CISCO SYSTEMS

Cisco Configuration Assurance Solution Reference Administrator Guide

Software Release 1.0

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
        800 553-NETS (6387)
Fax: 408 526-4100

Copyright

Document Copyright

Title: Administrator Guide
Part Number: D00065
Version: 17

Software Copyright

Product Name: IT Guru
Product Release: 11.0

Documentation Conventions

OPNET documentation uses specific formatting and typographic conventions to present the following types of information:

- Objects, examples, and system I/O

- Object hierarchies, notes, and warnings

- Computer commands

- Lists and procedures

Objects, Examples, and System I/O

- Directory paths and file names are in plain Courier typeface:

  ```
  opnet\release\models\std\ip
  ```

- Function names in body text are in italics:

  op_dist_outcome()

- The names of functions of interest in example code are in bolded Courier typeface:

  ```
  /* determine the object ID of packet's creation module */
  src_mod_objid = op_pk_creation_mod_get (pkptr);
  ```

- Variables are enclosed in angle brackets (< >):

  ```
  <opnet_user_home>/op_admin/err_log
  ```

Object Hierarchies, Notes, and Warnings

Menu hierarchies are indicated by right angle brackets (>); for example:

Open File > Print Setup > Properties...

Attribute hierarchies are represented by angled arrows (↘) that indicate that you must drill down to a lower level of the hierarchy:

> Attribute level 1 ◣ Attribute level 2 ◣ Attribute level 3

Note—Notes are indicated by text with the word Note at the beginning of the paragraph. Notes advise you of important supplementary information.

WARNING—Warnings are indicated by text with the word WARNING at the beginning of the paragraph. Warnings advise you of vital information about an operation or system behavior.

Computer Commands

These conventions apply to Windows systems and navigation methods that use the standard graphical-user-interface (GUI) terminology such as click, drag, and dialog box.

- Key combinations appear in the form "press `<button>+x`"; this means press the `<button>` and `x` keys *at the same time* to do the operation.

- The mouse operations *left-click* (or *click*) and *right-click* indicate that you should press the left mouse button or right mouse button, respectively.

Lists and Procedures

Information is often itemized in bulleted (unordered) or numbered (ordered) lists:

- In bulleted lists, the sequence of items is not important.

- In numbered lists, the sequence of items is important.

Procedures are contained within procedure headings and footings that indicate the start and end of the procedure. Each step of a procedure is numbered to indicate the sequence in which you should do the steps. A step may be followed by a description of the results of that step; such descriptions are preceded by an arrow.

Procedure FM-1 Sample Procedure Format

1 Procedure step.

➡ Result of the procedure step.

2 Procedure step.

End of Procedure FM-1

For more information about using and maintaining OPNET documentation, see the OPNET IT Guru Documentation Guide.

Document Revision History

Release Date	Product Version	Chapter	Description of Change
February 2005	11.0 PL3	License Server	• Added information from FAQ 725 for diagnose mode.
October 2004	11.0 PL1	License Manager	• Added various information on license file conversion.
		License Server	• Added requirement to stop and restart server when Restricting License Server Administration and Restricting License Server Users. • Updated and clarified procedures for Starting the License Server. • Added information about License File Format Conversion.
August 2004	11.0	License Manager	• Changed data type of license_http_proxy_password and license_password preferences.
		License Server	• Added information on loan authorization files in Restricting Loanable Licenses.
March 2004	10.5 PL1	Installation Support	• Corrected the command line in Procedure 2-8 Updating from a Previous Release (UNIX) on page AG-2-10 • Deleted obsolete procedures for installing OPNET in a different directory (WIN and UNIX)
January 2004	10.5 PL0	License Manager	• Added preferences license_http_proxy_password, license_http_proxy_user, and manage_loanable_licenses.
August 2003	10.0 PL1	License Manager	• Added loanable license operations: Extend On-Loan License (button), Change Authorized Loan Duration (button), and Change Loan Properties (button).
January 2003	10.0	ALL	• First Issue

Contents

List of Figures

List of Tables

List of Procedures

1   Basic Concepts

This manual contains installation support information and a description of the OPNET license system. The information and procedures in this manual are for system administrators or IT Guru users who install and maintain computing environments in UNIX or Windows operating systems, and need to do the following tasks:

- Install new user accounts

- Update the IT Guru software

- Relocate IT Guru software

- Use the license system

What You Need to Know

To do the administrator tasks described in this manual, you need to know the following concepts and techniques:

- For UNIX installations

    — techniques of becoming super-user: `su`, `login`, `rlogin`

    — disk partition, directory, file, and path name concepts

    — Network Filesystem (NFS) concepts

    — C shell usage and conventions

    — host workstation directory organization

    — basic directory and file commands: `cd`, `mkdir`, `chmod`, `chown`

- For Windows installations

    — techniques of becoming administrator (Windows)

    — disk partition, directory, file, and path name concepts

    — command interpreter usage and conventions

    — host workstation directory organization

    — basic directory and file commands: `cd`, `mkdir`

If you are not familiar with these concepts, you may want to obtain the assistance of an in-house system administrator familiar with UNIX or Windows. Alternatively, you may prefer to develop the necessary skills yourself, either by acquiring a beginning text or attending a beginning class.

Terminology

architecture directory An architecture-specific system directory within a particular IT Guru release. IT Guru executables and libraries are typically stored in this directory. Architecture directories are subdirectories of the `sys` directory of a particular release. In this manual, the symbol `<arch>` represents an architecture directory. The following table lists the names used for this directory under the various architectures supported by IT Guru.

Table 1-1   Architecture Directory Names

Vendor	CPU	Operating System	*<arch>* Directory Name
Sun Microsystems	SPARC	Solaris	`sun_sparc_solaris`
various	various	all UNIX systems	`unix`
various	Pentium	Windows	`pc_intel_win32`

binary directory A directory containing the IT Guru binaries. The binaries for a specific release and computer architecture are located in `<reldir>/sys/<arch>/bin`. Under UNIX a special binary directory contains scripts that allow IT Guru to locate the binaries for the platform being used.

In this manual, the symbol `<bindir>` represents the path to a binary directory. For example, if IT Guru 11.0.A is installed in the directory `/usr/opnet`, then `<bindir>` represents the Solaris path name

`/usr/opnet/11.0.A/sys/sun_sparc_solaris/bin`

or the Windows path name

`\opnet\11.0.A\sys\pc_intel_win32\bin`

CD-ROM directory; CD-ROM drive The mount point for the CD-ROM drive of the install workstation. The symbol `<cd_dir>` represents the CD-ROM directory in this manual. (Under Windows, the CD-ROM drive will be mounted at a particular drive letter, rather than a directory. The symbol `<cd_drive>` represents the drive letter of the CD-ROM drive.)

client workstation A workstation used to execute IT Guru programs. Each client workstation must have access to the IT Guru directory, either on its local disk, on a server disk, or via the Network Filesystem (NFS).

install workstation	A workstation with a compatible CD-ROM drive. This workstation must be able to mount the server workstation disk partition containing the OPNET directory via the Network Filesystem. At many sites, the server workstation has a CD-ROM drive and is therefore also the install workstation. At completely stand-alone sites, a single workstation fills all three roles: client, server, and install workstation.
library directory	A directory containing the IT Guru libraries. The libraries for a specific release and computer architecture are located in `<reldir>/sys/<arch>/lib`. In this manual, the symbol `<libdir>` represents a library directory. For example, if IT Guru is installed in the directory `/usr/opnet` under Solaris 2.5.1, then `<libdir>` represents the directory path name `/usr/opnet/`11.0.A`/sys/sun_sparc_solaris/lib`.
licensing system	The licensing system allows you to run itguru or another licensed application on any workstation on the local network. See Chapter 3 License Manager on page AG-3-1 for a description of the important components of this system.
OPNET directory	The directory in which the IT Guru system software is or will be loaded. You can choose where to place IT Guru in the directory tree; almost any location will work. However, because the IT Guru system software occupies a significant amount of disk space, the disk partition holding the OPNET directory must have enough free space before installation begins (refer to the OPNET web site to determine the amount of partition free space required). Typical locations for the OPNET directory on UNIX systems are `/usr/opnet` or `/usr/local/opnet`. The symbol `<opnet_dir>` represents the OPNET directory. Typically, there is only one path name to the OPNET directory. Different subdirectories within the OPNET directory may contain different releases of the IT Guru software.
release CD-ROM	The distribution media supplied as part of the IT Guru release materials.
release directory	A directory containing the software for a particular IT Guru release. Release directories are subdirectories of the OPNET directory. In this manual, the symbol `<reldir>` represents the release directory. You can derive the name of the release directory from information printed on the CD-ROM label. For example, if the label reads "IT Guru 11.0.A", the corresponding release directory name is 11.0.A.
server workstation	The workstation that stores the OPNET directory on its disk. A server workstation may also be a client workstation. More commonly, however, a server workstation is a file server that is shared by a workgroup.

2 Installation Support

This chapter provides information that supports the basic IT Guru installation instructions provided on the installation sheets. This information includes the following:

- Installation troubleshooting suggestions

- Procedures for updating or moving existing software

- Procedures for running previous releases

- Procedures for removing and relocating software

In most cases, you won't need the information contained here. It is provided for any special cases that might arise.

For information about supported platforms, memory usage, and other requirements, visit the Technical Support area of the OPNET website at (www.opnet.com/support).

UNIX Installation Support

Most sites should follow the installation procedure described on the UNIX Installation sheet. This procedure uses the installation program to configure your workstation automatically and install IT Guru. However, if your workstation has an unusual or incorrect configuration, the installation program may fail. If so, you can use the information here to solve the problem.

UNIX Installation Troubleshooting

This section provides solutions for problems that may occur during UNIX installations. Each problem has a discussion section that explains what is happening and a solution section that explains how to solve the problem. If your problem is not described here, contact Technical Support for help.

Problem   Attempts to run programs that use IT Guru libraries result in "No such file or directory" errors.

Discussion   The PATH environment variable must be set to include the correct IT Guru executable directory. Either the variable does not include the IT Guru executable directory or it is set for the directory of an earlier release.

Solution   Make sure each user has the correct environment path, as follows:

Procedure 2-1   Checking the Environment Path

1   Log in to the user's account.

2   Open the user's shell startup file (`.cshrc` in the C shell).

3   Add the following directory to the user's PATH variable.

```
<opnet_dir>/<release>/sys/unix/bin
```

End of Procedure 2-1

Windows Installation Support

Most sites should follow the installation procedure described on the Windows Installation sheet. This procedure uses the setup program to automatically configure your computer and install IT Guru. However, if your computer has an unusual or incorrect configuration, the installation program may fail. If so, you can use the information here to solve the problem.

WARNING—Changing file systems on Windows platforms, such as from FAT to NTFS, will invalidate the license file. To maintain the validity of your licenses during a file system change, you should first de-register your licenses, then change the file system, and finally re-register your licenses. See Deregistering Licenses on page AG-2-11 and Reregistering Licenses After Moving System Software on page AG-2-12 for information on how to deregister and re-register licenses.

Windows Installation Troubleshooting

This section provides solutions for problems that may occur during Windows installations or operation. Each problem has a discussion section that explains what is happening and a solution section that explains how to solve the problem. If your problem is not listed here, contact Technical Support for help.

Problem   Trying to run an OPNET licensed program results in the message: The OPNET licensing system depends on the following nonexistent service: Tcpip.

Discussion   There is a problem with the TCP/IP software.

Solution   Try installing TCP/IP again (as described in Procedure 2-2 on page AG-2-4), then repeat the step that failed. If the problem persists, contact OPNET Technical Support.

Problem   Issuing the sup_info command in the op_license_util program produces the message "Ipc Port Entry (0) currently holds no addr" or a similar error.

Discussion   There is a problem with the TCP/IP software.

Solution   Try installing TCP/IP again (as described in Procedure 2-2 or Procedure 2-3), then repeat the step that failed. If the problem persists, contact the OPNET Technical Support staff.

Problem   The Windows `setup` program reports that TCP/IP is not installed.

Discussion   The OPNET licensing system requires that the Windows TCP/IP software be installed. The TCP/IP software, in turn, requires the presence of an installed network adapter driver.

Solution   Use the following procedures to install and configure the necessary software:

1) Procedure 2-2 Installing TCP/IP for a Network Connection (Windows NT 4.0) on page AG-2-4

   or

   Procedure 2-3 Installing TCP/IP for a Network Connection (Windows 2000) on page AG-2-5

2) Procedure 2-4 Verifying that a Network Adapter Driver is Installed on page AG-2-6

3) Procedure 2-6 Configuring TCP/IP on page AG-2-7

To install TCP/IP for a network connection on a Windows NT 4.0 computer:

Procedure 2-2   Installing TCP/IP for a Network Connection (Windows NT 4.0)

1 Verify that you are logged on as a user with administrator's privileges.

2 Insert your Windows CD-ROM into the CD-ROM drive of the install workstation. If a Windows CD-ROM window opens, close it.

3 Open the Windows Control Panel and double-click the Network icon.

➥ The Network (Network Settings) dialog box opens.

4 In the Network (Network Settings) dialog box, click on the Protocols tab. Then click the Add… (Add Software) button.

➥ The Select Network Protocol (Add Network Software) dialog box opens.

5 Select TCP/IP Protocol (TCP/IP Protocol and related components) from the list of available software and Click the OK button.

➥ The TCP/IP Setup dialog box opens.

6 If the install workstation is not on a network, answer No to the question about using a DHCP server. If the install workstation is on a network, consult your system administrator for the correct response.

➥ The Windows Setup dialog box opens, showing the path to the software on the CD-ROM.

7 Verify that the path is `<CD-ROM_drive>:\i386`, where `<CD-ROM_drive>` is the letter of the install workstation CD-ROM drive. Change the path if necessary,.

---

8 Click Continue.

➥ The TCP/IP software is installed from the CD-ROM.

9 Click OK, then Close to close the Windows Setup dialog box and return to the TCP/IP Setup dialog box.

10 Click on the IP Address tab and enter the IP number, subnet mask, and default gateway. (If you do not know these, ask your system administrator.)

11 Click on the DNS tab and enter the host name, domain name and DNS service search order. (The latter value is the IP address of your DNS server.)

12 Click OK to reboot your computer.

End of Procedure 2-2

To install TCP/IP for a network connection on a Windows 2000 computer:

Procedure 2-3   Installing TCP/IP for a Network Connection (Windows 2000)

1 Verify that you are logged on as an administrator or a member of the administrator's group.

2 Insert your Windows 2000 CD-ROM into the CD-ROM drive of the install workstation. If a Windows CD-ROM window opens, close it.

3 From the Windows Start menu, choose Settings > Network and Dial-up Connections.

➥ The Network and Dialup Connections dialog box appears.

4 Double-click on the network connection for which you want install TCP/IP, then click Properties.

5 Click the General tab for a LAN connection, or the Networking tab for all other connection types.

6 If Internet Protocol (TCP/IP) does not appear in the list of installed components, perform the following steps:

6.1 Click Install, then Protocol, then Add.

➥ The Select Network Protocol dialog appears.

6.2 Select Internet Protocol (TCP/IP) from the protocols list, then click OK.

➥ Internet Protocol (TCP/IP) now appears in the list of supported protocols for the selected connection.

7 Double-click on the Internet Protocol (TCP/IP) list item to open the Internet Protocol (TCP/IP) Properties dialog box.

8 Specify your machine's IP address.

If your network is run on a DNCP server, choose Obtain IP address automatically.

If your network is not run on an DNCP server:

8.1 Click Use the following IP address... and enter the IP address, subnet mask, default gateway, preferred DNS server, and alternate DNS server.

9 Click Advanced... to open the Advanced TCP/IP Settings dialog box, then click the DNS tab.

10 Enter the DNS suffix in the DNS suffix for this connection field.

11 Click OK to close the Advanced TCP/IP Settings dialog box and return to the Internet Protocol (TCP/IP) Properties dialog box.

12 Click OK to close the Internet Protocol (TCP/IP) Properties dialog box.

End of Procedure 2-3

Confirm that a network adapter driver is installed. If not, install a dummy driver. To verify that a network adapter driver is installed, perform the following procedure.

Procedure 2-4   Verifying that a Network Adapter Driver is Installed

1 If it is not already available, open the Network dialog box.

2 Click the Adapters tab to see if there is at least one adapter in the Network Adapters list.

- If there is at least one adapter in the list, continue with Procedure 2-6 Configuring TCP/IP on page AG-2-7.

- If there are no adapters in the list, you must install a "dummy" driver. Continue with Procedure 2-5.

End of Procedure 2-4

To install a network adapter driver, do the following procedure.

Procedure 2-5   Installing a Network Adapter Driver

1 In the Network (Network Settings) dialog box, click the Add… (Add Adapter) button.

➥ The Select Network Adapter (Add Network Adapter) dialog box opens.

2 Select MS Loopback Adapter from the list of available drivers.

3 Click the OK (Continue) button.

➥ The MS Loopback Adapter Card Setup dialog box opens.

4 Click the OK button.

➥ The standard 802.3 frame type is selected.

5 If prompted, enter the path to the software:

```
<CD-ROM_drive>:\i386
```

➥ The software is installed from the CD-ROM.

End of Procedure 2-5

To configure TCP/IP to work with OPNET, use the following procedure.

Procedure 2-6   Configuring TCP/IP

Note—This procedure may result in numerous error messages about various network services. You can ignore these messages.

1 In the Network dialog box, click the Protocols tab.

2 Click the Properties… (Configure) button.

➥ The Microsoft TCP/IP Properties (TCP/IP Configuration) dialog box opens.

3 Enter the following configuration information for the workstation. Your network administrator can provide appropriate values for your network.

IP Address—Enter the network address of the install workstation. If the workstation is not connected to a network, you can enter any value (1.1.1.1, for example).

4 Subnet Mask—Enter a value appropriate for the install workstation, if one is not entered automatically. (With the example IP Address in step 3a, the Subnet Mask would be 255.0.0.0.)

5 Default Gateway—Enter the address of the gateway used by the install workstation. Again, if the workstation is not connected to a network, you can enter any value (use 1.1.1.1 again).

6 Click the OK button.

7 If an alert dialog about adapter cards with an empty primary WINS address appears, you can generally continue by clicking Yes. If a problem occurs, consult your network administrator.

8 Close the Network (Network Settings) dialog box. Restart the install workstation if a dialog box suggesting this appears.

End of Procedure 2-6

The necessary TCP/IP software is now ready for use with the Floating License System.

Update Installation Procedures

You must do an *update system installation* to install IT Guru on a server workstation where an earlier release of IT Guru is installed. A server workstation with IT Guru already installed normally has a directory called the OPNET directory. This directory has a subdirectory for each installed release of IT Guru.

The update installation will add a new subdirectory to the OPNET directory that corresponds to the new release. The new release will continue to use the existing Floating License database and OPNET execution permits will remain usable after installation.

Running Previous Releases

If you have installed the latest version of the software, you can still run earlier releases by creating batch files to set the appropriate system variables (Windows) or by updating your PATH (UNIX), as described in the following procedures.

To run a previous Windows release, do the following procedure:

Procedure 2-7   Running Previous Releases of OPNET (Windows)

1 Use a batch file to set the opnet_dir, Lib, Path, and Include system variables (a batch file is any file with a `.bat` extension).

For example, the following batch file could be used to set up an environment for version 4.0:

```
@echo off
set mil3_dir = c:\OPNET
set path = c:\opnet\4.0.A\sys\pc_intel_win32\bin;%path%
set lib = c:\opnet\4.0.A\sys\pc_intel_win32\lib;%lib%
set include = c:\opnet\4.0.A\sys\include;%include%
echo OPNET 4.0.A environment has been set up
```

When you want to run version 4.0, first run the above batch file in a command window (by typing the name of the batch file, including the extension), then issue the standard OPNET start-up commands from the same window (such as `opnet -product` itguru.

Note—The latest version of the license server (`op_license_server`) should be running on your machine, regardless of the OPNET version you are running. For example, if you run both release 7.0 and release 6.0, you should be running the 7.0 license server. If you selected the "serve licenses from this computer" option during the license configuration portion of the installation, the new license server was automatically installed in place of any existing servers.

End of Procedure 2-7

To run a previous UNIX release, do the following procedure:

Procedure 2-8   Running Previous Releases of OPNET (UNIX)

1 Reset your PATH variable for the OPNET version you want to run.

For example, to run version 6.0, you would reset your PATH as follows:

```
set path=(<opnet_dir>/6.0.A/sys/unix/bin $path)
```

Note—The latest version of the license server (`op_license_server`) should be running on your machine, regardless of the OPNET version you are running. For example, if you run both release 7.0 and release 6.0, you should be running the 7.0 license server. If you selected the "serve licenses from this computer" option during the license configuration portion of the installation, the new license server was automatically installed in place of any existing servers.

End of Procedure 2-8

Removing IT Guru System Software from Your Workstation

Typically, you want to free up the disk space used by an old release when it is no longer needed. If you are removing release 6.0 make sure you have converted your license file to the 7.0 format. See the installation information packaged with the CD or the Technical Support area of the OPNET Technologies web site for instructions.

To remove system software from a Windows workstation, do the following procedure:

Procedure 2-9   Removing System Software from a Windows Workstation

1 If you are not already, log in as administrator to the machine where the IT Guru system software is located.

2 Choose Control Panel > Add/Remove Programs.

3 Select each item that begins with IT Guru, then click Add/Remove.

4 If you do not want to keep your IT Guru models and other data, delete the contents of directories `<HOME>/<op_admin>` and `<HOME>/<op_models>`, then remove the directories.

End of Procedure 2-9

To remove system software from a UNIX workstation, do the following procedure:

Procedure 2-10   Removing System Software from a UNIX Workstation

1 If you are not already, log in as root to the machine where the IT Guru system software is located.

2 Delete the directory (`<opnet_dir>`) containing the IT Guru software.

3 If you do not wish to keep your OPNET models and other data, delete the contents of directories `<HOME>/<op_admin>` and `<HOME>/<op_models>`, then remove the directories.

End of Procedure 2-10

Relocating IT Guru System Software

If you want to move IT Guru system files from one computer to another, the simplest method is to uninstall the system software from the old location and reinstall it in the new location using the original installation CDs.

To do this, you must deregister licenses, uninstall, and reinstall the system software, then reregister the licenses in the new location.

WARNING—IT Guru will be unavailable during the following procedures. To minimize disruption, do the relocation operation during a low-use period and warn users in advance.

To deregister licenses, do the following procedure:

Procedure 2-11   Deregistering Licenses

1 (Windows only) Log in to the machine where the IT Guru system software is located.

2 Launch the License Manager:

Windows:

Select License Manager (Start > IT Guru <program_name>).

UNIX:

Enter the following command:

`op_license_manager`

➥ The License Manager opens in one window. The IT Guru program opens in another window, but has limited functionality.

3 Revoke any licenses that are still in use by selecting the licenses and clicking on the Revoke License button.

4 In the License Manager tree-view, choose the server where the IT Guru system software is located (it should be the machine you are logged into).

5 Deregister the licenses in that server's license file:

    5.1 Expand the license file icon.

    5.2 Select and deregister all of the licenses in the license file by clicking on the Deregister License button and following the on-screen prompts.

6 Exit IT Guru.

End of Procedure 2-11

To relocate the system software, do the following procedure:

Procedure 2-12   Relocating System Software

  1 If you are not already, log in as root (or administrator) to the machine where the IT Guru system software is located.

  2 (Windows only) Select Control Panel > Add/Remove Programs.

  3 Select each item that begins with IT Guru, then click Add/Remove.

  4 (UNIX only) Delete the directory (`<opnet_dir>`) containing the IT Guru software.

  5 Reinstall IT Guru in the desired location, using the original CDs. Follow the installation procedures outlined on the Installation sheets that were packaged with the CDs.

End of Procedure 2-12

To reregister licenses after moving the system software, do the following procedure:

Procedure 2-13   Reregistering Licenses After Moving System Software

  1 Log in to a user account (or as a user) to the machine where the OPNET software is now located.

  2 Launch OPNET by typing the following commands (where `<program_name>` is the executable name, such as `modeler` or `itguru`):

```
cd <reldir>/sys/unix/bin/
./<program_name>
```

  3 When prompted, select License Management.

  4 Click on the Add License button and follow the on-screen prompts.

End of Procedure 2-13

---

3   License Manager

This chapter contains the following main sections:

- License Manager Concepts

- Using the License Manager

- Licensing Preferences

License Manager Concepts

You use the License Manager to maintain application licenses. Typical maintenance operations are

- Adding a license

- Extending the expiration or maintenance date of a specific license

- Starting or stopping a license server

- Reviewing usage statistics

The License Manager can oversee multiple servers in a network. Each server allocates licenses to one or more clients. IT Guru licenses are floating licenses; this means that a pool of licenses is maintained by the server. Any user who can access the server can use any free license. Licenses are not pre-assigned to a specific user.

The licensing system consists of these parts:

- One or more computers, each running at least one license server. The server is a service (on Windows platforms) or a daemon process (on UNIX platforms). Each computer has its own file of licenses, called `license_file`.

- Client machines, which request and are granted licenses from a particular server. To specify the server queried, configure the license_port and license_server preferences in the Preferences file (`env_db<rel_num>`), or specify the preferences when you launch the program.

- Licenses, which allow a user to use specific applications (such as IT Guru) and modules (such as Multi-Vendor Import). See About Licenses on page AG-3-4 for details.

Note—Multiple processes or services can run on one computer; therefore, one server can run both licensing processes (one license process per port) and broker processes (one broker process per port).

Figure 3-1 shows a license system for two servers.

Figure 3-1   License Manager Components

The IT Guru License Manager tool oversees the servers

```
   ┌──────────────────┐                      ┌──────────────────┐
   │ Licensed          │                     │ Licensed          │
   │ application        │                    │ application        │
   │ (such as itguru)  │                      │ (such as itguru)  │
   └──────────────────┘                      └──────────────────┘
              ╲                                    ╱
        ┌──────────────────────────────────────────┐
        │ The application gets licenses from         │
        │ a Windows or UNIX server                   │
        └──────────────────────────────────────────┘
            ╱                                    ╲
   ┌──────────────────┐                      ┌──────────────────┐
   │ UNIX license      │                     │ Windows license   │
   │ server            │                     │ server            │
   │ (op_license_server)│                   │ (op_license_server)│
   └──────────────────┘                      └──────────────────┘
            │ ↑                                    │ ↑
   ┌──────────────────────────┐          ┌──────────────────────────┐
   │ The license server        │          │ The license server        │
   │ queries the license file. │          │ queries the license file. │
   └──────────────────────────┘          └──────────────────────────┘
```
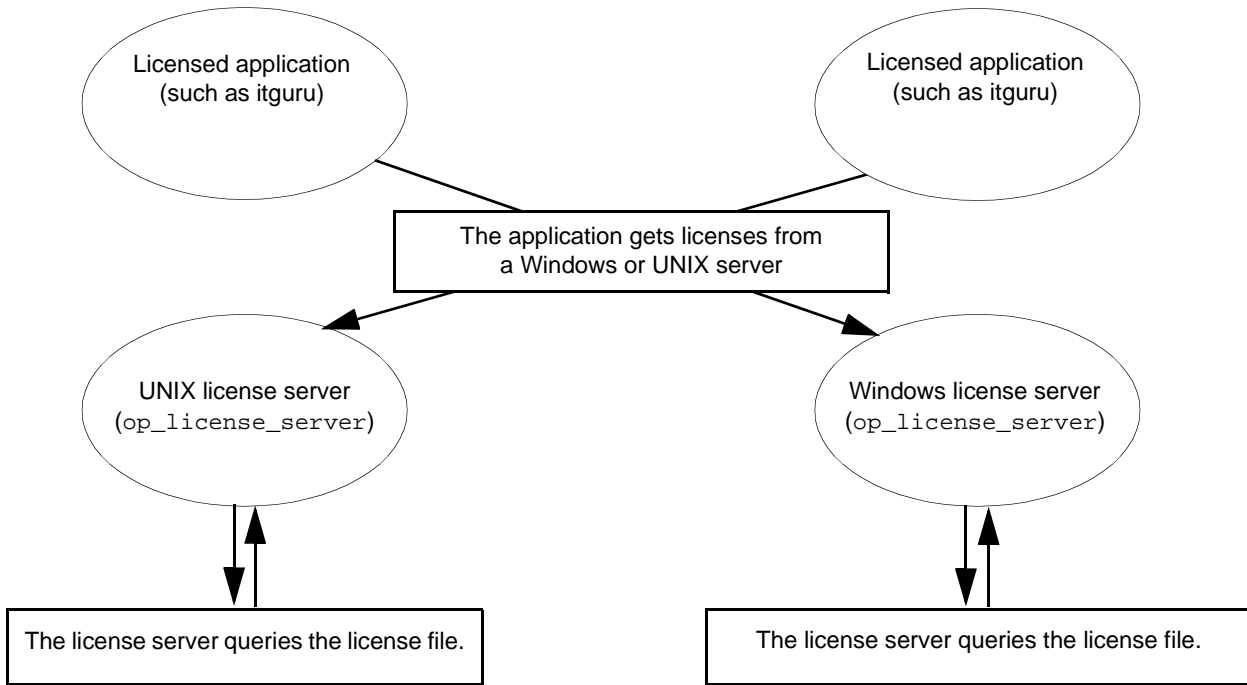
About License Servers

The License Manager shows information about the license servers in the network in a tree-view.

Figure 3-2   License Manager Window
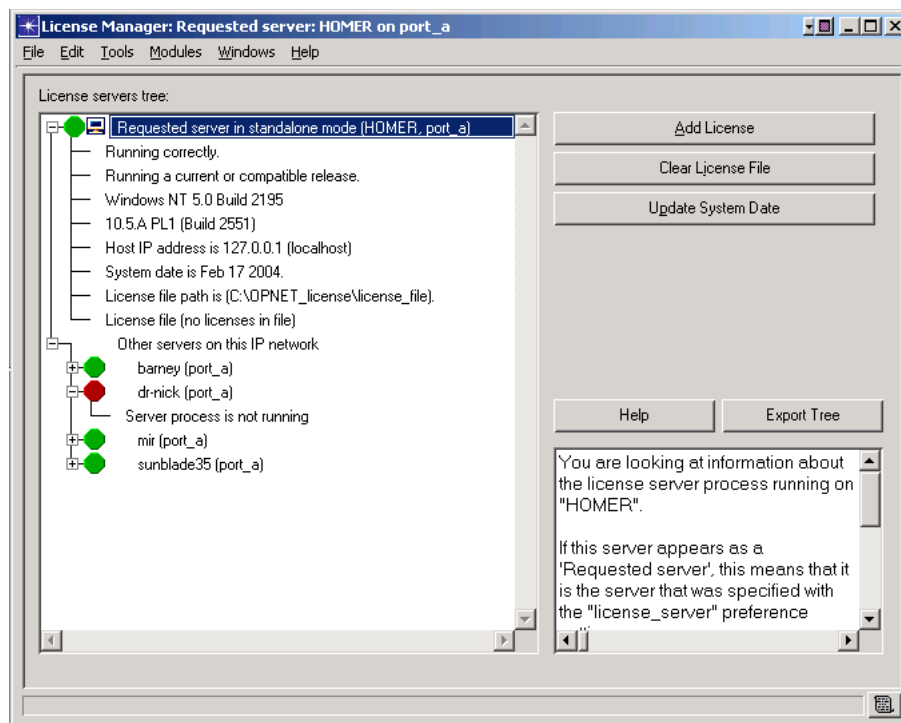
The "Host IP address" given for each server is the return address of the IP packet received by the License Manager and not necessarily the local IP address known by the server. For example, if the server's "home" IP address is 172.16.1.1, but it is behind a firewall and the client is on the other side of the firewall, the client view of the return address will be the firewall IP address (such as 12.54.1.2).

The "Requested server" branch shows the server from which the IT Guru program requests licenses. You specify this server by listing the server name and port in your Preferences file or by launching the program with the -license_server and -license_port licensing preferences. A command line preference overrides the matching preference in Preferences. This means that if the value for license_server in the Preferences file is "xxx" and the command line preference value is "yyy", the "yyy" server appears as the requested server.

The "Local servers" branch shows other license servers running on your computer.

The "Other servers on this IP network" branch shows other license servers running in your IP network segment.

About Licenses

A license conveys the right to use an application. A single license typically bundles one or more applications (such as IT Guru), the simulation program, and one or more modules. Licenses are allocated on a per-component basis. This means that a component that is part of a license (perhaps a module such as ACE) may be free and can be given to any requester, even if another component of the same license (most likely an application program) is in use.

A license has several associated attributes, as described below.

Table 3-1   License Attribute Definitions

Attribute	Description
License number	This attribute specifies the software license. A license may bundle several programs. This means that a single license (for example, 100/1) that includes the programs IT Guru, Expert Service Prediction, and Multi-Vendor Import will be shown as three separate lines in the License Manager interface.
Program name	This attribute specifies which programs are included in the license (such as IT Guru or the ACE module).
Status	This attribute identifies the state of the license: • A *free license* (shown in green) is available to the next user who requests it. • An *in use license* (shown in white) is unavailable. • An *expired license* (shown as yellow with red X) is no longer valid.
License expiration	This attribute is a date or the word "permanent", depending on the type of license purchased.
Maintenance expiration	This attribute is a date. It is not possible to buy perpetual maintenance.
User	If the license is in use, this attribute shows the user's name.
Host	If the license is in use, this attribute shows the machine where the license is being used.
End of Table 3-1	

License Files

Licenses are stored in a file named `license_file`. There can be only one license file on a machine. The file is stored in one of the following directories:

Windows: `<primary_hard_drive>:\OPNET_license`

The `<primary_hard_drive>` is the first drive letter (usually C:) that names a non-removable, non-network local drive partition.

UNIX: `/opt/OPNET_license` or `/var/adm/OPNET_license`

The default directory is `/opt/OPNET_license`, which must be a local directory (that is, not a symbolic link or mounted across a network). If `/opt` is not local, the license server will look in the `/var/adm/OPNET_license` directory. You cannot switch between these directories or specify which one will be used; the software will first try `/opt/OPNET_license` and only if that directory is not usable will it try `/var/adm/OPNET_license`.

Simulation Program Licenses

Beginning with IT Guru 7.0, a license is required to run a simulation. The exact implementation of simulation licensing depends on your installation.

If you already had IT Guru installed and upgraded from 6.0 to 7.0, you will have converted your 6.0 licenses to 7.0 licenses. Each license will include a simulation site license. This simulation site license (unlike other licenses) is not checked out and can be used as a simulation license by any program in the license file. A simulation being run from any licensed program merely checks for the existence of a valid site license before running.

When you purchase additional licenses, or if you are installing IT Guru for the first time, a *simulation runtime license* is included with each license you purchase. This type of license is checked out. If you wish to run multiple simulations, you must have multiple simulation runtime licenses.

Loanable Licenses

Loanable licenses can be temporarily transferred from one license server to another, without the assistance of OPNET Technical Support. This is useful for providing licenses to OPNET applications that will be run on a portable computer or at a remote site that doesn't have network access, without needing to register a license for that computer.

It is important to note when loaning a license that a "day" is defined as 24 hours. If a license is loaned at 10:00AM on Monday for a duration of one day, the loan expires on the loanee's computer at 10:00AM on Tuesday. For loans of more than one day, the number of days specified is multiplied by 24 hours to determine the end of the loan period.

A simplified method of managing loanable licenses is built into the License Manager. For details, see License Operations for Loanable Licenses on page AG-3-11.

A more complex loanable license system is available, with additional features such as access lists and control of loan periods; contact OPNET Technical Support if you need these additional features.

Enterprise Licenses

Enterprise licenses allow OPNET applications to be used on IP networks other than the network in which the OPNET license server is located. Standard workgroup OPNET licenses require that the server and the client be used in the same single classful IP network.

All the standard operations apply to Enterprise licenses.

To configure Enterprise licensing on a license server, you need the following:

- Enterprise licenses in your license server's license file.

  Enterprise licenses are standard OPNET product licenses configured for use outside the IP network of the license server. Normally, this involves using the Add License operation to add licenses to your license file.

- IP Network Extensions (IPNETX) in your license server's license file.

  Each IPNETX in the license file identifies an IP network to which Enterprise licenses are available. You administer IPNETX like a standard OPNET product license: you view what extensions are available to be added, then add them to your license file using the regular license registration process.

The purpose of IPNETX is to identify IP networks to the license server; IPNETXs do not get checked out for use by applications.

Using the License Manager

This section describes how to start the License Manager and how to do License Manager operations.

Starting the License Manager

You can start the License Manager the following ways:

- You can start the License Manager and IT Guru in the manage license mode. In this mode
  — IT Guru does not use a license and has only limited functions. You will be able to use some system menu functions, but none of the editors.
  — The License Manager opens automatically.

  This mode is useful when you are performing license management functions only. You must use this mode if you are deleting all licenses, because the License Manager will not allow you to delete a license that is in use.

- You can start the License Manager and IT Guru both with one command.

- You can start the License Manager from within IT Guru.

To start the license manager from a command line, do the following procedure:

Procedure 3-1   Starting the License Manager From a Command Line

  1 Launch the program (for example, itguru) with the `manage_licenses` preference:

  ```
  <program> -manage_licenses
  ```

  ➡ The License Manager opens in one window. The IT Guru program opens in another window, but has limited functions.

End of Procedure 3-1

To start the license manager with a script command, do the following procedure:

Procedure 3-2   Starting the License Manager With a Script Command (UNIX)

  1 Enter the following command:

  ```
  op_license_manager
  ```

  ➡ The License Manager opens in one window. The IT Guru program opens in another window, but has limited functions.

End of Procedure 3-2

To start the license manager from the Windows Start menu, do the following procedure:

Procedure 3-3   Starting the License Manager From the Start Menu (Windows)

   1 Select Start > OPNET <program_name> > License Manager.

   ➥ The License Manager opens in one window. The IT Guru program opens in another window, but has limited functions.

End of Procedure 3-3

To start the license manager from within IT Guru, do the following procedure:

Procedure 3-4   Starting the License Manager from Within IT Guru

   1 Launch your program (for example, itguru).

   2 Choose License > License Management.

   ➥ The License Manager opens.

End of Procedure 3-4

Operations

License Manager operations fall into one of three broad groups:

- License Manager operations (which are always available)

- Server operations (the server-of-interest must be selected)

- License operations (apply to a specific license or license file)

Many License Manager operations can be accessed from a pop-up menu by right-clicking on a server, license file, or license icon in the tree view.

Note—If a license file is in an old format and needs to be converted, all operations except Stop Server and Convert License File will be disabled. See License File Format Conversion on page AG-4-14 for more information.

License Manager Operations

Export Tree (button) Sends the information in the tree to a text file. This is useful for debugging.

Convert License File (File menu, button) Converts a pre-11.0 license file to a format the License Manager can use. After conversion, the license file will be unusable by pre-11.0 license servers. You should convert the license file after the 11.0 installation process.

Product Modules (Modules menu) Lets you specify which product options to use. Only the product options for which you have purchased licenses can be selected from the list. (Specialized model licenses are not listed here, but will be used at DES run time.)

Server Operations

Start Server (button) Starts the selected server, allowing it to issue licenses and perform other license server functions. This button is active only when the selected server is your own (local) machine. To determine if a machine is local, type `hostname` in a shell window. See Procedure 4-4 on page AG-4-7 for details.

Stop Server (button) Stops the selected server. See Procedure 4-8 on page AG-4-9 for details.

Update System Date (button) Allows you to reset the license server's date to the current date. Resetting the date requires that you contact OPNET via either the Internet, e-mail, or phone/fax.

Note—You might need to do this operation because the server's date is not the current date. This can occur even if the computer running the license server is set to the current date.

Set as Default Server (button) Makes the selected server the default server. This server will be the requested server the next time you start IT Guru, and the values of the license_server and license_port preferences will be the correct ones for this server.

Refresh Server Information (File menu) Scans your network for license servers and rebuilds the tree.
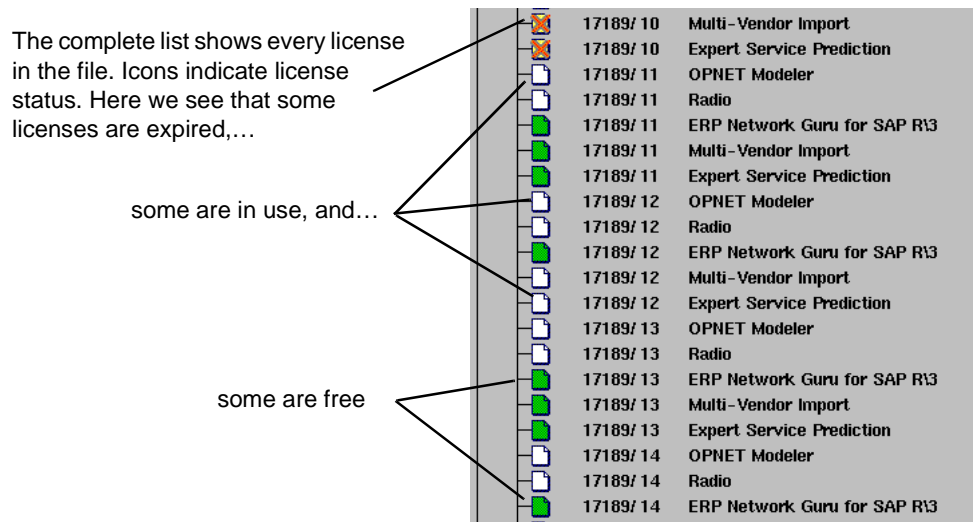
Show Local Server's Usage Statistics (Tools menu) Shows usage statistics for the local server.

Reset Local Server's Usage Statistics (Tools menu) Resets the usage statistics for the local server.

License Operations

The contents of the License file are displayed when you expand the License file tree. You can right-click on a license file (when it is expanded to show the individual licenses) and sort the licenses for that server by license number, product type, status, or user.

Figure 3-3 Example License File

The complete list shows every license in the file. Icons indicate license status. Here we see that some licenses are expired,…

some are in use, and…

some are free

License operations are as follows. Except for the Convert License File operation, you can restrict who has access to these operations by creating an `admin_auth` file. If you do not create such a file, any user has access to these operations from any machine. See Restricting License Server Administration on page AG-4-11 for details.

Add License (button) Revoke License (button) Immediately revokes a loan. The user of the license receives a warning and has two minutes to save files and exit the application.

Change Maintenance Expiration (button) Lets you set a new maintenance expiration date. This date determines:

• The time period for which you have access to OPNET Technical Support.

• Which release of an application you can run. Say you have installed the newest version of IT Guru, which has a release date later than the maintenance expiration of a particular license. That license will not run the new release, though it will run earlier versions of IT Guru. Licenses with a later maintenance expiration can run the new release.

Change License Expiration (button) This button appears only if you select a permit that has an expiration. You cannot perform this function on a permanent permit.

Deregister License (button) This button removes a license from your computer, if it is about to be reformatted or decommissioned. The button does not appear, if you have selected a permit that is in use.

Clear License File (button) This button appears only if no licenses in the file are in use.

Register New License (Tools menu) Same as the Add License button.

License Operations for Loanable Licenses

There are several additional license operations you can use with loanable licenses:

• Borrow Selected License

• Extend On-Loan License

• Return On-Loan License

• Change Authorized Loan Duration

• Change Loan Properties

Borrow Selected License (button) Borrows the selected license (which must be loanable) and adds it to the requested server's license file. Use Procedure 3-5 to borrow licenses.

Procedure 3-5   Borrowing a Loanable License

1   Make sure the requested license server is on the computer that will be using the loanable license. Typically, this is your local computer.

2   In the server tree-view, select one or more loanable licenses from other license servers. The selected licenses must be available to be loaned (green license icon with an "L").

   (Some license servers may not appear in the tree-view because they are on a different network segment or weren't found due to network congestion. You can use the license_managed_servers preference to force such license servers to appear. See the description of this preference in Licensing Preferences on page AG-3-14.)

3   Click the Borrow Selected License button.

   ➥ If the other servers can be contacted and the licenses are loanable, you will be prompted for the duration of the loan.

End of Procedure 3-5

Extend On-Loan License (button) Extends the duration of the loan for the selected licenses. Use Procedure 3-6 to return a license before the end of the loan.

Procedure 3-6   Extending a License Loan

1   Start the License Manager on the machine that has borrowed the licenses to be extended (make sure it is connected to a network that can access the broker machine).

2   Open the license file folder and select the license of interest.

3   Click the Extend On-Loan License button.

End of Procedure 3-6

Return On-Loan License (button) Returns the selected licenses to the servers that provided them. Normally, a borrowed license will automatically disappear from the requester's license file and become available again in the provider's license file at the end of the loan period. Use Procedure 3-7 to return a license before the end of the loan.

Procedure 3-7   Returning a Loanable License

1 In the server tree-view, select one or more licenses that are on loan.

2 Click the Return On-Loan License button.

   ➥ If the loanable license provider can be contacted, the licenses are returned to it and removed from the local license file.

   Note—In some cases, OPNET may be unable to contact the license server from which the licenses were borrowed. This can happen if the server is known by several names and the name used when borrowing the license is not the name needed to return it. (For example, the server was known as `licserv` internally when the license was borrowed, but now must be called `public_licserv.mycompany.com` because the client is outside the network.) In such cases, OPNET displays a dialog box requesting the server's name.

End of Procedure 3-7

Change Authorized Loan Duration (button) Assists you in contacting OPNET to change the length of time for which a license can be loaned.

Change Loan Properties (button) Changes the maximum number of days for which the selected loanable license can be borrowed. (The maximum value set here cannot exceed the authorized loan duration of the license.) Use Procedure 3-8 to change the loan properties.

Procedure 3-8   Changing Loan Properties

1 In the server tree-view, select one or more loanable licenses. The selected licenses must be available to be loaned (green license icon with an "L").

2 Click the Change Loan Properties button.

3 In the Extend Loan Period Allowed dialog box, enter the maximum number of days for which the selected licenses can be borrowed and click Continue.

   ➥ The License Manager changes the loan period for the selected licenses and displays a dialog box with the results of the operation.

4 Click Close.

End of Procedure 3-8

Licensing Preferences

Licensing preferences apply to the license server or to licenses. They are supported by any licensed application, such as IT Guruand `op_runsim`. One additional preference, tool_name, is used to launch both IT Guru and the License Manager simultaneously. See Starting the License Manager on page AG-3-7 for details about using the tool_name preference. See the documentation for your product for details about the preference itself.

license_broker_host

Used with loanable license commands to specify the license broker's host machine. New values for this preference take effect only at startup. Brokers are used only when the manage_loanable_licenses preference is TRUE.

Data Type	string
Default Value	""

license_broker_port

Used with loanable license commands to specify the license broker's port. New values for this preference take effect only at startup. Brokers are used only when the manage_loanable_licenses preference is TRUE.

Data Type	string
Default Value	""

license_group

Specifies your group ID number, the number assigned to you by OPNET when you purchased the software. To find your group ID, choose About This Application from the Help menu. Your group ID is used when you perform license transactions via the OPNET web site.

Data Type	string
Default Value	""

license_http_proxy_password

Specifies a password to use when authenticating to an HTTP proxy server. If your site controls access to the Internet with an HTTP proxy server, you should set this preference to allow OPNET express licensing transactions to take place. This preference is stored in encrypted format.

Data Type	password
Default Value	""

license_http_proxy_port

Specifies an HTTP proxy server port to be used for express license registrations.

Data Type	integer
Default Value	80

license_http_proxy_server

Specifies an HTTP proxy server to be used for express license registrations.

Data Type	string
Default Value	""

license_http_proxy_user

Specifies a user name to use when authenticating to an HTTP proxy server. If your site controls access to the Internet with an HTTP proxy server, you should set this preference to allow OPNET express licensing transactions to take place.

Data Type	string
Default Value	""

license_http_server

Specifies the web server the License Manager uses when performing license transactions via the OPNET web site.

Data Type	string
Default Value	"licenses.opnet.com"

license_http_use_proxy

Specifies whether to use an HTTP proxy server for express license registrations.

Data Type	boolean
Default Value	FALSE

license_managed_servers

Specifies a list of <server>, <port> pairs to be explicitly contacted by the License Manager. This preference causes license servers that are not in the same IP network segment as the License Manager to appear in the license server tree-view. If <port> is not specified, "port_a" is assumed. For example: `iasimov,port_a sunblade11,port_b sunblade10.`

Data Type	string list
Default Value	<empty>

license_password

Specifies the password sent to the OPNET web server for authentication before beginning a license transaction. This is typically the same password you use when entering the User Community section of the OPNET web site. This preference is stored in encrypted format.

Data Type	password
Default Value	""

license_ping_old_servers

Specifies whether the License Manager should try to locate servers from pre-7.0 releases of OPNET. If TRUE, the License Manager will take longer to start up as it looks for old license servers on the network.

Data Type	boolean
Default Value	FALSE

license_port

Specifies the name of the communication port. This preference can have one of three possible values: port_a, port_b, or port_c. This preference is used in conjunction with license_server to uniquely identify a server running the licensing process and must be assigned a value.

To determine which ports are available for use by `op_license_server`, run `op_license_util` in port check mode (`op_license_util -port_check`). The licensing system uses UDP/IP ports for communication. Each port corresponds to a UDP/IP port (port_a is 2047, port_b is 2123, and port_c is 2345).

Data Type	string
Default Value	"port_a"

license_server

Specifies the name of a server that has a license file and can allocate licenses to clients requesting them. The server name is a string that follows the naming conventions supported by the TCP/IP protocol suite. This means that simple names (such as cbanana) and dot-separated addressing domains (athena.mit.edu) are supported. This preference is used with license_port to uniquely identify a server running the licensing process. An error will occur if a licensing process is not running on the specified host computer or if the host computer is not found. This preference must be assigned a value.

Data Type	string
Default Value	"localhost"

license_server_standalone

This preference can be used with itguru or `op_runsim`, but not with `op_license_server`.

Specifies that itguru will run in stand-alone licensing mode. In this mode, the program acts as its own license server. Other machines cannot get licenses from this server. Only this single instance of the application will launch.

Data Type	boolean
Default Value	FALSE

license_server_standalone_diagnose

This preference can be used with itguru or `op_runsim`, but not with `op_license_server`.

Specifies that itguru will run in stand-alone licensing mode and will send diagnostic information to the license log. In this mode, the program acts as its own license server. Other machines cannot get licenses from this server. Only this single instance of the application will launch.

Data Type	boolean
Default Value	FALSE

license_simple_loanable_enable

Specifies whether the license manager supports simplified loanable licensing.

Data Type	boolean
Default Value	TRUE

license_username

Specifies the user name that will be sent to the OPNET web server during license transactions. Used with license_password to authenticate yourself to the web server.

Data Type	string
Default Value	""

manage_loanable_licenses

Specifies whether the license manager can communicate with loanable license brokers to manage loanable licenses. When TRUE, the license manager uses loanable license brokers to provide advanced license-management features such as access lists and pools. When FALSE, the simplified system of loanable license management described in this manual is used.

Data Type	boolean
Default Value	FALSE

mtn_warn_int

Specifies the interval in days between maintenance expiration warnings. These warnings are automatically displayed whenever you exit a program using that requires a license, beginning 60 days before expiration and ending when maintenance is renewed. The warning appears every n days, where n is the value of this preference, except for the period beginning 7 days before expiration and ending 7 days after expiration, when the warning appears every day.

Data Type	integer
Default Value	3

4   License Server

> **WARNING**—Because the license format can change, your license server should run the latest OPNET release. A newer version of the license server can always serve licenses to earlier versions of the product.

`op_license_server` is the application that issues licenses to licensed applications. You may not need to directly invoke this application at all, because the graphical License Manager allows you to perform most common operations, including starting and stopping the license server. However, you may want to use the command line operations offered by `op_license_server`, perhaps by including commands in a script file.

`op_license_server` runs as a service (on Windows platforms) or as a daemon process (on UNIX platforms), issuing licenses to licensed applications. A daemon process is one that executes continuously without being attached to a user shell. Applications send messages to `op_license_server` by referencing its host (the workstation on which it runs) and its port (a unique identifier of a communications port on that host).

You can restrict who has access to certain server operations by creating an `admin_auth` file. If you do not create such a file, any user has access to any of these operations on any server. See Restricting License Server Administration on page AG-4-11 for information.

You can restrict who can obtain licenses from a particular server by creating a `user_auth` file. See Restricting License Server Users on page AG-4-12 for details.

`op_license_server` can run in a standalone or network configuration:

- In the stand-alone configuration, `op_license_server` runs on the same computer as the licensed applications.

- In the network configuration, `op_license_server` executes on a host computer that is a part of an IP network (typical for client-server configurations). Within a local area network (LAN), multiple executing instances of `op_license_server` can coexist, but duplicate licenses (licenses with the same identification numbers) are not allowed. For example, if one license server allocates licenses 100-1 through 100-10, another license server cannot allocate those same licenses.

`op_license_server` is typically started by one of the boot scripts of the host operating system. See section Stopping the License Server on page AG-4-9 for methods of stopping `op_license_server`.

When you invoke a licensed application (such as IT Guru), the application sends a request for a license to `op_license_server`. This application examines the license file and, if a license is free, sends a reply granting the licensed application permission to run. If all licenses are in use, `op_license_server` sends a reply denying permission and the application notifies you.

License Server Modes

The license server has two modes: normal and diagnose.

Normal Mode

Use normal mode for everyday operation. In this mode, the license server performs all of the usual functions, including writing certain events to a log file.

Diagnose Mode

Diagnose mode is not often used, because it is very verbose and creates large log files. However if you are debugging licensing behavior or looking for specific information about when and by whom licenses are checked out, then you can use diagnose mode.

The information generated by running the license server in diagnose mode is recorded to a file called license_server_log, which is located in

- Windows: `<primary_hard_drive>:\OPNET_license`

- UNIX: `/opt/OPNET_license`

This is the same directory where the license_file is located.

Note—The diagnose mode of the License Server writes verbose information to this file that will eventually create a large license_server_log. This file must be deleted occasionally.

To use the diagnose mode, follow the appropriate procedure:

- Procedure 4-1—Describes how to use diagnose mode on an ad hoc basis for either Windows or UNIX platforms.

- Procedure 4-2—Windows: Describes how to configure diagnose mode to start automatically when the computer is restarted.

- Procedure 4-4—UNIX: Describes how to configure diagnose mode to start automatically when the computer is restarted.

Procedure 4-1   Starting the License Server in Diagnose Mode (Ad Hoc)

1 Log in to the machine where the License Server is running.

2 Shut down the License Server. See Stopping the License Server on page AG-4-9 for more information.

    2.1 Start the OPNET License Manager.

    2.2 Locate and select the License Server of interest from the left side of the License Manager window.

    2.3 Click the "Stop" button on the right side of the License Manager window.

       ➥ After a moment, the license server stops.

3 Start the OPNET License Server in diagnose mode:

    3.1 **Windows:** Select "OPNET License Server" from the Services control panel:

       Windows 2000: Start > Programs > Administrative Tools > Services

       Windows NT: Start > Settings > Control Panel > Services

       • Right-click on the "OPNET License Server" service and choose Properties.

       • Add `-diagnose TRUE` to the Start Parameters.

       • Click on the Start button to start the License Server in diagnose mode.

    3.2 **UNIX:** Open a c-shell.

       Type the command `op_license_server -diagnose &`

    Note—Make sure the path to the OPNET software is in your shell PATH

4 Inspect the license_server_log for the information you desire.

5 To disable diagnose mode:

    5.1 Stop the License Server.

    5.2 Select the License Server of interest (in red).

    5.3 Click "Start" to start the License Server in the normal mode.

End of Procedure 4-1

Procedure 4-2   Starting in Diagnose Mode for Windows (Recurrent)

1 Log in to the machine where the License Server is running.

2 Shut down the License Server. See Stopping the License Server on page AG-4-9 for more information.

    2.1 Start the OPNET License Manager.

2.2 Locate and select the License Server (indicated by the green dot) of interest from the left side of the License Manager window.

2.3 Click the "Stop License Server" button on the right side of the License Manager window.

➥ After a moment, the license server stops.

Note—You may need administrator privileges to perform these actions.

3 Modify the system registry.

Note—Since you are editing your system's registry, you should make a backup copy in case you need to recover.

3.1 Select Start > Run > "regedit".

3.2 Navigate to the following key: `\\My Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\OPNET License Server`.

3.3 Double-click on "ImagePath", in the right pane.

➥ The ImagePath value appears in quotes.

3.4 Add the argument `-diagnose` to the end of the value (outside the quotation marks).

3.5 Exit the registry.

4 Start the OPNET License Server. See Starting the License Server (Preferred Method) on page AG-4-7.

4.1 Navigate to the Services panel.

Windows 2000: Start > Programs > Administrative Tools > Services > OPNET License Server.

Windows NT: Start > Settings > Control Panel > Services > OPNET License Server.

4.2 Right-click on the OPNET License Server service, and select Start.

5 Close the Services panel.

End of Procedure 4-2

Procedure 4-3   Starting in Diagnose Mode for UNIX (Recurrent)

1 Modify the auto-boot scripts as described in Starting the License Server on page AG-4-7.

2 Append the "-diagnose" flag to the command line as shown below:

```
<bindir>/op_license_server -license_port <port_name> -diagnose
```

Note—Fill in your own installation directory for <bindir>; substitute the port which defaults to "port_a" for <port_name> in the example.

End of Procedure 4-3

Preferences

Preferences enable you to configure various aspects of program operation. To run correctly, op_license_server must be started with the license_port preference. This preference specifies which one of three ports (port_a, port_b, or port_c) is used to communicate with an application.

Implementation in Supported Platforms

* On Windows platforms, you can change this preference by modifying the Registry.

* On UNIX platforms, you can change this preference by stopping op_license_server, then re-starting it with the new license_port value.

op_license_server supports the following preference sets:

* Standard preferences

* Diagnostics preferences

* Licensing preferences (license_port only)

For information about the Licensing preference set, see Licensing Preferences on page AG-3-14.

For information about other sets of preferences, see Preferences on page ISR-3-1 of the Sentinel *Reference Guide.*

op_license_server Preference

op_license_server also supports the following additional preference:

diagnose

This preference specifies that op_license_server run in diagnose mode, writing detailed information to the log file license_server_log. This file is located in:

* <primary_hard_drive>:\OPNET_license (Windows platforms)

* /opt/OPNET_license (UNIX platforms)

Run `op_license_server` in diagnose mode only when troubleshooting the license server.

Data Type	boolean
Default Value	False

Starting the License Server

There are several ways to start the OPNET license server. Procedure 4-4 gives the preferred way. The remaining procedures in this section give alternate methods for specific OS platforms.

Regardless of the method you use, you should note these considerations:

• You can only start the local license server (the one for the computer you are logged in to).

• The OPNET license server (`op_license_server`) must have read/write permissions on the license file to work correctly.

• If you installed OPNET as "standalone", it will obtain licenses on its own. There is no need to start the license server in this case.

Procedure 4-4   Starting the License Server (Preferred Method)

1 Run the License Manager (as in Starting the License Manager on page AG-3-7).

2 In the License Manager tree view, select the license server for your computer. (It will have a red dot in front of its name, indicating that it is not running.)

3 Click the Start Server button.

End of Procedure 4-4

Windows

The following procedure gives an alternate way to start the license server on Windows.

Procedure 4-5   Starting the License Server on Windows (Alternate Method)

1 Start the Services application (in the Administrative Tools section of the Windows Control Panel).

2 In the resulting dialog box, find OPNET License Server in the scrolling list of available services. If the Status column entry for this service does not read "Started", select it and click the Start button.

3 The Startup column entry should read "Automatic", which indicates that `op_license_server` will be started automatically whenever Windows is restarted. If this is not the case, change the Startup Type property to "Automatic".

End of Procedure 4-5

UNIX

There are two alternate ways to start the license server on UNIX:

- Manually, from the command line.

- Automatically, using auto-boot commands typically located in the `etc/rc` file.

Procedure 4-6 Starting the License Server on UNIX (Manually)

1 Log into the host computer where `op_license_server` is running.

2 Change to the `<reldir>/sys/<arch>/bin` directory, where `<reldir>` is your release directory (such as `<opnet_dir>/7.0.A`) and `<arch>` is your architecture (such as `sun_sparc_solaris`).

3 Type the following command. If you do not know which port is available for `op_license_server`, enter "`port_a`". If that port is unavailable, an error message will tell you which ports are available and you can re-enter the command with the correct port.

```
./op_license_server -license_port <port>
```

End of Procedure 4-6

Procedure 4-7 Starting the License Server on UNIX (Automatically

Note—Root permissions are usually required for this procedure.

1 Create the following file: `/etc/rc3.d/S999_opnet_lic_server`.

2 Insert the following auto-boot commands into the file you created:

```
# OPNET License Server
echo 'starting OPNET License Server...'
```

End of Procedure 4-7

Stopping the License Server

WARNING—Do not stop the license server while any licensed application is running. For best system behavior, revoke all in-use licenses with the License Manager before stopping the license server.

Procedure 4-8 gives the preferred way for stopping the license server. You can also use one of the alternate methods given for specific OS platforms.

Procedure 4-8   Stopping the License Server (Preferred Method)

1   Run the License Manager (as in Starting the License Manager on page AG-3-7).

2   In the License Manager tree view, select the license file of the server you intend to stop and verify that no licenses are in use.

   • If any licenses are checked out, select and revoke those licenses. The user receives a warning message and a short grace period, allowing time to save files and exit the application. If the user does not exit, the application will quit.

3   Click the Stop License Server button.

End of Procedure 4-8

Windows

Start the Windows "Services" application (in the Administrative Tools section of the Control Panel). Select OPNET License Manager from the list of available services and click the Stop button to stop the supervisor service.

UNIX

Procedure 4-9 and Procedure 4-10 describe two alternate ways to stop the license server on UNIX.

Procedure 4-9   Stopping the License Server on UNIX (Alternate Method 1)

1   Invoke the License Manager program from the command line in the stop server mode:

```
op_license_util -license_server_kill -license_server <server> \
   -license_port <port>
```

For information about `op_license_util`, see the *Program Descriptions* chapter of your product documentation.

End of Procedure 4-9

Procedure 4-10   Stopping the License Server on UNIX (Alternate Method 2)

1   Determine the process id (pid) of `op_license_server` by logging into the process's host and using the `ps` command.

2   Execute the `kill` command from the command line:

```
kill <pid>
```

End of Procedure 4-10

License Server Log

The license server application (`op_license_server`) writes messages and errors to a log file. The log file, named `license_server_log` is located in:

- `<primary_hard_drive>:\OPNET_license` (Windows)

- `/opt/OPNET_license` (UNIX)

If the log file grows too large, you can remove it even when the license server is running.

The type and quantity of information written to the log file varies depending on whether the license server is operating in normal or diagnose mode.

In normal mode, the following events are logged:

- Start up and termination of the License Manager

- Arrival of an unexpected or invalid packet from a requesting application

- Inability to read from or write to the license database

- Use of an invalid license file

- Expiration of a license

In diagnose mode, the license server logs information on the following additional events:

- Requesting client is not on the same IP network as the license server

- License freed due to time-out

- License issued or refused

- Arrival of a continuation request from an application

- Arrival of a quit request from an application

- Arrival of a request to use a revoked or reissued license

Restricting License Server Administration

You can restrict access to server administration operations by creating an administration authorization file (`admin_auth`) that is stored on a specific license server. This file specifies machines and users: only the users listed, when logged into the machines listed, can perform server administration operations on that server.

The following operations are restricted:

- Add License

- Revoke License (however, users who are already using licenses can always revoke their own licenses)

- Change Maintenance Expiration

- Change License Expiration

- Deregister License

- Clear License File

- Update System Date

- Start Server

- Stop Server

If you do not create an administration authorization file, any user from any machine has access to these operations.

The administration authorization file is a text file with the following format:

```
<machine> <user>
...
<machine> <user>
```

You can use a plus sign (+) to mean any user or any machine, as shown in the following example.

```
engineering1 root
js_pizza_box jsmith
ww_NT wwilson
+ hhoover
engineering_test +
```

This example file shows that:

- any user logging in as `root` on `engineering1` can perform server administration operations

- `jsmith` can perform operations when logged into js_pizza_box

- `wwilson` can perform operations when logged into `ww_NT`

- `hhoover` can perform operations when logged into any machine

- any user can perform operations when logged into `engineering_test`

Name the administration authorization file as `admin_auth` and place it on the license server for which you want to control administration operations, in the same directory as the license file:

Windows: `<primary_hard_drive>:\OPNET_License\`

UNIX: `/opt/OPNET_License/` or
      `/var/admin/OPNET_License/`

After adding or editing an administration authorization file, you must do one of the following things to make it take effect:

- In the License Manager, choose Tools > Refresh Server Authorization Files.

- Stop and restart the license server.

Restricting License Server Users

You can restrict the users of a particular license server by creating a user authorization file (`user_auth`). In this file you list machine-user pairs that are allowed to receive licenses from that server. A license server with a `user_auth` file will grant licenses only to those machine-user pairs listed in the file.

A user authorization file is a text file with the same format as an administration authorization file (see Restricting License Server Administration on page AG-4-11 for details). Name the user authorization file as `user_auth` and place it on the license server for which you want to specify users, in the same directory as the license file:

Windows: `<primary_hard_drive>:\OPNET_License\`

UNIX: `/opt/OPNET_License/` or
      `/var/admin/OPNET_License/`

After adding or editing a user authorization file, you must do one of the following things to make it take effect:

• In the License Manager, choose Tools > Refresh Server Authorization Files.

• Stop and restart the license server.

Restricting Loanable Licenses

You can restrict who can borrow particular licenses by creating a loan authorization file (`loan_auth`) on a license server. This file lists specific machine-user pairs and the licenses they are authorized to borrow. Users contacting a license server that has a `loan_auth` file will be allowed to borrow only those licenses authorized for them and the machine to which they are logged in.

The loan authorization file is a text file with the format:

```
<machine> <user> <licenses>
...
<machine> <user> <licenses>
```

Machine and user are specified as described in Restricting License Server Administration on page AG-4-11. The `<licenses>` specification gives a license number or range of license numbers to which a machine-user pair has access. Licenses are identified by license number; contiguous license numbers can be given as a range. For example, if the following loan authorization file resides on a license server:

```
engineering1 root 1000/1-10
ww_NT wwilson 1000/3
+ + 1002/1
```

the following loans are authorized from that server:

• any user logged in as `root` on `engineering1` can borrow any license in the range 1000/1 to 1000/10

• `wwilson`, logged into `ww_NT`, can borrow only license 1000/3

• any user, logged into any machine, can borrow license 1002/1

No other machine-user pairs can borrow licenses from this server, and no other licenses can be loaned by the server.

Name the loan authorization file as `loan_auth` and place it on the license server for which you want to restrict license loans, in the same directory as the license file:

Windows: `<primary_hard_drive>:\OPNET_License\`

UNIX: `/opt/OPNET_License/` or
        `/var/admin/OPNET_License/`

If you are administering a remote license server that has a `loan_auth` file and are connected from a machine that is not allowed to borrow licenses from that server, some of the licenses might not appear as being loanable even though they really are.

License File Format Conversion

The format of the license file changed from release 10.5 to 11.0. Because of this, license files from pre-11.0 installations must be converted before the OPNET 11.0 license server can use them. After installing the 11.0 software, you must convert your license files by doing Procedure 4-11.

Until the license file is converted, the 11.0 license server will be unable to provide licenses to any 11.0 clients. (However, it can provide licenses to pre-11.0 clients.) After the license file is converted, 11.0 license servers will be able to serve licenses to both 11.0 and older license clients.

Procedure 4-11   Converting Pre-11.0 License Files

1   Start the 11.0 License Manager (as in Starting the License Manager on page AG-3-7).

2   In the License Manager tree view, select the server whose license file you want to convert. Servers with unconverted license files are marked by a yellow dot with a C, as shown in the following figure.
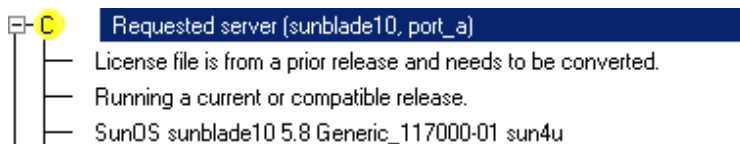
3   Click the Convert Pre-11.0 License File button and follow the on-screen prompts.

   Note—More detailed instructions on how to convert a license file are posted at the OPNET Support Center (www.opnet.com/support); follow the License Registration link to the Instructions section.

End of Procedure 4-11

Index