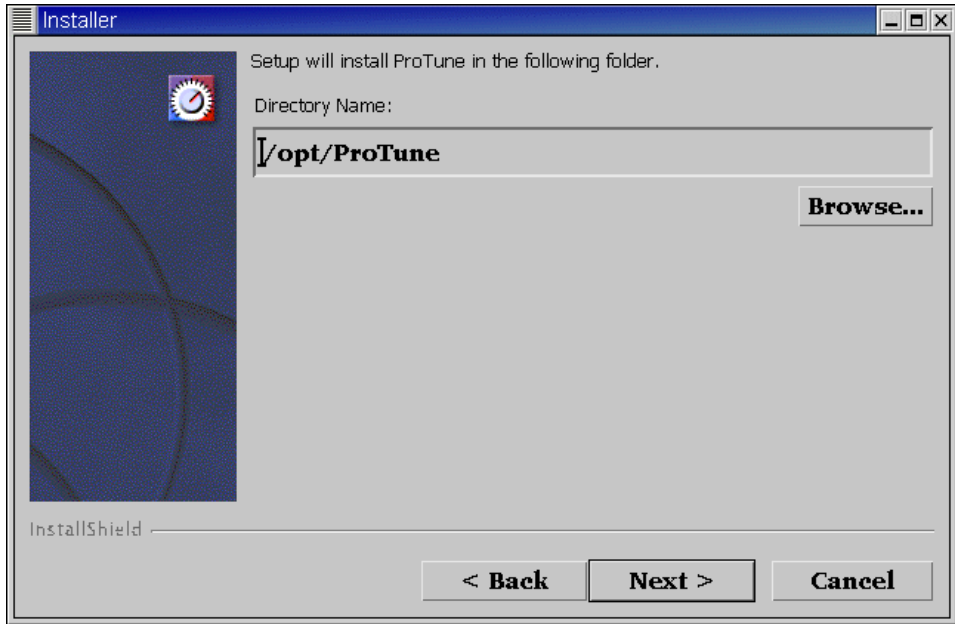
1 Type:

install.sh

The installation program begins and displays the license agreement.



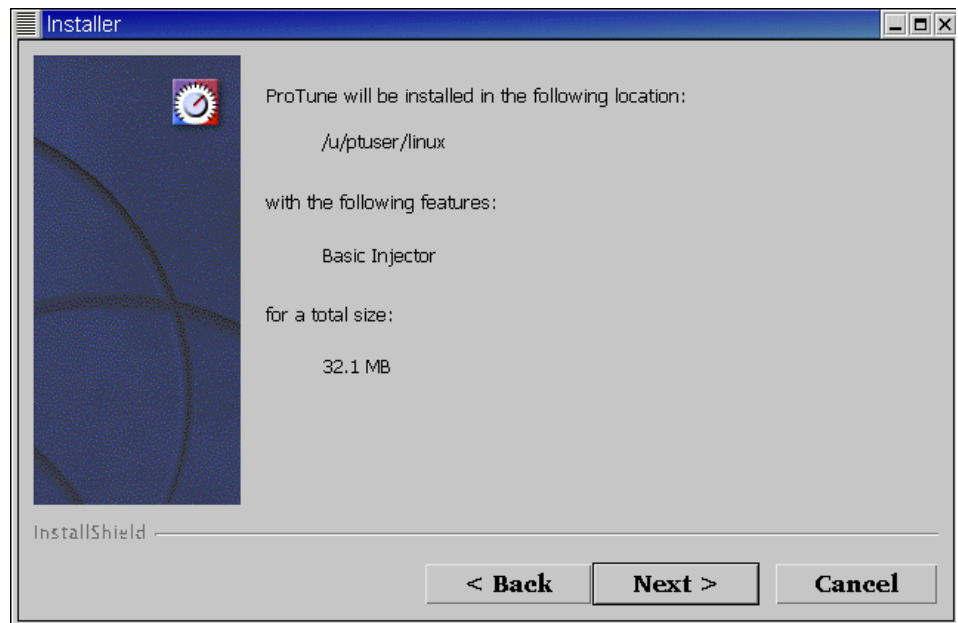
- 2 Read the agreement and select the option to accept it. The ProTune installation program begins and displays the installation location dialog box.



Choose the location where you want to install ProTune. To select a different location, click **Browse**, choose a directory, and click **OK**.

Click **Next**.

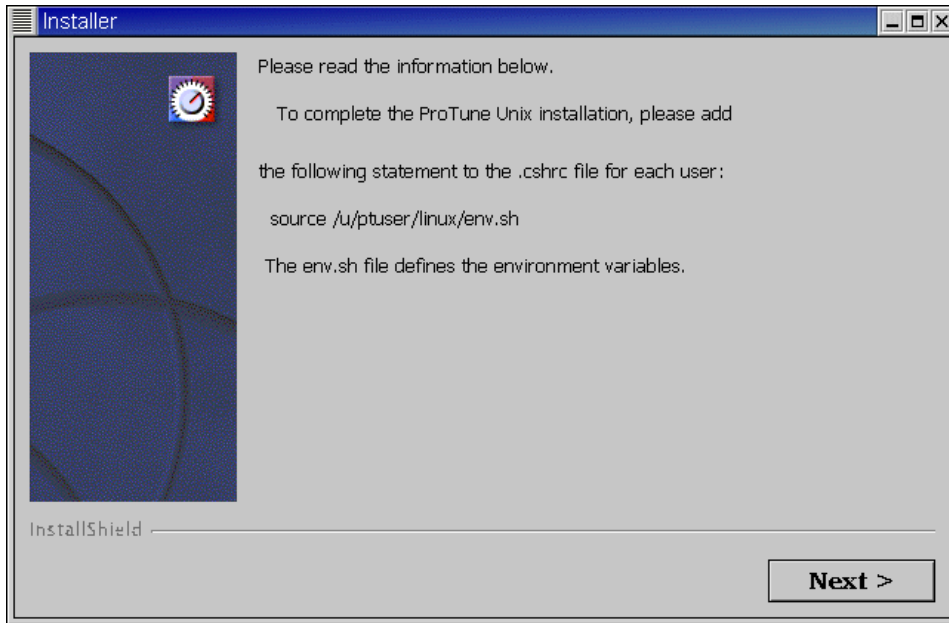
- 3 A read-only dialog box with your installation settings appears.



To select different installation settings, click **Back**. To begin installation, click **Next**. The installation process begins.

- 4 At the end of the installation, a message appears about setting the ProTune environment variables. The next step outlines this procedure. First complete

the automatic installation by clicking **Next**, and then clicking **Finish** in the screen that follows this message.



- 5** The installation process prepared a file called *env.sh* that contains environment variable definitions for your cshell environment. Open the *.cshrc* file for each ProTune user and add the following statement:

```
source /opt/ProTune/env.sh
```

where */opt/ProTune* is the ProTune installation directory.
Bourne shell and kshell users should refer to Chapter 7, "Post Installation" for instruction on modifying the *.profile* file.
- 6** Bring up a new terminal to run the *.cshrc* file. For more information about *.cshrc* files, see Chapter 7, "Post Installation."
- 7** Be sure to run *verify_generator* to verify your Vuser installation. This is a confirmation step, to ensure that the specified directory and device name are correct, and that you have sufficient disk space. For information about the tests performed by *verify_generator*, see Chapter 8, "Verifying Your Installation."

Preparing to Install from a CD-ROM (IBM only)

When installing ProTune load generators on an IBM platform, you must mount the CD-ROM drive to access the installation program.

To mount the CD-ROM drive:

- 1** Insert the CD-ROM into the drive and log in or *su* as root.
- 2** Create the ProTune installation directory by typing:

```
mkdir -p /usr/cdrom/lrun
```

- 3** To add a CD-ROM file system, you need to use SMIT. To enter the program, type:

```
smit storage
```

- 4** From within SMIT, select **File Systems**.
- 5** Select **Add/Change/Show/Delete File Systems**.
- 6** Select **CD ROM File Systems**.
- 7** Select **Add a CDROM File System**.
- 8** Choose a DEVICE name. Note that device names for CD-ROM file systems must be unique.
- 9** Type in the following MOUNT POINT:

```
/usr/cdrom/lrun
```

- 10** Select the **Do** command, or click enter if you are using the ASCII interface.
- 11** Quit the SMIT program.
- 12** Type the following command in order to mount the CD-ROM file system:

```
smit mountfs
```

- 13** For the FILE SYSTEM Name, select either **/dev/cd0** or **/dev/cd1**.

- 14 Select the mount directory:

```
/usr/cdrom/lrun
```

- 15 Select **cdvfs** to set the TYPE of file system.
- 16 Select **Yes** to mount as a READ-ONLY system.
- 17 Select **Do** or **Enter** if you are using the ASCII interface.
- 18 Close your connection as the root user.

Running the Uninstall Program

The uninstall program, like the installation program, uses a Java Runtime Environment (JRE). You can also run the uninstall program in UI mode, or in console mode. To run the program in console mode, add the console parameter to the end of the command line.

To run the ProTune uninstall program:

- 1 To access the program, type:

```
cd <installation directory>/_uninst
```
- 2 Type:

```
uninstall.bin [-console]
```

7

Post Installation

After installing ProTune load generators, prior to starting work, you should check that your environment is configured properly.

This chapter discusses:

- ▶ Setting Environment Variables
- ▶ Checking Authorizations
- ▶ Sample `.cshrc` and `.profile` Files

After you complete the post-installation configurations, run the ProTune verification utility to check your installation. For more information, see Chapter 8, “Verifying Your Installation.”

Setting Environment Variables

The ProTune installation procedure created a file, `env.sh` which sets the environment variables. Rather than manually updating your `.cshrc` file with the variable definitions, you include a statement to access `env.sh` at the end of the `.cshrc` file. This section describes the environment variables in your `env.sh` file. Note that if you are working with `kshell` or Bourne shell, you should manually set these variables in your `.profile` file. The syntax in the examples below are for `cshell` users. For `kshell` and Bourne shell users, see “ProTune Settings in the `.profile` File” on page 48.

- ▶ `M_LROOT`
- ▶ `PATH`
- ▶ `LD_LIBRARY_PATH` (Solaris, Linux), `LIBPATH` (AIX), `SHLIB_PATH` (HP-UX)

M_LROOT: Set M_LROOT to the ProTune installation directory. For example:

```
setenv M_LROOT /tools/protune
```

PATH: The location of ProTune’s executable programs, the *bin* directory, must be added to the PATH variable.

```
set path = ($path $M_LROOT/bin)
```

LD_LIBRARY_PATH: The path should include the location of ProTune’s dynamic libraries (\$M_LROOT/bin). To set the path, type:

```
setenv LD_LIBRARY_PATH ${LD_LIBRARY_PATH}:$M_LROOT/bin
/*Solaris and Linux*/
setenv SHLIB_PATH ${SHLIB_PATH}:$M_LROOT/bin/*HP Platforms */
setenv LIBPATH “${LIBPATH}:$M_LROOT/bin” /*IBM Platforms */
```

Check the dynamic libraries used by your application, and make sure that their path is also included in the appropriate dynamic library path environment variable (LD_LIBRARY_PATH, SHLIB_PATH or LIBPATH).

To check the dynamic libraries used by your application, type:

```
ldd my_application /* Sun and Linux platforms */
chrtr my_application /* HP platforms */
dump -H my_application /* IBM platforms */
```

Note: Remember that in order to use Oracle73, you need to add the path Oracle73 libraries to the dynamic libraries path environment variable.

Checking Authorizations

In order to execute Vusers on remote hosts, you must be authorized to execute a *remote shell*. To check your permissions on a host, type:

- For Solaris, Linux and IBM platforms:

```
rsh hostname ls
```

- For HP platform:

```
remsh hostname ls
```

If you do not have permission, consult the *.rhosts* file (man *rsh* or *remsh*).

Sample .cshrc and .profile Files

ProTune Settings in the .cshrc File

The following is an example of ProTune settings within a user's *.cshrc* file:

```
# ProTune settings #
#Chooses a path based on the location of the machine dependent ProTune
installation

switch ("`uname`")
  case SunOS:
    setenv M_LROOT {replace with ProTune Solaris installation path}
    setenv LD_LIBRARY_PATH ${LD_LIBRARY_PATH}:${M_LROOT}/bin
    breaksw

  case HP-UX:
    setenv M_LROOT {replace with ProTune HP-UX installation path}
    setenv SHLIB_PATH ${M_LROOT}/bin ${SHLIB_PATH}
    breaksw
```

```
case Linux:
    setenv M_LROOT {replace with ProTune SunOs installation path}
    setenv LD_LIBRARY_PATH ${LD_LIBRARY_PATH}:${M_LROOT}/bin
breaksw

case AIX:
    setenv M_LROOT {replace with ProTune AIX installation path}
    setenv LIBPATH ${M_LROOT}/bin:${LIBPATH}
breaksw
endsw

set path = ($M_LROOT/bin $path)

# End ProTune setting #
```

ProTune Settings in the .profile File

The following is an example of ProTune settings within a user's .profile file for kshell and Bourne shell environments:

```
# ProTune settings #
#Chooses a path based on the location of the machine dependent ProTune
installation

case "$(uname)" in
    SunOS)
        M_LROOT={replace w/ ProTune Solaris installation path} ; export M_LROOT
        LD_LIBRARY_PATH=${M_LROOT}/bin ; export LD_LIBRARY_PATH
        ;;

    HP-UX)
        M_LROOT={replace w/ LR HP-UX installation path} ; export M_LROOT
        SHLIB_PATH=${M_LROOT}/bin ; export SHLIB_PATH
        ;;
```

AIX)

```
M_LROOT={replace w/ ProTune AIX installation path} ; export M_LROOT  
LIBPATH=${M_LROOT}/bin ; export LIBPATH
```

```
::
```

Linux)

```
M_LROOT={replace w/ ProTune Linux installation path} ; export  
M_LROOT  
LD_LIBRARY_PATH=${M_LROOT}/bin; export LD_LIBRARY_PATH  
esac
```

```
PATH=${M_LROOT}/bin:${PATH}; export PATH
```

```
# End ProTune setting #
```


8

Verifying Your Installation

ProTune has a setup verification utility *verify_generator*, that checks the ProTune setup. It checks environment variables and your *.cshrc* file to verify that they are set up correctly. The *verify_generator* utility checks the remote Vuser hosts.

It is strongly recommended that you run *verify_generator* after a Vuser installation, before attempting to invoke ProTune.

The *verify_generator* Test

The utility checks the following items in the Vuser environment:

- at least 128 file descriptors
- proper *.rhost* permissions: *-rw-r--r--*
- the host can be contacted using *rsh* to the host. If not, checks for the host name in *.rhosts*
- *M_LROOT* is defined
- *.cshrc* defines the correct *M_LROOT*
- *.cshrc* exists in the home directory
- the current user is the owner of the *.cshrc*
- a ProTune installation does exist in *\$M_LROOT*
- the executables have executable permissions
- *PATH* contains *\$M_LROOT/bin*, and */usr/bin*
- the *rstatd* daemon exists and is running

verify_generator Option

The `verify` utility checks the local host for its communication parameters and its compatibility with all types of Vusers. If you intend to run all of the Vusers on one host, type:

```
verify_generator
```

`verify_generator` either returns 'OK' when the setting is correct, or 'Failed' and a suggestion on how to correct the setup.

The syntax of `verify_generator` is as follows:

```
verify_generator [-v]
```

-v

Provides detailed information about the checks.

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