



Licensing Mentor Graphics Software

Software Version 2014_2

December 2014

© 1992 - 2014 Mentor Graphics Corporation
All rights reserved.

This document contains information that is proprietary to Mentor Graphics Corporation. The original recipient of this document may duplicate this document in whole or in part for internal business purposes only, provided that this entire notice appears in all copies. In duplicating any part of this document, the recipient agrees to make every reasonable effort to prevent the unauthorized use and distribution of the proprietary information.

This document is for information and instruction purposes. Mentor Graphics reserves the right to make changes in specifications and other information contained in this publication without prior notice, and the reader should, in all cases, consult Mentor Graphics to determine whether any changes have been made.

The terms and conditions governing the sale and licensing of Mentor Graphics products are set forth in written agreements between Mentor Graphics and its customers. No representation or other affirmation of fact contained in this publication shall be deemed to be a warranty or give rise to any liability of Mentor Graphics whatsoever.

MENTOR GRAPHICS MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MATERIAL INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

MENTOR GRAPHICS SHALL NOT BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING BUT NOT LIMITED TO LOST PROFITS) ARISING OUT OF OR RELATED TO THIS PUBLICATION OR THE INFORMATION CONTAINED IN IT, EVEN IF MENTOR GRAPHICS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

U.S. GOVERNMENT LICENSE RIGHTS: The software and documentation were developed entirely at private expense and are commercial computer software and commercial computer software documentation within the meaning of the applicable acquisition regulations. Accordingly, pursuant to FAR 48 CFR 12.212 and DFARS 48 CFR 227.7202, use, duplication and disclosure by or for the U.S. Government or a U.S. Government subcontractor is subject solely to the terms and conditions set forth in the license agreement provided with the software, except for provisions which are contrary to applicable mandatory federal laws.

TRADEMARKS: The trademarks, logos and service marks ("Marks") used herein are the property of Mentor Graphics Corporation or other parties. No one is permitted to use these Marks without the prior written consent of Mentor Graphics or the owner of the Mark, as applicable. The use herein of a third-party Mark is not an attempt to indicate Mentor Graphics as a source of a product, but is intended to indicate a product from, or associated with, a particular third party. A current list of Mentor Graphics' trademarks may be viewed at: www.mentor.com/trademarks.

Mentor Graphics Corporation
8005 S.W. Boeckman Road, Wilsonville, Oregon 97070-7777
Telephone: 503.685.7000
Toll-Free Telephone: 800.592.2210
Website: www.mentor.com
SupportNet: supportnet.mentor.com/

Send Feedback on Documentation: supportnet.mentor.com/doc_feedback_form

Table of Contents

Chapter 1

Mentor Graphics Licensing System	7
Licensing Overview	7
FlexNet Licensing Features	8
Licensing Features	9
Obtaining Licenses	9
License File Format	10
Editing the License File	10
Exact Access Date	11
Firewalls	12
Mentor Graphics Support	12

Chapter 2

Basic License Administration	13
License Configuration for UNIX	14
Before You Begin on UNIX	14
Installing Licensing on a License Server	15
Configuring Licensing on a License Server	15
Starting a License Server	17
Configuring Licensing on a Client Workstation	17
Updating Licenses	18
Starting a License Server Automatically on UNIX	21
License Management for Windows	22
Starting a License Server as a Service	22
Editing the License File on Windows	25

Chapter 3

Planning for Licensing	27
Understanding License Servers	27
Independent Servers	27
Redundant Servers	29
Using Different Types of Workstations as License Servers	31
Factors That Affect Your Choice of License Servers	31
Number of License Servers	31
Types of Licenses Available	32
Network Topology	32

Chapter 4

Customizing Licensing	35
Licensing Environment Variables	35
FlexNet Licensing Environment Variables	35
UNIX Environment Variables	36

Windows Environment Variables	42
Using Daemon Options File	46
Options File Location and Format	47
Options File Keywords	47
Example Options File	48
Controlling License Consumption	48
Order of Entries in a License File	49
Running Mentor Graphics Software with Other FlexNet Licenses	49
Using Separate License Files and License Daemons	49
Merging License Files	50
Chapter 5	
Troubleshooting Licensing	53
Common Troubleshooting Tips	53
License Availability	54
Status Report	55
Environment Variables	56
Troubleshooting with the MGLS Debug Log File	56
What to do if	57
Contacting Mentor Graphics Support	60
Appendix A	
Command Reference	61
Notational Conventions	62
lmdown	63
lmgrd	65
lmhostid	67
lmreread	69
lmstat	71
mgl_s_ok	74
pcls_ok	75
LMTOOLS	77
Glossary	
Index	
Third-Party Information	
End-User License Agreement	

List of Figures

Figure 1-1. Exact Access Date in a License File	11
Figure 2-1. Config Services Tab Dialog Box	23
Figure 2-2. Start/Stop/Reread Tab	24
Figure 3-1. Independent Servers	29
Figure 3-2. Redundant Servers	30
Figure A-1. pcls_ok Dialog Box	75
Figure A-2. LMTOOLS Dialog Box	77

List of Tables

Table 5-1. Troubleshooting Licensing	57
Table A-1. Notational Conventions	62
Table A-2. Imdown Options	63
Table A-3. Imgrd Options	65
Table A-4. Imhostid Options	67
Table A-5. Imreread Options	69
Table A-6. Imstat Options	71
Table A-7. mgls_ok Options	74

Chapter 1

Mentor Graphics Licensing System

This manual provides instructions and information for the system or license administrator on how to use the Mentor Graphics Licensing System (MGLS) and the PC Licensing System (PCLS) to license Mentor Graphics software. This manual provides detailed information on:

- [“Basic License Administration”](#) on page 13
- [“Planning for Licensing”](#) on page 27
- [“Customizing Licensing”](#) on page 35
- [“Troubleshooting Licensing”](#) on page 53
- [“Command Reference”](#) on page 61

This chapter includes sections on [“Licensing Overview,”](#) [“Obtaining Licenses,”](#) [“License File Format,”](#) and [“Mentor Graphics Support.”](#)

Licensing Overview

Mentor Graphics software uses the Mentor Graphics licensing system to administer software licenses. This software is based on FlexNet™ licensing and uses the FlexNet license file format. If your network already contains software from other vendors that are licensed using FlexNet, you can integrate Mentor Graphics licenses into your current licensing strategy.

The software and related documentation, which is enabled by the authorization code(s) and licensed to you for the period set forth in the authorization code(s), is subject to license restrictions.

Installation of the authorization code(s) and use of the enabled software, indicates your complete and unconditional acceptance of the terms and conditions set forth in the License Agreement between you and Mentor Graphics Corporation.

If you do not have a signed agreement with Mentor Graphics Corporation, the terms of our standard End User License Agreement apply. You can view the agreement at the end of this manual.

FlexNet Licensing Features

For more detailed information about FlexNet, refer to the *License Administration Guide*. This manual is available in PDF format as part of the documentation set shipped on the application CD, or you can view it on SupportNet:

<http://supportnet.mentor.com/>

The four main components of FlexNet are:

- Application program

The application program using FlexNet is linked with the program module (the FlexNet client library) that provides the communication with the license server.

- License manager daemon (**lmgrd**)

The **lmgrd** daemon handles the initial contact with the client application programs, passing the connection to the appropriate vendor daemon. It also starts and restarts the vendor daemons

Note



Node-locked uncounted licenses do not require **lmgrd** or a vendor daemon. For more information, refer to “[Types of Licenses Available](#)” on page 32.

- Vendor daemon (**mgcld**)

In FlexNet, licenses are handled by running processes. There is one process for each vendor who has a FlexNet-licensed product on the network. This process is called the *vendor daemon*. The vendor daemon tracks how many licenses are checked out, and who has those licenses. If the vendor daemon terminates for any reason, all users lose their licenses. Users normally regain their licenses automatically when **lmgrd** restarts the vendor daemon. For Mentor Graphics products, this vendor daemon is **mgcld**.

- License file

FlexNet licensing data is stored in a text file called the *license file*. The license file is created by Mentor Graphics and contains data supplied by Mentor Graphics. It contains information about the server and vendor daemon, and at least one line of data (called a *FEATURE* or *INCREMENT* line) for each licensed product.

Each *FEATURE* or *INCREMENT* line contains an encryption code based on the data in that line, the host ID of the server(s), and other Mentor Graphics-supplied data, such as expiration date, count, and version.

For a line-by-line description of a license file, refer to the *License Administration Guide*.

Licensing Features

The following are some of the major features of licensing:

- **Provides complete application licensing.** You can purchase licenses for an entire Mentor Graphics station, such as Idea Station, a related group of applications (called a composite license), or a single application.
- **Lets you share licenses between hardware architectures.** For example, a Linux system configured as a license server can dispense licenses to applications running on a Windows system.
- **Allows you to customize licensing.** As a system manager, you can control who has access to a specified license, connection time-outs, license file location, and the location of licensing software.
- **Logs licensing information.** License check out, check in, queue, and denial information is written to a log file. License server status information is also written to the log file.
- **Provides management tools to assist in license configuration and management.** The [mgls_ok](#) command (UNIX only) is used to test licenses. The [mgls_ok](#) tool is loaded automatically during your software installation process. The [pcls_ok](#) command (Windows only) is used to test licenses. Mentor Graphics licensing software also supports standard FlexNet administration commands. For more information on all of these commands, refer to [“Command Reference”](#) on page 61.

Caution



If you change your system's date and time, it may prevent the Mentor Graphics applications from checking out a license.

Obtaining Licenses

To order Mentor Graphics software licenses, follow these steps:

1. **Determine the number of licenses you require for each station, composite, or application and whether any license servers are required to administer them.**

The number of licenses is determined by:

- Number of users for each feature
- Network configuration
- Number of existing independent or redundant servers you have on your network

For more information, refer to [“Understanding License Servers”](#) on page 27.

2. Contact your local Mentor Graphics sales office to request licenses.

They can provide you with information on the number of node-locked and floating licenses your company purchased and any current license server configurations you may have. You will need to provide:

- Any new license server configurations
- The host ID of client and license server workstations for node-locked licenses
- The host ID of the license server workstation for all floating licenses

Mentor Graphics creates the new license(s) and sends them to you in an email attachment.

License File Format

The license file you receive in the e-mail attachment is in text format. The license file contains:

- A comment line indicating the Mentor Graphics site number (optional).
- The license server or servers and their host ID and a TCP/IP port number. You must provide the correct host name on this line.
- The name and pathname of the licensing daemons. There is only one daemon per license vendor. You must provide the pathname to the vendor daemon on this line.
- The license itself, which is a string of characters beginning with the word “FEATURE” or “INCREMENT”. Several FEATURE or INCREMENT entries may exist.


For example:

```
INCREMENT msimhdlsim mgcld 2011.010 24-dec-2011 1 6D4EB05E70B264DEDDC8 \
  VENDOR_STRING=29866B83 SN=28286352 SIGN2="0DD5 66BD BA83 54DE 4B46 \
  75E6 15E5 7B7C FDB6 10B7 D979 85FF 7485 52BF 54A6 19EC 035B A40C AD9C \
  370D C301 AE22 AB2B 26FD 9798 7CF2 29EA 67EF 8EB8 0B47"
```

For a line-by-line description of a license file, refer to the *License Administration Guide*.

Editing the License File

You can use a text editor to perform edits on the license file. The following edits to the license file are the most common:

**Caution**

When you receive your license(s) from Mentor Graphics, do not hand edit the FEATURE or INCREMENT lines, or use a carriage return alone to force the remainder of the line onto the next line. FEATURE and INCREMENT lines contain encrypted data. If you edit these lines, Mentor Graphics application may not run.

- Reordering FEATURE or INCREMENT lines, or adding additional comments.

Note

The order of the features in the license file is significant. For more information refer to [“Order of Entries in a License File”](#) on page 49.

- Appending new licenses to an existing license file.
- Changing the name of the server workstation in the SERVER line.
- Changing the port number in the SERVER line.
- Changing the pathname to **mgcld** in the DAEMON line.

Note

FlexNet refers to a DAEMON line as a VENDOR line.

- Changing the options file pathname in the DAEMON line. For more information on the options file, refer to [“Using Daemon Options File”](#) on page 46.

Caution

Do not edit any other portion of the license file, or your licenses might not work.

Exact Access Date

Exact Access provides a consistent global licensing mechanism to help you manage your licenses and decrease inadvertent, non-contractual usage of software that results from transfers, unbundling, and other maintenance activities.

Exact Access incorporates a version date that allows you access to software updates released prior to your support contract expiration date. Figure 1-1 shows an INCREMENT line from a license file with the Exact Access date circled:

Figure 1-1. Exact Access Date in a License File

INCREMENT msimhdlsim mgcld 2011.010 24-dec-2011 1 6D4EB05E70F
VENDOR_STRING=29866B83 SN=28286352 SIGN2="0DD5 66BD BA83 54
75E6 15E5 7B7C FDB6 10B7 D979 85FF 7485 52BF 54A6 19EC 035B
370D C301 AE22 AB2B 26FD 9798 7CF2 29EA 67EF 8EB8 0B47"

Exact Access Date

As long as the license Exact Access date is equal to or later than the release date, the license is valid for running the application. However, if the release date is later than the license Exact Access date, then you will not be able to execute the application.

Firewalls

Firewalls can interfere with licensing communication. On license servers it is recommended that you specify a static port number for the **mgcld** vendor daemon. This can be done on the DAEMON line in your license file using the PORT=keyword. For example:

```
DAEMON mgcld C:\MentorGraphics\Licensing\mgcld.exe PORT=4000
```

Once the **mgcld** is set to run on a specific port, open that port on your firewall.

On Windows, it is recommended that you make exceptions for the licensing processes **lmgrd.exe** and **mgcld.exe**, as well as any other vendor daemons you might be running.

Refer to your firewall documentation on opening ports and making exceptions for processes or consult your Network Administrator.

Mentor Graphics Support

Mentor Graphics software support includes software enhancements, technical support, access to comprehensive online services with SupportNet, and the optional On-Site Mentoring service. For details, see:

<http://supportnet.mentor.com/>

If you have questions about this software release, please log in to SupportNet. You may search thousands of technical solutions, view documentation, or open a Service Request online at:

<http://supportnet.mentor.com/overview/>

If your site is under current support and you do not have a SupportNet login, you may easily register for SupportNet by filling out the short form at:

<http://supportnet.mentor.com/user/register.cfm>

Visit the Mentor Graphics Licensing and Installation Communities site for the most frequently used licensing content on SupportNet and to collaborate with Mentor community members and technical experts:

http://communities.mentor.com/mgcx/community/licensing_installation

All customer support contact information can be found at:

<http://supportnet.mentor.com/contacts/>

Chapter 2

Basic License Administration

This chapter describes the procedures to administer the Mentor Graphics licensing software on UNIX.

For licensing installation and configuration on Windows, refer to the Mentor Install Program online help, if applicable. Otherwise, refer to the product installation mechanism for how to install Windows licensing (PCLS).

License Configuration for UNIX	14
Before You Begin on UNIX	14
Installing Licensing on a License Server	15
Configuring Licensing on a License Server	15
Starting a License Server	17
Configuring Licensing on a Client Workstation.....	17
Updating Licenses.....	18
Starting a License Server Automatically on UNIX	21
License Management for Windows	22
Starting a License Server as a Service	22
Editing the License File on Windows.....	25

License Configuration for UNIX

UNIX



This section applies only to UNIX-based systems.

To configure licensing on UNIX, complete the following tasks:

- Pre-installation considerations, [page 14](#)
- Installing licensing on a server, [page 15](#)
- Configuring licensing on a server, [page 15](#)
- Starting a license server, [page 17](#)
- Configuring licensing on a client workstation, [page 17](#)

This section also discusses updating licensing by completing the following tasks:

- Replacing the license file, [page 18](#)
- Adding new licenses, [page 20](#)

Before You Begin on UNIX

Before you begin configuring Mentor Graphics Licensing, you must complete the following:

- 1. Determine which machine(s) you will use as license servers, and determine their host IDs.**

For information on license servers, refer to [“Planning for Licensing”](#) on page 27.

- 2. Order and receive Mentor Graphics Licenses.**

For instruction on requesting licenses, refer to [“Obtaining Licenses”](#) on page 9.

- 3. Ensure that the proper networking components are installed and configured correctly.**

In order for Mentor Graphics Licensing software to work correctly, workstation hardware and operating system versions must be at a level adequate to support the current versions of software. For hardware and operating system information, refer to your application’s configuration information.

Also, you must configure TCP/IP on your network for licensing to work properly.

- 4. Decide if you will further customize licensing.**

For more information, refer to [“Customizing Licensing”](#) on page 35.

Installing Licensing on a License Server

This section applies to installing licensing on a license server for the first time. For updates or additions to the license file, refer to [“Updating Licenses”](#) on page 18.

The following procedures offer step-by-step instructions on installing licensing software on a license server for the first time.

1. Order and receive Mentor Graphics Licenses.

For instruction on requesting licenses, refer to [“Obtaining Licenses”](#) on page 9.

2. Install products and licensing software or just licensing software on the desired license server.

When you install a Mentor Graphics application, the licensing software will also be loaded into the software tree.

If the workstation you choose as a license server does not already contain other Mentor Graphics software or a Mentor Graphics tree, locate the *mgls.<vco>* directory and copy the entire *mgls.<vco>* directory onto the license server (where *vco* is the platform designation). For example:

```
$ mkdir /net/indep1/usr/pkg/mgc_lic
$ cp -r $MGC_HOME/pkg/mgls.ixl \
/net/indep1/usr/pkg/mgc_lic/
```

For information on license servers, refer to [“Understanding License Servers”](#) on page 27.

Configuring Licensing on a License Server

In the previous procedure, you installed licensing on a license server. This section tells you how to configure licensing on a server for the first time by completing the following steps:

1. Configure the license file on the license server.

For information on the license file, refer to [“License File Format”](#) on page 10.

Use the following procedures to configure your license file:

a. Place the license e-mail attachment you received from Mentor Graphics into a text file.

There are no restrictions on the name of the file or where you put it; however, you should keep a copy of each file in a safe location for backup purposes.

b. **Specify the server name.**

Edit the SERVER entry in the license file with the correct license server host name. If you are administering licenses using a redundant server configuration, you must supply the host name for each license server in your configuration. For example:

Before: SERVER put_server_name_here 5500361a 1717
After: SERVER enterprise 5500361a 1717

Note



Running multiple networked applications on the same port number, even on separate machines, can introduce instability into the environment and cause unpredictable results that may be extremely difficult to diagnose. Ensure that the port number you choose is dedicated to license server communications only.

c. **If necessary, change the server port entry in the license file from the default value of 1717 to an open port on your system.**

If you are using a redundant server configuration, you must do this for each server listed in the license file that cannot use port 1717.

d. **If you are using a redundant server configuration, copy the license file to the other license servers in your configuration.**

If you are using a single server configuration, skip this step.

Redundant license servers each require a local copy of the same license file.

e. **Edit the DAEMON line to include the path to the vendor daemon mgcld.**

Note



Firewalls can interfere with licensing communication. On license servers it is recommended that you specify a static port number for the **mgcld** vendor daemon. For more information on dealing with Firewalls, refer to [Firewalls](#).

The path to the vendor daemon should be located in the licensing software directory in `../bin/mgcld` (for example: `/usr1/mgc_tree/pkgs/mgls/bin/mgcld`). You must use the absolute path to the daemon. An absolute pathname begins with a '/' (slash); presently, FlexNet does not allow you to use an environment variable in this pathname. If you want, add the path to the daemon options file to the DAEMON line. For more information, refer to [“Using Daemon Options File”](#) on page 46.

For example, an edited daemon line:

```
DAEMON mgcld /usr1/mgc_tree/pkgs/mgls/bin/mgcld
```

2. **You may also want to adjust the order of your FEATURE or INCREMENT lines. For more information, refer to [“Order of Entries in a License File”](#) on page 49.**


3. If you want to customize license usage, edit the daemon options file.

For information on the daemons option file, refer to [“Using Daemon Options File”](#) on page 46.

Starting a License Server

In the previous procedure, you configured licensing on a server. This section shows you how to start the license server.

 **Note** You must complete [“Configuring Licensing on a License Server”](#) on page 15 to begin this section.

 **Note** Mentor recommends you not run license servers as “root”.

To start the license server, complete the following steps:

1. Start lmgrd on the license server.

The following command starts a license server:

```
$ lmgrd -c license_file
```

Where *license_file* is the license file that you configured in [“Configuring Licensing on a License Server”](#) on page 15.

You can create a daemon log file by adding the **-l** *<logfile>* switch. For example:

```
$ lmgrd -c license_file [-l logfile]
```

You can then use the UNIX **tail -f** *<logfile>* command to monitor the status of the license server.

2. Verify the server is valid and has started.

The following command verifies the license server is working:

```
$ lmstat -a -c license_file
```

This command reports the server and daemon status and the product usage.

Configuring Licensing on a Client Workstation

In the previous procedure, you started a license server. This section shows you how to configure licensing on a client workstation by completing the following steps:

Note



You must complete this procedure for each shell you perform the steps in. You must either repeat the steps for each shell or place the steps in the shell startup script.

1. Set user environment variables to find the licensing software, and set user environment variables for the application to find the license file.

Each user must set the LM_LICENSE_FILE variable to point to the license file location, as described in [“FlexNet Licensing Environment Variables”](#) on page 35.

In some situations, you may set the MGLS_LICENSE_FILE variable instead. For more information and examples of how to set these variables, refer to [“MGLS_LICENSE_FILE”](#) on page 38.

2. Validate the server environment.

Use [lmstat](#) to check that the server is up and a feature is available.

```
$ lmstat -a [-c license_file]
```

This command reports the server and daemon status and the product usage.

For options and more information on [lmstat](#), refer to [page 71](#).

Note



If you do not set LM_LICENSE_FILE, you must use the **-c** switch.

3. Verify a client can check out a license.

Use [mgls_ok](#) to verify a client can check out a specific license feature.

```
$ mgls_ok license_name
```

For information on [mgls_ok](#), refer to [page 74](#).

Updating Licenses

This section includes instructions on replacing the license file and adding new licenses.

Replacing the License File

You may need to replace an entire license file if you receive license renewals that involve the entire license file or if the licenses were transferred to a new server host ID.

To replace an existing license file, follow these instructions:

1. Set license environment variables.

You must set `LM_LICENSE_FILE` or `MGLS_LICENSE_FILE` to the path of the license file. This allows the licensing software to find the location of the license file. For more information, refer to [“Licensing Environment Variables”](#) on page 35.

2. Stop the License Server.

You can shut down all license daemons. The license daemons write out their last messages to the log file, close the file, and exit. All licenses that were checked out are rescinded, so the next time an application attempts to verify a license, the license will not be valid. To shut down the licensing daemons, follow these steps:

a. Inform the license users that you are shutting down the daemons.

b. Shut down the daemons.

To confirm the shutdown, use **lmdown** with the **-c** option to shut down the daemons.

```
$ lmdown [-c license_file]
```

For more information on **lmdown**, refer to [page 63](#).

Note



If you do not set `LM_LICENSE_FILE`, you must use the **-c** switch.

c. If you started the daemon with a logfile, check the daemon log to ensure the daemons have exited:

```
$ tail -f <logfile>
```

```
6/24 12:00(lmgrd)SHUTDOWN request from daven at node daven
```

```
6/24 12:00(lmgrd)Shutting down mgcld
```

```
6/24 12:00(mgcld)daemon shutdown requested-shutting down
```

3. If you use the daemon options file, edit the daemon options file.

You can add custom information for your site to this empty file; otherwise, you can ignore its presence. If you make changes to the empty daemon options file, you should rename the modified file or move it to another location so that it is not overwritten with another empty file the next time you install Mentor Graphics software. You will also need to edit the fourth field of the daemon line in the license file with the correct pathname to the options file and restart the license server for the option to take affect.

For information on the daemons option file, refer to [“Using Daemon Options File”](#) on page 46.

4. Replace the license file.

You can either place the new license file in the same location as the old one, or you can place the new license file in a new location. If you place the license file in a new

location, you must ensure the license server can find the license file and the appropriate environment variables are set to the proper values.

Note

If you transferred the licenses to a new server host ID, the licenses must be served from the machine with the matching host ID value.

5. Start lmgrd on the license server.

The following command starts a license server:

```
$ lmgrd [-c license_file]
```

Where *license_file* is the license file that you configured in [“Configuring Licensing on a License Server”](#) on page 15.

You can create a daemon log file by adding the **-l** *<logfile>* switch. For example:

```
$ lmgrd [-c license_file] [-l logfile]
```

You can then use the UNIX **tail -f** *<logfile>* command to monitor the status of the license server.

6. Verify the server is valid and has started.

The following command verifies the license server is working:

```
$ lmstat -a [-c license_file]
```

This command reports the server and daemon status and the product usage.

Note

If you do not set LM_LICENSE_FILE, you must use the **-c** switch.

7. Verify a client can check out a license.

Use [mgls_ok](#) to ensure a client can check out a specific license feature.

```
$ mgls_ok license_name
```

For information on **mgls_ok**, refer to [page 74](#).

Adding New Licenses on UNIX

If, after your software and license installation, you decide to purchase additional Mentor Graphics licenses for your existing software, you can add new licenses to your existing license server. To append new licenses to an existing license file, perform the following steps:

1. Set license environment variables.

You must set `LM_LICENSE_FILE` or `MGLS_LICENSE_FILE` to the path of the license file. This allows the licensing software to find the location of the license file. For more information, refer to [“Licensing Environment Variables”](#) on page 35.

2. Edit the license file with the new licenses.

Use a text editor to add the new `FEATURE` or `INCREMENT` lines to the existing license file.

3. Re-read the license file if the server is running.

Issue the following command to re-read the license file if the license server is running:

```
$ lmreread [-c license_file]
```

For more information on `lmreread`, refer to [page 69](#).

Note



If you do not set `LM_LICENSE_FILE`, you must use the `-c` switch.

4. Validate the server environment.

Use `lmstat` to check that the server is up and a feature is available.

```
$ lmstat -a [-c license_file]
```

This command reports the server and daemon status and product usage.

Note



If you do not set `LM_LICENSE_FILE`, you must use the `-c` switch.

For options and more information on `lmstat`, refer to [page 71](#).

5. Verify a client can check out a license.

Use `mglsook` to verify a client can check out a specific license feature.

```
$ mglsook license_name
```

For information on `mglsook`, refer to [page 74](#).

Starting a License Server Automatically on UNIX

Note



This section applies only to UNIX-based systems.

On UNIX-based machines, you must create a script to execute during boot up or reboot. Adding a startup script is useful when a machine is used as a license server and is rebooted frequently. For more information and an example script, refer to the Mentor Graphics Application Note [MG576233](#).

License Management for Windows

This section covers:

- [Starting a License Server as a Service](#)
- [Editing the License File on Windows](#)

For licensing installation and configuration on Windows, refer to the Mentor Install Program online help, if applicable, and the *How to Install PCLS* manual (pcls_install.pdf). Otherwise, refer to the product installation mechanism for how to install Windows licensing (PCLS).

Starting a License Server as a Service

A license server is a daemon process that provides support for floating and nodelocked counted licenses. It is only required if you have purchased these licenses for your Mentor Graphics applications.



Note

Mentor Graphics recommends that the **lmgrd**, the vendor daemon (mgcld), the license file, the FlexNet debug log file, the report log file, and the options files reside on a local disk. If any of these files reside on a mapped drive (or network shared drive), then the license server may not start, and the loss of either the license server machine or the file server machine will cause the licenses to be unavailable.

To start a licensing server using **LMTOOLS**, do the following:

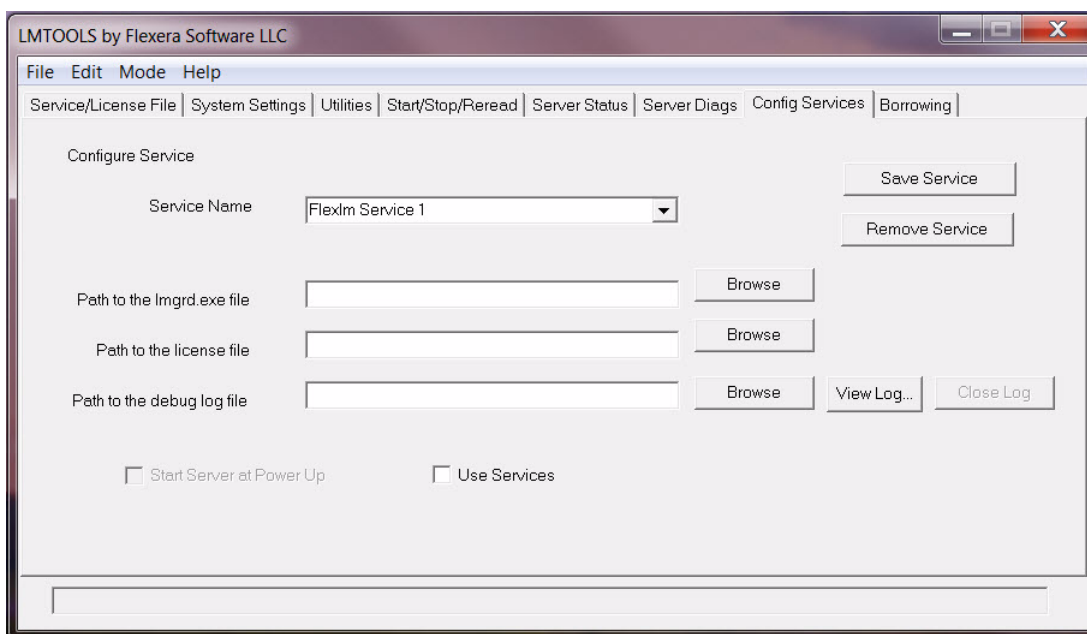
1. **Start LMTOOLS.**

Navigate to **Start > Programs > Mentor Graphics Licensing > lmtools**.

2. **Click the Config Services tab.**

The Config Services tab displays the dialog box shown in Figure [2-1](#).

Figure 2-1. Config Services Tab Dialog Box



3. Fill in the dialog boxes.

You can type over the Service Name or select from the drop down list.

Use the browse buttons to navigate to the path for *lmgrd.exe* (normally located at *C:\MentorGraphics\Licensing\lmgrd.exe*), the license file, and the FlexNet debug log file.

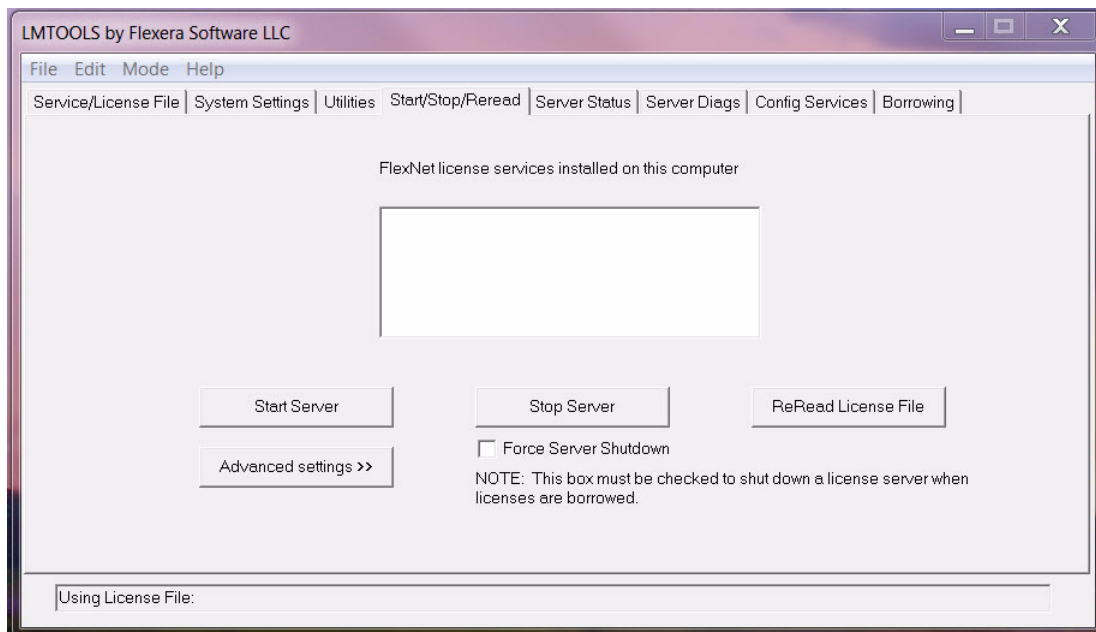
Select **Start Server at Power Up** and **Use Services** to have the license server start automatically when rebooting the machine.

4. Click the Save Service and Yes buttons in the subsequent dialog box.

5. Click the Start/Stop/Reread tab.

The **Start/Stop/Reread** tab displays the dialog box shown in Figure [2-2](#).

Figure 2-2. Start/Stop/Reread Tab



6. Click the Start Server button.

The message “Server Start Successful” displays.

7. Check the status of the server.

Click the **Server Status** tab, select **Display everything**, and click the **Perform Status Enquiry** button.

8. Verify a license can be checked out by using pcls_ok.

Start **pcls_ok** by navigating to **Start > Programs > Mentor Graphics Licensing > pcls_ok**. Refer to [Figure 2-1](#) on page 23.

Type a valid license name into the Feature field, optionally type the Version number of the application you are trying to verify in the Version edit box, and click the **Apply** button. (Determine a license name you want to verify by looking at the license file.) A message box will display, stating the feature was successfully checked out. For more information on **pcls_ok**, refer to “Command Reference” in the *Licensing Mentor Graphics Software* manual (mgc_licen.pdf). For more information on the Version number, refer to “Exact Access Date” in the *Licensing Mentor Graphics Software* manual (mgc_licen.pdf).

You can also check the contents of the daemon log file to see if a feature was checked out.

Once your license server is running, any machine on the same network should be able to access it by setting the licensing environment variables using the port@host syntax. For more information on the environment variables, refer to “FlexNet Licensing

Environment Variables” in the *Licensing Mentor Graphics Software* manual (mgc_licen.pdf).

Editing the License File on Windows

If, after your software and license installation, you decide to purchase additional Mentor Graphics licenses for your new or existing software, you can add the new licenses to your license server (if the licenses are generated for that server).

To edit the license file:

1. Open the license file. Scroll past the header section and locate the line that begins with **SERVER**.

```
SERVER put_server_name_here 00188BCCD07C 1717
DAEMON mgcld path_to_mgcld
INCREMENT ces mgcld 2011.090 14-sep-2010 4 5D1720DB8156471920C3 \
  VENDOR_STRING=D5806CD3 SN=9220623 SIGN2="06A4 B296 2311 52F6 DEB6 7D60
\
  C0CF 1FD6 9133 A59D 4E37 00D7 EC0A F614 3F00 1938 08EE 7554 7ED0 421A \
  BABD 2859 20AA A2C2 42EE 0D95 852D 1153 AB00 B9DD"
INCREMENT pcblayout mgcld 2011.090 14-sep-2010 4 AD0780ABB7C879028876 \
  VENDOR_STRING=2ED26BB6 SN=9220621 SIGN2="1C99 1A24 9878 FFC6 721E F84B
\
  C18B 09E9 CB76 6AF8 76CD 975E 94ED 6D05 057B 0617 7CE2 35D9 F9C4 5D75 \
  2807 E581 D51B 6D13 8B12 D45D 531F EE4D 8542 B01D"
INCREMENT xefablinkpro mgcld 2011.090 14-sep-2010 4 7DE7905B502576265F63 \
  VENDOR_STRING=61CC3270 SN=9220669 SIGN2="1DA7 47BE F0B2 DC21 226E CEF0
\
  3E33 4CBA 83C7 C1F0 FE67 21B0 FAA7 7D95 6DD7 107E 0FEF 30B8 AECA 8DB5 \
  8B06 5F10 6DBE D3CF 2BBE 1CC5 6EA4 866C FDBE 51F3"
```

2. Highlight the **put_server_name_here** field with the mouse and type **Ctrl-V** to paste the hostname that was copied from LMTOOLS. Take note of the completed **SERVER** line. For example:

Before:

```
SERVER put_server_name_here 00188BCCD07C 1717
```

After:

```
SERVER umbrella 00188BCCD07C 1717
```

Note



Running multiple networked applications on the same port number, even on separate machines, can introduce instability into the environment and cause unpredictable results that may be extremely difficult to diagnose. Ensure that the port number you choose is dedicated to license server communications only.

3. **Verify the port number.** The fourth field of the **SERVER** line is the communication port number. The default value is 1717. This number can be set to any other port number which is currently not in use.



Tip: In the rare case that the IPX/SPX protocol is present on the license server, specify TCP communication by placing TCP: before the port number. This keyword forces communication through TCP rather than the less reliable UDP.

In this example, here is the SERVER line after editing:

```
SERVER umbrella 00188BCCD07C TCP:1717
```

Note



Firewalls can interfere with licensing communication. On license servers it is recommended that you specify a static port number for the mgcld vendor daemon. For more information on dealing with Firewalls, refer to “Firewalls” in the *Licensing Mentor Graphics Software* manual (mgc_licen.pdf).

4. The path_to_mgcld must be replaced with the location of the mgcld file, which is found in the folder where the licensing software is installed. For example:

Before:

```
DAEMON mgcld path_to_mgcld
```

After:

```
DAEMON mgcld C:\MentorGraphics\Licensing\mgcld.exe
```

Take note of the completed DAEMON line.

5. Select **File > Save** to save the license file and close the text editor window.

Chapter 3

Planning for Licensing

Because the authorization codes in your license file are tied to a particular server or set of servers, *you must choose your license server(s) before you can request licenses from Mentor Graphics.*

This section provides detailed information about:

- [“Understanding License Servers”](#) on page 27
- [“Factors That Affect Your Choice of License Servers”](#) on page 31

Understanding License Servers

Mentor Graphics licenses are administered by one or more workstations that function as license servers. A license server stores the license file, contains a local copy of the licensing software, and runs the license daemon. A license server must be accessible from any workstation running a Mentor Graphics application using basic TCP/IP communication protocols.

License servers can be configured to operate independently or in a redundant group of three. If your site is large and you usually have many people using Mentor Graphics applications simultaneously, you might have several multiple independent servers, several groups of redundant servers, or a combination of the two types.

Independent Servers

Independent servers contain unique sets of license data. You can have any number of independent servers. For example, assume you choose three workstations to act as independent license servers whose host names are `server_a`, `server_b`, and `server_c`. Your site has purchased 15 licenses for Board Station, 10 licenses for Idea Station, and 25 Falcon Framework licenses. All licenses are floating. In the following independent configuration example, you might choose to divide your licenses among the three independent servers as follows:

- **The license file for `server_a`** will contain five Board Station licenses, four Idea Station licenses, and nine Falcon Framework licenses. The license file for `server_a` would look similar to the following:

```
SERVER server_a 5500361a 1717
DAEMON mgcld /usr1/mgc_master_tree/pkgs/mgls/bin/mgcld
INCREMENT falconfw_s mgcld 2001.020 31-dec-2002 9 BCA0E090B221cc99a241
  VENDOR_STRING=ABFA24DC sn=4322
INCREMENT board_s mgcld 2001.020 31-dec-2002 5 BCA0E090B221cc99a241 \
  VENDOR_STRING=ABFA24DC sn=19
```

```
INCREMENT idea_s mgcld 2001.020 31-dec-2002 4 BCA0E090B221cc99a241 \  
VENDOR_STRING=ABFA24DC sn=43872
```

- **The license file for server_b** will contain five Board Station licenses, three Idea Station licenses, and eight Falcon Framework licenses. The license file for server_b would look similar to the following:

```
SERVER server_b 2670943d 1717  
DAEMON mgcld /usr1/vendor/mgls/bin/mgcld  
INCREMENT falconfw_s mgcld 2001.020 31-dec-2002 8 BCA0E090B221cc99a241  
VENDOR_STRING=ABFA24DC sn=127  
INCREMENT board_s mgcld 2001.020 31-dec-2002 5 BCA0E090B221cc99a241 \  
VENDOR_STRING=ABFA24DC sn=8100  
INCREMENT idea_s mgcld 2001.020 31-dec-2002 3 BCA0E090B221cc99a241 \  
VENDOR_STRING=ABFA24DC sn=532
```

- **The license file for server_c** will contain five Board Station licenses, three Idea Station licenses, and eight Falcon Framework licenses. The license file for server_c would look similar to the following:

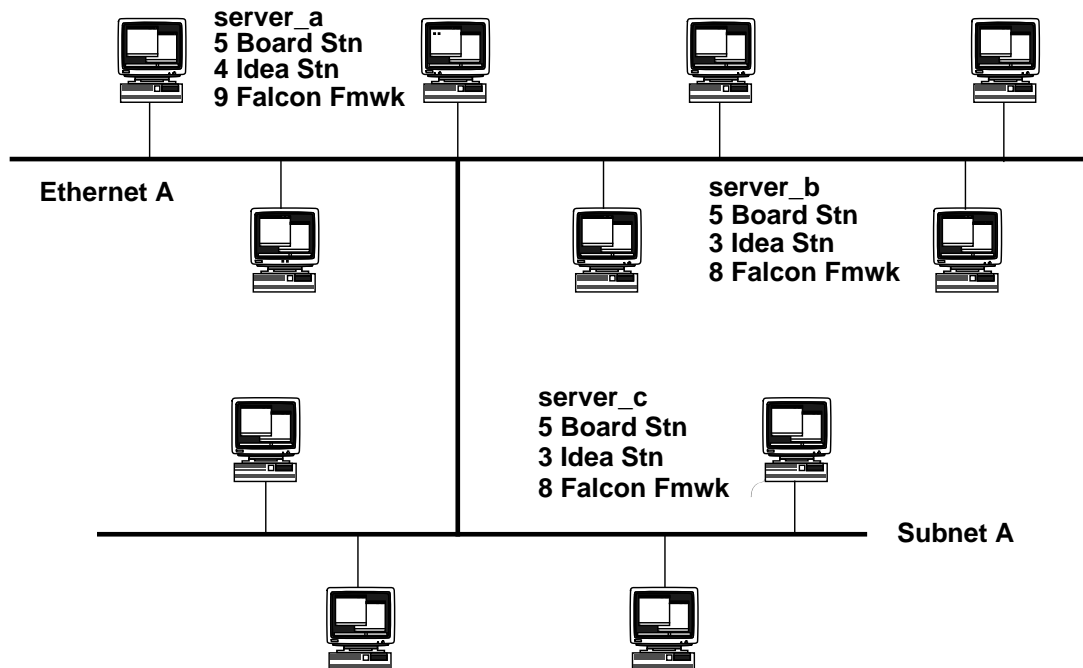
```
SERVER server_c 590b2641 1717  
DAEMON mgcld /usr1/vendor/mgls/bin/mgcld  
INCREMENT falconfw_s mgcld 2001.020 31-dec-2002 8 BCA0E090B221cc99a241  
VENDOR_STRING=ABFA24DC sn=2221  
INCREMENT board_s mgcld 2001.020 31-dec-2002 5 BCA0E090B221cc99a241 \  
VENDOR_STRING=ABFA24DC sn=307  
INCREMENT idea_s mgcld 2001.020 31-dec-2002 3 BCA0E090B221cc99a241 \  
VENDOR_STRING=ABFA24DC sn=97234
```

Figure 3-1 shows the example independent configuration on an Ethernet. In Figure 3-1, if server_a is off the network, the licenses associated with that license server are not available. However, because licenses are distributed among servers, server_b and server_c can still provide a combined total of 10 Board Station licenses, six Idea Station licenses, and 16 Falcon Framework licenses. If server_b is off the network, server_a and server_c can still provide licenses.

Some important items to note about the multiple independent server configuration:

- Because authorization codes are generated to be administered by one particular server, you must decide how to balance your licenses between multiple independent servers before having Mentor Graphics generate your authorization codes. Once you have Mentor Graphics create a license file for a particular server, you cannot move licenses between servers without having Mentor Graphics generate new authorization codes.
- Redundancy is only achieved through the distribution of licenses among multiple independent servers (also referred to as, “redundancy via license file list”). When a license server is removed from the network, you lose access to any licenses administered by that server.

Figure 3-1. Independent Servers



Redundant Servers

Redundant servers contain the same set of license data. Redundant servers are configured in groups of three. As the name implies, redundant servers operate as a quorum system and provide a backup mechanism should you lose one license server. As long as a majority of the license servers in the redundant configuration are still operational, you retain access to all your licenses.

For example, assume you choose three workstations, (hosts named server_a, server_b, and server_c) to act as redundant license servers. Again, your site has purchased 15 licenses for Board Station, 10 licenses for Idea Station, and 25 Falcon Framework licenses. All licenses are floating.

With the exception of the DAEMON line, each license server would have a license file with the same license information, as follows:

```
SERVER server_a 5500361a 1717
SERVER server_b 2670943d 1717
SERVER server_c 590b2641 1717
DAEMON mgcld /usr1/mgc_master_tree/pkgs/mgls/bin/mgcld
INCREMENT falconfw_s mgcld 2001.020 31-dec-2002 25 BCA0E090B221cc99a241
  VENDOR_STRING=ABFA24DC sn=2243
INCREMENT board_s mgcld 2001.020 31-dec-2002 15 BCA0E090B221cc99a241 \
  VENDOR_STRING=ABFA24DC sn=1552
INCREMENT idea_s mgcld 2001.020 31-dec-2002 10 BCA0E090B221cc99a241 \
  VENDOR_STRING=ABFA24DC sn=8791
```

The DAEMON line provides the license server with an absolute path to the location of the **mgcld** daemon on that server. If the pathname to the daemon is different on each server, the DAEMON line needs to reflect the correct pathname for that particular server; however, if the path to the **mgcld** daemon is the same for each server, the DAEMON line is the same in each license file.

The order in which the license servers are listed in the license file is also important. The listing of license servers needs to be identical in all three license files. The first server listed is the master. If, for some reason, the master license server goes down, one of the slaves is automatically reassigned as the master. This happens in the background and requires no user or system management interaction. However, licensing will temporarily deny new license requests while this reassignment occurs, which can take a few minutes. Applications that currently hold a license are not affected.

Figure 3-2 shows the example redundant configuration on an Ethernet. If server_a is off the network, all licenses are still available, since a quorum (two out of three) exists with server_b and server_c. If server_b is off the network, a quorum still exists, since server_a and server_c are still up and running and can therefore provide licenses. However, if both server_a and server_b are down, no licenses will be served because a quorum does not exist.

Note


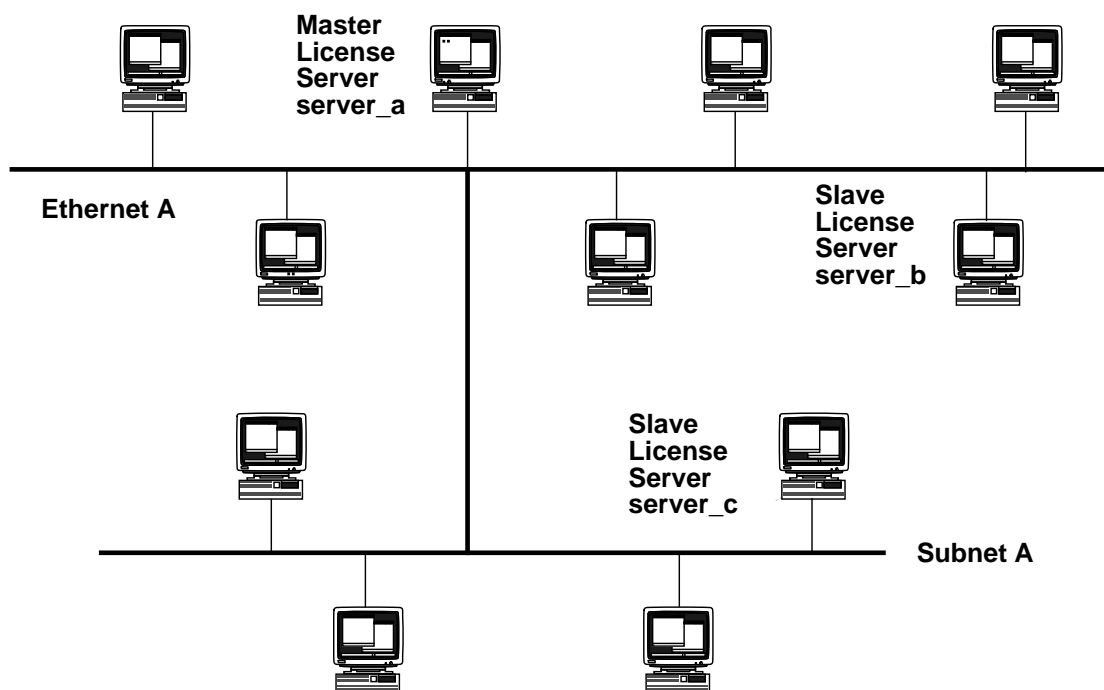
 This server configuration offers redundancy, NOT load balancing. Use multiple independent servers to distribute license requests if desired.

Figure 3-2. Redundant Servers



Using Different Types of Workstations as License Servers

It is possible to use different types of workstations as license servers. You can use a Sun license server to administer licenses to HP workstations. (This assumes the workstations running the application and the license server are supported platforms.)

It is also possible to use a UNIX license server to administer licenses to Windows workstations, as well as use a Windows license server to administer licenses to UNIX workstations.

Factors That Affect Your Choice of License Servers

When configuring license servers on your network, you want to choose a configuration that minimizes problems and maintenance, yet allows for future growth. The server configuration you choose depends on:

- [“Number of License Servers”](#) on page 31
- [“Types of Licenses Available”](#) on page 32
- [“Network Topology”](#) on page 32

Number of License Servers

Because licensing uses TCP/IP as a basis for communication, you can receive an error if the number of application requests exceeds the number of TCP/IP sockets available on a license server. Such an error occurs when a license server runs out of file descriptors in that operating system (the default in some operating system shells is 64). Many newer operating systems, such as Sun Solaris, offer a minimum of several hundred file descriptors per shell; however, you should be aware of a system’s file descriptor limits when deciding on its use as a license server.

Although this limit is not a problem in most small and medium size networks, if your site is very large, you need to plan the number of required license servers so as not to exceed this limit. A good way to do this is to identify your peak usage. For example, if you have 200 licenses, but only 40 users, you can probably have all the licenses in the same license file and never exceed the licensing limit for the server. If you have 1000 licenses and 160 users, you probably want to distribute your licenses between at least two independent servers or two groups of redundant servers, or increase the number of available file descriptors on your server.

Note



The number of file descriptors available to license server processes (lmgrd and mgcld) controls the number of concurrent license checkouts. The recommendation is to estimate the highest number of concurrent users and then set the available file descriptors to roughly 10 percent above that amount. For example, 3700 concurrent users require 3700 file descriptors. A setting of 4096 (2^{12}) is roughly 10 percent greater than 3700.

As a general rule, the more independent license servers or groups of redundant servers that exist on a network, the more difficult it is to distribute licenses. As the number of license servers and the modifications to the license file on a network increase, network traffic and the chances of having problems can also increase.

When deciding on the number of license servers that is right for your network, consider the following guidelines:

- To provide a level of fault-tolerance, use a multiple independent server configuration or a redundant server configuration. A redundant configuration provides a backup methodology if a license server goes down that does not cause you to lose a portion of your licenses.
- Keep the number of independent servers or groups of redundant servers to a minimum to reduce the complexity of license distribution.

Types of Licenses Available

There are two types of licenses that can authorize the operation of Mentor Graphics applications. These two types of licenses are:

- **node-locked license** — Enables you to run an application only on the system specified in the license for that application. Thus, execution of the application is tied to one particular system in your network. Mobile compute (node-locked uncounted) licenses (Windows only) allow use on the machine specified in the license file. This type of license does not require a license server. For more information on this type of license, refer to the *License Administration Guide*.
- **floating license** — Enables you to run an application on any workstation that meets the environmental requirements for Mentor Graphics software. Floating/node-locked counted licenses are made available via a license server.

In general, node-locked licenses for the same workstation increase the chance of configuration problems if they are spread out among several independent license servers. When planning the layout of your license servers, make sure that all node-locked licenses for a particular system are located on the same license server.

Note



The use of node-locked and floating licenses on the same server may limit the ability to take advantage of the FlexNet Licensing options file for site-defined access restrictions.

Network Topology

The licensing system operates in a server/client relationship that requires an application to communicate with a license server to acquire a license. When possible, it is best to locate a license server closest to a majority of application users on the same subnet. Subnets, routers,

bridges, or other network devices that might impede the throughput of network traffic can also affect the speed at which an application is able to obtain a valid license. The amount of time it takes an application to get a license will, in turn, impact the time that application takes to invoke.

Chapter 4

Customizing Licensing

This chapter discusses different ways to customize your licensing. This chapter covers:

- [“Licensing Environment Variables”](#) on page 35
- [“Using Daemon Options File”](#) on page 46
- [“Controlling License Consumption”](#) on page 48
- [“Running Mentor Graphics Software with Other FlexNet Licenses”](#) on page 49

Licensing Environment Variables

This section describes the Mentor Graphics license environment variables and their relation to the standard FlexNet Licensing environment variables. These variables are client-specific variables. This section discusses:

- [FlexNet Licensing Environment Variables](#)
- [“UNIX Environment Variables”](#) on page 36
- [“Windows Environment Variables”](#) on page 42

FlexNet Licensing Environment Variables

LM_LICENSE_FILE is the FlexNet Licensing environment variable used by the license server and application to determine the location of license files. You can use LM_LICENSE_FILE on client workstations to allow applications invoked on those workstations to point to a license file not stored in the default location or to point to one or more license servers. For Mentor Graphics applications, the MGLS_LICENSE_FILE environment variable overrides LM_LICENSE_FILE.

In some environments, you may combine the FlexNet Licensing information for several vendors into a single license file. The default locations are:

- **UNIX** — */usr/local/flexlm/licenses/license.dat*
- **Windows** — *C:\flexlm\license.dat*



Windows

This section applies only to Windows.

For information on setting LM_LICENSE_FILE on Windows, refer to [“Windows Environment Variables”](#) on page 42.

UNIX



This section applies only to UNIX-based systems.

End users can usually override the default license location by setting the environment variable LM_LICENSE_FILE to point elsewhere, or by following instructions supplied with the licensed application.

Note



The **"-c"** option overrides the setting of the LM_LICENSE_FILE environment variable for **lmgrd** and other FlexNet Licensing utilities like **lmstat** and **lmdown**.

For more information on MGLS_LICENSE_FILE, refer to [page 38](#).

UNIX Environment Variables

UNIX



This section applies only to UNIX-based systems. These environment variables only affect the local shell where the value is set. To affect all shells, you must modify the shell startup scripts.

You can control your licensing environment with environment variables. With the exception of MGLS_HOME and MGC_HOME, one of which must be set to allow licensing to run, use of environment variables is optional.

The following pages describe the environment variables that control various aspects of licensing:

- [“MGC_HOME”](#) on page 37
- [“MGLS_CONN_TIMEOUT”](#) on page 37
- [“MGLS_DEBUG_LOG_DIR”](#) on page 37
- [“MGLS_EXP_WARN_DAYS”](#) on page 38
- [“MGLS_HOME”](#) on page 38
- [“MGLS_LICENSE_FILE”](#) on page 38
- [“MGLS_INCLUDE_LICENSES and MGLS_EXCLUDE_LICENSES”](#) on page 40
- [“MGLS_LICENSE_SOURCE”](#) on page 41

- “MGLS_OPTIONS_FILE” on page 41

MGC_HOME

The MGC_HOME variable is used to locate Mentor Graphics software when it is located within the Mentor Graphics tree. If the server contains a local Mentor Graphics tree, you only need to set MGC_HOME and do not need to set MGLS_HOME. The standard location of the licensing software in a MGC_HOME tree is at *\$MGC_HOME/pkgs/mgls*.

MGLS_CONN_TIMEOUT

The MGLS_CONN_TIMEOUT variable allows you to specify a time out value, in seconds, for a TCP/IP connection between an application and the licensing server, based on the network's load and configuration. If you have a heavily loaded or very large network, you can set the value to a relatively large value (for example, one minute) for application connection retries, so the application can connect with the license daemon at invocation.

Maximum value = 600 seconds (10 minutes)

Default value = 10 seconds

MGLS_DEBUG_LOG_DIR

The MGLS_DEBUG_LOG_DIR environment variable is used to enable debugging of the Mentor Graphics licensing system. It creates a Mentor Graphics licensing debug log file. The purpose of the log file is to help you troubleshoot basic licensing problems with client applications, such as licensing software not installed properly, license files not found or defined in multiple locations, etc. The log file does not contain any output from the server-side processes **lmgrd** and **mgcld**.

Note



Setting the MGLS_DEBUG_LOG_DIR environment variable will negatively impact performance so it should only be turned on for debugging purposes. Unset the MGLS_DEBUG_LOG_DIR environment variable when troubleshooting is complete.

The log file contains information about:

- Licensing environment variables
- Licensing software files (location and version)
- License file search path
- Licensing errors

Set the MGLS_DEBUG_LOG_DIR environment variable to an existing directory to write the debug log files. The specified directory must exist and be writable by the user invoking the

client application. If the directory does not exist or is not writable, then no debug log file is generated.

The MGLS debug log file is a text file with the process ID of the application embedded in the log file name. For example: debug_log.7852.txt. Each invocation of the application starts a new log file. Therefore, no log files are appended to or overwritten.

MGLS_EXP_WARN_DAYS

The MGLS_EXP_WARN_DAYS variable allows you to set the number of days before the license expiration date that warning messages start to display. The licensing default is fifteen days, but some sites may require earlier notification.

Maximum value = 90 days

Minimum value = 1 day

Default value = 15 days

Note



Setting the value to zero (0) returns the setting to the default value of 15 days.

MGLS_HOME

The MGLS_HOME variable is used to locate licensing software. It is only necessary to set MGLS_HOME if the local copy of the licensing software is outside of a Mentor Graphics tree. If the server contains a local Mentor Graphics tree, you only need to set MGC_HOME, and do not need to set MGLS_HOME.

Note



MGLS_HOME should only be set by license administrators on server systems that do not have a Mentor Graphics tree. MGLS_HOME is NOT recommended in a user environment.

MGLS_LICENSE_FILE

LM_LICENSE_FILE is the FlexNet Licensing environment variable used by the license server and application to determine the location of license data files. You can use LM_LICENSE_FILE on client workstations to allow applications invoked on those workstations to use a license file not stored in the default location or to point to multiple license sources. MGLS_LICENSE_FILE works like LM_LICENSE_FILE, but tells licensing to ignore the setting of LM_LICENSE_FILE and to get the license file or server from the value of MGLS_LICENSE_FILE.

MGLS_LICENSE_FILE is used when multiple products have FlexNet Licensing to allow other vendor products to use the LM_LICENSE_FILE variable, while allowing Mentor Graphics licensing products to get their licenses from the value of MGLS_LICENSE_FILE. Only Mentor Graphics software recognizes MGLS_LICENSE_FILE; software from other vendors that use FlexNet Licensing will ignore it. The standard FlexNet Licensing commands will only recognize LM_LICENSE_FILE; therefore, MGLS_LICENSE_FILE will not work with these commands.

The total length of MGLS_LICENSE_FILE and LM_LICENSE_FILE is dynamic and dependent on the environment. In particular, the number of available file descriptors affects the number of license server/file entries. The base licensing technology, FlexNet, limits each port@host entry to 1024 characters and a license path entry to 4096 characters. Your environment could add additional constraints.

MGLS_LICENSE_FILE and LM_LICENSE_FILE have the same syntax, which is:

```
license_file_pathname1:license_file_pathnameN:port@host1:port@hostN
```

On Windows, use a semicolon (;) rather than a colon (:) as the path separator for independent servers. For example:

```
license_file_pathname1;license_file_pathnameN;port@host1;port@hostN
```

When you define multiple license servers, the application utilizes the license servers in the order specified by the license file. For example, if your license file contains the following:

```
license_server1:license_server2
```

The application requests a license from license_server1 and, if the license is in use or not available, then the application requests the license from license_server2.

Port@Host

There are two ways to reference a license server. The first and recommended method to reference a license server is to use the port@host syntax. This allows you to contact a license server without having to know the pathname to the license file the license server is using. The following example shows the Bourne shell syntax using port@host for an independent server:

```
$ MGLS_LICENSE_FILE=1717@host  
$ export MGLS_LICENSE_FILE
```

The following example shows the Bourne shell syntax for indicating the pathname to a group of redundant servers using port@host.

```
$ MGLS_LICENSE_FILE=1717@a,1717@b,1717@c  
$ export MGLS_LICENSE_FILE
```

Note



There is one important difference when you use this port@host syntax; you must specify and separate with commas all servers in a redundant configuration on UNIX.

To point to multiple server configurations, combine any of the syntax in a colon-separated list as in the following example:

```
$ MGLS_LICENSE_FILE=/net/indep1/usr/lic:\
1717@a,1717@b,1717@c:/net/indep3/home/lic
$ export MGLS_LICENSE_FILE
```

Path to License File

The second method uses the pathname of the license file. (This method is not recommended for redundant servers.) For example, the following Bourne shell syntax denotes the pathnames to the license files of three independent servers:

```
$ MGLS_LICENSE_FILE=/net/indep1/usr/lic:/net/indep2/usr/lic:\
/net/indep3/home/lic
$ export MGLS_LICENSE_FILE
```

The following example shows the Bourne shell syntax for indicating the pathname to a group of redundant servers, 1a through 1c, where redun1a is the master:

```
$ MGLS_LICENSE_FILE=/net/ser_1a/usr/lic,/net/ser_1b/usr/lic,\
/net/ser_1c/usr/lic
$ export MGLS_LICENSE_FILE
```

MGLS_INCLUDE_LICENSES and MGLS_EXCLUDE_LICENSES

MGLS_INCLUDE_LICENSES and MGLS_EXCLUDE_LICENSES are two new client side variables. These variables are very similar to the FlexNet Options file INCLUDE and EXCLUDE functionality, except the restriction takes place on the client side (not the server side).

Caution



Do not mix the use of the client-side variables with restrictions on the server side (FlexNet Options file), at least for the same feature name. Otherwise, you may end up not being able to checkout any license!

The MGLS_INCLUDE_LICENSES and MGLS_EXCLUDE_LICENSES can be useful in cases where users need to control whether or not they can get a certain license (for example, expadvpack_c). However, be very careful with the setting of these variables because you can unknowingly restrict your machine from getting any licenses. Where possible, set these variables inside a script that also invokes the application (example: Xpedition PCB), so that the restriction does not impact all other Mentor Graphics applications.

Note the following examples:

- The following is an example of a UNIX (bash shell) script, where you want only the expadvpack_c license to be checked out.

Note

No other features can be checked out, which is why the MGLS_INCLUDE_LICENSES should only be set inside a script and NOT as an environment variable.

```
#!/bin/sh
set MGLS_INCLUDE_LICENSES=expadvpack_c
export MGLS_INCLUDE_LICENSES
$SDD_HOME/common/linux/bin/ExpeditionPCB
```

- In this example, you want to invoke ExpeditionPCB and have it ignore (exclude) the expadvpack_c license.

```
#!/bin/sh
set MGLS_EXCLUDE_LICENSES=expadvpack_c
export MGLS_EXCLUDE_LICENSES
$SDD_HOME/common/linux/bin/ExpeditionPCB
```

When including a list of features, use the colon (Linux) or semi-colon (Windows) as the delimiter. For example, to never checkout a expadvpack_c or a expadvtech_c license, set the following variable:

```
MGLS_EXCLUDE_LICENSES=expadvpack_c;expadvtech_c
```

MGLS_LICENSE_SOURCE

The MGLS_LICENSE_SOURCE variable specifies the order of the features licensing considers in license check-out requests. For example, you can use MGLS_LICENSE_SOURCE to ensure that a particular license is consumed before any other licenses. The list is a colon-separated list of feature names that licensing searches from left to right.

For example:

```
$ MGLS_LICENSE_SOURCE=quicksimii:idea_s:ANY
$ export MGLS_LICENSE_SOURCE
```

MGLS_OPTIONS_FILE

The MGLS_OPTIONS_FILE variable specifies the path to the MGLS options file. Use the MGLS options file on UNIX to specify MGLS specific options. The MGLS options file is a text file that is usually stored in the same directory as your license file.

Use of the MGLS options file is optional; you only need to use it if you want to use MGLS specific options.

Note



The MGLS_OPTIONS_FILE contains MGLS specific options. The daemon options file contains FlexNet Licensing specific options. These two files are mutually exclusive, where options in one file do not affect options in the other. See [“Using Daemon Options File”](#) on page 46 for information about the daemon options file.

The Mentor Graphics options file keyword is MGLSLOG. The MGLSLOG keyword enables the **mgcld** daemon to write verbose entries in the license server FlexNet debug log file. The additional information includes atomic license requested and a unique identifier of the FEATURE line granted at checkout.

The syntax for a MGLSLOG line in the daemon options file would appear as follows:

```
MGLSLOG {IN | OUT | DENIED | QUEUED | ALL}
```

where:

- **IN** — Reports licenses checked in
- **OUT** — Reports licenses checked out
- **DENIED** — Denies license requests when there are no more licenses
- **QUEUED** — Places license requests in a queue to wait for an available license when there are no more licenses
- **ALL** — Uses all the fields for message reporting in the FlexNet debug log file

Windows Environment Variables

Windows



This section applies only to Windows.

During installation, the licensing software sets the necessary values in the system registry. Problems with licensing software can occur if MGLS_LICENSE_FILE or LM_LICENSE_FILE is not set properly on your machine. Use **Start > Programs > Mentor Graphics Licensing > pcls_ok** to verify the value of the registry settings and environment variables and quickly determine the cause of any licensing problems. For more information, refer to [“pcls_ok”](#) on page 75.

Setting Environment Variables on Windows

The licensing installation software sets the necessary registry settings during configuration. If the values need to change, you can try running the Configure Licensing menu item to change the values.

If you still encounter environment variable problems, manually set the MGLS_LICENSE_FILE or LM_LICENSE_FILE environment variable to the location of the license file.

MGLS_CONN_TIMEOUT

The MGLS_CONN_TIMEOUT variable allows you to specify a time out value, in seconds, for a TCP/IP connection between an application and the licensing server, based on the network's load and configuration. If you have a heavily loaded or very large network, you can set the value to a relatively large value (for example, one minute) for application connection retries, so the application can connect with the license daemon at invocation.

Maximum value = 600 seconds (10 minutes)

Default value = 10 seconds

MGLS_DEBUG_LOG_DIR

The MGLS_DEBUG_LOG_DIR environment variable is used to enable debugging of the Mentor Graphics licensing system. It creates a Mentor Graphics licensing debug log file. The purpose of the log file is to help you troubleshoot basic licensing problems with client applications, such as licensing software not installed properly, license files not found or defined in multiple locations, etc. The log file does not contain any output from the server-side processes **lmgrd** and **mgld**.

Note



Setting the MGLS_DEBUG_LOG_DIR environment variable will negatively impact performance so it should only be turned on for debugging purposes. Unset the MGLS_DEBUG_LOG_DIR environment variable when troubleshooting is complete.

The log file contains information about:

- Licensing environment variables
- Licensing software files (location and version)
- License file search path
- Licensing errors

Set the MGLS_DEBUG_LOG_DIR environment variable to an existing directory to write the debug log files. The specified directory must exist and be writable by the user invoking the client application. If the directory does not exist or is not writable, then no debug log file is generated.

The MGLS debug log file is a text file with the process ID of the application embedded in the log file name. For example: *debug_log.7852.txt*. Each invocation of the application starts a new log file. Therefore, no log files are appended to or overwritten.

MGLS_INCLUDE_LICENSES and MGLS_EXCLUDE_LICENSES

MGLS_INCLUDE_LICENSES and MGLS_EXCLUDE_LICENSES are two new client side variables. These variables are very similar to the FlexNet Options file INCLUDE and EXCLUDE functionality, except the restriction takes place on the client side (not the server side).

Caution



Do not mix the use of the client-side variables with restrictions on the server side (FlexNet Options file), at least for the same feature name. Otherwise, you may end up not being able to checkout any license!

The MGLS_INCLUDE_LICENSES and MGLS_EXCLUDE_LICENSES can be useful in cases where users need to control whether or not they can get a certain license (for example, expadvpack_c). However, be very careful with the setting of these variables because you can unknowingly restrict your machine from getting any licenses. Where possible, set these variables inside a script that also invokes the application (example: Xpedition PCB), so that the restriction does not impact all other Mentor Graphics applications.

Note the following examples:

- In this example, you want only the expadvpack_c license to be checked out.

Note



No other features can be checked out, which is why the MGLS_INCLUDE_LICENSES should only be set inside a script and NOT as an environment variable.

```
SET MGLS_INCLUDE_LICENSES=expadvpack_c
START %SDD_HOME%\common\win32\bin\ExpeditionPCB.exe
```

- In this example, you have a mix of atomic Xpedition licenses (wgpcb, wgascentl2, wgascentlx, etc.), as well as the expadvpack_c composite. You want to ignore the expadvpack_c composite so you can checkout the atomic licenses instead.

```
SET MGLS_EXCLUDE_LICENSES=expadvpack_c
START %SDD_HOME%\common\win32\bin\ExpeditionPCB.exe
```

When including a list of features, use the colon (Linux) or semi-colon (Windows) as the delimiter. For example, to never checkout a padses_c, padsls_c or a dxdesigner040_c set the following variable:

```
MGLS_EXCLUDE_LICENSES=padses_c;padsls_c;dxdesigner040_c
```

MGLS_LICENSE_SOURCE on Windows

The MGLS_LICENSE_SOURCE variable specifies the order of the features licensing considers in license check-out requests. This variable on Windows is equivalent to “[MGLS_LICENSE_SOURCE](#)” on page 41.

For example, you can use MGLS_LICENSE_SOURCE to ensure that a “padses_c” license is consumed before any other licenses.

For example:

```
MGLS_LICENSE_SOURCE=padses_c:ANY
```

MGLS_LICENSE_SEARCH

The MGLS_LICENSE_SEARCH environment variable is only applicable in PCLS on Windows. Setting MGLS_LICENSE_SEARCH=1 on Windows, changes the license search behavior to emulate the default behavior on UNIX; it restricts Mentor Graphics applications from searching for licenses beyond the first license designator that exists.

Note



This variable is not normally necessary. Use caution in setting it as it limits the license search for all Mentor Graphics applications. Only set in cases where you are sure you do not want the remaining designators to be searched.

Mentor Graphics applications on Windows look for the following license designators:

```
environment variable: MGLS_LICENSE_FILE
registry value: HKEY_LOCAL_MACHINE\SOFTWARE\MentorGraphics\
  Licensing\MGLS_LICENSE_FILE
environment variable: LM_LICENSE_FILE
registry value: HKEY_LOCAL_MACHINE\SOFTWARE\FLEXLM License Manager\
  LM_LICENSE_FILE
file: C:\flexlm\license.dat
```

For example, you set

```
MGLS_LICENSE_FILE and LM_LICENSE_FILE
```

```
then set
```

```
MGLS_LICENSE_SEARCH=1
```

The search stops at the MGLS_LICENSE_FILE environment variable and looks no further; the search does not continue on to the LM_LICENSE_FILE environment variable. If the MGLS_LICENSE_FILE environment variable contains multiple servers or paths, they will be searched.

If the MGLS_LICENSE_SEARCH environment variable is not set, a license search continues through as many license servers or pathnames in as many designators that are set, (this is sometimes referred to as "ratcheting"), until either obtaining the license or reporting that it cannot find the license.

Licensing on Windows will stop looking through the above list and quit ratcheting as soon as it acquires a license.

Using Daemon Options File

You can use the daemon options file on Windows and UNIX to perform activities such as excluding an individual, group, or internet from using one particular FEATURE or INCREMENT line, reserving a FEATURE or INCREMENT for an individual, and screening

license usage data that is written to the log file. Use of the daemon options file is optional; you only need to use it if you want to restrict or customize license usage.

Information about the location of the daemon options file and how to reference it appears in the following section. An example daemon options file appears on page [48](#).

Options File Location and Format

The daemon options file is a text file that is usually stored in the same directory as your license file. Refer to the *License Administration Guide* for information on specific FlexNet Licensing options.

Note



The daemon options file contains FlexNet Licensing specific options. The MGLS options file, specified by the MGLS_OPTIONS_FILE environment variable, contains MGLS specific options. These two files are mutually exclusive, where options in one file do not affect options in the other file. See “[MGLS_OPTIONS_FILE](#)” on page 41 for information about the MGLS_OPTIONS_FILE environment variable and the MGLS options file.

On UNIX, if you want to create a daemon options file, you could put it in the following location: `$MGC_HOME/etc/cust/mgls/mgcl.d.opt`.

If you want to use a daemon options file (for example, you want to add custom information for your site to this file), you will also need to edit the license file with the correct pathname to the options file and restart the license server for the options to take effect.

The licensing software locates the options file by the pathname you enter as the fourth field in a DAEMON line in the license file. For example, if you name the options file `mgcl.d.opt` and place it in the `/usr2/licenses` directory, the Mentor Graphics daemon line in the license file would appear as follows:

```
DAEMON mgcl.d <daemon_path> OPTIONS=/usr2/licenses/mgcl.d.opt
```

If you do not want to use a daemon options file, you can omit the fourth field of the DAEMON line, as follows:

```
DAEMON mgcl.d <daemon_path>
```

Options File Keywords

Each line in the daemon options file consists of an *option keyword* followed by the required number of fields for that keyword. Some of the acceptable FlexNet Licensing option keywords in the daemon options file are EXCLUDE, EXCLUDEALL, GROUP, INCLUDE, INCLUDEALL, NOLOG, RESERVE, and REPORTLOG.

Note



When specifying a port or options file on the DAEMON line, the field names must be in uppercase (for example: PORT= and OPTIONS=).

Each keyword must be followed by one or more required arguments. Because the daemon options file is associated with the **mgld** licensing daemon, any feature you name in the daemon options file following a keyword must be supported by the **mgld** daemon. For information on more of the option keywords, refer to the *License Administration Guide*.

Example Options File

The following shows an example daemon options file (Note: There are more command possibilities than those shown.):

```
# Daemon Options file for Widget Corporation
RESERVE 1 icgraph USER john
RESERVE 1 calibredrc HOST bigengine
EXCLUDE qhsimvh USER randy
NOLOG QUEUED
```

In this example file, at least one icgraph license will always be reserved for USER john. And, at least one calibredrc license will always be reserved for HOST bigengine. USER randy will always be prevented from using qhsimvh licenses. Messages for queued licenses are not logged. For more information, refer to the *License Administration Guide*.

Controlling License Consumption

There may be many different types of licenses on your network that will authorize the same application. For example, a license server can authorize a request from a Design Architect application session by granting either an Idea Station license (idea_s) or a Design Architect composite license (designarch_c). Also, any station, composite, or option license can be node-locked or floating.

If you have a license file that contains multiple types of licenses for the same application, you might want to control the order in which licenses are consumed. You can only designate a node-locked license for one particular system in your network, while you can use a floating license for any system in your network. Using up a floating license, when a node-locked license is available, deprives one user of a floating license and leaves the node-locked license idle, since no other workstation can use it.

When you consume a station license for a given application, the license offers broad functionality, but only the user holding the station license can use applications associated with that station license.

For information on the different types of licenses, refer to [“Types of Licenses Available”](#) on page 32.

Order of Entries in a License File

The licensing software uses two mechanisms to determine the order of license check out. The first mechanism uses the order of the license file entries to determine which license to check out. If Feature2 appears before Feature1 in the license file, and both licenses can satisfy the license request, Feature2 will be used if it is available for check out.

The second mechanism applies to license entries with the same feature name. If there are multiple licenses for the same feature name, and each has different license attributes, the licensing software automatically sorts the licenses based upon the following criteria:

- FEATURE before INCREMENT
- Uncounted before counted
- Version — lower versions before higher versions

You can override this order by adding the “sort=” attribute. For more information, refer to the *License Administration Guide*.

Running Mentor Graphics Software with Other FlexNet Licenses

The application program using FlexNet Licensing is linked with the program module (called the FlexNet Licensing client library) that provides the communication with the license server. During execution, the application program communicates with the vendor daemon to request a license.

The **lmgrd** daemon handles the initial contact with the client application programs, passing the connection to the appropriate vendor daemon. It also starts and restarts the vendor daemons.

In FlexNet, licenses are handled by running processes. There is one process for each vendor who has a FlexNet-licensed product on the network. This process is called the *vendor daemon*. The vendor daemon keeps track of all the licenses that are checked out and who has those licenses. For Mentor Graphics products, this vendor daemon is named **mgcld**.

Because Mentor Graphics has its own vendor daemon, it is possible to run Mentor Graphics software along with other FlexNet licenses.

Using Separate License Files and License Daemons

You can run Mentor Graphics software with other FlexNet licenses by keeping separate license files and license daemons, which is recommended by FlexNet Licensing.

The advantages to keeping separate license files include bringing down a license server only affects the licenses for one vendor daemon, avoiding potential conflict between daemons, and

avoiding potential conflicts between FlexNet Licensing versions. The disadvantages include more maintenance overhead, difficulty tracking all licenses, and non-centralized licenses.

For more information, refer to the *License Administration Guide*.

Merging License Files

It is also possible for you to have one license file that contains information for separate software and license daemons. Some system administrators prefer to consolidate license files for administrative purposes. The advantages to having one license file include centralized administration, one license file to track, and licensing environment variables with smaller values. The disadvantages include conflicting versions and bringing down the license server brings down all vendor daemons and licenses.

The following section describes how to merge license files.

File Requirements for Merging License Files

In order to merge license files successfully, the server host IDs for all of the licenses must match exactly. For example, compare the SERVER lines from a current license file and a new license file:

```
SERVER juneau 00A0CCA420A3 1700
SERVER juneau 00A0CCA420A3 13334
```

In this example, the server host ID of each file is exactly the same: 00A0CCA420A3 . Therefore, you can consolidate the licenses from these two files into one file.

You cannot combine the following:

```
SERVER juneau 00A0CCA420A3 1700
SERVER juneau VB_HOSTID=CCA420A3 27009
```

Even though both server host IDs may be valid on the machine, they are not identical.

The final edited license file will only contain one SERVER line except redundant clusters. Because the server host ID forms part of each license's encryption code, that server host ID must appear on the SERVER line. All of the licenses that are going to be placed in one license file must have been generated using the same server host ID.

It is possible for a given license file to contain multiple DAEMON lines as long as the server host IDs match.

Basic Procedure for Merging License Files

Once you have verified the license files have matching server host IDs, follow these steps:

1. Select one license file to start.
2. Copy the entire contents of the file and paste into a text editor.
3. Open the second license file.
4. Copy the DAEMON line and all FEATURE or INCREMENT lines and paste into the new document.

You can either group all of the DAEMON lines together at the beginning of the file:

```
SERVER juneau 00A0CCA420A3 1700
DAEMON mgcld <path_to_mgcld>
DAEMON ivblicd <path_to_ivblicd>
```

Or, you can separate licenses according to daemon:

```
SERVER juneau 00A0CCA420A3 1700
DAEMON mgcld <path_to_mgcld>
INCREMENT falconfw_s mgcld...

DAEMON ivblicd <path_to_ivblicd>
INCREMENT VBPCB_NT ivblicd...
```

The DAEMON line should appear in the license file before the first FEATURE or INCREMENT line utilizes that vendor daemon.

5. Edit the SERVER line and all DAEMON lines as usual.
6. Save the license file in text format.
7. Stop and restart the license server to bring up and read the combined license file.

The merged license file should be ready for use with your license server.

Chapter 5

Troubleshooting Licensing

Mentor Graphics licensing provides several tools to assist you in troubleshooting licensing problems.

- The FlexNet debug log file contains valuable information on the state of the license server.
- On UNIX-based machines, the **mgl_s_ok** command and some FlexNet Licensing commands allow you to check various aspects of the licensing system.
- On Windows-based machines, **pcls_ok** and **LMTOOLS** allow you to check the licensing system.
- The MGLS_DEBUG_LOG_DIR environment variable, when set, creates a Mentor Graphics licensing debug log file to help you troubleshoot basic licensing problems.
- This chapter also includes the section: “What to do if...” on page 57.
- For more troubleshooting tips, you can also refer to the *License Administration Guide*. This manual is available in PDF format as part of the documentation set shipped on the application CD, or you can view it on SupportNet:
<http://supportnet.mentor.com/>
- Additionally, if you have questions about this software release, log in to SupportNet KnowledgeBase. Refer to “Contacting Mentor Graphics Support” on page 60.

Common Troubleshooting Tips

You should verify the following three areas when troubleshooting licensing:

1. License availability
2. Status report
3. Environment Variables
4. MGLS debug log file

The following sections contain instructions on performing these tasks on both UNIX- and Windows-based workstations.

License Availability

Check that you have a specific license in a specific license file available for use.

mgls_ok Utility

UNIX



This section applies only to UNIX-based systems.

On UNIX workstations, run the **mgls_ok** utility. This utility allows you to attempt to check out and check back in a specified license, and reports any problems. For example:

```
$ $MGC_HOME/bin/mgls_ok license_name
```

For details on and options available with this command, refer to “[mgls_ok](#)” on page 74.

Note



Some Mentor Graphics applications use \$MGC_HOME/bin and some use \$MGLS_HOME/bin.

pcls_ok Utility

Windows



This section applies only to Windows.

On Windows workstations, run the **pcls_ok** utility. This utility allows you to attempt to check out and check back in a specified license, and reports any problems.

For some Mentor Graphics products, you can access the **pcls_ok** utility from **Start > Programs > Mentor Graphics Licensing > pcls_ok**. For others, you can access **pcls_ok** from a binary directory. For example, *\$MGC_HOME/bin/pcls_ok*.

To use **pcls_ok**:

1. Type the FEATURE or INCREMENT name for the application you are trying to verify in the **Feature** edit box.
2. Optionally, type the Version number of the application you are trying to verify in the **Version** edit box. For more information, refer to “[Exact Access Date](#)” on page 11.
3. Click **Apply**.

pcls_ok attempts to check out and check back in the specified license.

If **pcls_ok** was able to successfully check out the license, your application should access it. If not, **pcls_ok** displays an error message describing the cause of the check out failure. For more information, refer to “[pcls_ok](#)” on page 75. **pcls_ok64** works much the same way as **pcls_ok**, however, it only works on Win64 systems. Refer to “[pcls_ok](#)” on page 75.

Many licensing failures are due to invalid or incorrect license environment configuration. The **pcls_ok** utility displays all of the license environment locations and their current settings.

Status Report

Run a status report to see server, daemon, and product usage

lmstat -a



UNIX

This section applies only to UNIX-based systems.

On UNIX workstations, issue the following command:

```
$ lmstat -a -c license file
```

This command reports server, daemon, and product usage for the workstation. The **lmstat -a** command:

- Checks license usage
- Reports the number of installed and available licenses for the specified product
- Lists all active licenses
- Lists all users of the specified feature
- Checks product availability

For more information, refer to “[lmstat](#)” on page 71.

LMTOOLS



Windows

This section applies only to Windows.

On Windows workstations, run the **LMTOOLS** utility and select **Server Status**. This status report provides the same information as **lmstat -a** on UNIX.

This utility displays server, daemon, and product usage. For the licensed application to access the required licenses, the licenses must either be available locally or from a license server. To verify this, use the FlexNet Licensing utility **LMTOOLS** and select **Server Status**. For detailed information on accessing and using **LMTOOLS**, refer to “[LMTOOLS](#)” on page 77.

Environment Variables

Verify variables are set to the correct values. For information on which environment variables need to be set and the correct values, refer to “[Customizing Licensing](#)” on page 35.

Troubleshooting with the MGLS Debug Log File

The `MGLS_DEBUG_LOG_DIR` environment variable is used to enable debugging of the Mentor Graphics licensing system. It creates a Mentor Graphics licensing debug log file. The purpose of the log file is to help you troubleshoot basic licensing problems with client applications, such as licensing software not installed properly, license files not found or defined in multiple locations, etc. The log file does not contain any output from the server-side processes **lmgrd** and **mgld**.

Note



Setting the `MGLS_DEBUG_LOG_DIR` environment variable will negatively impact performance so it should only be turned on for debugging purposes. Unset the `MGLS_DEBUG_LOG_DIR` environment variable when troubleshooting is complete.

The log file contains information about:

- Licensing environment variables
- Licensing software files (location and version)
- License file search path
- Licensing errors

Set the `MGLS_DEBUG_LOG_DIR` environment variable to an existing directory to write the debug log files. The specified directory must exist and be writable by the user invoking the client application. If the directory does not exist or is not writable, then no debug log file is generated.

The MGLS debug log file is a text file with the process ID of the application embedded in the log file name. For example: *debug_log.7852.txt*. Each invocation of the application starts a new log file. Therefore, no log files are appended to or overwritten.

What to do if...

If you have other problems starting an application or with the server workstation, Table 5-1 contains troubleshooting suggestions.

Table 5-1. Troubleshooting Licensing

Problem	Probable Cause	Solution
mgcld returns a message telling you the server has the wrong host ID when attempting to start the license server.	<ol style="list-style-type: none"> 1. You are running the license server on the wrong machine. 2. The host ID has changed. 3. The host ID in the license file was modified. 	Verify the host ID with lmhostid (UNIX) or LMTOOLS (Windows). If the host ID does not match, contact Mentor Graphics for a new license file. For contact information, refer to “Obtaining Licenses” on page 9.
lmgrd returns “execel failed” on startup.	1. There is no executable at the location referred to by the license file.	Verify the path to mgcld is correct in the license file.
	2. The executable does not have execute permission.	Use the chmod command to set execute and read permissions.
	3. The executable is for a different machine architecture.	Ensure you have the proper version of mgcld for your architecture.
The license server reports continual “lost lock” errors in the log file and exits.	The lock file is being removed by a person or another daemon.	Check your processes to see if another mgcld daemon is running. You can run only one mgcld on any particular workstation.

Table 5-1. Troubleshooting Licensing (cont.)

Problem	Probable Cause	Solution
The application or LMTOOLS can not connect to the server.	1. The wrong license file is being referenced by the application.	Verify the application is using the correct license file.
	2. The server is down.	Verify the server is up, using lmstat (UNIX) or LMTOOLS (Windows).
	3. mgcld is not running.	Use lmstat -a (UNIX) or LMTOOLS (Windows) to determine if mgcld is running.
	4. The hostname in the license file is not recognized by the system.	Verify the host ID with lmhostid (UNIX) or LMTOOLS (Windows). If the host ID does not match, contact Mentor Graphics for a new license file. For contact information, refer to “Obtaining Licenses” on page 9.
	5. The network is down.	Check the network using standard network commands.
You receive the error, “Inconsistent encryption.”	1. The license file was modified.	Restore the license file from a backup or reinstall the encoded license you received from Mentor Graphics.
	2. License data corrupted in transmission.	Call Mentor Graphics.

Table 5-1. Troubleshooting Licensing (cont.)

Problem	Probable Cause	Solution
When attempting to invoke a UNIX application, you receive the error, “Child communication failure Licensing system communication failure (from: Core/licensing/MGLS_run07)”.	<p>The license server has exceeded the number of file descriptors available to its operating system. Each license request uses one TCP/IP socket, which, in turn, uses one file descriptor.</p> <p>If LM_LICENSE_FILE or MGLS_LICENSE_FILE environment points to multiple license servers (for example, 4), the <i>mgl_s_async</i> process connects to all four servers, thus using up four file descriptors.</p> <p>Each operating system has a limited number of file descriptors; the default in some operating system shells is 64. If several users are simultaneously attempting to obtain licenses, and each user is connecting to multiple file servers, you could reach the file descriptor limit and receive this error.</p>	<p>There are two possible solutions to this problem:</p> <ol style="list-style-type: none"> 1. Increase the number of file descriptors available to the operating system. For example, on a Sun Solaris, you would use the limit command to display and adjust the number of available file descriptors. On an HP workstation, you would use SAM for the same purpose. 2. Reduce the number of servers listed in the LM_LICENSE_FILE or MGLS_LICENSE_FILE variable. <p>Note the occurrence of a child communication failure is heavily dependent upon the network configuration and the number of simultaneous users.</p>
Application hangs when file descriptor limit reached.	The default limit in some operating system shells is 64 file descriptors. Programs that check out large numbers of licenses can cause the program to run out of file descriptors.	Raise the file descriptor limit in the invoking shell to allow all licenses to be acquired.

Table 5-1. Troubleshooting Licensing (cont.)

Problem	Probable Cause	Solution
Machine hangs or IOT trap message appears.	IOT fault.	<ol style="list-style-type: none">1. If the license sever is hanging, reboot the license server.2. Determine whether or not the license daemon is running. If not, restart the daemon.3. If the client machine is hanging, reboot the client machine. Ensure the license daemon is running on the server when the client reboots.

Contacting Mentor Graphics Support

If you have verified the previous areas and still need help solving your licensing problem, login to SupportNet Knowledgebase. You can search technical solutions in the Knowledgebase or open a Service Request online at:

<http://supportnet.mentor.com/>

If you do not have a SupportNet login, you can request one by filling out the short form at:

<http://supportnet.mentor.com/user/register.cfm>


For phone support in the United States or Canada, call 1-800-547-4303. For phone support in other locations, contact your local sales office or distributor. All other customer support contacts can be found on our website at:

<http://supportnet.mentor.com/contacts/>

Appendix A

Command Reference

This appendix contains notational conventions and command reference information for Mentor Graphics licensing commands and for *some* FlexNet Licensing commands. Mentor Graphics commands are normally found in `$MGLS_HOME/bin` or `$MGC_HOME/pkgs/mgls/bin` (UNIX) and via the **Start menu** (Windows).

 **Note** — Mentor Graphics currently does not support **lmadmin**. **lmadmin** is not included in the Mentor Standard Licensing release. Use the commands listed in this Appendix to manage your license server and disregard the **lmadmin** documentation in the *License Administration Guide*.

For detailed information on all FlexNet Licensing commands, refer to the *License Administration Guide*.

Notational Conventions	62
lmdown	63
lmgrd	65
lmhostid	67
lmreread	69
lmstat	71
mgls_ok	74
pcls_ok	75
LMTOOLS	77

Notational Conventions


The following notational conventions are used in this manual:

Table A-1. Notational Conventions

Syntax	Usage
<i>\$MGC_HOME/install8</i>	Standard italic text indicates generic arguments and options. An italic font is also used to indicate a pathname, manual name, or highlighted comment.
mgl_s_ok -pd	Bold standard text within a paragraph indicates commands or options you type.
<i>path_to_license_file</i>	Monospaced italic text in a shell command should be replaced with user-supplied values.
tar -xf	Monospaced bold text indicates user input in an example command. Enter literal text (that which is not in italics) exactly as shown.
< >	Replace anything between < > with an appropriate user-supplied variable.
[]	Brackets enclose optional arguments. Do not enter the brackets.
	The vertical bar indicates an either/or choice between items. Do not include the bar in the command.
#	The pound symbol (#) indicates a UNIX super-user or root shell.
\$	The dollar symbol (\$) indicates a non-root UNIX shell prompt.
%	The percent symbol (%) indicates a non-root UNIX C-shell prompt


lmdown

UNIX

 This section applies only to UNIX-based systems. To shutdown daemons on Windows, refer to “[LMTOOLS](#)” on page 77.

Shuts down selected license daemons (both **lmgrd** and selected vendor daemons) on all machines.

Caution

 You should protect the use of **lmdown**, since shutting down the servers causes users to lose their licenses.

Command Usage

lmdown [**-c** *license_file_list*] [**-vendor** *vendor_daemon*] [**-q**] [**-all**] [**-force**]

Required Arguments

None

Options lmdown

Note


 Mentor Graphics does not support license borrowing in its implementation of FlexNet.

Table A-2. lmdown Options

-c <i>license_file_list</i>	Uses the specified license file. Note that specifying -c <i>license_file_list</i> is always recommended with lmdown .
-vendor <i>vendor_daemon</i>	Shuts down only this one vendor daemon. lmgrd will continue running if this option is specified. (Requires v6.0 lmdown and lmgrd .)
-q	Specifies not to prompt or print a header.
-all	Shuts down all servers if multiple servers are specified. -q is implied with this option.
-force	Restricts lmdown to run only from the machine where the license server is running, if licenses are borrowed.

Description

lmdown sends a message to every license daemon pointed to by the `LM_LICENSE_FILE` environment variable, asking it to shut down. The license daemons write out their last messages to the log file, close the file, and exit. All licenses that were given out by those daemons are rescinded, so the next time a client program attempts to verify a license, the license is not valid.

Note



On UNIX, do not use **kill -9** to shut down the license servers. On Windows, if you must use the Task Manager to kill the FlexNet Licensing service, be sure to end the **lmgrd** process first.

lmdown can be used to shut down a three-server redundant license server. It does this with a one-minute delay before the servers shut down. To shut down only one of a set of redundant servers, you must kill both the **lmgrd** and vendor daemon processes on that license server machine.

Examples

The following example shows the result of the **lmdown** command:

```
$ lmdown -c license_file
lmdown - Copyright (c) 1989-2011 by Flexera Software, Inc. All rights
reserved.
```

```
Port@Host  Vendors
1) 1700@mgcsrcvr mgcld

Are you sure (y/n)? y
1 FLEXnet License Server shut down
```


lmgrd

The main license daemon program for FlexNet Licensing. Starts a license server.

Command Usage

lmgrd [-c *license_file_list*] [-l [+]*debug_log_path*] [-2 -p] [-local] [-x **lmdown**]
[-x **lmremove**] [-z] [-v] [-help]

Required Arguments

None

Options lmgrd

Table A-3. lmgrd Options

-c <i>license_file_list</i>	Uses the specified license file.
-l [+] <i>debug_log_path</i>	Write debugging information to the <i>debug_log_path</i> . This option uses the letter l. Prepending <i>debug_log_path</i> with the plus (+) character appends logging entries.
-2 -p	Restricts usage of lmdown , lmreread , and lmremove to a FlexNet Licensing administrator who is root by default. If there is a UNIX group called lmadmin , then use is restricted to only members of that group. If root is not a member of this group, then root does not have permission to use any of the above utilities. Using this option prevents a Windows user from shutting down the license server with lmdown .
-local	lmdown can only be run from the same machine where lmgrd is running.
-x lmdown	Disables the lmdown command (no user can run lmdown). If lmdown is disabled, you will need to stop lmgrd via kill pid (UNIX) or CTRL-ALT-DEL (Windows), and stop the lmgrd and vendor daemon processes. On UNIX, ensure the kill command does not have a -9 argument.
-x lmremove	Disables the lmremove command (no user can run lmremove).
-z	Runs lmgrd in the foreground. If -l <i>debug_log_path</i> is also used, then no windows are used. If the -l argument is not used, separate windows are used for lmgrd and each vendor daemon.
-v	Prints lmgrd 's version number and copyright, and then exits.
-help	Displays usage information and exits.

Description

When **lmgrd** is invoked, it looks for the license file that contains information about features and vendors and starts a license server.

Mentor recommends not running license servers as “root”.

Example

```
$ lmgrd -c license_file -l logfile
```

Related Commands

[**lmdown**](#)

Imhostid

Reports the host identification (hostid) number of a system.

Command Usage

Imhostid [-n] [*type*] [-utf8]

Options Imhostid

Table A-4. Imhostid Options

-n	Only the hostid, itself, is returned as a string, which is appropriate to use with HOSTID= in the license file. Header text is suppressed.
-type	One of the following hostid types. If not specified, the default hostid for the current platform is displayed.

Platform-dependent hostids

- ether** — Ethernet address
- string** — String id
- vsn** — Volume serial number (Windows platforms only)
- flexid** — Parallel or USB FLEXid dongle identification. This is applicable only for those platforms that support FLEXid dongles.
- long** — 32-bit hostid

Platform-independent hostids

- display** — Current display name. On Windows, it is the system name or, in the case of a terminal server environment, the terminal server client name. On UNIX, it is the form /dev/ttyxx or the X-Display name.
- hostdomain** — Current host with its fully qualified domain name
- hostname** — Current host name
- internet** — IP address of current platform in the form ###.###.###.###

-utf8	The hostid is output as a UTF-8 encoded string rather than an ASCII string. If your hostid contains characters other than ASCII A through Z, a through z, or 0 through 9, use this option with Imhostid. To view a correct representation of the resulting hostid, use a utility, such as Notepad, that can display UTF-8 encoded strings.
--------------	--

Description

Imhostid displays the hostid of a system.


Examples

The following example shows the output of **lmhostid**:

```
$ lmhostid  
lmhostid - Copyright (c) 1989-2011 by Flexera Software, Inc. All rights  
reserved.  
The FlexNet host ID of this machine is "80fcf93d"
```

Imreread

Tells the license daemon to reread the license file and start any new vendor daemons that have been added.

 **Note** — Mentor Graphics recommends you not use **Imreread** and instead restart the license server if you have replaced the license file or made changes to the options file.

Command Usage

Imreread [-c *license_file_list*] [-vendor *vendor*] [-all]

Required Arguments

None

Options Imreread

Table A-5. Imreread Options

-c <i>license_file_list</i>	Uses the specified license file.
-vendor <i>vendor</i>	Only this one vendor daemon should reread the license file. lmgrd will restart the vendor daemon, if necessary.
-all	Instructs all lmgrds to re-read if more than one lmgrd is specified.

Description

Imreread allows the system manager to tell the license daemon to reread the license file. Use this if the data in the license file has changed, so the new data can be loaded into the license daemon without shutting it down and restarting it.

Imreread uses the license data files from the default file, if no license file is specified, to find the license daemon that needs to reread the license file. The license daemon always rereads the original file it loaded. If you need to change the path to the license file, you must shut down the daemon and restart it with the new license file path.

You cannot use **Imreread** if the server node name or port numbers have been changed in the license file. In this case, you must shut down the daemon and restart it for those changes to take effect.

If the optional vendor daemon name is specified, only the named daemon re-reads the license file and its end-user options file. **lmgrd** does not re-read the license file in this case.

Examples

The following example shows the **lmreread** command and the subsequent log file entry:

```
$ lmreread  
lmreread - Copyright (c) 1989-2011 by Flexera Software, Inc. All  
rights reserved.  
lmreread successful
```

Related Commands

[lmgrd](#)

Imstat

Reports status of all network licensing activities, including:

- Daemons that are running
- License files
- Users of individual features
- Users of features served by a specific vendor daemon

Command Usage

Imstat [-a] [-c *license_file_list*] [-f [*feature*]] [-i [*feature*]] [-s [*server*]] [-S [*vendor*]] [-t *timeout_value*]

Required Arguments

None

Options Imstat

Table A-6. Imstat Options

-a	Displays all information.
-c <i>license_file_list</i>	Uses the specified license file(s).
-f [<i>feature</i>]	Lists all users of the specified feature.
-i [<i>feature</i>]	Displays information from the FEATURE/INCREMENT line for the specified <i>feature</i> , or all features if <i>feature</i> is not specified.
-s [<i>server</i>]	Displays status of all license files listed in \$VENDOR_LICENSE_FILE or \$LM_LICENSE_FILE on <i>server</i> , or on all servers if <i>server</i> is not specified.
-S [<i>vendor</i>]	Lists all users of <i>vendor</i> 's features.
-t <i>timeout_value</i>	Sets connection timeout to <i>timeout_value</i> . This limits the amount of time Imstat spends attempting to connect to <i>server</i> .

Description

Imstat provides information about the status of server systems, vendor daemons, or features.

Imstat prints information that it receives from the license server. It does not report on:

- Unserved licenses

- Queued users
- Licenses shared due to duplicate grouping

To report on an uncounted license, the license must be added to a served license file and the application must be directed to use the license server for that license file (via @host, port@host or USE_SERVER).

lmremove requires the output of **lmstat -a**.

Examples

The following example shows the status returned by **lmstat** used with no arguments:

```
$ lmstat
lmstat - Copyright (c) 1989-2011 by Flexera Software, Inc. All
rights reserved.
Flexible License Manager status on Fri 11/12/2011 10:39
License server status: 1700@mgcsrvr
  License file(s) on mgcsrvr: /usr1/mgc/mgc.licenses:

mgcsrvr: license server UP (MASTER) v9.5
Vendor daemon status (on mgcsrvr):
  mgcld: UP v9.5
```

The following example shows the report returned by **lmstat** when you use it with the **-f** switch:

```
$ lmstat -f calibredrc
lmstat - Copyright (c) 1989-2011 by Flexera Software, Inc. All
rights reserved.
Flexible License Manager status on Fri 11/12/2011 10:42
Users of calibredrc: (Total of 2 licenses issued; Total of 1 license
in use)
  "calibredrc" v2003.090, vendor: mgcld
    floating license
      macd myhost myhost (v2003.08) (mgcsrvr/1700 102), start Fri
11/12 10:42
```

The following example shows the output returned by **lmstat** when you use it with the **-a** switch. Note that **lmstat -a** generates a lot of network activity.

```
$ lmstat -a
lmstat - Copyright (c) 1989-2011 by Flexera Software, Inc. All
rights reserved.
Flexible License Manager status on Fri 11/12/2011 10:45
License server status: 1700@mgcsrvr
  License file(s) on mgcsrvr: /usr1/mgc/mgc.licenses:
mgcsrvr: license server UP (MASTER) v9.5
Vendor daemon status (on mgcsrvr):
  mgcld: UP v9.5
Feature usage info:
Users of calibredrc: (Total of 2 licenses issued; Total of 1 license
in use)
  "calibredrc" v2003.090, vendor: mgcld
    floating license
```



```
macd myhost myhost (v2003.08) (mgcsrvr/1700 102), start Fri  
11/12 10:42  
Users of msimhdlmix: (Total of 2 licenses issued; Total of 0  
licenses in use)
```

mgls_ok

Note



This section applies to UNIX-based systems.

Reports license availability for specified `license_name`.

Command Usage

mgls_ok [-v] [-silent] [-h] [-pd *product_date*] *license_name*

Options mgls_ok

Table A-7. mgls_ok Options

-v	Displays mgls_ok version.
-silent	Do not display results.
-h	Displays help text for mgls_ok.
-pd <i>product_date</i>	Requests a license with specified product date (yyyy.mm).

Example

The following example shows the use of **mgls_ok** with the **-pd** switch:

```
$ mgls_ok -pd 1997.07 designarch
checking availability of "designarch"
license granted through "idea_s"
```

pcls_ok

Windows

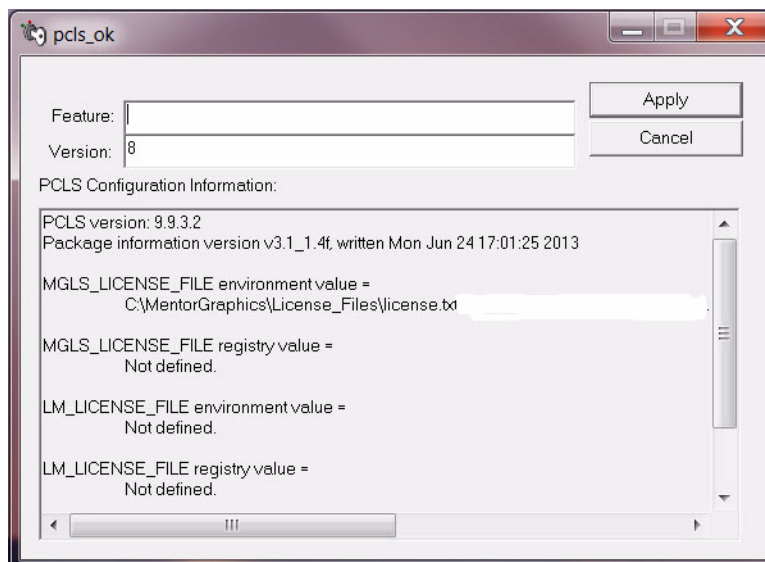


This section applies only to Windows.

pcls_ok checks out and checks in a specified license and reports any problems. **pcls_ok** also reports the version of the licensing software. **pcls_ok** allows you to verify the license file by displaying the environment and registry settings for MGLS_LICENSE_FILE and LM_LICENSE_FILE and a default location *C:\flexlm\license.dat*.

Access **pcls_ok** through **Start > Programs > Mentor Graphics Licensing > pcls_ok**. Refer to the **pcls_ok** dialog box in Figure A-1.

Figure A-1. pcls_ok Dialog Box



Note



This release of PCLS includes a Win64 version of **pcls_ok.exe** named **pcls_ok64.exe**. You can run this binary only on Win64 machines.

To use **pcls_ok**:

1. Type the FEATURE or INCREMENT name for the application you are trying to verify in the Feature text box.
2. Optionally, type the Version number of the application you are trying to verify in the **Version** edit box. For more information, refer to [“Exact Access Date”](#) on page 11.
3. Click **Apply**.

pcls_ok attempts to check out and check back in the specified license.

If **pcls_ok** was able to successfully check out the license, your application should access it. If not, **pcls_ok** displays an error message that describes the cause of the check-out failure.

LMTOOLS

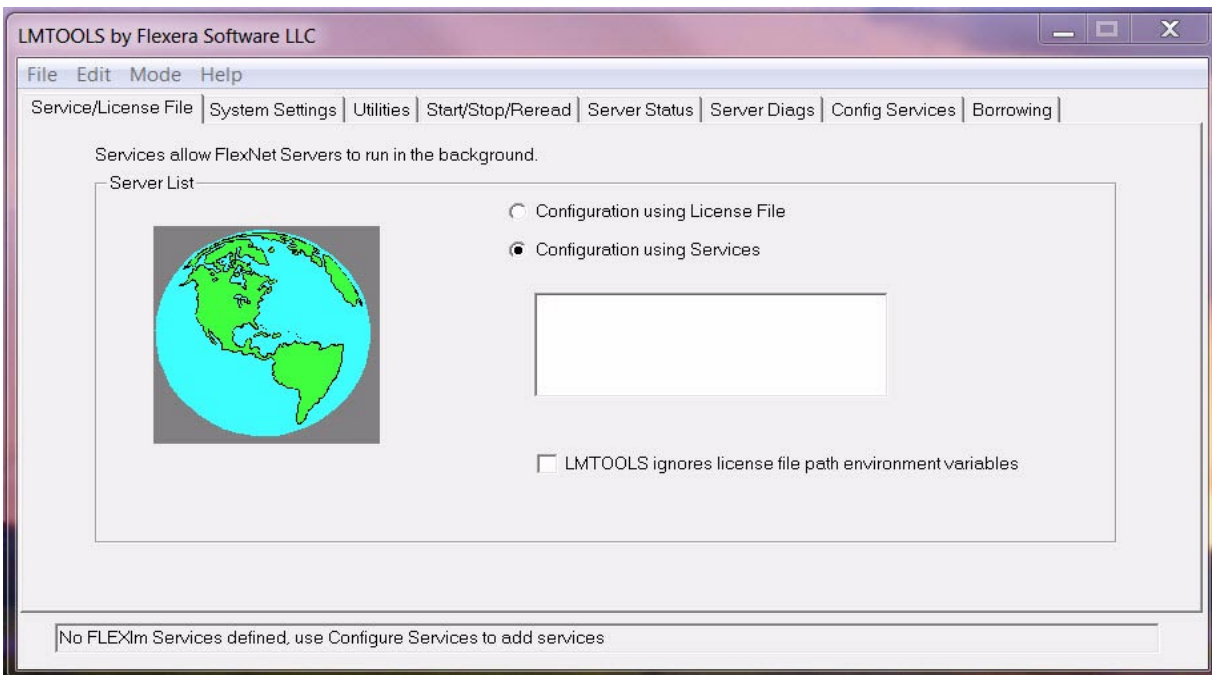
Windows



This section applies only to Windows.

Access the FlexNet Licensing utility **LMTOOLS** through **Start > Programs > Mentor Graphics Licensing > lmtools**. Refer to the **LMTOOLS** dialog box in Figure A-2.

Figure A-2. LMTOOLS Dialog Box



Some of the functions **LMTOOLS** performs include:

- Starting, stopping, and configuring FlexNet license servers
- Getting system information, including hostids
- Getting server status

The **LMTOOLS** dialog box provides several features including, Service/License File, System Settings, Utilities, Start/Stop/Reread, Server Status, Server Diags, and Config Services that can help determine why licensing cannot find or serve a license. Since this is a FlexNet Licensing utility, it does not recognize the **MGLS_LICENSE_FILE** environment settings. You can force **LMTOOLS** to look at a specific license file by selecting the **Service/License File** tab, selecting **Configuration using License File**, typing the path to one or more of the license file names or port@host in the text box, and selecting the **LMTOOLS ignores license file path environment variables** option.

The **LMTOOLS** dialog box provides a button for most of the utilities described in the *License Administration Guide*. For a more complete description of each command, refer to the FlexNet Licensing documentation. The commands you are most likely to use are **Server Status**, **Server Diags**, and **Reread**.

The **Server Status** tab displays a listing of each feature found in a specified license file or server. If the license server you reference is online, detailed information about each feature line served by the server displays. If the feature your application requested is not listed, then your licenses are not available on that server. You may add licenses to the license file and ask the server to reread it by clicking the **Start/Stop/Reread** tab in the **LMTOOLS** dialog box and press the **ReRead License File** button.

The **Server Diagnostics** tab prints specific information on each license found in the file(s) and server(s) listed in your path. If a license is not available for checkout, the software displays an error message explaining why. In this dialog box, specify a license feature name and press the **Perform Diagnostics** button to print specific information on that license.

Reread allows the system manager to tell the license daemon to reread the license file. To use this command, select the **Start/Stop/Reread** tab on the **LMTOOLS** dialog box, and press the **ReRead License File** button. Use this if the data in the license file has changed, so the new data can be loaded into the license daemon without shutting it down and restarting it.

LMTOOLS has two modes in which to configure a license server:

- Configuration using a license file

Operations are performed on a particular license file that resides either local or remote. In this mode, you cannot start the **lmgrd** process, but you can do everything else. To configure this mode, do the following:

- a. Invoke **LMTOOLS**.
- b. Click the **Configuration using License File** button.
- c. Type one or more the license file names or *port@host* specifications.

- Configuration using services

Operations are performed on a service, which allows starting **lmgrd** processes local to the system on which **LMTOOLS** is running.

For details on configuration using services, see the *License Administration Guide*.

The following file paths, used when configuring **LMTOOLS**, are limited to 255 characters:

- Path to the **lmgrd.exe** file
- Path to the license file
- Path to the debug log file

Related Commands

[**lmhostid**](#)

[**lmreread**](#)

[**lmstat**](#)

[**lmdown**](#)

atomic license

An atomic license authorizes the use of a single application or option to an application.

composite license

A composite license usually ends in a "_c" suffix and typically authorizes the use of more than one application under the same license, although a composite license does not usually authorize as many applications as a station license.

Exact Access date

Date encoded in a FEATURE or INCREMENT line. Allows access to software updates for existing licensed software released prior to a support contract expiration date.

feature

A portion of the license file that contains the Mentor Graphics software license. Features are either composite, station, or atomic licenses and can be node-locked or floating.

FEATURE or INCREMENT line

The actual license that enables a product in the license file.

Flexera

Software company that produces FlexNet Licensing.

FlexNet Licensing

Flexible license manager provided by Flexera Software. The Mentor Graphics licensing software uses FlexNet Licensing as the basis of the licensing system.

floating license

Type of license that can run on any workstation.

hardware key (dongle)

Device plugged into a parallel port or USB port. Provides a unique hostid for the licensing system (Windows only).

hostid

A unique hardware based number for each machine. Ties licenses to a specified server or workstation.

independent server

Contains a unique set of license data. If an independent server is off the network, then all licenses associated with the server are unavailable.

license daemon

The daemon process that sends client processes to the correct vendor daemon on the correct machine. Mentor Graphics licensing includes two daemons, **lmgrd** (license daemon) and **mgld** (vendor daemon).

license file

A text file that contains the customer site identification, license server and daemon information, and FEATURE or INCREMENT lines, which are the actual licenses for the supported products.

license server

A workstation that runs the license daemons and provides licenses to client workstations.

Mobile Compute License

Equivalent to a *node-locked uncounted license*.

node-locked license

Type of license that is tied to a particular system.

node-locked uncounted license

Node-locked uncounted licenses (Windows only) are locked to hardware keys or Ethernet addresses of PCs and can be used remotely. This type of license does not require a license server or network connection.

redundant servers

Configured in a group of three license servers that all contain the same license data. Allows access to all licenses on the servers when a majority of the servers are operational.

station license

A station license usually ends in a "_s" suffix and authorizes the use of any applications contained in that station.

vendor daemon

The daemon that dispenses licenses for the requested feature. This daemon is built by the application's vendor and contains the vendors unique encryption. Mentor Graphics vendor daemon is **mgld**.

— A —

add new licenses, 25

Adding licenses

UNIX, 20

Windows, 25

— C —

Commands

lmdown, 63

lmgrd, 65

lmhostid, 67

lmreread, 69

lmstat, 71

mglis_ok, 74

pcls_ok, 75

communication port number, 25

Customizing Licensing, 9

— D —

Daemon options file, 46

Daemons

mgcld, 16, 30

starting on UNIX, 17, 20

Debug log file, 17, 20, 65

— E —

editing the license file, 25

Environment variables

LM_LICENSE_FILE, 18, 35

MGC_HOME, 37, 61

MGLS_EXP_WARN_DAYS, 38

MGLS_HOME, 38, 61

MGLS_LICENSE_FILE, 18, 38, 42, 43

MGLS_LICENSE_SOURCE, 41, 45

Exact Access date, 11

— F —

FEATURE line, 10

field names, uppercase, 48

Files

mgcld.opt, 19

Firewalls, 12

FLEXnet

LM_LICENSE_FILE, 18, 35, 38, 39

Floating licenses, 32

floating licenses

communication port number, 25

— H —

Hardware keys, 81

Hostid

lmhostid, 67

— I —

INCREMENT line, 10

Independent License Servers, 27

IPX/SPX protocol, 26

— K —

KnowledgeBase, 53

— L —

License file, 8

Exact Access date, 11

FEATURE line, 10

INCREMENT line, 10

license file

communication port number, 25

license ratcheting, 46

license server

IPX/SPX protocol, 26

UDP, 26

License server types

Independent, 27

Redundant, 29

License servers

site preparation, 31

starting automatically on UNIX, 22

starting automatically on Windows, 23

starting on UNIX, 17

License types

atomic, 81

composite, 81
floating, 32, 81
node-locked, 32, 82
node-locked uncounted, 32
station, 82

Licenses

adding on UNIX, 20
adding on Windows, 25

Licensing

communication port number, 25
IPX/SPX protocol, 26
station license, definition, 82
tools to assist in troubleshooting, 53
UDP, 26

LM_LICENSE_FILE environment variable,
38

lmdown, 63

lmgrd, 8, 49, 65

lmhostid, 67

lmreread, 69

lmstat, 71

lmtools, 56

LMTOOLS dialog box, 77

Log file, 17, 20

creating, 17, 20

— M —

MGLS_DEBUG_LOG_DIR, 37, 43

MGLS_DEBUG_LOG_DIR environment
variable, 37, 43, 56

MGLS_EXP_WARN_DAYS environment
variable, 38

MGLS_HOME environment variable, 38

MGLS_LICENSE_FILE environment
variable, 38

MGLS_LICENSE_SEARCH, 46

MGLS_LICENSE_SOURCE environment
variable on UNIX, 41

MGLS_LICENSE_SOURCE environment
variable on Windows, 45

MGLS_OPTIONS_FILE environment
variable, 41

MGLSLOG, 42

— N —

Node-locked licenses, 32

Node-locked uncounted licenses, 32

Notational conventions, 62

— O —

open a Service Request, 53

options file, 48

— P —

pcls_ok, 75

port or options file, 48

— R —

ratcheting, 46

Redundant License Servers, 29

— S —

Station license, 82

SupportNet, 53

— T —

TCP/IP

connection time-out, 37, 43

port number, 10

Tools to assist in troubleshooting licensing, 53

Troubleshooting

suggestions, 57

— U —

UDP, 26

UNIX

adding licenses, 20

starting license server automatically, 22

starting license servers, 17

— V —

Variables

see Environment Variables

Vendor daemon, 8, 49

see also mgcld

— W —

Windows

adding licenses, 25

communication port number, 25

IPX/SPX protocol, 26

setting environment variables, 43

starting license server automatically, 23

Third-Party Information

This section provides information on open source and third-party software that may be included in the Mentor Graphics Licensing product.

- This software application may include OpenSSL version 1.0.0l third-party software, which is distributed on an "AS IS" basis, WITHOUT WARRANTY OF ANY KIND, either express or implied. To obtain a copy of the OpenSSL version 1.0.0l source code, send a request to request_sourcecode@mentor.com. This offer shall only be available for three years from the date Mentor Graphics Corporation first distributed OpenSSL version 1.0.0l. OpenSSL version 1.0.0l may be subject to the following copyrights:

© 1995-1998 Eric Young (eay@cryptsoft.com)

All rights reserved.

This package is an SSL implementation written by Eric Young (eay@cryptsoft.com).

The implementation was written so as to conform with Netscapes SSL.

This library is free for commercial and non-commercial use as long as the following conditions are aheared to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgement: "This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)" The word 'cryptographic' can be left out if the rouines from the library being used are not cryptographic related :-).
4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

© 1998-2011 The OpenSSL Project. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>)"
4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org.
5. Products derived from this software may not be called "OpenSSL" nor may "OpenSSL" appear in their names without prior written permission of the OpenSSL Project.
6. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)"

THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT "AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

© 1998-2000 nCipher Corporation Limited.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the copyright notice, this list of conditions, and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions, and the following disclaimer, in the documentation and/or other materials provided with the distribution

IN NO EVENT SHALL NCIPHER CORPORATION LIMITED ('NCIPHER') AND/OR ANY OTHER AUTHORS OR DISTRIBUTORS OF THIS FILE BE LIABLE for any damages arising directly or indirectly from this file, its use or this licence. Without prejudice to the generality of the foregoing: all liability shall be excluded for direct, indirect, special, incidental, consequential or other damages or any loss of profits, business, revenue goodwill or anticipated savings; liability shall be excluded even if nCipher or anyone else has been advised of the possibility of damage. In any event, if the exclusion of liability is not effective, the liability of nCipher or any author or distributor shall be limited to the lesser of the price paid and 1,000 pounds sterling. This licence only fails to exclude or limit liability for death or personal injury arising out of negligence, and only to the extent that such an exclusion or limitation is not effective.

NCIPHER AND THE AUTHORS AND DISTRIBUTORS SPECIFICALLY DISCLAIM ALL AND ANY WARRANTIES (WHETHER EXPRESS OR IMPLIED), including, but not limited to, any implied warranties of merchantability, fitness for a particular purpose, satisfactory quality, and/or non-infringement of any third party rights.

US Government use: This software and documentation is Commercial Computer Software and Computer Software Documentation, as defined in sub-paragraphs (a)(1) and (a)(5) of DFAR 252.227-7014, "Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation." Use, duplication or disclosure by the Government is subject to the terms and conditions specified here.

By using or distributing this file you will be accepting these terms and conditions, including the limitation of liability and lack of warranty. If you do not wish to accept these terms and conditions, DO NOT USE THE FILE.

The actual dynamically loadable plugin, and the library files for static linking, which are also provided in some distributions, are not covered by the licence described above. You should have received a separate licence with terms and conditions for these library files; if you received the library files without a licence, please contact nCipher.

© 2002 Bob Beck <beck@openbsd.org>

© 2002 Theo de Raadt

© 2002 Markus Friedl

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR AND CONTRIBUTORS ``AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

© 2004, Richard Levitte <richard@levitte.org>

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS ``AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

© 2004 Kungliga Tekniska Högskolan

(Royal Institute of Technology, Stockholm, Sweden).

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. Neither the name of the Institute nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE INSTITUTE AND CONTRIBUTORS ``AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE INSTITUTE OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

© 2007 KISA(Korea Information Security Agency). All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Neither the name of author nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY AUTHOR AND CONTRIBUTORS ``AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

© 1999 Bodo Moeller. All rights reserved.

This is free software; you can redistribute and/or modify it under the terms of either

- the GNU General Public License as published by the Free Software Foundation, version 1, or (at your option) any later version,

or

- the following license:

Redistribution and use in source and binary forms, with or without modification, are permitted provided that each of the following conditions is met:

1. Redistributions qualify as "freeware" or "Open Source Software" under one of the following terms:
 - a) Redistributions are made at no charge beyond the reasonable cost of materials and delivery.

- b) Redistributions are accompanied by a copy of the Source Code or by an irrevocable offer to provide a copy of the Source Code for up to three years at the cost of materials and delivery. Such redistributions must allow further use, modification, and redistribution of the Source Code under substantially the same terms as this license.
- 2. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- 3. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- 4. All advertising materials mentioning features or use of this software must display the following acknowledgment: "This product includes software developed by Bodo Moeller." (If available, substitute unlauted o for oe.)
- 5. Redistributions of any form whatsoever must retain the following acknowledgment: "This product includes software developed by Bodo Moeller."

THIS SOFTWARE IS PROVIDED BY BODO MOELLER ``AS IS" AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL BODO MOELLER OR HIS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.



End-User License Agreement

The latest version of the End-User License Agreement is available on-line at:
www.mentor.com/eula

IMPORTANT INFORMATION

USE OF ALL SOFTWARE IS SUBJECT TO LICENSE RESTRICTIONS. CAREFULLY READ THIS LICENSE AGREEMENT BEFORE USING THE PRODUCTS. USE OF SOFTWARE INDICATES CUSTOMER'S COMPLETE AND UNCONDITIONAL ACCEPTANCE OF THE TERMS AND CONDITIONS SET FORTH IN THIS AGREEMENT. ANY ADDITIONAL OR DIFFERENT PURCHASE ORDER TERMS AND CONDITIONS SHALL NOT APPLY.

END-USER LICENSE AGREEMENT ("Agreement")

This is a legal agreement concerning the use of Software (as defined in Section 2) and hardware (collectively "Products") between the company acquiring the Products ("Customer"), and the Mentor Graphics entity that issued the corresponding quotation or, if no quotation was issued, the applicable local Mentor Graphics entity ("Mentor Graphics"). Except for license agreements related to the subject matter of this license agreement which are physically signed by Customer and an authorized representative of Mentor Graphics, this Agreement and the applicable quotation contain the parties' entire understanding relating to the subject matter and supersede all prior or contemporaneous agreements. If Customer does not agree to these terms and conditions, promptly return or, in the case of Software received electronically, certify destruction of Software and all accompanying items within five days after receipt of Software and receive a full refund of any license fee paid.

1. ORDERS, FEES AND PAYMENT.

- 1.1. To the extent Customer (or if agreed by Mentor Graphics, Customer's appointed third party buying agent) places and Mentor Graphics accepts purchase orders pursuant to this Agreement (each an "Order"), each Order will constitute a contract between Customer and Mentor Graphics, which shall be governed solely and exclusively by the terms and conditions of this Agreement, any applicable addenda and the applicable quotation, whether or not those documents are referenced on the Order. Any additional or conflicting terms and conditions appearing on an Order or presented in any electronic portal or automated order management system, whether or not required to be electronically accepted, will not be effective unless agreed in writing and physically signed by an authorized representative of Customer and Mentor Graphics.
- 1.2. Amounts invoiced will be paid, in the currency specified on the applicable invoice, within 30 days from the date of such invoice. Any past due invoices will be subject to the imposition of interest charges in the amount of one and one-half percent per month or the applicable legal rate currently in effect, whichever is lower. Prices do not include freight, insurance, customs duties, taxes or other similar charges, which Mentor Graphics will state separately in the applicable invoice. Unless timely provided with a valid certificate of exemption or other evidence that items are not taxable, Mentor Graphics will invoice Customer for all applicable taxes including, but not limited to, VAT, GST, sales tax, consumption tax and service tax. Customer will make all payments free and clear of, and without reduction for, any withholding or other taxes; any such taxes imposed on payments by Customer hereunder will be Customer's sole responsibility. If Customer appoints a third party to place purchase orders and/or make payments on Customer's behalf, Customer shall be liable for payment under Orders placed by such third party in the event of default.
- 1.3. All Products are delivered FCA factory (Incoterms 2010), freight prepaid and invoiced to Customer, except Software delivered electronically, which shall be deemed delivered when made available to Customer for download. Mentor Graphics retains a security interest in all Products delivered under this Agreement, to secure payment of the purchase price of such Products, and Customer agrees to sign any documents that Mentor Graphics determines to be necessary or convenient for use in filing or perfecting such security interest. Mentor Graphics' delivery of Software by electronic means is subject to Customer's provision of both a primary and an alternate e-mail address.

2. **GRANT OF LICENSE.** The software installed, downloaded, or otherwise acquired by Customer under this Agreement, including any updates, modifications, revisions, copies, documentation and design data ("Software") are copyrighted, trade secret and confidential information of Mentor Graphics or its licensors, who maintain exclusive title to all Software and retain all rights not expressly granted by this Agreement. Mentor Graphics grants to Customer, subject to payment of applicable license fees, a nontransferable, nonexclusive license to use Software solely: (a) in machine-readable, object-code form (except as provided in Subsection 5.2); (b) for Customer's internal business purposes; (c) for the term of the license; and (d) on the computer hardware and at the site authorized by Mentor Graphics. A site is restricted to a one-half mile (800 meter) radius. Customer may have Software temporarily used by an employee for telecommuting purposes from locations other than a Customer office, such as the employee's residence, an airport or hotel, provided that such employee's primary place of employment is the site where the Software is authorized for use. Mentor Graphics' standard policies and programs, which vary depending on Software, license fees paid or services purchased, apply to the following: (a) relocation of Software; (b) use of Software, which may be limited, for example, to execution of a single session by a single user on the authorized hardware or for a restricted period of time (such limitations may be technically implemented through the use of authorization codes or similar devices); and (c) support services provided, including eligibility to receive telephone support, updates, modifications, and revisions. For the avoidance of doubt, if Customer provides any feedback or requests any change or enhancement to Products, whether in the course of receiving support or consulting services, evaluating Products, performing beta testing or otherwise, any inventions, product improvements, modifications or developments made by Mentor Graphics (at Mentor Graphics' sole discretion) will be the exclusive property of Mentor Graphics.
3. **ESC SOFTWARE.** If Customer purchases a license to use development or prototyping tools of Mentor Graphics' Embedded Software Channel ("ESC"), Mentor Graphics grants to Customer a nontransferable, nonexclusive license to reproduce and distribute executable

files created using ESC compilers, including the ESC run-time libraries distributed with ESC C and C++ compiler Software that are linked into a composite program as an integral part of Customer's compiled computer program, provided that Customer distributes these files only in conjunction with Customer's compiled computer program. Mentor Graphics does NOT grant Customer any right to duplicate, incorporate or embed copies of Mentor Graphics' real-time operating systems or other embedded software products into Customer's products or applications without first signing or otherwise agreeing to a separate agreement with Mentor Graphics for such purpose.

4. BETA CODE.

- 4.1. Portions or all of certain Software may contain code for experimental testing and evaluation (which may be either alpha or beta, collectively "Beta Code"), which may not be used without Mentor Graphics' explicit authorization. Upon Mentor Graphics' authorization, Mentor Graphics grants to Customer a temporary, nontransferable, nonexclusive license for experimental use to test and evaluate the Beta Code without charge for a limited period of time specified by Mentor Graphics. Mentor Graphics may choose, at its sole discretion, not to release Beta Code commercially in any form.
- 4.2. If Mentor Graphics authorizes Customer to use the Beta Code, Customer agrees to evaluate and test the Beta Code under normal conditions as directed by Mentor Graphics. Customer will contact Mentor Graphics periodically during Customer's use of the Beta Code to discuss any malfunctions or suggested improvements. Upon completion of Customer's evaluation and testing, Customer will send to Mentor Graphics a written evaluation of the Beta Code, including its strengths, weaknesses and recommended improvements.
- 4.3. Customer agrees to maintain Beta Code in confidence and shall restrict access to the Beta Code, including the methods and concepts utilized therein, solely to those employees and Customer location(s) authorized by Mentor Graphics to perform beta testing. Customer agrees that any written evaluations and all inventions, product improvements, modifications or developments that Mentor Graphics conceived or made during or subsequent to this Agreement, including those based partly or wholly on Customer's feedback, will be the exclusive property of Mentor Graphics. Mentor Graphics will have exclusive rights, title and interest in all such property. The provisions of this Subsection 4.3 shall survive termination of this Agreement.

5. RESTRICTIONS ON USE.

- 5.1. Customer may copy Software only as reasonably necessary to support the authorized use. Each copy must include all notices and legends embedded in Software and affixed to its medium and container as received from Mentor Graphics. All copies shall remain the property of Mentor Graphics or its licensors. Customer shall maintain a record of the number and primary location of all copies of Software, including copies merged with other software, and shall make those records available to Mentor Graphics upon request. Customer shall not make Products available in any form to any person other than Customer's employees and on-site contractors, excluding Mentor Graphics competitors, whose job performance requires access and who are under obligations of confidentiality. Customer shall take appropriate action to protect the confidentiality of Products and ensure that any person permitted access does not disclose or use Products except as permitted by this Agreement. Customer shall give Mentor Graphics written notice of any unauthorized disclosure or use of the Products as soon as Customer becomes aware of such unauthorized disclosure or use. Except as otherwise permitted for purposes of interoperability as specified by applicable and mandatory local law, Customer shall not reverse-assemble, reverse-compile, reverse-engineer or in any way derive any source code from Software. Log files, data files, rule files and script files generated by or for the Software (collectively "Files"), including without limitation files containing Standard Verification Rule Format ("SVRF") and Tcl Verification Format ("TVF") which are Mentor Graphics' trade secret and proprietary syntaxes for expressing process rules, constitute or include confidential information of Mentor Graphics. Customer may share Files with third parties, excluding Mentor Graphics competitors, provided that the confidentiality of such Files is protected by written agreement at least as well as Customer protects other information of a similar nature or importance, but in any case with at least reasonable care. Customer may use Files containing SVRF or TVF only with Mentor Graphics products. Under no circumstances shall Customer use Products or Files or allow their use for the purpose of developing, enhancing or marketing any product that is in any way competitive with Products, or disclose to any third party the results of, or information pertaining to, any benchmark.
- 5.2. If any Software or portions thereof are provided in source code form, Customer will use the source code only to correct software errors and enhance or modify the Software for the authorized use. Customer shall not disclose or permit disclosure of source code, in whole or in part, including any of its methods or concepts, to anyone except Customer's employees or on-site contractors, excluding Mentor Graphics competitors, with a need to know. Customer shall not copy or compile source code in any manner except to support this authorized use.
- 5.3. Customer may not assign this Agreement or the rights and duties under it, or relocate, sublicense, or otherwise transfer the Products, whether by operation of law or otherwise ("Attempted Transfer"), without Mentor Graphics' prior written consent and payment of Mentor Graphics' then-current applicable relocation and/or transfer fees. Any Attempted Transfer without Mentor Graphics' prior written consent shall be a material breach of this Agreement and may, at Mentor Graphics' option, result in the immediate termination of the Agreement and/or the licenses granted under this Agreement. The terms of this Agreement, including without limitation the licensing and assignment provisions, shall be binding upon Customer's permitted successors in interest and assigns.
- 5.4. The provisions of this Section 5 shall survive the termination of this Agreement.

6. **SUPPORT SERVICES.** To the extent Customer purchases support services, Mentor Graphics will provide Customer with updates and technical support for the Products, at the Customer site(s) for which support is purchased, in accordance with Mentor Graphics' then current End-User Support Terms located at <http://supportnet.mentor.com/supportterms>.

7. LIMITED WARRANTY.

- 7.1. Mentor Graphics warrants that during the warranty period its standard, generally supported Products, when properly installed, will substantially conform to the functional specifications set forth in the applicable user manual. Mentor Graphics does not warrant that Products will meet Customer's requirements or that operation of Products will be uninterrupted or error free. The

warranty period is 90 days starting on the 15th day after delivery or upon installation, whichever first occurs. Customer must notify Mentor Graphics in writing of any nonconformity within the warranty period. For the avoidance of doubt, this warranty applies only to the initial shipment of Software under an Order and does not renew or reset, for example, with the delivery of (a) Software updates or (b) authorization codes or alternate Software under a transaction involving Software re-mix. This warranty shall not be valid if Products have been subject to misuse, unauthorized modification, improper installation or Customer is not in compliance with this Agreement. MENTOR GRAPHICS' ENTIRE LIABILITY AND CUSTOMER'S EXCLUSIVE REMEDY SHALL BE, AT MENTOR GRAPHICS' OPTION, EITHER (A) REFUND OF THE PRICE PAID UPON RETURN OF THE PRODUCTS TO MENTOR GRAPHICS OR (B) MODIFICATION OR REPLACEMENT OF THE PRODUCTS THAT DO NOT MEET THIS LIMITED WARRANTY. MENTOR GRAPHICS MAKES NO WARRANTIES WITH RESPECT TO: (A) SERVICES; (B) PRODUCTS PROVIDED AT NO CHARGE; OR (C) BETA CODE; ALL OF WHICH ARE PROVIDED "AS IS."

7.2. THE WARRANTIES SET FORTH IN THIS SECTION 7 ARE EXCLUSIVE. NEITHER MENTOR GRAPHICS NOR ITS LICENSORS MAKE ANY OTHER WARRANTIES EXPRESS, IMPLIED OR STATUTORY, WITH RESPECT TO PRODUCTS PROVIDED UNDER THIS AGREEMENT. MENTOR GRAPHICS AND ITS LICENSORS SPECIFICALLY DISCLAIM ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT OF INTELLECTUAL PROPERTY.

8. **LIMITATION OF LIABILITY.** EXCEPT WHERE THIS EXCLUSION OR RESTRICTION OF LIABILITY WOULD BE VOID OR INEFFECTIVE UNDER APPLICABLE LAW, IN NO EVENT SHALL MENTOR GRAPHICS OR ITS LICENSORS BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS) WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY, EVEN IF MENTOR GRAPHICS OR ITS LICENSORS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL MENTOR GRAPHICS' OR ITS LICENSORS' LIABILITY UNDER THIS AGREEMENT EXCEED THE AMOUNT RECEIVED FROM CUSTOMER FOR THE HARDWARE, SOFTWARE LICENSE OR SERVICE GIVING RISE TO THE CLAIM. IN THE CASE WHERE NO AMOUNT WAS PAID, MENTOR GRAPHICS AND ITS LICENSORS SHALL HAVE NO LIABILITY FOR ANY DAMAGES WHATSOEVER. THE PROVISIONS OF THIS SECTION 8 SHALL SURVIVE THE TERMINATION OF THIS AGREEMENT.

9. **HAZARDOUS APPLICATIONS.** CUSTOMER ACKNOWLEDGES IT IS SOLELY RESPONSIBLE FOR TESTING ITS PRODUCTS USED IN APPLICATIONS WHERE THE FAILURE OR INACCURACY OF ITS PRODUCTS MIGHT RESULT IN DEATH OR PERSONAL INJURY ("HAZARDOUS APPLICATIONS"). EXCEPT TO THE EXTENT THIS EXCLUSION OR RESTRICTION OF LIABILITY WOULD BE VOID OR INEFFECTIVE UNDER APPLICABLE LAW, IN NO EVENT SHALL MENTOR GRAPHICS OR ITS LICENSORS BE LIABLE FOR ANY DAMAGES RESULTING FROM OR IN CONNECTION WITH THE USE OF MENTOR GRAPHICS PRODUCTS IN OR FOR HAZARDOUS APPLICATIONS. THE PROVISIONS OF THIS SECTION 9 SHALL SURVIVE THE TERMINATION OF THIS AGREEMENT.

10. **INDEMNIFICATION.** CUSTOMER AGREES TO INDEMNIFY AND HOLD HARMLESS MENTOR GRAPHICS AND ITS LICENSORS FROM ANY CLAIMS, LOSS, COST, DAMAGE, EXPENSE OR LIABILITY, INCLUDING ATTORNEYS' FEES, ARISING OUT OF OR IN CONNECTION WITH THE USE OF MENTOR GRAPHICS PRODUCTS IN OR FOR HAZARDOUS APPLICATIONS. THE PROVISIONS OF THIS SECTION 10 SHALL SURVIVE THE TERMINATION OF THIS AGREEMENT.

11. INFRINGEMENT.

11.1. Mentor Graphics will defend or settle, at its option and expense, any action brought against Customer in the United States, Canada, Japan, or member state of the European Union which alleges that any standard, generally supported Product acquired by Customer hereunder infringes a patent or copyright or misappropriates a trade secret in such jurisdiction. Mentor Graphics will pay costs and damages finally awarded against Customer that are attributable to such action. Customer understands and agrees that as conditions to Mentor Graphics' obligations under this section Customer must: (a) notify Mentor Graphics promptly in writing of the action; (b) provide Mentor Graphics all reasonable information and assistance to settle or defend the action; and (c) grant Mentor Graphics sole authority and control of the defense or settlement of the action.

11.2. If a claim is made under Subsection 11.1 Mentor Graphics may, at its option and expense: (a) replace or modify the Product so that it becomes noninfringing; (b) procure for Customer the right to continue using the Product; or (c) require the return of the Product and refund to Customer any purchase price or license fee paid, less a reasonable allowance for use.

11.3. Mentor Graphics has no liability to Customer if the action is based upon: (a) the combination of Software or hardware with any product not furnished by Mentor Graphics; (b) the modification of the Product other than by Mentor Graphics; (c) the use of other than a current unaltered release of Software; (d) the use of the Product as part of an infringing process; (e) a product that Customer makes, uses, or sells; (f) any Beta Code or Product provided at no charge; (g) any software provided by Mentor Graphics' licensors who do not provide such indemnification to Mentor Graphics' customers; or (h) infringement by Customer that is deemed willful. In the case of (h), Customer shall reimburse Mentor Graphics for its reasonable attorney fees and other costs related to the action.

11.4. THIS SECTION 11 IS SUBJECT TO SECTION 8 ABOVE AND STATES THE ENTIRE LIABILITY OF MENTOR GRAPHICS AND ITS LICENSORS, AND CUSTOMER'S SOLE AND EXCLUSIVE REMEDY, FOR DEFENSE, SETTLEMENT AND DAMAGES, WITH RESPECT TO ANY ALLEGED PATENT OR COPYRIGHT INFRINGEMENT OR TRADE SECRET MISAPPROPRIATION BY ANY PRODUCT PROVIDED UNDER THIS AGREEMENT.

12. TERMINATION AND EFFECT OF TERMINATION.

12.1. If a Software license was provided for limited term use, such license will automatically terminate at the end of the authorized term. Mentor Graphics may terminate this Agreement and/or any license granted under this Agreement immediately upon written notice if Customer: (a) exceeds the scope of the license or otherwise fails to comply with the licensing or confidentiality provisions of this Agreement, or (b) becomes insolvent, files a bankruptcy petition, institutes proceedings for liquidation or winding up or enters into an agreement to assign its assets for the benefit of creditors. For any other material breach of any

provision of this Agreement, Mentor Graphics may terminate this Agreement and/or any license granted under this Agreement upon 30 days written notice if Customer fails to cure the breach within the 30 day notice period. Termination of this Agreement or any license granted hereunder will not affect Customer's obligation to pay for Products shipped or licenses granted prior to the termination, which amounts shall be payable immediately upon the date of termination.

- 12.2. Upon termination of this Agreement, the rights and obligations of the parties shall cease except as expressly set forth in this Agreement. Upon termination, Customer shall ensure that all use of the affected Products ceases, and shall return hardware and either return to Mentor Graphics or destroy Software in Customer's possession, including all copies and documentation, and certify in writing to Mentor Graphics within ten business days of the termination date that Customer no longer possesses any of the affected Products or copies of Software in any form.
13. **EXPORT.** The Products provided hereunder are subject to regulation by local laws and United States ("U.S.") government agencies, which prohibit export, re-export or diversion of certain products, information about the products, and direct or indirect products thereof, to certain countries and certain persons. Customer agrees that it will not export or re-export Products in any manner without first obtaining all necessary approval from appropriate local and U.S. government agencies. If Customer wishes to disclose any information to Mentor Graphics that is subject to any U.S. or other applicable export restrictions, including without limitation the U.S. International Traffic in Arms Regulations (ITAR) or special controls under the Export Administration Regulations (EAR), Customer will notify Mentor Graphics personnel, in advance of each instance of disclosure, that such information is subject to such export restrictions.
14. **U.S. GOVERNMENT LICENSE RIGHTS.** Software was developed entirely at private expense. The parties agree that all Software is commercial computer software within the meaning of the applicable acquisition regulations. Accordingly, pursuant to U.S. FAR 48 CFR 12.212 and DFAR 48 CFR 227.7202, use, duplication and disclosure of the Software by or for the U.S. government or a U.S. government subcontractor is subject solely to the terms and conditions set forth in this Agreement, which shall supersede any conflicting terms or conditions in any government order document, except for provisions which are contrary to applicable mandatory federal laws.
15. **THIRD PARTY BENEFICIARY.** Mentor Graphics Corporation, Mentor Graphics (Ireland) Limited, Microsoft Corporation and other licensors may be third party beneficiaries of this Agreement with the right to enforce the obligations set forth herein.
16. **REVIEW OF LICENSE USAGE.** Customer will monitor the access to and use of Software. With prior written notice and during Customer's normal business hours, Mentor Graphics may engage an internationally recognized accounting firm to review Customer's software monitoring system and records deemed relevant by the internationally recognized accounting firm to confirm Customer's compliance with the terms of this Agreement or U.S. or other local export laws. Such review may include FlexNet (or successor product) report log files that Customer shall capture and provide at Mentor Graphics' request. Customer shall make records available in electronic format and shall fully cooperate with data gathering to support the license review. Mentor Graphics shall bear the expense of any such review unless a material non-compliance is revealed. Mentor Graphics shall treat as confidential information all information gained as a result of any request or review and shall only use or disclose such information as required by law or to enforce its rights under this Agreement. The provisions of this Section 16 shall survive the termination of this Agreement.
17. **CONTROLLING LAW, JURISDICTION AND DISPUTE RESOLUTION.** The owners of certain Mentor Graphics intellectual property licensed under this Agreement are located in Ireland and the U.S. To promote consistency around the world, disputes shall be resolved as follows: excluding conflict of laws rules, this Agreement shall be governed by and construed under the laws of the State of Oregon, U.S., if Customer is located in North or South America, and the laws of Ireland if Customer is located outside of North or South America. All disputes arising out of or in relation to this Agreement shall be submitted to the exclusive jurisdiction of the courts of Portland, Oregon when the laws of Oregon apply, or Dublin, Ireland when the laws of Ireland apply. Notwithstanding the foregoing, all disputes in Asia arising out of or in relation to this Agreement shall be resolved by arbitration in Singapore before a single arbitrator to be appointed by the chairman of the Singapore International Arbitration Centre ("SIAC") to be conducted in the English language, in accordance with the Arbitration Rules of the SIAC in effect at the time of the dispute, which rules are deemed to be incorporated by reference in this section. Nothing in this section shall restrict Mentor Graphics' right to bring an action (including for example a motion for injunctive relief) against Customer in the jurisdiction where Customer's place of business is located. The United Nations Convention on Contracts for the International Sale of Goods does not apply to this Agreement.
18. **SEVERABILITY.** If any provision of this Agreement is held by a court of competent jurisdiction to be void, invalid, unenforceable or illegal, such provision shall be severed from this Agreement and the remaining provisions will remain in full force and effect.
19. **MISCELLANEOUS.** This Agreement contains the parties' entire understanding relating to its subject matter and supersedes all prior or contemporaneous agreements. Some Software may contain code distributed under a third party license agreement that may provide additional rights to Customer. Please see the applicable Software documentation for details. This Agreement may only be modified in writing, signed by an authorized representative of each party. Waiver of terms or excuse of breach must be in writing and shall not constitute subsequent consent, waiver or excuse.