Cisco WAE Design 7.3.0 GUI Installation Guide

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C H A P T E R 1

WAE Design GUI Installation

This section contains the following topics:

Overview

This section provides instructions for installing the WAE Design GUI. You additionally need to install the WAE Design license and if applicable, install the floating license server.

- License Installation, on page 5—Information on how to install dedicated and floating licenses.

- WAE Design Floating License Server, on page 11—Procedure for installing and setting up the FlexNet Publisher license server. This is needed only if administering floating licenses.

The installation process does not explain how to install any drivers or require any changes to the operating system. You can download and install the files to any folder or directory.

Prerequisites

The following are WAE design GUI installation prerequisites:

- A license is required for all features except for the example plan files. If you have questions about obtaining a license, contact your support representative or system administrator.

- Meet the necessary system requirements and package dependencies. For a list of these, see the "Installation Requirements" chapter in the *Cisco WAE Installation Guide*.

- If you are using the WAE Design GUI and the Parse Configs tool (File > Get Plan from > Configs), Java environment variables must be configured correctly and JAVA_HOME must point to a valid JRE/JDK-1.8 installation.

  For example:

- Windows—Add a new system variable named JAVA_HOME and enter the variable value as the JDK installation path (C:\Program Files\Java\jre1.8.0_102).

- Linux—Enter the following command:

```
admin@system1 ~ # export JRE_HOME=<JDK/JRE_installation_path>
```

- Mac—Add the following line in the startup shell (~/.bash_profile):

```
export JAVA_HOME=$(/usr/libexec/java_home -v 1.8)
```

- If you are using MacOS X 10.12 or later with the Design GUI and the Parse Configs tool, add the following lines in ~/.bash_profile:

```
launchctl setenv JAVA_HOME `/usr/libexec/java_home -v 1.8`
export JAVA_HOME=$(/usr/libexec/java_home -v 1.8)
```

Linux, Windows, and Mac Installation

Step 1 Download the digitally signed Cisco WAE Planning software package from the Cisco download site.

Step 2 Verify and extract the digitally signed binary to a location of your choice. See Verification of Digitally Signed Images, on page 2.

Step 3 Install and verify the license. See License Installation, on page 5.

Verification of Digitally Signed Images

The Cisco WAE Design software is digitally signed. This is to ensure that the WAE Design software running on your systems is secure and has not been tampered with, and that the software originated from a trusted source.

Verify Signed Images for Linux and Mac

Step 1 For both Linux and Mac, the certificates and digital signatures are embedded in the downloaded files - `WAE-Design-k9-7.3.0-Linux-x86_64.signed.bin` and `WAE-Design-k9-7.3.0-MacOSX-x86_64.signed.bin` respectively.

Step 2 Run the self-extracting signed binary. This extracts the Release Binary and validates using the signature file.

Verification in Linux

```
[admin@wae-vm-21 workspace.signed]$ ./WAE-Design-k9-7.3.0-Linux-x86_64.signed.bin
Unpacking...
Verifying signature...
Downloading CA certificate from http://www.cisco.com/security/pki/certs/crcam2.cer ...
Successfully downloaded and verified crcam2.cer.
Downloading SubCA certificate from http://www.cisco.com/security/pki/certs/innerspace.cer ...
Successfully downloaded and verified innerspace.cer.
Successfully verified root, subca and end-entity certificate chain.
Successfully fetched a public key from WAE-CCO_RELEASE.cer.
Successfully verified the signature of WAE-Design-k9-7.3.0-Linux-x86_64.bin using WAE-CCO_RELEASE.cer
```

Verification in Mac

```
ADMIN:MacSigned admin$ ./WAE-Design-k9-7.3.0-MacOSX-x86_64.signed.bin
Unpacking...
Verifying signature...
Downloading CA certificate from http://www.cisco.com/security/pki/certs/crcam2.cer ...
Successfully downloaded and verified crcam2.cer.
Downloading SubCA certificate from http://www.cisco.com/security/pki/certs/innerspace.cer ...
Successfully downloaded and verified innerspace.cer.
Verify CMD1: openssl verify -CAfile crcam2.cer innerspace.cer
Verify CMD2: openssl verify -CAfile crcam2.cer -untrusted innerspace.cer WAE-CCO_RELEASE.cer
Successfully verified root, subca and end-entity certificate chain.
Successfully fetched a public key from WAE-CCO_RELEASE.cer.
Successfully verified the signature of WAE-Design-k9-7.3.0-MacOSX-x86_64.tar.gz using
WAE-CCO_RELEASE.cer
Extracting the package from the TAR archive ...
tar -zxf WAE-Design-k9-7.3.0-MacOSX-x86_64.tar.gz
Cleaning up ...
```

Step 3   The generated `WAE-Design-k9-7.3.0-Linux-x86_64.bin` is the Linux installer for WAE.

Run the Linux installer once more to extract the Linux binary.

Note   For MAC there is no installation binary, as the software is automatically extracted after verification process.

Verify Signed Images for Windows

Step 1   Extract the downloaded file. You will find `wae_design` binary.

Step 2   Right click on `wae_design` executable and select **Properties**.

Step 3   Select the **Digital Signatures** tab in the Properties window.

Step 4   Double click on the Cisco digital signature to display further information.

Start WAE Design

To start WAE Design from the directory in which the WAE Design software is installed:

Step 1   Do one of the following:

- On Windows or Linux, double-click the **wae_design** executable.

- On Mac, open the **Terminal**, enter:

```
cd <directory-where-you-unpacked-the-distribution>
open ./WAE_Design.app
```

Step 2   From the CLI, enter:

```
./wae_design
```

(Optional) On Windows, you can associate the plan file using the .pln format with the **wae_design** executable. Double-clicking a .pln file opens the plan in a new instance of the GUI.

CHAPTER 2

License Installation

This section contains the following topics:

WAE Design Dedicated and Floating Licenses

A license is required for all features except for sample plan files used in the WAE Design application. If you have questions about obtaining a license, contact your Cisco support representative or system administrator.

Dedicated Licenses	Checked Out Floating Licenses	Borrowed Floating
• Each license is unique to a specific device. • Always available (until expiration). • No network connectivity is required. • Must be downloaded to an accessible device.	The FlexNet Publisher license server must be set up (usually by a system administrator). For information on setting up this license server, see the "WAE Design Floating License Server" chapter.	
	• A single license is shared among users who have permission from the license server. • You must have connectivity to the license server. • There are a maximum number of licenses, and you cannot check out one if they are all in use. • You must either download the floating license to an accessible device, or know the hostname and MAC address of the license server. To connect to a different port, you need to know the license server's port number. • Regardless of the method used, you must install the license one time. Thereafter, it is automatically checked out from the server when starting the GUI or any CLI tool. When the GUI is closed or the tool stops, the license is checked in to the license server for use by others.	• Users borrow licenses that are stored on the license server for a user-specified number of days. Other users cannot use the borrowed license. • You must install the license one time. Thereafter, it is available for borrowing. • After borrowing the license file once, it is available until you return it or until the number of days for which it is borrowed expires. If you do not return it, the license expires. • Connectivity to the license server is required to borrow a license, but is not required when using a borrowed license. You must also have connectivity if returning a borrowed license prior to its expiration date. • You cannot borrow a license if a dedicated license is already installed.

Cisco Smart Licensing

Cisco offers Smart Licensing, which enables you to monitor Cisco WAE software licenses and endpoint license consumption easily and efficiently through a simple registration and license consumption reporting process instead of having to install node-locked license files. Details of all Cisco products and licenses that you have purchased are maintained in a centralized database called the Cisco Smart Software Manager (CSSM). For more information, refer to the Cisco Smart Licensing Overview on Cisco.com. To enable Smart Licensing in WAE Design, you must install the WAE server with the Smart Licensing feature enabled. Follow the steps outlined in the "Cisco Smart Licensing" section in the *Cisco WAE Server Installation Guide*.

Install a License from WAE Design

To use the WAE Design GUI, you need either a dedicated license or a floating license. *Regardless of the license type or method of installation, you need only install it one time*. If it is a floating license, thereafter when you start WAE Design, the floating license is available to check out or borrow.

To verify a license and its features, choose **File > License > Check**.

Install a License

Before you begin:

- Confirm that you have the license on an accessible device.

- For floating licenses, the FlexNet Publisher license server must be set up (usually by a system administrator).

Step 1   From the WAE Design, choose **File > License > Install**.

Step 2   Do one of the following:

    a. If you are installting a dedicated license, choose **From license file**. Click **Browse** to navigate to the location or enter the name of the license file (.lic extension).

    b. If you are installing a floating license from the license server (that is, you do not have the license file), choose **Specify license server**. Enter both the hostname and the MAC address of the license server. The MAC address must be a 12-digit hexadecimal number without any colon (:) separators.

        If the port is not specified, ports 27000-27009 are scanned to find the license server port and connect to it. Optionally, you can enter the license server's TCP port number using a range of 1024 to 65535. The default license server port is 27000.

    c. If you are installing a smart license, choose **Use smart license.**. Enter the host on which WAE server is installed, port on which the WAE server listens for netconf messages, and WAE server login credentials (Username and Password).

Step 3   Click **OK** to confirm the license installation.

    Note   Once license is installed, restart the WAE Design client to pickup the installed license.

Borrow and Return a Floating License

If you have installed a floating license, you can borrow a license from the server for up to 30 days. The license is automatically returned to the license server at 11:59 p.m. on the last day (based on the local time on the floating license server).

You must have connectivity to the floating license server to borrow a license or to return it prior to the specified date. Connectivity is not required, however, during the period of time for which you are borrowing the license.

The number of remaining available days for the license is listed under **File > License > Borrow**. To determine the exact date on which the license will expire, choose **File > License > Check**.

Borrow a Floating License

To borrow a floating license:

Step 1   In WAE Design, choose **File > License > Borrow**.

Step 2   Enter the number of days you want to borrow the license (integer from 1 to 30), and click **OK**.

Return a Floating License

To return a floating license:

Step 1   In WAE Design, choose **File > License > Return.**

Step 2   Enter the number of days you want to borrow the license (integer from 1 to 30), and click **OK**.

Install a License from the CLI

You can use the CLI to install licenses for all products. For each license you are installing, run the license_install tool. When prompted, enter the number associated with the directory in which you want to install the license.

By default, when using license_install -file, the tool merges the features granted by the new license with those in an existing license.

Install a Dedicated License

If you are installing a dedicated license, pass the name of the license file (.lic extension). By default, the tool merges the features granted by the new license with those in an existing license.

```
license_install -file <path>/<filename>.lic
```

When prompted, enter the number associated with the directory in which you want to install the license.

By default, when using license_install -file, the tool merges the features granted by the new license with those in an existing license.

Install a Floating License

If you are installing a floating license from the license server (that is, you do not have the license file), use both the -server-host and -server-mac options. The MAC address must be a 12-digit hexadecimal number without any colon (:) separators.

```
license_install -server-host <license_server_hostname> -server-mac
<license_server_MAC_address>
```

If the -server-port option is not specified, ports 27000-27009 are scanned to find the license server port and connect to it. Optionally, you can enter the license server's TCP port number using a range of 1024 to 65535. The default license server port is 27000. Example:

```
license_install -server-host lic.cisco.com -server-mac 1a2b3c4d5e6f -server-port 27000
```

To borrow a license, use the license_borrow command and specify the number of days (integer from 1 to 30). Example:

```
license_borrow -num-days 23
```

To return a license, use the license_return command. There are no required or optional options.

Verify a License

Run the license_check tool. To see descriptions of the license features, use the -detail option (which defaults to true). Example:

```
license_check -detail
```

To determine the number of days before the license expires and the exact date on which the license expires, use the license_check command.

CHAPTER 3

WAE Design Floating License Server

This section contains the following topics:

About FlexNet Publisher Licenses

The FlexNet Publisher license server must be set up if WAE Design users are to use floating licenses. Using this server, you can control access to the licenses, monitor who has them checked out, and check log activity.

The FlexNet Publisher license server has two interfaces. One is a CLI, which requires that you start an lmgrd daemon so all users can access the floating licenses. The other is a web UI, where you must install and configure an lmadmin tool. Best practice is to use only one or the other interface (CLI or web) to administer the license server.

- For information about FlexNet Publisher and for more details on all FlexNet Publisher CLI commands and GUI, refer to the *FlexNet Publisher License Administration Guide* (`FlexLM_EndUser_LicAdmin.pdf`). This is located in `$CARIDEN_HOME/docs`, which by default is `/opt/cariden/software/mate/current/docs`. This section includes some FlexNet Publisher instructions for both the CLI and GUI that could change without Cisco's knowledge.

- All instructions and examples assume you used `/opt/cariden` as the default installation directory. If you did not, substitute your installation directory for `/opt/cariden`.

- Throughout this section, bin is `/opt/cariden/software/flexlm/current/bin`.

Prerequisites

- You must have the required packages installed. For a list of package dependencies, see the "Installation Requirements" chapter in the Cisco WAE Installation Guide.

• You must have a WAE Design floating license installed on the same device or VM as the FlexNet Publisher floating license server, which means you must have WAE Design installed. Contact your Cisco representative for this license, and see License Installation to install this license.

Pre-Installation

| Note | If you are installing the FlexNet Publisher license server on a different Linux device than the one on which a WAE server installation resides, complete Step 1 to Step 4. Otherwise, skip to Step 5. Follow all steps on the device where the FlexNet Publisher license server resides. |

Step 1   Log in to the FlexNet Publisher license server as root or as a user with administrative capabilities.

Step 2   Create a lowercase, alphanumeric username where the first letter is an alphabetical character.

```
/usr/sbin/useradd <username>
```

Step 3   Set a password.

```
passwd <username>
```

Step 4   Create an installation directory that has root privileges. The best practice is to use the default installation directory, which is /opt/cariden.

```
cd ~/
mkdir -p /opt/cariden
```

Step 5   Change the owner of the installation directory to the newly created user.

```
chown <username> /opt/cariden
```

Step 6   Verify that there are no local firewalls blocking the services. For a list of ports used, see Configure License Server Ports, on page 13 and the "Installation Requirements" chapter in the *Cisco WAE Installation Guide*.

The following example shows how to disable the iptables firewall as root:

```
service iptables save
service iptables stop
sudo chkconfig iptables off
```

Step 7   Check if the redhat-lsb (Linux Standards Base) package is installed. This package is required to run the FlexLM license server.

```
yum list installed | greb redhat-lsb
```

If it is not there, install it.

```
yum install redhat-lsb-4.0-7.el6.centos.x86_64
```

(choose repo for your distribution).

Step 8   If you already have a license server installed and running, enter one of the following commands to stop it gracefully:

```
bin/lmdown -c <license_file>
bin/lmdowm –all
```

If the server is distributing borrowed licenses, enter one of the following commands:

```
bin/lmdown -c <license_file> -force
bin/lmdowm -all -force
```

Step 9   Download the License Server Software package from the Cisco WAE Automation software download site. You must download a new license package regardless of whether this is an upgrade or a new installation.

Step 10   The WAE Design license file's SERVER statement must be the same hostname as the output from the hostname CLI command.

      a. Determine the hostname.

```
hostname
```

      b. Edit the /etc/sysconfig/network file to include the hostname returned in the preceding step.

```
HOSTNAME=<hostname>
```

Step 11   Ensure the /etc/hosts file on the client devices contains the same hostname as identified in Step 4. (Client devices are the devices that will be checking the licenses in and out of the server.)

Install License Server

Before you begin

Confirm that you have the Cisco WAE License Server installer package (WAE_License_Server-3.0-Linux-x86_64.sh) downloaded from the WAE Automation Software Download site.

The installer runs /lmadmin-i86_lsb-11_11_1_1.bin from the installed folder (/opt/cariden/software/wae-license-server).

Step 1   If you want to run the license server web UI, run /lmadmin-i86_lsb-11_11_1_1.bin from the /opt/cariden/software/wae-license-server/bin directory.

Step 2   Although the default is to install lmadmin into /opt/FNPLicenseServerManager, the best practice is to install it into /opt/cariden/software/flexlm/current/web.

```
chmod 755./<lmadmin_package>.bin;./<lmadmin_package>.bin
```

Configure License Server Ports

To check out or borrow a floating license, client devices must establish two TCP connections to the license server. One connection is to the floating license server daemon. Unless otherwise configured, this daemon listens on the first available port in the range of 27000 and 27009. The other connection is to the Cisco daemon, which the license server randomly selects from the ephemeral range (which often ranges from 49152 to 65535).

If firewall policies block the above ports, you can change the ports by adding the port information to the floating license server's license file. By default, the file contains the following information:

```
SERVER <hostname> <MAC address>
VENDOR Cisco
```

Modify the preceding lines as follows to change the ports that these daemons use.

Port Type	Syntax	Example
Server daemon	SERVER <hostname> <MAC address> <port>	SERVER Centos10 525400232200 5053
Cisco daemon	VENDOR cisco PORT= <port>	VENDOR cisco PORT=27010

Start License Server

Note The following instructions are for using either the CLI or license web server, but not both. The recommended practice is to install and use one or the other.

To start the license server, you must have access to its license file, which is not the same as the WAE license. Download the floating license server file (.lic extension) to a directory of your choice on the device where the license server will be installed. The best practice is to put it in /opt/cariden/etc.

To start the CLI server daemon (lmgrd) and specify the lmgrd log file name and location, enter the following from /opt/cariden/software/flexlm/current/bin:

```
./lmgrd -c <license_filename> -l <log_path_filename>.log
```

To start the license server using the web UI:

Step 1 Create a backup of the Cisco daemon file so that it can be easily restored in case of failure.

```
.cp /opt/cariden/software/flexlm/current/bin/cisco /opt/cariden/software/flexlm/current/bin/cisco.bak
```

Step 2 Copy the Cisco daemon files to the flexlm/web directory.

```
cp /opt/cariden/software/flexlm/current/bin/cisco
/opt/cariden/software/flexlm/web/cisco
```

Step 3 Configure the following parameters from the /opt/cariden/software/flexlm/web directory. For more information, see lmadmin -help.

   a. By default, the lmadmin server has a user named "admin" with a password of "admin." If needed, add another user to this lmadmin server.

```
./lmadmin -useradd <username> - pass <password>
```

   b. Import the WAE Design license file that was installed.

```
./lmadmin -import <path>/<license_filename>
```

   For example:

```
lmadmin -import ~/.cariden/etc/MATE_Floating.lic
```

   c. Start the lmadmin process with its default settings.

Step 4   Start the license server web UI, which by default uses a non-secure port of 8090. By entering the following in a web browser, you are redirected to the secure port.

```
http:<server_hostname>:8091
```

Step 5   Click the Administration link, and log in using the an administrative username and password. Both have a default of "admin."

Step 6   Click the Vendor Daemon Configuration tab, click the Administer link, and then click Start.

Post-Installation

Log Files

By default, the lmadmin logs are in /opt/cariden/software/flexlm/web/logs.

The lmgrd log files are located wherever you specified the <log_path_filename> .log when starting the lmgrd daemon (lmgrd -l <log_path_filename> .log).

Verify Ports

To verify the ports, you can use any of several methods, as follows:

Step 1   Verify the license server daemon port is running. For example, you can telnet to this port to verify that it is running:

```
telnet <license_server_IP_address> <license_server_daemon_port>
```

For example:

```
telnet 127.0.0.1 27000
```

Step 2   Verify the license server is listening to the specified port.

For example:

```
netstat -a | egrep '27000[0-9]'
```

| tcp | 0 | 0 | * :27000 | *.* | LISTEN |
| tcp | 0 | 0 | localhost:48245 | localhost:27000 | ESTABLISHED |

tcp	0	0	localhost:27000	localhost:48245	ESTABLISHED

Step 3 View the lmgrd log file, which indicates on which ports the license server and Cisco daemons are listening.

For example:

```
13:00:14 (lmgrd) lmgrd tcp-port 27001
13:00:14 (lmgrd) cisco using TCP-port 42207
```

Step 4 For lmadmin, go to the admin page.

- To verify the server daemon's port, choose Administration > Server Configuration > License Server Configuration.

- To verify the Cisco daemon's port, choose Administration > Server Configuration > Vendor Daemon Configuration.

Distribute Information to Clients

Either distribute the same floating .lic file that you installed to all WAE Design users who need it, or give them both the MAC address and hostname for the license server. Having users install licenses via the MAC address and port is the recommended practice since it eases administration.

After end users install the floating license once, the license is automatically validated from the server each time the user opens the WAE Design GUI or runs the CLI tools.

Set Up Access Control List for Web Server

If you are using the web server to administer licenses, you can set up an access control list. This is optional, but doing so can improve the security of who can access the web server, as well as give you an easily maintainable list of license users. To do this, you need to know the user ID for all users who are checking out licenses from the license server. The user ID is what they use to log in to their operating systems.

Step 1 Create and open a file named cisco.opt in /opt/cariden/software/flexlm/current/bin.

Step 2 Create groups to make it easier and faster to configure inclusions and exclusions. You can then use these groups, rather than specifying individual users.

```
GROUP group_name user_name1 user_name2 user_username3..
```

Example: The group name is **akdevops**, and each name following it is a user.

```
GROUP akdevops theresa lone loretta byron patrick sharon
```

Step 3 For each user or group that you want to grant license access, add an **INCLUDEALL** line.

```
INCLUDEALL type {user_name | group_name}
```

Example:

```
INCLUDEALL GROUP akdevops
INCLUDEALL USER gbd456
INCLUDEALL USER odd789
```

Step 4 For each user or group you want to exclude from accessing the license server, add an **EXCLUDEALL USER** line.

```
EXCLUDEALL type {user_name | group_name}
```

Example:

```
EXCLUDEALL GROUP region_fea
EXCLUDEALL USER rgu456
EXCLUDEALL USER ilt789
```

Step 5   Save the file.

Configure Borrowing Parameters

Note   If you have a floating license that was generated prior to May 2015, you must acquire a new one to enable borrow licenses.

Step 1   Configure the /opt/cariden/bin/cisco.opt file to define who is permitted to borrow licenses.

Anyone not in an **INCLUDE_BORROW** statement is not permitted to borrow licenses. Thus, it is easier to use groups that user names. The inclusion format is as follows. You must specify a line item for each feature. For a list of these features, use the license_check tool.

```
INCLUDE_BORROW feature type {user_name | group_name}
```

Example:

```
INCLUDE_BORROW MD_Layer1 USER ohara
INCLUDE_BORROW MD_SegmentRouting GROUP akdevops
```

Step 2   You can refine this **INCLUDE_BORROW** list by excluding users. The **EXCLUDE_BORROW** has precedence over the **INCLUDE_BORROW** statements such that if a user or group is identified in both lists, that user or group will be excluded as specified.

```
EXCLUDE_BORROW feature type {user | group_name}
```

Example:

```
EXCLUDE_BORROW MD_VPN USER diana
EXCLUDE_BORROW MD_BGP GROUP acme
```

Step 3   (Optional) Specify the number of licenses for a feature that cannot be borrowed. This is useful for ensuring that users who need to check out licenses will have them available.

```
BORROW_LOWWATER feature number
```

Example: Save 23 MD_Sim licenses for use by those who are not borrowing licenses.

```
BORROW_LOWWATER MD_Sim 23
```

Verify Licenses in Use

Use the **lmstat** command to summarize how many licenses are in the original license file and how many are in use.

```
lmstat -a
```

The results show how many licenses are checked out and borrowed. The output contains *_Users entries and entries for each feature. The *_Users is determined by the users who have access to the license. Each feature lists a set of licenses checked out for that feature.

Example:

```
Users of MD_Users: (Total of 300 licenses issued; Total of 295 licenses in use)
"MD_Users" v5, vendor:cisco
```

Checked-out licenses are only displayed for *_Users, whereas borrowed licenses are shown for *_Users, as well as for individual features. The output uses the following format, where <time> is the time at which the license was checked out or borrowed. The <license_handle> is a unique ID for the license. If a user has the same license checked out twice, for example, each instance has a unique <license_handle> .

```
<feature> <version> <vendor>
<username> <user_hostname> <display> (<license>/<port>
<license_handle>) <time>
```

Example of a checked-out license:

```
dusan md1 /dev/pts/0 (v5) (matelic.cisco.com/27000 37337), start Wed 5/20 11:50
```

Licenses that are borrowed are listed with a (linger: #) notation, where # is the number of seconds for which the license is borrowed.

```
<username> <user_hostname> <display> (<license>/<port> <license_handle>) <time> <linger>
```

Example of a borrowed license:

```
obi obi-mbpr /dev/pts/18 (v5) (matelic.cisco.com/27000 18848), start Fri 5/8 16:26 (linger:
 2532780)
```

Reclaim Unused Licenses

You can reclaim licenses that have been checked out or borrowed. This feature is useful when a license remains idle, such as when an employee is on vacation or accidentally has the license running on two devices.

Reclaiming licenses is only valid through the CLI **lmremove** command.

Use the **lmstat -a** command described in Verify Licenses in Use to identify the required inputs to the **lmremove** command.