



Cisco Application Analysis Solution Reference Administrator Guide

Software Release 11.5

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Cisco Application Analysis Solution

Reference

Administrator Guide

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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 windowing 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
April 2005	11.0 PL3	Licensing	<ul style="list-style-type: none"> • Combined License Manager and License Server chapters. • Updated content with information from various Technical Support FAQs.
February 2005	11.0 PL3	License Server	<ul style="list-style-type: none"> • Added information from FAQ 725 for diagnose mode.
October 2004	11.0 PL1	License Manager	<ul style="list-style-type: none"> • Added various information on license file conversion.
		License Server	<ul style="list-style-type: none"> • Added requirement to stop and restart server when Restricting License Server Administration and Restricting License Users. • Updated and clarified procedures for Starting the License Server. • Added information about License File Format Conversion.
August 2004	11.0	License Manager	<ul style="list-style-type: none"> • Changed data type of license_http_proxy_password and license_password preferences.
		License Server	<ul style="list-style-type: none"> • Added information on loan authorization files in Restricting Loanable Licenses.
March 2004	10.5 PL1	Installation Support	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Added preferences license_http_proxy_password, license_http_proxy_user, and manage_loanable_licenses.
August 2003	10.0 PL1	License Manager	<ul style="list-style-type: none"> • Added loanable license operations: Extend the Loan Period for a Loanable License, Change Authorized Loan Duration (button), and Change Loan Properties (button).
January 2003	10.0	ALL	<ul style="list-style-type: none"> • First Issue

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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	<code><arch></code> Directory Name
Sun Microsystems	SPARC	Solaris	<code>sun_sparc_solaris</code>
various	various	all UNIX systems	<code>unix</code>
various	Pentium	Windows	<code>pc_intel_win32</code>

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 11.5.A is installed in the directory `/usr/opnet`, then `<bindir>` represents the Solaris path name

```
/usr/opnet/11.5.A/sys/sun_sparc_solaris/bin
```

or the Windows path name

```
\opnet\11.5.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, then `<libdir>` represents the directory path name `/usr/opnet/11.5.A/sys/sun_sparc_solaris/lib`.
- licensing system*** The licensing system allows you to run IT Guru or another licensed application on any workstation on the local network. See The Licensing System 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).
- A typical location for the OPNET directory is:
- Windows: `C:\Program Files\Cisco`
- 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.
- 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 “lpc 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 OK.
 - ➔ 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 OK (Continue) button.
 - ➔ The MS Loopback Adapter Card Setup dialog box opens.

- 4 Click OK.
 - ➔ 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 OK.
- 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 license file 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 Log in as administrator to the machine where IT Guru 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> and 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 Log in as root to the machine where IT Guru software is located.
- 2 Delete the directory containing the IT Guru software (<opnet_dir>/<reldir>).
- 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> and 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 > Programs > OPNET IT Guru 11.5 > License Manager).
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 treeview, 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 containing the IT Guru software (<opnet_dir>/<reldir>).
- 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 Licensing

This chapter describes the OPNET licensing infrastructure, providing an overview of licenses, the licensing system, and the components of the licensing system. OPNET licensing includes two major components:

- License Manager
- License Server

The *License Manager* program is the graphical user interface (GUI) that allows you to interact with License Servers and license files. The License Manager can be used to manage License Servers and license files on local and remote computers.

A License Server is an application running in the background on a computer. When IT Guru is run, it looks for a License Server to grant it a license to run.

The Licensing System

The License Manager can oversee multiple license servers in a network. Each license server allocates licenses to one or more clients. IT Guru licenses, if not used in standalone mode, are floating licenses; this means that a pool of licenses is maintained by the license server. Any authorized user who can access the license server can use any free license. Licenses are not pre-assigned to a specific user. By default all users are authorized to obtain licenses. See Restricting License Users on page AG-3-29 for information on how to restrict the use of licenses.

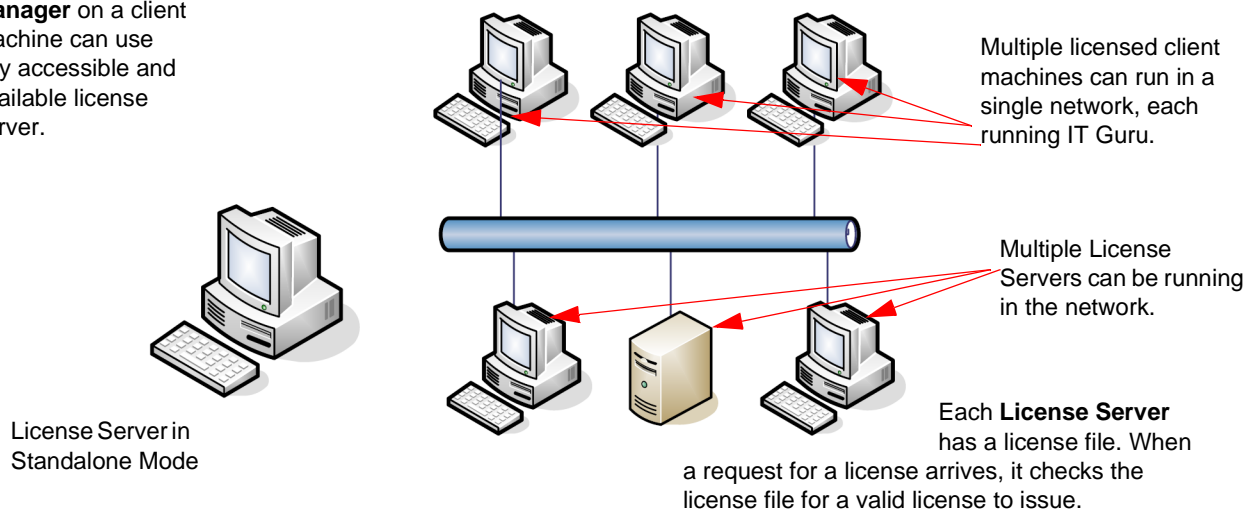
The licensing system consists of these parts:

- License Servers—One or more computers, each running one license server. The license 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—Clients request and are granted licenses from a particular license server. See Set as Default Server (button) on page AG-3-11 for more information.
- Licenses—Licenses allow a user to use specific applications (such as IT Guru) and modules (such as Multi-Vendor Import). See About Licenses on page AG-3-2 for details.

Figure 3-1 shows an example of a licensing system.

Figure 3-1 License Manager Components

The **License Manager** on a client machine can use any accessible and available license server.



About Licenses

A license conveys the right to use an application. A license may be a single permit or a bundle of permits. A 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-permit 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.

Key Concept—You can turn on or off product modules such as Multi-Vendor Import (MVI). Choose License > Product Modules from the IT Guru system editor (the “splash screen” that appears when you start IT Guru), and check the options you want. When you are finished, restart IT Guru.

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.

- Solaris: `/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/admin/OPNET_license`.

License Manager

The License Manager is the first component you encounter during installation. There are two ways to configure the licensing system during installation:

- Standalone mode—This allows you to run OPNET products only on the machine on which the license is installed.
- Floating mode—This allows the license server to issue licenses to run applications on multiple computers.

Regardless of the type of license installation, you can use the License Manager to administer application licenses. Typical license operations are

- Selecting a default license server
- Adding a license to the license file
- Extending the expiration or maintenance date of a specific license
- Starting or stopping a license server
- Reviewing usage statistics

Using the License Manager

This section describes how to start the License Manager and how to perform 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 deregistering all licenses, because the License Manager will not allow you to deregister 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 the Windows Start menu, perform the following procedure:

Procedure 3-1 Starting the License Manager From the Start Menu (Windows)

- 1 Select Start > Programs > Cisco Application Analysis Solution 1.1 > License manager.

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

End of Procedure 3-1

To start the License Manager with a script command, perform 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 a command line, perform the following procedure:

Procedure 3-3 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 3-3

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

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

- 1 Launch itguru.
- 2 Choose License > License Management.
 - ➔ The License Manager opens.

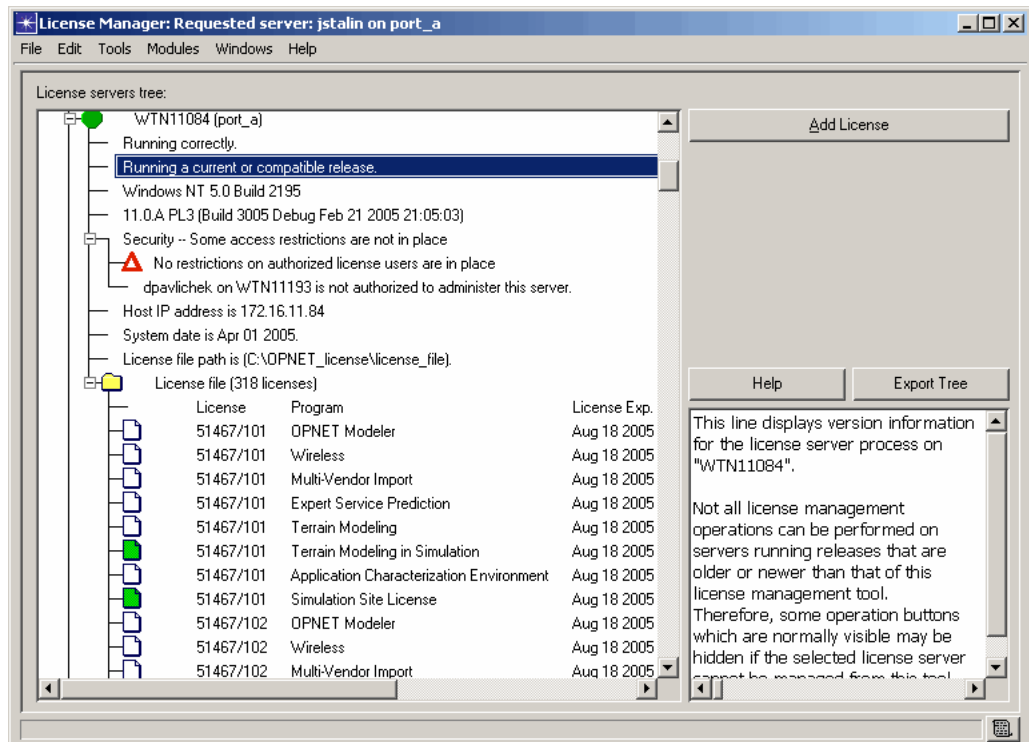
Note—At least one license in the license file will be in use.

End of Procedure 3-4

About the License Server Tree

The License Manager shows information about the license servers in the network in a treeview.

Figure 3-2 License Manager Window



Click on the “Help” button to see a legend and description, shown in Figure 3-3, of the icons shown in the License Manager window.

Figure 3-3 License Manager Help Screen

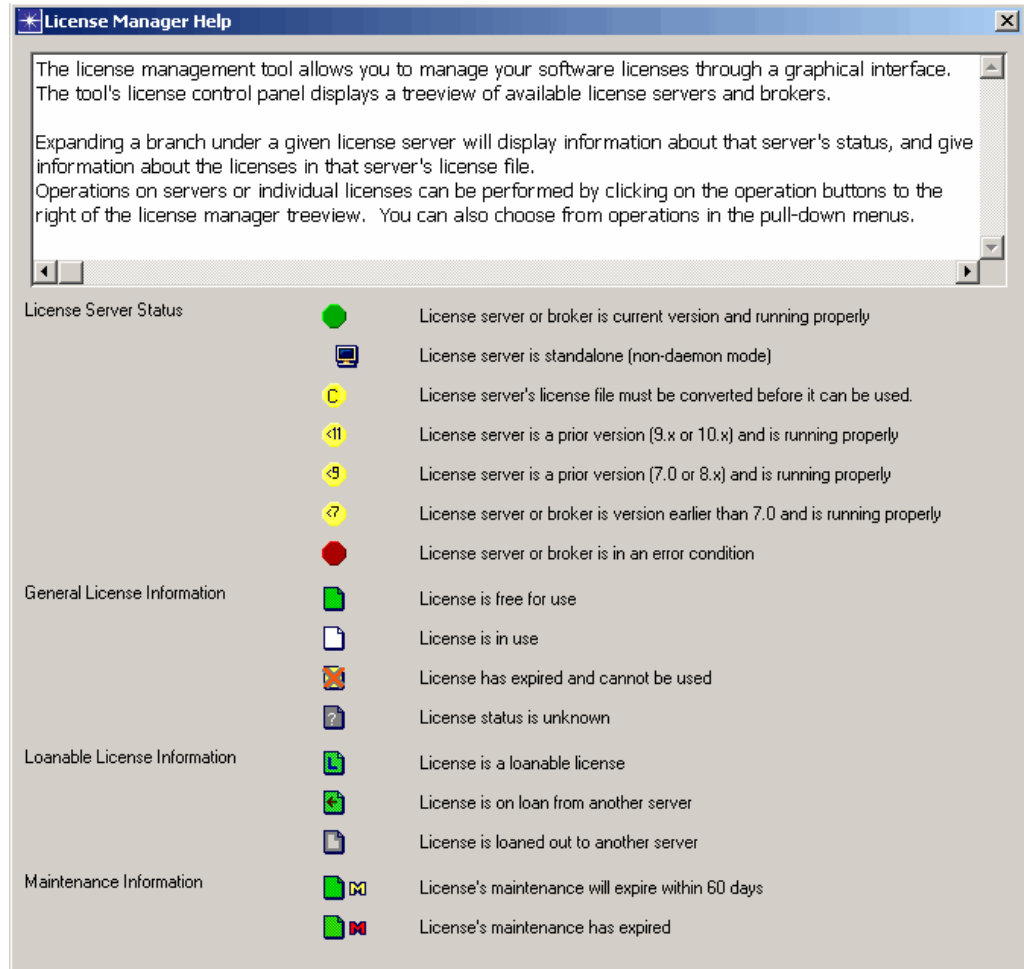


Table 3-1 lists the elements of the license servers displayed in the License Manager window.

Table 3-1 License Server Elements

Field	Description
Requested Server	This branch shows the server from which the IT Guru program can request and be issued licenses. You specify this server during Guru installation, by selecting it from within the License Server tree, or by listing the server name and port in your Preferences file in the <code>license_server</code> and <code>license_port</code> preferences, respectively.
Operating System	The OS version of the License Server is displayed in the tree.
OPNET Build	The OPNET software version and build installed on the license server are displayed in the tree.
Security	Shows whether or not there is an <code>admin_auth</code> or <code>user_auth</code> file in place to control license management and usage. For more information, see Restricting License Server Administration on page AG-3-27.
Host IP Address	The “Host IP address” given for each server is the return address of the IP packet received by the License Manager. This is not necessarily the actual IP address of the license server but could be the address of the firewall port through which the license server is accessed, for example.
System Date	The system date of the License Server is displayed.
License File Path	The full path of the license file location is displayed in the tree.
License File	Shows the number and type of licenses installed on the server. See Table 3-2 for more information on license attributes.
Local Servers	Shows other license servers running on your computer.
Other Servers on this IP Network	Shows other license servers running on your IP network segment.
End of Table 3-1	

A license has several associated attributes, as listed in Table 3-2.

Table 3-2 License Attribute Definitions

Attribute	Description
Status	<p>This icon identifies the state of the license:</p> <ul style="list-style-type: none"> • A <i>free license</i> (shown in green) is available to the next user who requests it. • An <i>in use license</i> (shown in white) is unavailable. • An <i>expired license</i> (shown as yellow with red X) is no longer valid.
License number	<p>A unique pair of numbers that identifies the license. A license may bundle several programs. This means that a single license (for example, 100/1) that includes the programs IT Guru and Multi-Vendor Import will be shown as two separate lines in the License Manager interface.</p>
Program name	<p>Controls which products or modules the license can run (such as IT Guru or the ACE module).</p>
License expiration	<p>Controls how long you can use the license. After a license expires, it no longer runs OPNET products.</p>
Maintenance expiration	<p>Controls which releases of the OPNET software can be run.</p>
User	<p>If the license is in use, this attribute shows the name of the user who checked out the license.</p>
Host	<p>If the license is in use, this attribute shows the machine where the license is being used.</p>
Time in Use	<p>If the license is in use, this attribute shows the days, hours, minutes, and seconds elapsed since the start of use.</p>
End of Table 3-2	

Operations

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)

License operations are available from the drop-down menu. Many License Manager operations can also be accessed from a pop-up menu by right-clicking on a server, license file, or license icon in the treeview.

License Manager Operations

Export Tree (button) The license tree can be exported to a tab-delimited text file using the Export Tree feature. This feature is useful for troubleshooting.

Convert License File (File menu, button) Converts a pre-11.0 license file to a format the License Manager can use. After conversion, older license servers can use the license file, but you should only use the latest release of License Server to add or deregister licenses from the license file. You should convert the license file after the 11.0 installation process.

Note—The button to convert the license file is “Convert pre-11.0 License File”.

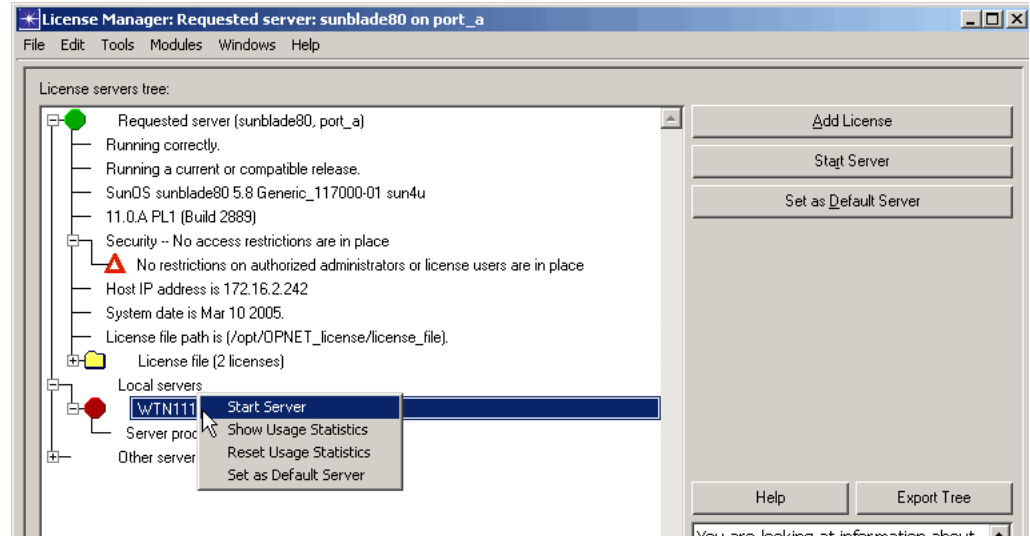
Note—If a license file is in an old format and needs to be converted, all operations except Stop Server, Start Server, and Convert License File are disabled. See License File Format Conversion on page AG-3-29 for more information.

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 when discrete event simulations are run.)

Server Operations

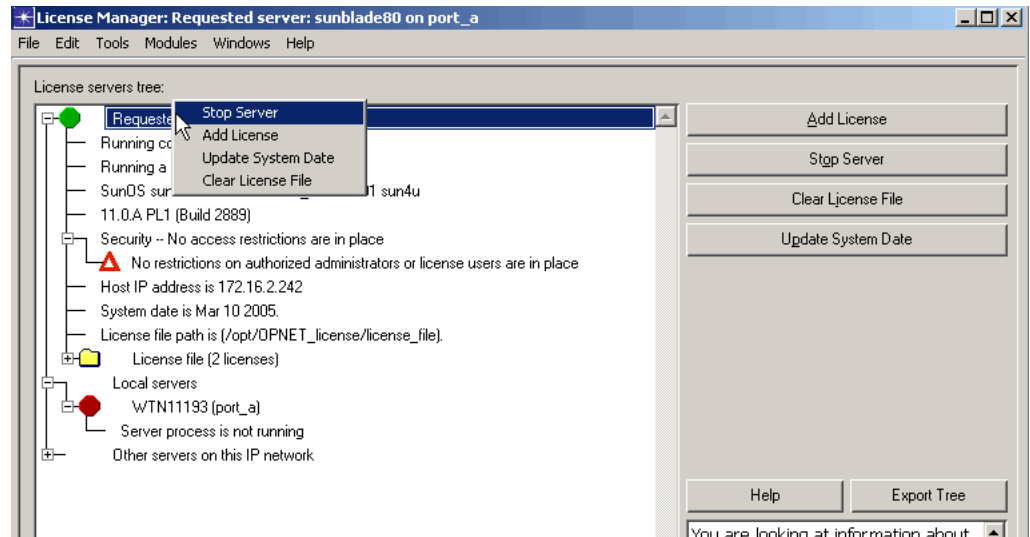
Start Server (button) Starts the selected server, allowing it to issue licenses and perform other license server functions. This button is active only when the selected server is your own (local) machine. To determine if a machine is local, type `hostname` in a shell window. See Procedure 3-5 on page AG-3-19 for details. You can also right-click on the server, and select “Start Server” from the pop-up menu. If the selected license server is already running, this button is not visible.

Figure 3-4 Right-Click Server Operations



Stop Server (button) Stops the selected server. A server can be stopped even if running on a remote machine. See Procedure 3-10 on page AG-3-22 for details. You can also right-click on the server and select “Stop Server” from the pop-up menu, as shown in Figure 3-4. If the selected license server is not running or is in standalone mode, this button is not visible.

Figure 3-5 Right-Click Server Operations



Update System Date (button) Allows you to reset the license server's date, shown in the System Date field as described in Table 3-1, to the current date. Resetting the date requires that you contact OPNET via either the Internet, e-mail, or phone/fax. You can also right-click on the server, and select "Update System Date" from the pop-up menu, as shown in Figure 3-5.

Note—You might need to perform 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) Sets user preferences so that the selected server is 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 correspond to this server. You can also right-click on a server other than the server you are currently using, and select "Set as Default Server" from the pop-up menu.

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.

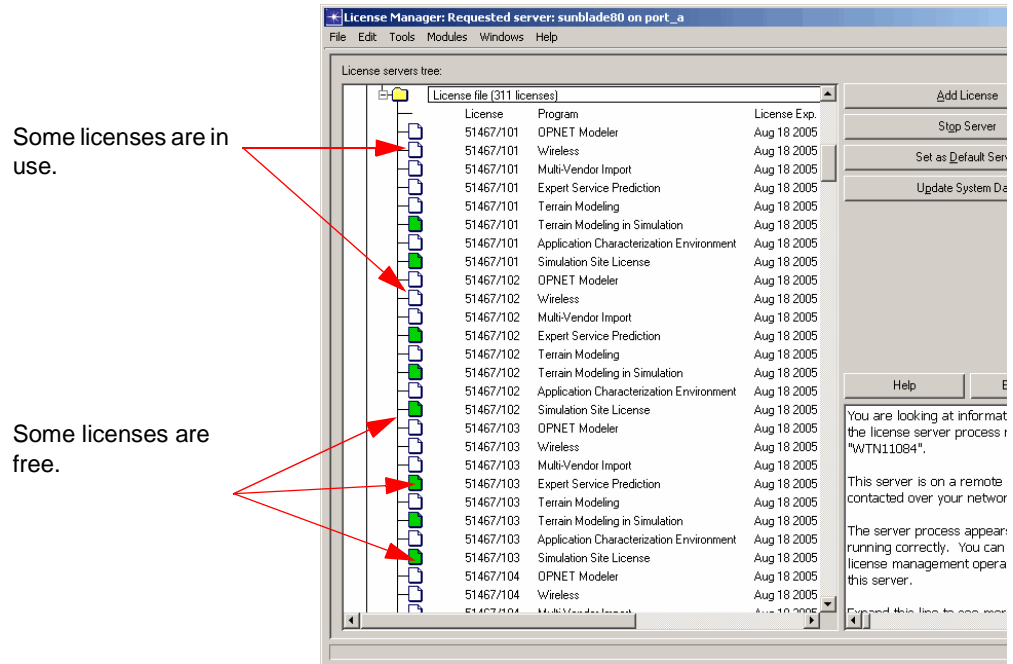
Reset Local Server's Usage Statistics (Tools menu) Resets the usage statistics for the local server.

Create License File (Button) This button appears only if there is no license file on the computer where the license server is running. When you click this button, a new license file is created. It will not have any licenses in it. Use the Add License (button) to add licenses.

License Operations

The contents of the License file are displayed when you expand the License file folder under a selected server. 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 3-6 Example License File



You can restrict who has access to the following 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-3-27 for details. License operations are as follows.

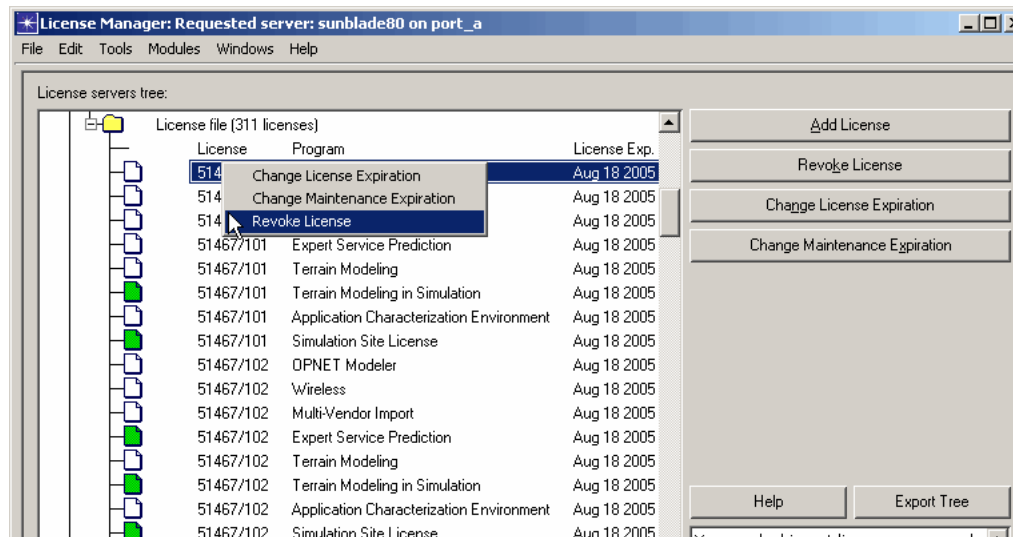
Add License (button) Allows you to add one or more licenses to a server. Requires that you contact OPNET by Internet, e-mail, or telephone (voice or fax). You can also right-click on a server to add a license from the pop-up menu, as shown in Figure 3-7.

You can find detailed instructions on adding licenses on the OPNET Technical Support website: http://www.opnet.com/services/licenses_register.html.

Figure 3-7 Add License from Pop-Up Menu

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

Figure 3-8 Revoke License from Pop-Up Menu



Change Maintenance Expiration (button) Lets you set a new maintenance expiration date. You can change maintenance expiration from the pop-up menu by right-clicking on the license. The maintenance expiration date determines

- The time period for which you have access to OPNET Technical Support.
- Which release of an application you can run. For example, suppose 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.

You can find detailed instructions on changing the maintenance expiration date on the OPNET Technical Support website:

http://www.opnet.com/services/licenses_register.html.

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. You can also right-click on a license and change its expiration.

You can find detailed instructions on changing the expiration date for a license on the OPNET Technical Support website:

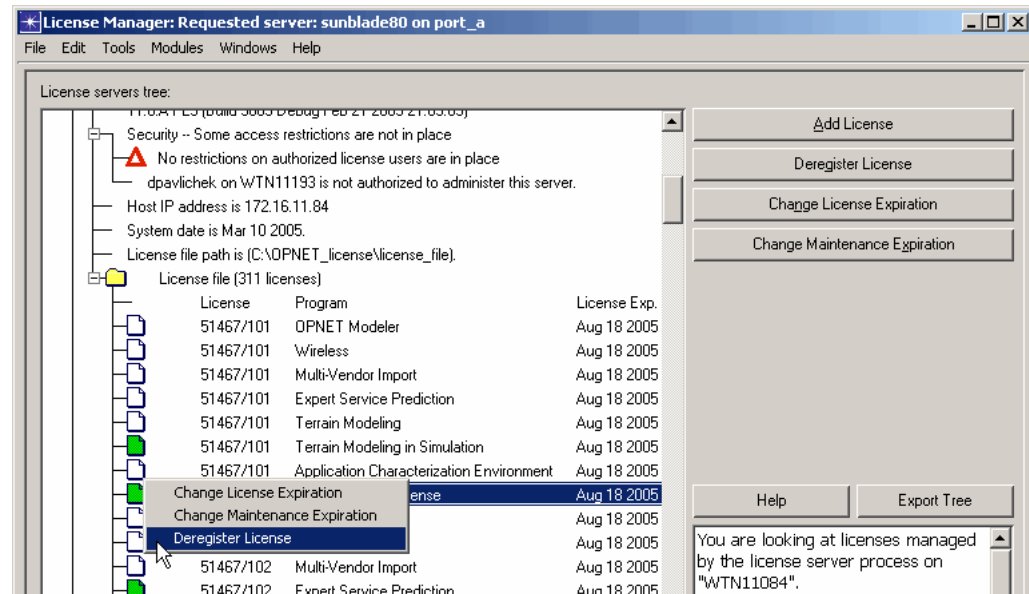
http://www.opnet.com/services/licenses_register.html.

Note—You can move a license from one license file to another. To do this you must first deregister the license from one license file, then add the license to the target license file. You can only deregister a license a certain number of times each year, as specified in your agreements with OPNET Technologies, Inc.

Deregister License (button) This button removes a license from your computer. Typically, you will use this if the computer is about to be reformatted or decommissioned, or if you want to move the license to another license file. The button does not appear if you have selected a permit that is in use. You can also right-click on a license and deregister it from the pop-up menu, as shown in Figure 3-9.

You can find detailed instructions on license deregistration on the OPNET Technical Support website:
http://www.opnet.com/services/licenses_register.html.

Figure 3-9 Deregister License from Pop-Up Menu



Clear License File (button) This operation deregisters all licenses from the license file in a single operation. This button appears only if no licenses in the file are in use. The choice also appears on the pop-up menu when you right-click on a license file, if no licenses in the file are in use. You should contact OPNET Technical Support by e-mail, phone, or fax before performing this operation.

When should you use “Deregister License” or “Clear License File”? These two choices perform the same operation but on a different scale.

- If you want to deregister all of your licenses in a single operation, use Clear License File. This deregisters all licenses in the license file at once, regardless of their contract number range. You must contact OPNET Technical Support by e-mail, phone, or fax before proceeding.
- If you want to deregister a selected license use the Deregister License operation and select which licenses will be removed from your license file. You do not need to contact OPNET Technical Support before performing this operation.

Deregister License is the recommended method, because you do not need to contact OPNET Technical Support. Select the license of interest, click on the Deregister License button, and then click Express. Follow the prompts to remove the licenses from your license file.

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

Validate License File (Button) This button only appears in rare circumstances in which a license file has become invalid. An invalid license file cannot be used to issue licenses. You must contact OPNET Technical Support to use this operation.

License Server

WARNING—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.

License Server (`op_license_server`) is the application that issues licenses to licensed applications, when you use workgroup licensing. 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.

Note—If you are using standalone licensing, Guru accesses the license file locally and does not use `op_license_server`.

`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 license operations on any server. See Restricting License Server Administration on page AG-3-27 for information.

You can restrict who can obtain licenses from a particular server by creating a `user_auth` file. See Restricting License Users on page AG-3-29 for details.

Licensing Schemes

When you install Guru, you are asked to choose a licensing scheme. Table 3-3 describes the use cases for each type of licensing.

Note—To change licensing schemes, you must reinstall the latest Guru version from your product CD or from a downloaded version obtained on the OPNET Support Center website. Normally this is all that is required to change the licensing scheme. However, if you previously used Edit > Preferences in IT Guru to change the value of the `license_server_standalone` preference, you must manually set `license_server_standalone` to the correct value after reinstalling the software.

Table 3-3 Licensing Schemes

Licensing Scheme	Use Case
Standalone	<ul style="list-style-type: none"> • OPNET products will be used only on the computer where the license is installed. • All discrete event simulations (DES) will be launched from the IT Guru GUI, rather than from a command line or from a script. • Report Server, 3DNV, or VNE Server applications are not used.
Workgroup/Floating	<ul style="list-style-type: none"> • You want to share a license among several users in the same IP network. • You want to run DES from command line, script, or batch file (outside the context of the IT Guru GUI). • A VNE Server application will obtain its license from this License Server.
End of Table 3-3	

Standalone Licensing

In the standalone configuration Guru acts as its own License Server, accessing the license directly without any intermediary program. When you use standalone mode, Guru may only be run on the computer where the license is installed.

Workgroup Licensing

In the workgroup, or “floating”, configuration, `op_license_server` executes on a host computer that is on the same classful IP network as the clients it serves.

Note—The license server and clients must be in the same classful IP network. Therefore, unless the license server and the client have the same network address, licenses cannot be issued.

Within the 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.

Starting the License Server

There are several ways to start the License Server. `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-3-22 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 license server 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.

Procedure 3-5 describes the preferred way to start the License Server. The remaining procedures in this section describe alternate methods for specific operating systems.

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

- You can only start the local License Server (the one for the computer into which you are logged in).
- The OPNET License Server (`op_license_server`) must have read/write permissions on the license file to work correctly.
- If you installed Guru in standalone licensing mode, it will obtain licenses on its own. There is no need to start the license server in this case.

Procedure 3-5 Starting the License Server (Preferred Method)

- 1 Run the License Manager (as in Starting the License Manager on page AG-3-3).
- 2 Select the License Server for your computer in the License Manager treeview. (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 3-5

Windows

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

- Manually
- Automatically

Procedure 3-6 Starting the License Server on Windows (Manually)

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

Note—Your path to the Services application depends on your version of the Windows operating system. Please consult your Microsoft manual for assistance.

- 2 Locate 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 3-6

If you want the License Server to start automatically whenever the computer is rebooted, follow Procedure 3-7.

Procedure 3-7 Starting the License Server on Windows (Automatically)

- 1 Install or reinstall IT Guru.
- 2 Select “Floating: Serve licenses from this computer” as your licensing scheme.
- 3 Complete the installation.

End of Procedure 3-7

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 3-8 Starting the License Server on UNIX (Manually)

- 1 Log into the host computer where `op_license_server` is running.
- 2 Navigate to the binary directory (`<bindir>`) for your OPNET release and architecture.
- 3 Type the following command.

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

Note—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.

End of Procedure 3-8

Procedure 3-9 Starting the License Server on Solaris and Linux (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...'
<bindir>/op_license_server -license_port <port>
```

- 3 (Linux only) Copy the same script to `/etc/rc5.d` using the following command:

```
cp /etc/rc3.d/S999_opnet_lic_server /etc/rc5.d
```

End of Procedure 3-9

Stopping the License Server

WARNING—Do not stop the License Server while any licensed application is running, unless you will bring the license server back up within 15 minutes. For best system behavior, ask users to stop using the software or revoke all in-use licenses with the License Manager before stopping the License Server.

Procedure 3-10 describes the preferred way for stopping the License Server. You can also use one of the alternate methods given for specific OS platforms.

Procedure 3-10 Stopping the License Server (Preferred Method)

- 1 Run the License Manager (as in Starting the License Manager on page AG-3-3).
- 2 In the License Manager treeview, 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, you can forcibly revoke them. To do so, 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.
 - You can choose not to revoke any checked-out licenses if you will bring the license server back up within a few minutes.
- 3 Click the Stop License Server button.

End of Procedure 3-10

Procedure 3-11 Stopping the License Server on Windows (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 3-11

Windows

In addition to the preferred method, you can stop the License Server on Windows by starting the Windows “Services” application. Select OPNET License Manager from the list of available services, and click the Stop button to stop the supervisor service. You can also use Procedure 3-11.

UNIX

Procedure 3-12 describes an alternate way to stop the license server on UNIX.

Procedure 3-12 Stopping the License Server on UNIX (Alternate Method)

WARNING—Use this procedure only when other methods do not work.

- 1 Determine the process id (pid) of `op_license_server` by logging into the process' host and using the `ps` command.
- 2 Execute the `kill` command from the command line:

```
kill <pid>
```

End of Procedure 3-12

License Server Reporting

A new utility lets a license server track license usage statistics and produce statistical reports upon request. When tracking is enabled on the license server, you can generate reports from the license manager console, using two new commands, on any client. Either command lets you specify a number of days on which to report.

- `fldb_stats`—Produces a usage report for the license server.
- `license_stats`—Produces a usage report for individual licenses.

The report displays on the screen, and a time-stamped `.csv` copy of the file is placed in your `\op_admin\tmp` directory.

Enable License Tracking

Use one of the following procedures, depending on your platform, to enable license tracking.

Procedure 3-13 Enable License Tracking (Windows)

- 1 Stop the license server, using Procedure 3-10 or Procedure 3-11.
- 2 Start the license server, adding the command to enable tracking.
 - 2.1 Choose Start > Programs > OPNET IT Guru 11.5 > OPNET Console 11.5.

2.2 Type `op_license_server -license_usage_tracking_enable [-license_usage_tracking_history_days <number of days>]`, at the DOS prompt.

Note—If you do not use the `-license_usage_tracking_history_days <number of days>` parameter, tracking is automatically enabled for a 30 day history.

End of Procedure 3-13

Procedure 3-14 Enable License Tracking (UNIX)

- 1 Stop the license server, using Procedure 3-10 or Procedure 3-12.
- 2 Start the license server, adding the command to enable tracking.
 - 2.1 Open a shell.
 - 2.2 Type `op_license_server -license_usage_tracking_enable [-license_usage_tracking_history_days <number of days>]`, at the prompt.

Note—If you do not use the `-license_usage_tracking_history_days <number of days>` parameter, tracking is automatically enabled for a 30 day history.

End of Procedure 3-14

Obtaining License Server Statistics

Once license tracking is enabled, you can generate statistical reports about license usage. Use one of the following procedures, depending on your platform, to generate a report.

License Server Usage Reports

A license server usage report provides license file statistics, including license ID (license number, contract number and program name), total time in use, average checkout time, number of checkouts, number of unique users who accessed the file, and user IDs of those who accessed the file.

Procedure 3-15 Generate License Usage Reports per Server (Windows)

- 1 Choose Start > Programs > OPNET IT Guru 11.5 > OPNET Console 11.5, to open a console window.

Note—You can generate the reports from any client machine that has access to the license server.

- 2 Type `op_license_util -license_server <license_server_name>`.
➔ A license server prompt displays.

- 3 Type `fldb_stats` to print a usage report for the license server.
 - ➔ The report displays and scrolls on the screen.
- 4 Enter the number of days for which you wish to report.
- 5 Obtain a .csv copy of the report from your `\op_admin\tmp` directory.

Note—The naming convention of the file is
`license_usage_report_MM-DD-YYYY_HH:MM:SS`.

End of Procedure 3-15

Procedure 3-16 Generate License Usage Reports per Server (UNIX)

- 1 Open a shell.
 - Note**—You can generate the reports from any client machine that has access to the license server.
- 2 Type `op_license_util -license_server <license_server_name>`.
 - ➔ A license server prompt displays.
- 3 Type `fldb_stats` to print a usage report for the license server.
 - ➔ The report displays and scrolls on the screen.
- 4 Enter the number of days for which you wish to report.
- 5 Obtain a .csv copy of the report from your `/op_admin/tmp` directory.

Note—The naming convention of the file is
`license_usage_report_MM-DD-YYYY_HH:MM:SS`.

End of Procedure 3-16

License File Usage Reports

A license file usage report provides license server statistics, including maximum number of concurrent users, maximum number of concurrent licenses in use, and average number of concurrent licenses in use. Figure 3-10 shows an example of the .csv file that is produced.

Figure 3-10 License File Usage Report

	A	B	C
1	Report Date	Jun 28 2005	
2	Report Time	15:39:27	
3	Number of Days	65.57	
4			
5	Maximum number of distinct users at one time	10	
6	Maximum number of licenses in use at one time	100	
7	Average number of licenses in use (time average)	5.700047	
8			
9			
10			
11			
12			
13			

Procedure 3-17 Generate License Usage Reports per License File (Windows)

- 1 Choose Start > Programs > OPNET IT Guru 11.5 > OPNET Console 11.5, to open a console window.

Note—You can generate the reports from any client machine that has access to the license server.

- 2 Type `op_license_util -license_server <license_server_name>`.

➔ A license server prompt displays.

- 3 Type `license_stats` to print a usage report for the license server.

➔ The report displays and scrolls on the screen.

- 4 Enter the number of days for which you wish to report.

- 5 Obtain a .csv copy of the report from your `\op_admin\tmp` directory.

Note—The naming convention of the file is `license_file_usage_report_MM-DD-YYYY_HH:MM:SS`.

End of Procedure 3-17

Procedure 3-18 Generate License Usage Reports per License File (UNIX)

- 1 Open a shell.

Note—You can generate the reports from any client machine that has access to the license server.

- 2 Type `op_license_util -license_server <license_server_name>`.

➔ A license server prompt displays.

- 3 Type `license_stats` to print a usage report for the license server.

➔ The report displays and scrolls on the screen.

- 4 Enter the number of days for which you wish to report.

- 5 Obtain a .csv copy of the report from your `/op_admin/tmp` directory.

Note—The naming convention of the file is `license_file_usage_report_MM-DD-YYYY_HH:MM:SS`.

End of Procedure 3-18

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

WARNING—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\`

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

Linux: `/opt/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 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.

WARNING—If you do not create a user authorization file, any user from any machine can obtain licenses and run applications.

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-3-27 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\  
Solaris: /opt/OPNET_license/ or  
         /var/adm/OPNET_license/  
Linux: /opt/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.

License File Format Conversion

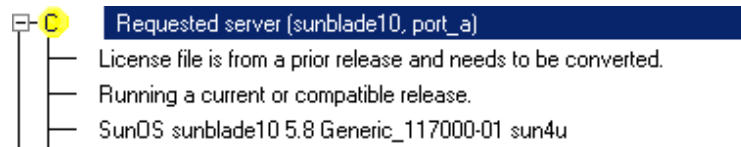
The format of the license file changed from release 10.5 to 11.0. Because of this, license files from pre-11.0 installations must be converted before the OPNET 11.0 license server can use them. After installing the 11.0 software, you must convert your license files by doing Procedure 3-19.

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 3-19 Converting Pre-11.0 License Files

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

- In the License Manager treeview, 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.



- 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 3-19

Troubleshooting

This section contains information intended to help you troubleshoot common problems, decipher licensing errors, and debug licensing operations.

Diagnose Mode

This section provides a description of the diagnose mode available for License Server and procedures specific to your operating system.

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`

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

Linux: `/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 3-20—Describes how to use diagnose mode on an ad hoc basis on Windows, Solaris, and Linux platforms.
- Procedure 3-21—Windows: Describes how to configure diagnose mode to start automatically when the computer is restarted.
- Procedure 3-5—UNIX: Describes how to configure diagnose mode to start automatically when the computer is restarted.

Procedure 3-20 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-3-22 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:

Windows

- 3.1 Select OPNET License Server from the Services control panel:

Windows 2000, XP: 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` to the Start Parameters.
- Click on the Start button to start the License Server in diagnose mode.

UNIX

- 3.1 Open a c-shell.

Type the command `op_license_server -diagnose &`

Note—Make sure the path to IT Guru 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 3-20

Procedure 3-21 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-3-22 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-3-19.

4.1 Navigate to the Services panel.

Windows 2000, XP: 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 3-21

Procedure 3-22 Starting in Diagnose Mode for UNIX (Recurrent)

1 Modify the auto-boot scripts as described in Starting the License Server on page AG-3-19.

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 3-22

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 the following directory:

Windows: `<primary_hard_drive>:\OPNET_License\`

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

Linux: `/opt/OPNET_license/`

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

Common Problems and Solutions

Cannot Find License Server You Wish to Use

- If you cannot see the license server you want in the license treeview, you can add it to your `license_managed_servers` preference. (See Preferences on page AG-3-42). After editing the preference, click on File > Refresh Server Information in the License Manager.
- If the above method is problematic, you can also set the default license server by directly changing the `license_server` preference to the hostname or IP address of the computer that has the licenses you want to use.
- For standard workgroup licensing, the license server you choose must be in the same classful IP network as the computer on which you are running OPNET products.
- For loanable licensing, make sure you set the requested server to be a local License Server.

License Not Obtained

If you see a dialog box telling you that a license was not obtained, consider the following possible solutions for each type of problem. The type of problem is described in the “What Happened?” section of the dialog box.

- There was no response from the license server.
 - Are `license_server` and `license_port` set to the correct value, and are they spelled correctly? Use the “hostname” command to determine the exact spelling and capitalization.
 - Is the specified license server running?
 - Can the client ping the server? Can the server ping the client? This applies even if the server is the client. TCP/IP must be installed and running, even in standalone mode.
 - Is the license server an older release of IT Guru? Run the latest release of the License Server.
 - Rarely this may be accompanied by errors saying the `op_models` directory does not exist. It could be the case that changes to the preferences cannot be stored because IT Guru cannot write to the home directory. This can be due to permissions or because the directory does not exist.
- There are no licenses in the server's license file.
 - Set the `license_server` preference to a host with available licenses.
 - Use the Add Licenses button in the License Manager to add licenses to the server's license file.

- The license server did not grant your request for licenses.
 - You may be running a License Server that is too old for your licenses. In that case upgrade to the latest available License Server.
 - In the case of the “11.0 License Not Obtained” error message, perform the “Convert pre-11.0 License File” operation described in Procedure 3-19.
 - Set the `license_server` preference to a computer with available licenses.
 - Use the Add Licenses button in the License Manager to add licenses to the server's license file.
 - Deselect any product modules that are not in use.
- The only available license has expired or The only available license's maintenance has expired.
 - Perform the Change Maintenance Expiration operation if the current authorized maintenance date is not reflected in the license file.
 - Perform the Change License Expiration operation if the current authorized expiration date is not reflected in the license file.
 - Be sure to use Select Product Modules to deselect product modules that are unavailable.
 - In rare instances you may need to perform the Update System Date operation, if License Server date is too far in the future.
- The requested license was found in the license server's license file but it is in use.
 - The most common cause of this message is that the license is in use by another user.
 - If IT Guru exited ungracefully, select the license in the License Manager, then click on the Revoke License button to revoke the permits that are erroneously listed as “in use”. (IT Guru will automatically recover from this situation after no more than one hour without intervention).

Note—VNE Server licenses are not recovered in the one hour time period. A license may not be automatically revoked for several days.

- The license server is a “standalone” license server. A standalone license server cannot issue licenses to other applications.
 - An obvious remedy is to make sure you are selecting a License Server that is not in standalone mode.
 - If you are certain you have selected the correct default server, switch the License Server to server mode. Stop the license server and (re)install the latest software patch level (on the server machine). During the installation, choose Floating: Serve licenses from this computer.

- Your machine's IP network address is different from the IP network address of the license server.
 - You must use a License Server on your local IP network. Check to be sure you are using a License Server on your local IP network.
 - This error can also occur if the computer running the License Server received a new IP address after the License Server was started. The solution is to restart the License Server by stopping it, then starting it again in the License Manager.
- The license server cannot write to its license file. A license server cannot give licenses unless it can write to its license file.
 - Make sure the owner of the License Server process/daemon has permissions to write to the license file.
- The license server cannot lock its license file. A license server cannot give licenses unless it can lock its license file.
 - Make sure the owner of the License Server process/daemon has permissions to create/delete files and directories in the `OPNET_license` directory.
 - Make sure enough disk space is available to create a small file or directory in the `OPNET_license` directory.

Note—A standalone License Server has the same permissions as the user logged in, while a License Server running in server mode typically has root or Administrator privileges.

- The license server's license file is invalid. A license server cannot give licenses from an invalid file.
 - Make sure you are running the latest version of License Server. If you are not running the latest version of License Server, you may encounter problems when adding, deregistering, or obtaining licenses.
 - If you receive this error, refer to Validate License File (Button) on page AG-3-15.
- A license server's license file does not exist. A license server cannot give out licenses without a license file.
 - The license file may have been deleted, or the license server does not have permissions to create a new license file upon startup. If the license server should have a license file, check to see if it was deleted.
 - Otherwise, select a different license server.
 - If necessary, refer to Create License File (Button) on page AG-3-11.

- Your username/hostname is not authorized to obtain licenses from the license server.
 - The user account or computer from which you are trying to access the license server is not authorized in the `user_auth` file. Check the `user_auth` file on the computer where the license server is running.
 - For more information, refer to Restricting License Users on page AG-3-29.
 - Try to login from an authorized account or computer.

No licenses in file

If there are no licenses in your license file, you may need to sign your Electronic Licensing Agreement (ELA). To do this

- 1) Point your browser to the OPNET Support Center
<http://www.opnet.com/support>.
- 2) Click on the License Registration link. When prompted, log in with your OPNET username and password. The License Registration page appears.
- 3) Click on the View Electronic License Agreements link. The OPNET Technologies, Inc., License Agreement Review page appears in a separate browser window.
- 4) Find the agreement that you are interested in signing. On the left side of this agreement, click on the Sign link.
- 5) Read the license agreement, then click on the Continue button at the bottom of the page.
- 6) The next page asks if you are authorized by your organization to sign the license agreement. Read the page, and if you agree, click the I Agree button.
- 7) The next page is the actual acceptance of the legal agreement. Read the page, and if you agree, click on the I Agree button.

Note—Each set of licenses has two agreements: Usage and Maintenance. You need to sign both agreements before your licenses will be available for use.

Error: A "SERVERS" license is required to use the "server_definer" process model

The SERVERS license, also called Server Specialized Model (SSM) is used for studying advanced server characteristics, such as the effect of disk access time, CPU usage, and other detailed aspects of server usage.

- If you intended to use this feature, but don't have access to a server license, please contact info@opnet.com or your OPNET sales account manager.

- If you did NOT intend to use this feature, you can fix the problem by
 - making sure that the "Server: Modeling Method" on all nodes is set to "Simple CPU", and
 - removing any "Server Definition" utility nodes from the network

You may see a similar error for other specialized models, including those in the following table:

Table 3-4 Specialized Models

Model	License
Server	SERVERS
Circuit Switched	CIRCSW
GPRS	GPRS
PNNI	PNNI
UMTS	UMTS
DOCSIS	DOCSIS
IPv6	IPV6
MPLS	MPLS
Mainframe	MFRAME
End of Table 3-4	

Error: License Invalid with code=4

An invalid license file with code = 4 indicates that an OPNET 10.5 (or previous) License Server was used to add licenses to a license file that is in the 11.0 (or later) format.

Resolve by deregistering all licenses from the file using the 10.5 License Server, then use 11.0 License Server to add them back.

Avoid this problem by always using the latest available version of the OPNET License Server and OPNET License Manager to perform license operations.

Error: License Server's IP Address Does Not Match the IP Address of Co-Located Workstation

When you install a license server on your computer, the license is manipulated by a system service: `op_license_server`. If your computer's IP address changes (due to a dial-up or VPN connection, for example) between the time the License Server started and the time IT Guru is launched, the License Server process does not pick up the change. Restarting the license server will refresh its awareness of its IP address.

- 1) - Run the License Manager
- 2) - Choose the local license server process (green dot) from the server treeview
- 3) - Click the Stop Server button. After a moment, the license server stops.
- 4) - Click the Start Server button. After a moment, the license server starts.

Error: Bad checksum [error -16111]

The "bad checksum" error during license registration usually indicates one of two things:

- The Transaction Code was mistyped. Make sure that the complete Transaction Code was entered and that it doesn't have extra spaces or characters.
- The hostname was mistyped. Make sure you used the correct capitalization--this field is case-sensitive. Also check for extra spaces or characters.

Entries in License Server Authorization Files Do Not Work

- Make sure your license authorization files contain the correct format. A '+' may replace either or both fields to indicate that you want to allow all.

```
hostname username
```
- After making any necessary changes to the authorization files, use the License Manager menu item Tools > Refresh Server Authorization Files, so the License Server uses the latest changes. For releases of License Manager 10.5 and earlier, you must stop and restart the License Server for the changes to take effect.

When Entering Approval Code on the Web, Receive Error: "Multiple Decryption Choices"

This message is most common with older releases of IT Guru. Older versions of the licensing system generated Transaction Codes that were less specific than they are now. Therefore, many times a Transaction Code made from either version could be confused with transaction codes from the other. That is what is meant by "Multiple Decryption Choices." To avoid this problem

- If you are using the Express method, simply try the operation again.
- If you are using the Browser method to perform a license operation, discard the Transaction Code that caused this error message, and try again with a new Transaction Code.

Lost Confirmation Code during Registration

If you lost your Confirmation Code during a registration, you may see the error, "This license has a pending registration". Confirmation codes are stored in the session log of the machine running the OPNET License Server.

You can view the session log by choosing Help > Session Log > Open.

Note—Confirmation codes are not necessary with the Express method of license registration.

**Potential Server or
DNS Configuration
Error**

If you receive an error similar to this, there is usually not a true problem:

```
<<< Diagnostic Error >>>
* Package: Vos (Virtual Operating System)
* Function: Vos_Sec_Fl_Dmn_Versioned_Ping
* Error: Potential server or DNS configuration error:
License server (X) returned (Y) as its host name.
```

This means that your preference settings for the License Server differ from what the server reports. This can happen when the server has multiple hostnames or interfaces.

To prevent the message

- Refer to the server in your preferences by the correct hostname or IP address.
- Suppress this and other diagnostic error messages by setting the `diag_enable` preference to FALSE.

Preferences

Licensing preferences are supported by any licensed application, such as IT Guru and `op_runsim`. Preferences enable you to configure various aspects of program operation.

`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 for express license registrations on the OPNET Technical Support 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 space-separated 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 treeview. 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 used for authentication before beginning an express license registration on the OPNET Technical Support web site. 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 IT Guru. 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 on the machine where a license server is to be run (`op_license_util -port_check`). The licensing system uses UDP/TCP ports for communication. Each port corresponds to a UDP/TCP port (`port_a` is 2047, `port_b` is 2123, and `port_c` is 2345).

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

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

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.

This preference can be used with `itguru` or `op_runsim`, but not with `op_license_server`. When this preference is `TRUE`, the `license_server` and `license_port` preferences are ignored.

Data Type	boolean
Default Value	FALSE

license_server_standalone_diagnose

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.

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

Data Type	boolean
Default Value	FALSE

license_username

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

Data Type	string
Default Value	“”

mtn_warn_int

Specifies the interval in days between maintenance expiration warnings. These warnings are automatically displayed when you exit a program 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

op_license_server Preferences

`op_license_server` supports the following preference sets:

- Standard preferences
- Diagnostics preferences
- Licensing preferences (`license_port` only)

`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`. For more information, refer to License Server Log on page AG-3-34.

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

Data Type	boolean
Default Value	False

For information about the Standard and Diagnostics preference sets, see Preferences on page ITR-2-1 of the *Guru Reference Guide*.

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