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About This Manual

Organization

This manual includes the following chapters:

- Chapter 1, *Installation Overview and Platform Requirements*, defines the version 6.X installation and platform requirements.
- Chapter 2, *Software Structure*, describes the MATRIx Product Family directory structure and planning options.

Conventions

The following font, format, symbol and note, caution, and warning conventions appear in this document.

Font Conventions

Fonts other than the standard text default font are used as follows:

- **bold Courier**: User input (anything you are expected to type in) is set in **bold Courier**.
- **bold Helvetica narrow**: Buttons, fields, and icons in a graphical user interface are set in **bold Helvetica narrow** type. Keyboard keys are also set in this type.
- **Courier**: Courier is used for command and function names, file names, directory paths, environment variables, messages and other system output, code and program examples, system calls, prompt responses, and syntax examples.
- **italics**: *Italics* are used with the default font for emphasis, first instances of terms, and publication titles.

*Italics* are also used with **Courier** or **bold Courier** to denote placeholders in syntax examples or generic examples.
About This Manual

Format Conventions

Code Examples or Program Output
This manual uses a special formatting convention to present code examples or screen output from the installation program. The example format has a numbered heading followed by a line; the end of the example is also followed by a line.

Symbol Conventions
The % symbol at the beginning of a Courier bold line is used to denote the C shell operating system prompt:

% setenv ISIHOME /new/ISI

Note, Caution, and Warning Conventions
Within the text of this manual, you may find notes, cautions, and warnings. These statements are used for the purposes described below.

Note  Notes provide special considerations or details which are important to the procedures or explanations presented.

Caution  Cautions indicate actions that may result in possible loss of work performed and associated data. An example might be a system crash that results in the loss of data for that given session.

Warning  Warnings indicate actions or circumstances that may result in file corruption, irrecoverable data loss, data security risk, or damage to hardware.

Related Publications
National Instruments provides a library of publications to support its products. Of special interest to the users of this publication are the installation guides, summarized as follows:

• System Administrator’s Guide (Windows)
• MATRIXx Product Family CD and booklet Installation Guide (Windows)
• Using MATRIXx Version 6.X Online Documentation
• FLEXlm End User Manual

For additional documentation, see the MATRIXx Help or the National Instruments home page at ni.com/matrixx.
Installation Overview and Platform Requirements

This chapter provides an overview of hardware and software requirements for MATRIXx version 6.X.

Installation Overview

The MATRIXx version 6.X software includes an installation program that performs a complete installation of the product. The installation instructions provided are for the C Shell. If you want to install version 6.X using a different shell, use the equivalent commands for the shell you prefer. The installation software includes the utilities described in Table 1-1.

Table 1-1. Installation Utilities

<table>
<thead>
<tr>
<th>Utility</th>
<th>Description</th>
<th>Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSTALLMX</td>
<td>Automated installation programs for installing the MATRIXx software, standalone license manager, or Altia animation software.</td>
<td>$ISIHOME</td>
</tr>
<tr>
<td>INSTALLLM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSTALLALTIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSTALLALTIAFP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lmhostid</td>
<td>Command used to report the host ID of a system.</td>
<td>$ISIHOME/ISILM</td>
</tr>
<tr>
<td>lm_startup</td>
<td>Script used to start the license manager.</td>
<td>$ISIHOME/ISILM</td>
</tr>
</tbody>
</table>

Version 6.X software also includes the Flexible License Manager (FLEXlm), which resides in the ISILM directory.

Note MATRIXx can be installed on a file server using a shared license manager.
Platform Requirements

MATRIXx 6.3 is available for Sun Solaris 2.9. For information on MATRIXx for other UNIX platforms, please contact NI at 1-877-493-2404.

National Instruments supports the MATRIXx version 6.X software in the hardware and software environments described in the following sections.

Hardware Requirements

The following requirements apply to UNIX systems running MATRIXx software:

- Minimum 16 MB RAM per user, 24 MB (or more) recommended.
- Minimum 60 MB swap per user, 80 MB (or more) recommended (typical ratio of RAM to swap space is 1 : 4).
- A CD-ROM drive for software installation or use of online books.
- Approximately 170 MB of disk space to complete a full MATRIXx installation. See Table 1-4 for details.
- A 3-button mouse or equivalent preferred.

Software Requirements

The following requirements apply to UNIX systems running MATRIXx software:

- The MATRIXx software requires a supported version of UNIX. Supported versions are described in Table 1-3.
- Floating licenses require properly functioning TCP/IP networking.
- Window Managers: MATRIXx version 6.X has been tested with the window managers shown in Table 1-2. While NI software may work under other X Windows-based window managers, their use is not supported. The applicable X11 version is R5 or later for all supported UNIX platforms.

Table 1-2. Supported Window Managers

<table>
<thead>
<tr>
<th>Platform</th>
<th>Window Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital UNIX</td>
<td>Digital Common Desktop Environment (CDE)</td>
</tr>
<tr>
<td>HP-UX</td>
<td>HP Common Desktop Environment (CDE)</td>
</tr>
<tr>
<td>IBM AIX</td>
<td>AIX Common Desktop Environment (CDE)</td>
</tr>
</tbody>
</table>
Compatible Compilers and Operating System Versions

The MATRIXx Product Family version 6.X software was developed and tested with the operating system versions and compiler versions listed in Table 1-3. These configurations are recommended for optimal compatibility.

Other operating system versions and compiler versions may be compatible with the MATRIXx version 6.X software, please check the National Instruments Technical Support page at ni.com/support or contact Technical Support at 1-877-493-2404.

<table>
<thead>
<tr>
<th>Platform</th>
<th>Window Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGI IRIX</td>
<td>4D Window Manager (4Dwm)</td>
</tr>
<tr>
<td>Sun Solaris</td>
<td>OpenWindows 3.X or Common Desktop Environment (CDE)</td>
</tr>
<tr>
<td>SunOS</td>
<td>OpenWindows 3.X</td>
</tr>
</tbody>
</table>

Table 1-2. Supported Window Managers (Continued)

![Table 1-2. Supported Window Managers (Continued)](image)

Caution Other compilers may work in certain cases, but they are not supported. NI recommends against using unsupported compilers.
Chapter 1  Installation Overview and Platform Requirements

Minimum Disk Space Requirements

The minimum space requirements for MATRIXx version 6.X on a UNIX host are shown in Table 1-4.

Table 1-4. Minimum Disk Space Requirements

<table>
<thead>
<tr>
<th>Product</th>
<th>Space Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATRIXx License Manager</td>
<td>140 MB</td>
</tr>
<tr>
<td>Altia Design Animation (optional)</td>
<td>5 MB</td>
</tr>
<tr>
<td>Altia FacePlate (optional)</td>
<td>40 MB</td>
</tr>
<tr>
<td></td>
<td>30 MB</td>
</tr>
<tr>
<td>Full installation</td>
<td>~215 MB</td>
</tr>
</tbody>
</table>

Installation Configurations

MATRIXx supports standalone and server installation on UNIX systems. Multiple different versions of MATRIXx software can be installed at one time on the same server, possibly for heterogeneous platforms. All of these versions can access the same license.dat file using a common license server.

All machines that will use MATRIXx software must be able to access the $ISIHOME root directory. Figure 1-2 shows a typical client-server configuration.
Licensing

MATRIXx uses FLEXlm licensing utilities. For licensing information, see Licensing Overview, FLEXlm Utilities, or the FLEXlm End User Manual on the MATRIXx documentation CD.

Troubleshooting Information

For troubleshooting tips, see the Troubleshooting Your Installation section of Chapter 4, Installation Overview and Platform Requirements. For additional troubleshooting assistance, contact matrixx@ni.com.
This chapter describes installation planning options and version 6.X directory structure.

Planning Options

Before starting the installation, you should make decisions about how and where you want to install MATRIXx tools. These issues must be addressed before you start the installation procedure detailed in Chapter 4, *Installation and Related Tasks*.

MATRIXx version 6.X must be installed in a different installation directory if you plan to keep versions prior to 6.X. The version 6.X installation will not affect an older version of MATRIXx software as long as you do not use the same parent directory. You do not have to do any extra work to keep the older version of MATRIXx, which will still use its own license manager.

You can install a copy of MATRIXx on a local node using either floating or node-locked licensing, or you can use a file server (a shareable disk) and a shared license manager to install the MATRIXx software on a network server. The directory structure detailed here is of interest in both situations, as it handles multiple versions and multiple platforms.

Directory Structure

The directory structure shown in Figure 2-1 shows the MATRIXx product structure, which enables you to manage the software in a central location, even in a heterogeneous network environment. This structure reduces the system administration issues of multiple installations for a given platform, because installation can be completed solely on a file server using a common license manager. You can safely install multiple versions of MATRIXx version 6.X into a common root installation directory ($ISIHOME).

*Note*  All machines that will use MATRIXx software must be able to access the $ISIHOME root directory.
Chapter 2  Software Structure

The commands used to invoke the MATRIXx suite of products are platform independent. These commands are found in the directory $ISIHOME/bin. Consequently, it is important that all users include $ISIHOME/bin in their path statements.

Note $ISIHOME and install-dir (referred to elsewhere in this document) are effectively equivalent.
Figure 2-1. MATRIXx Product Family Sample File Structure

NOTE: **platform** is hp, ibm, osf, sgi, sun, or solaris and **version** has the form 6.X.X.
Licensing and Terminology

This chapter provides an overview of licensing and describes licensing-related terminology and tasks. Version 6.X includes a license daemon, lmgrd, which controls all National Instruments product licenses. The lmgrd daemon resides in the directory named ISILM/bin/platform, and must be running on your license server (or on all three if you have a redundant license server configuration). It does not have to be on the node where you install version 6.X.

Licensing Overview

MATRIx licensing includes the following features:

- Floating and node-locked licenses
- Redundant license servers (optional)
- Flexible license checkout

Floating and Node-Locked Licenses

License configurations for counted floating licenses, node-locked licenses, and evaluation licenses are available on UNIX systems. To check out a floating license or counted node-locked licenses, a client system must be connected to the network and have properly functioning TCP/IP software. Evaluation and uncounted node-locked licenses do not require that you have a running license server or network support.

Windows 2000/NT/XP and UNIX systems can check out floating licenses from a UNIX license server by referencing a copy of the same license.dat file used by the UNIX server, or by using a proxy license file (Proxy License Files section).

Redundant License Servers

Redundant license servers are a set of three nodes designated to serve the same license file. If any node fails, the other two nodes will still be available to serve the licenses for MATRIx.
To support the redundant license server scheme, NI requires information for three servers. For UNIX servers, this includes the hostname and hostid (or equivalent parameter) for each server.

NI issues redundant license server keys once you provide the hostid of the three servers. At a minimum, you need to run the standalone license server installation program (INSTALLLM) and start the license server on each machine. Follow the instructions described in the Installing the Redundant License Servers section of Chapter 4, Installation and Related Tasks.

Figure 3-1 shows a typical redundant license-server configuration.
Flexible License Checkout

With MATRIXx version 6.X licensing, a feature (product component) is checked out as you use it. A feature stays checked out until you exit that product component. For example, Xmath and SystemBuild modules are checked out when first used and stay checked out until you exit Xmath or SystemBuild. SystemBuild is checked out when you launch the Catalog Browser (by starting SystemBuild) and stays checked out until you exit SystemBuild. The flexible license checkout feature is also known as on-demand checkout.

Xmath Licensing Commands

Xmath has the following license-related commands:

- `LICENSECHECKOUT` for checking out features for future use
- `LICENSEUSER` for displaying assigned licenses for any feature names specified
- `LICENSEINFO` for displaying a license report for your site
- `LICENSEFILE` for displaying the current license file search path
- `ISIREFNUM` for identifying your NI reference number

All of these commands must be run from the Xmath Commands window.

`LICENSECHECKOUT` is an intrinsic command that checks out a license for the listed feature or features. Run `LICENSEINFO` to see a list of feature names. Features are specified as strings, and the name must be exactly as displayed by `LICENSEINFO`.

Although features are normally checked out on-demand, you can use `LICENSECHECKOUT` to reserve features for future use (for example, for a scheduled demo or presentation). They are checked in when you exit Xmath.

This command can be placed in a global or local startup.ms file to check out required features at startup. The syntax is as follows:

`LICENSECHECKOUT feature1,feature2,...featureN`

For example:

`LICENSECHECKOUT "Xmath","Control","Sysid","Sysid2","sysbld","case"`
**LICENSEUSER**

The LICENSEUSER utility displays assigned licenses for any feature names specified. The default feature is Xmath if no argument is specified. LICENSEUSER accepts feature names in string form. To see a list of the feature names for products you have purchased (for example, *aca* indicates AutoCode Ada), issue the LICENSEINFO command. The syntax for LICENSEUSER is as follows:

```
LICENSEUSER feature1,feature2,...featureN
```

Typical output is shown in Example 3-1.

**Example 3-1: LICENSEUSER output**

```plaintext
licenseuser "xmath","aca"

Users of Xmath:

Number of licenses purchased : 10
Number of unused licenses : 4

<table>
<thead>
<tr>
<th>User</th>
<th>Node Name</th>
<th>Starting Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>muemura</td>
<td>sampras</td>
<td>Thu May 29 19:33:44 2001</td>
</tr>
<tr>
<td>lynch</td>
<td>tribble</td>
<td>Thu May 29 19:34:36 2001</td>
</tr>
<tr>
<td>sanjay</td>
<td>castaway</td>
<td>Sat May 31 19:01:04 2001</td>
</tr>
<tr>
<td>rpizzi</td>
<td>castor</td>
<td>Mon Jun 2 15:21:54 2001</td>
</tr>
<tr>
<td>dawn</td>
<td>venus</td>
<td>Wed Jun 4 11:05:06 2001</td>
</tr>
<tr>
<td>uma</td>
<td>sampras</td>
<td>Mon Jun 9 13:45:47 2001</td>
</tr>
</tbody>
</table>

Users of aca:

Number of licenses purchased : 4
Number of unused licenses : 2

<table>
<thead>
<tr>
<th>User</th>
<th>Node Name</th>
<th>Starting Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>muemura</td>
<td>sampras</td>
<td>Thu May 29 19:56:44 2001</td>
</tr>
<tr>
<td>uma</td>
<td>sampras</td>
<td>Mon Jun 9 13:51:47 2001</td>
</tr>
</tbody>
</table>
```
**LICENSEINFO**

**LICENSEINFO** displays a license report for your site as shown in Example 3-2.

**Example 3-2: LICENSEINFO license report**

```
licenseinfo
License file: $ISIHOME/ISILM/license.dat
License Server Name: hardrock
License Server ID: 38234001

<table>
<thead>
<tr>
<th>Module Name</th>
<th>Feature Name</th>
<th>Expiration Date</th>
<th>Type</th>
<th>Seats</th>
<th>Licensed Node</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xmath</td>
<td>Xmath</td>
<td>31-jan-2002</td>
<td>Floating</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Control Design Module</td>
<td>Control</td>
<td>31-jan-2002</td>
<td>Floating</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>SystemBuild</td>
<td>sysbld</td>
<td>31-jan-2002</td>
<td>Floating</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>HyperBuild Module</td>
<td>hyper</td>
<td>15-jan-2002</td>
<td>Floating</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>AutoCode C Single Processor</td>
<td>acc</td>
<td>31-jan-2002</td>
<td>Node-Locked</td>
<td>4</td>
<td>80379b46</td>
</tr>
<tr>
<td>Model Reduction Module</td>
<td>Modred</td>
<td>31-jan-2002</td>
<td>Floating</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Interactive Animation Module</td>
<td>icdm</td>
<td>31-jan-2002</td>
<td>Floating</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Robust Control Module</td>
<td>robust</td>
<td>31-jan-2002</td>
<td>Floating</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>RT/Fuzzy Module</td>
<td>blk_fuz</td>
<td>31-jan-2002</td>
<td>Floating</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>AutoCode Ada Single Processor</td>
<td>acc</td>
<td>31-jan-2002</td>
<td>Floating</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>DocumentIt</td>
<td>docit</td>
<td>31-jan-2002</td>
<td>Node-Locked</td>
<td>4</td>
<td>80379b46</td>
</tr>
</tbody>
</table>
```

**LICENSEFILE**

The **LICENSEFILE** command displays the current license file search path. The syntax and example output are as follows:

```
LICENSEFILE
License files searched by MATRIXx are as follows:
/homes/isi/isilm/license.dat
/homes/isi/isilm/tplic.dat
```

**ISIREFNUM**

The **ISIREFNUM** command displays the NI reference number (also known as your customer identification number). You should have this number ready if you plan to call NI customer support.

The syntax and example output are as follows:

```
ISIREFNUM
Your ISI Reference Number is as follows:
CUSTOMID99
```
Using Licensing

With concurrent licensing, you can have a different number of licenses for each module or application. An application or module is either available on a first-come, first-served basis, or node-locked to a given CPU. Some common uses of licensing are as follows:

- To see all the features your site has purchased or to view the license expiration date, use the command `LICENSEINFO`.
- To see who is using a given feature, or to see if a feature is available, use the `LICENSEUSER` command and specify the desired feature.
- To see the current license file search path, use the command `LICENSEFILE`.
- To reserve features for future use (for example, for a scheduled demo or presentation), use the `LICENSECHECKOUT` feature.

The initial distribution of licenses is determined at the time of the installation; to change licensing, your system administrator must get a new key from National Instruments License Administration. To generate a new license file from this key, run `INSTALLLM` as described in Chapter 4, *Installation and Related Tasks*.

National Instruments uses the FLEXlm license manager, a product of Macrovision Corporation. If you have license manager questions beyond the scope of this document, please see the *FLEXlm End User Manual* on the MATRIXx online documentation CD. For additional information about FLEXlm, see the Macrovision FAQ at [www.macrovision.com/solution/esd/support](http://www.macrovision.com/solution/esd/support).

License Files

The set of licensed features available for checkout by a MATRIXx user are contained in one or more license files, each containing encrypted feature lines. The following default license files are used by the MATRIXx products:

- `$ISIHOME/ISILM/license.da` — This primary license file contains feature lines for built-in MATRIXx features. The `license.dat` file is generated from NI provided authorization keys during the MATRIXx or standalone license manager installation procedures.
- `$ISIHOME/ISILM/tplic.dat` — This optional file contains license feature lines for third-party MATRIXx components. The encrypted feature lines in this file and the instructions for using the file will
typically be provided by your third-party supplier. Multiple features from different third-party suppliers can be placed in this file. Typically, this file will also contain the same SERVER and DAEMON lines as license.dat. This file is not modified during a MATRIXx or license manager installation, nor is it deleted by uninstall procedures.

The search paths used to locate these license files are set in the environment variable $LM_LICENSE_FILE by the MATRIXx product launching scripts. The above NI license file paths are prepended to any existing definition of $LM_LICENSE_FILE, thus allowing access to other MATRIXx or non-MATRIXx products also licensed by a FLEXlm license manager.

Normally, the only things you can change in a license file are:

- The hostname (not the hostid).
- The port number on the SERVER line. If this port number is already in use, the license daemon (lmgrd) will report Address In Use. The default port number used in MATRIXx 6.X license files is 27000, whereas for prior releases it was 5200. A valid number is any unused port number between 1025 and 64000. Beginning with MATRIXx 6.X, the port number can be removed and the FLEXlm license manager will serve on any available FLEXlm reserved port in the range 27000–27009. For redundant license servers, however, you must use a fixed port number.
- The path to the vendor daemon executable on the DAEMON line. (The vendor daemon is named mtxlmd.)
- name=value pairs on a FEATURE line can be changed if name is lowercase.

Redundant license server files contain three SERVER lines. The first SERVER line defines the primary license server. The second and third lines define the secondary license servers.

### Proxy License Files

If you are using a floating-license server, each licensing client needs a copy of the same license file used by the server. Alternatively, to avoid copying the license server file to each installation of MATRIXx, you can create a proxy license file in the ISILM directory of each MATRIXx installation. This approach can be used for both single and redundant license server configurations. The proxy license file (license.dat) can be constructed by taking the SERVER line or lines from the license server file and then adding a line containing USE_SERVER.
For example, a proxy license file for a single server configuration would be as follows:

```
SERVER host1 17003456 27000
USE_SERVER
```

A proxy license file for a redundant server configuration, for example, would be:

```
SERVER host1 17003456 27002
SERVER host2 17004355 27002
SERVER host3 17007ea8 27002
USE_SERVER
```

Unless your server nodes are changed, you will not have to update the license file for each individual MATRIXx installation when the server license file is updated.

Although a proxy license file is the preferred way to reference the actual license file used by a remote license server, you can also use a `port@host` definition for either of the environment variables `LM_LICENSE_FILE` or `MTXLMD_LICENSE_FILE`. `port` is the license file port number and `host` is the hostname, and both are taken from the SERVER line of the actual license file. `MTXLMD_LICENSE_FILE` is similar in use to `LM_LICENSE_FILE`, except that it is specific to the MATRIXx license manager daemon and overrides any concurrent definition of `LM_LICENSE_FILE`.

## Compatibility

The MATRIXx 6.X license manager uses the vendor daemon name `mtxlmd` (versus `isilmd` in prior releases) and the default port number 27000 (versus 5200 in prior releases). As a result, the MATRIXx 6.X license manager can coexist with earlier versions running on the same machine. Since version 6.X software must be installed in a different `$ISIHOME` directory, versions of the MATRIXx license manager prior to version 6.X do not have to be stopped to install the new software. You would only need to kill the older license manager daemon (`lmgrd`) if you choose to remove the old software.

Because of the addition of new features and new license manager functionality, license keys issued prior to MATRIXx 6.X cannot be used to regenerate a license file for version 6.X.
Licensing Requirements

If you are a new user, your software is shipped with an evaluation key. Note that the key clearly states the expiration date. You can install the evaluation license, and then later regenerate the license file for a standard installation (as described in the Updating a License File section of Chapter 4, Installation and Related Tasks). In order to obtain a standard license, you must provide the computername and hostid for each license server machine.

Finding the Host ID

FLEXlm uses different machine identifications for different machine architectures. For example, all Sun machines have a unique host machine identification. An Ethernet address is used on some machine architectures as the “host ID.” An Ethernet address is a 6-byte quantity, with each byte specified as 2 hexadecimal characters. Specify all 12 hex characters when using an Ethernet address as a host ID. For example, if the Ethernet address is 8:0:20:0:5:ac, you specify 080020005AC as the host ID. To find an Ethernet address for a machine, use the command ifconfig interface from the root account, where a valid interface can be found by typing netstat -i.

For 32-bit host IDs, which are displayed as less than 8 hex characters, prepend the ID with zeros (0’s) until it has exactly 8 hex characters. The same requirement applies to an Ethernet ID which should be padded to exactly 12 hex characters.

The program $ISIHOME/ISILM/lmhostid will print the exact host ID that FLEXlm expects to use on any given machine. Table 3-1 lists alternate methods to obtain the required host ID for each machine architecture.

Table 3-1. Obtaining the Host ID on Different Platforms

<table>
<thead>
<tr>
<th>Platform</th>
<th>Host ID</th>
<th>OS Command</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital</td>
<td>Ethernet ID</td>
<td>netstat -i</td>
<td>080020005532</td>
</tr>
<tr>
<td>HP-UX</td>
<td>32-bit ID</td>
<td>echo ‘uname -i’ 160 p</td>
<td>dc</td>
</tr>
<tr>
<td>IBM AIX</td>
<td>32-bit ID</td>
<td>uname -m then remove the last 2 digits, and use the remaining last 8 digits (006003294C00)</td>
<td>6003294C</td>
</tr>
</tbody>
</table>
Finding the Computer Name

Use either the `hostname` or the `uname -n` command at the UNIX prompt to display the Computer Name.

Contacting National Instruments

Contact License Administration in one of the following ways:

- Complete a Key Request Form (included with your software) and fax it to 512-683-9007.
- Send email with the information asked for in the Key Request Form to matrixx@ni.com.
- Call 877-493-2404 between 7 a.m. and 7 p.m. Central Time, Monday through Friday, and follow the voice mail directions which route you to the License Key Request administrator.

NI supplies the authorization key(s) and checksum(s) used to generate the license file, which enables you to use the packages and modules you purchased. An authorization key or checksum is an alphanumeric string that does not contain the numbers 0, 1, or 5 to avoid confusion with uppercase letters O, I, and S.
Installation and Related Tasks

This chapter describes how to install MATRIXx software, including any optional components such as Altia Design animation, and perform related tasks.

Version 6.X Installation

This section describes how to use the installation program INSTALLMX to install MATRIXx version 6.X software on a single platform using a CD-ROM drive.

Requirements

Your system must meet the hardware and software requirements for your platform specified in Chapter 1, *Installation Overview and Platform Requirements*.

Privileges

No special privilege is required to install the MATRIXx version 6.X software. National Instruments recommends that you perform the installation from an account that allows write permission to the installer only. If you plan a heterogeneous installation (installing the MATRIXx software for more than one platform) do not use root privilege. However, you may need root privilege to perform these installation-related tasks:

- Mount the CD-ROM.
- Kill an existing license daemon before installing, if it was started from another account.
- Modify the boot file to start the license daemon automatically after rebooting the license server.
Preparing for Installation

Preparing for installation includes two tasks (as applicable):

- Mount your CD-ROM.
- If you are an existing MATRIXx 6.X user, stop any MATRIXx 6.X license daemons on the installation machine.

Mounting Your CD-ROM Drive

You can use either a local or remote CD-ROM drive to access the MATRIXx 6.X installation file sets. If you do not already have a mounted CD-ROM, mount one with the following procedure:

Mounting a Local CD-ROM Drive

1. Log in to the root account and make a CD-ROM mount point.
   For example,
   ```
   % mkdir /cdrom
   ```
2. Mount the directory with the appropriate command for your platform:
   - Digital UNIX: `% mount -r -t cdfs -o noversion /dev/rz4c/cdrom`
   - HP-UX: `% mount -F cdfs -r -o cdcase /dev/dsk/c0t2d0/cdrom`
   - IBM AIX: `% mount -r -v cdfs /dev/cd0 /cdrom`
   - Solaris: `% mount -r -F hsfs /dev/dsk/c0t6d0s0 /cdrom`
   - SunOS: `% mount -r -t hsfs /dev/sr0 /cdrom`

   **Note** Device names (such as `/dev/sr0`) vary depending on configuration.

3. Log out of the root account.

Mounting a Remote CD-ROM Drive

1. Log in as root on the machine that has the CD-ROM drive attached to it.
2. Create a directory to be the CD-ROM drive mount point (such as `mkdir /cdrom`) and mount the CD-ROM drive according to the command specified in step 2 of the Mounting a Local CD-ROM Drive section.
3. Export the mount point of the CD-ROM drive to the NFS client; this allows your installation machine to mount the directory.
   \[
   \% \text{exportfs} -i -0 \text{ro} /\text{cdrom}
   \]

4. Log out from the machine that has the CD-ROM drive attached.

5. Log in to your installation machine as root.

6. Create a directory on the installation machine to be the mount point for the remote CD-ROM drive machine, and then mount it.
   \[
   \% \text{mkdir} /\text{cdrom}
   \%
   \text{mount} \text{cdrom}\text{drive}\text{machine}\text{name}:/cdrom/cdrom\_target
   \]

7. Log out from the installation machine (unless you need to stop a MATRIXx license daemon).

### Stopping MATRIXx License Daemons (for Existing MATRIXx 6.X Users)
You do not need to stop MATRIXx 5.X license daemons, because they will not be affected by the installation process. However, if you are running a version 6.X license server on the installation machine, take the following steps to stop the version 6.X license daemon:

1. Log in to the installation machine and check to see if a version 6.X \text{lmgrd} is running by entering:
   \[
   \text{Digital, HP-UX, IBM, SGI, Solaris:} \% \text{ps -ef} | \text{grep} \text{ISILM/bin} | \text{grep} -v \text{grep} \\
   \text{SunOS:} \% \text{ps -axw} | \text{grep} \text{ISILM/bin} | \text{grep} -v \text{grep}
   \]

2. If a version 6.X \text{lmgrd} daemon is present (as determined by the displayed installation path), note the process ID and kill it (if the \text{lmgrd} daemon was started by root, you need root privilege to kill the process). For example:
   \[
   \% \text{kill} \text{process-id}
   \]

### Installation Procedure
Before running the installation program, you will need the NI reference number, authorization key, and checksum. You will also need the hostname of your MATRIXx license server.

1. Make sure that you are logged on to the correct operating system type (for example, Solaris) under the desired account. The installation procedure detects your operating system type, so it must match the target installation operating system.
2. Run the `setup.sh` script that resides in the `matrixx` directory on the CD. The `setup.sh` script prompts you for your installation directory.

**Note** Do not install MATRIXx version 6.X into an existing MATRIXx 5.X directory.

The `setup.sh` script extracts your product files and runs the installation program. The installation program prompts you for your NI reference number, authorization key, and checksum if you choose to generate a new license file. If you have redundant server keys, the installation program also prompts for the hostnames of two other machines.

When you are prompted to generate a new license file, do one of the following:

- If you have an existing license file, exit with `Ctrl-C` when prompted to avoid generating a new license file.
- If you need a new license file, enter the license key data when prompted.
- If you intend to access a floating license provided by another host:
  - Exit with `Ctrl-C` when prompted (to avoid generating a new license).
  - With a text editor, create a proxy license file named `license.dat` in the `install-dir/ISILM` directory as described in the Proxy License Files section of Chapter 3, Licensing and Terminology.

3. For evaluation licenses, or if you already have a MATRIXx license server running on another node, you can skip this step. Otherwise, start the version 6.X license manager with the following command:

   ```
   % install-dir/ISILM/lm_startup
   ```

**Note** `install-dir` and `$ISIHOME` (referred to elsewhere in this document) are effectively equivalent.

To shut down the license manager, enter:

```
% install-dir/ISILM/lmdown -c license.dat
```

To check the status to see if startup worked, enter:

```
% install-dir/ISILM/lmstat -c license.dat
```

This lets you know if both the license server and vendor daemon are up.
You can also check the `install-dir/ISILM/isi.log` file to see if the license server is running correctly.

4. To start Xmath version 6.X, and test the installation, type:

   ```
   % install-dir/bin/xmath &
   ```

   or

   ```
   % install-dir/bin/xmath -v version &
   ```

   where `version` is the installation version that you just completed, or one of the versions in `install-dir/bin`.

5. If you are installing redundant license servers, complete the procedure described in the `Installing the Redundant License Servers` section.

6. (Optional) Once you have verified that Xmath starts successfully, go to the `Installing Altia Design Animation` section, if you plan to use Altia animation.

7. To ensure that the version 6.X license daemon is available after a reboot, add the following startup command to the platform boot file as described in Table 4-1:

   ```
   /bin/su username -c "umask 022; /path-to-lmgrd/lmgrd -c /path-to-isilm/license.dat -l
   /path-to-isilm/isi.log"
   ```

   where:

   - `/path-to-lmgrd` is equivalent to `install-dir/ISILM/bin.platform`
   - `/path-to-isilm` is equivalent to `install-dir/ISILM platform`
   - `platform` is `hp`, `ibm`, `osf`, `sgi`, `solaris`, or `sun`
   - `username` is a nonprivileged user

**Note**  License administration does not require root permission. This includes FLEXlm, `lmgrd`, and the vendor daemon. In fact, NI recommends that you do not run the license server (`lmgrd`) as root, because root processes can introduce security risks. If `lmgrd` is started from root, as in a system boot script, NI recommends that you use the `/bin/su` command to run `lmgrd` as a nonprivileged user. You will have to ensure that the vendor daemons listed in the `license.dat` file have execute permissions for `username`. The paths to the vendor daemons are listed on the corresponding DAEMON lines.
# Table 4-1. License Daemon Startup Command Instructions

<table>
<thead>
<tr>
<th>Platform</th>
<th>Boot File Instructions</th>
</tr>
</thead>
</table>
| Digital UNIX 4.0  | Create `/etc/init.d/matrixxlmd` containing the startup command. Enter the following: 
  `ln -s /etc/init.d/matrixxlmd /etc/rc3.d/S91matrixxlmd` |
| HP-UX 10.20       | Create `/sbin/init.d/matrixxlmd` containing the startup command. Enter the following: 
  `ln -s /sbin/init.d/matrixxlmd /sbin/rc2.d/S900matrixxlmd` |
| IBM AIX 4.3       | Append the startup command to `/etc/rc.nfs` |
| SGI IRIX 6.5      | Create `/etc/init.d/matrixxlmd` containing the startup command. Enter the following: 
  `ln -s /etc/init.d/matrixxlmd /etc/rc2.d/S91matrixxlmd` |
| Solaris 2.9       | Create `/etc/init.d/matrixxlmd` containing the startup command. Enter the following: 
  `ln -s /etc/init.d/matrixxlmd /etc/rc3.d/S26matrixxlmd` |
| SunOS 4.1.4       | Append the startup command to `/etc/rc.local` |
Installing Other Components

This section describes the installation procedures for installing optional MATRIXx components.

Installing Altia Design Animation

Since the Altia Design software uses the NI license manager, you must have either MATRIXx or the standalone license manager installed. Before beginning installation, follow the instructions in the Mounting Your CD-ROM Drive section.

To install Altia Design, follow these steps:

1. Make sure that you are logged on to the correct operating system type (for example, Solaris) under the desired account. The installation procedure detects your operating system type, so it must match the target installation operating system.

2. Run the setup.sh script that resides in the altia/design directory on the CD. The setup.sh script prompts you for the installation directory (which should be the same as your MATRIXx installation directory). The setup.sh script extracts your product files and runs the installation program.

3. After the installation program completes, you can run the Altia Design editor with the following command:

   % install-dir/bin/altia

4. (Optional) You can execute the automated demo with the install-dir/bin/altia_demo command. You can also run any of the five tutorials with the install-dir/bin/altia_tutorial1 through the altia_tutorial5 command.

   Note The Altia software uses the NI license manager. It does this by setting up the Altia code words file with the location of the MATRIXx license file (license.dat) during execution of the installation program.

Installing Altia FacePlate

Since the Altia FacePlate software uses the NI license manager, you must have either MATRIXx or the standalone license manager installed. Before beginning installation, follow the instructions in the Mounting Your CD-ROM Drive section.
To install Altia FacePlate, follow these steps:

1. Make sure that you are logged on to the correct operating system type (for example, Solaris) under the desired account. The installation procedure detects your operating system type, so it must match the target installation operating system.

2. Run the `setup.sh` script that resides in the `altia/face` directory on the CD. The `setup.sh` script prompts you for the installation directory (which should be the same as your MATRIXx installation directory). The `setup.sh` script extracts your product files and runs the installation program.

3. After the installation program completes, you can run the Altia Design editor with the following command:
   
   ```
   % install-dir/bin/altiafp
   ```

   **Note** The Altia software uses the ISI license manager. It does this by setting up the Altia code words file with the location of the MATRIXx license file (`license.dat`) during execution of the installation program.

### Installing the Standalone License Manager

The standalone license manager installation, which populates only the `ISILM` subdirectory tree, is a subset of the full MATRIXx installation. It can be used to provide support for other standalone product installations such as Altia Design animation, which requires MATRIXx licensing but may not need the full MATRIXx product set to function. In addition, it can provide the required licensing installation on single or redundant license servers.

The sequence of steps to install the standalone license manager is essentially the same as installing MATRIXx. Before beginning installation, follow the instructions in the *Mounting Your CD-ROM Drive* section.

Before running the installation program, you will need the NI reference number, authorization key, and checksum. You will also need the hostname of any MATRIXx license server.

1. Make sure that you are logged on to the correct operating system type (for example, Solaris) under the desired account. The installation procedure detects your operating system type, so it must match the target installation operating system.

2. Run the `setup.sh` script that resides in the `isilm` directory on the CD. The `setup.sh` script prompts you for your installation directory.
**Note**  Do not install into an existing MATRIXx 5.X directory.

The `setup.sh` script extracts your product files and runs the installation program. The installation program prompts you for your NI reference number, authorization key, and checksum if you choose to generate a new license file. If you have redundant server keys, the installation program also prompts for the hostnames of two other machines.

**Note**  Self-extracting versions of this same installation program are provided under the `isilm` directory on the CD for each of the supported license server platforms. Simply run the desired self-extracting shell script rather than `setup.sh` once you are logged on to the correct operating system type, and then follow the instructions in this section.

3. Start the version 6.X license manager with the following command (skip this step for an evaluation license).

   ```bash
   % install-dir/ISILM/lm_startup
   ```

   You can check the `install-dir/ISILM/isi.log` file to see if the license server is running correctly.

4. To ensure that the license daemon is available after a reboot, follow the instructions in step 7 in the *Installation Procedure* section (skip this step for an evaluation license).

5. Each separate installation of MATRIXx can access the license server with a proxy license file as described in the *Proxy License Files* section.

### Installing the Redundant License Servers

At a minimum, installing redundant license servers requires the installation of license manager software and starting the license manager daemon on two other nodes in addition to the primary license server. Special license keys are required for a redundant license server configuration.

To install a typical redundant license server configuration, follow these steps:

1. Perform a standalone license manager installation on the primary license server (see the *Installing the Standalone License Manager* section) or a complete MATRIXx installation if you want this machine to also serve the MATRIXx application files (see the *Installing the Standalone License Manager* section). Either procedure requires generating a license file and starting the license daemon.
Chapter 4  Installation and Related Tasks

2. On each of two secondary license servers, run either the standalone license manager installation (see the Installing the Standalone License Manager section) or a complete MATRIXx installation (if you want to replicate all the MATRIXx files), and then start the license daemon on each machine.

Note Rather than generating the license file on each secondary license server, copy license.dat from the ISILM directory of the primary server to the ISILM directory of each secondary server before starting the license daemons. Edit the DAEMON line of each secondary copy of license.dat to point to the daemon path that contains mtlxld for that server.

3. To ensure that the license daemons are available after a reboot, follow the instructions in step 7 in the Installation Procedure section.

4. Each separate installation of MATRIXx can access the license server with a proxy license file as described in the Proxy License Files section.

Unmounting Your CD-ROM Drive

After the installation is completed, you need to unmount the CD-ROM directories mounted as described in the Mounting Your CD-ROM Drive section:

1. Log in as root to the machine with a mounted CD-ROM directory.
2. Unmount any mounted CD-ROM directories. For example:
   
   ```
   % umount /cdrom
   ```

3. Log out.

Updating a License File

Run INSTALLLM to perform license maintenance. This utility runs the license file generator. To update a license file, take the following steps:

1. Change directory to install-dir.
2. Run INSTALLLM with the following command:
   
   ```
   % ./INSTALLLM
   ```
Using MATRIXx Help

MATRIXx version 6.X provides a hypertext markup language (HTML) help system. MATRIXx Help is a self-contained system with multiple hypertext links from one component to another. This help system, augmented by online and printed manuals, covers most MATRIXx topics except for installation.

Installation-Related Tasks

Setting Up a User Environment (.cshrc)

To allow access to MATRIXx version 6.X each time you log in, place the following command in your .cshrc file.

set path=(install-dir/bin compiler_path $path)

where install-dir is your installation directory and compiler_path is the path by which the user can access a compiler for linking external files such as LNXs and UCBs. Specify all compilers the user will require.

Note In previous MATRIXx versions, makefiles on some platforms contained literal compiler paths. As of 6.X, all makefiles contain only cc, CC, and f77 statements. All users must now include explicit compiler paths in their path definitions or linking will not work.

Running Multiple MATRIXx Versions

You can install multiple versions of MATRIXx version 6.X or later under a common installation directory. If you have multiple versions installed in a common directory, the following command lets you run a selected version:

% install-dir/bin/command_name -v version

where install-dir is your installation directory, command_name is xmath, sbsim, autostar, ia, encrypt, mtxdemo, or mtxhelp, and version is one of the versions in the install-dir/bin directory. The version string appears as a suffix on the launching scripts.
Recording Your NI Reference Number

To help us provide rapid support when you call National Instruments, the installation procedure prompts you for the 10-character National Instruments reference number while installing MATRIXx 6.X or the license manager. Your reference number is stored in the file `install-dir/ISILM/config.txt`. If you do not have a reference number, you can obtain one from National Instruments License Administration when you request your Authorization Key and enter it into the first line of the `config.txt` file as follows:

```
ISI REFERENCE NUMBER: 10_character_string
```

Note: Enter your NI reference number without any spaces.

You can use the Xmath `ISIREFNUM` command to display the reference number.

Moving the ISIHOME Directory Tree to Another Directory

If you want to move the ISIHOME directory tree to another directory after installing MATRIXx version 6.X, the preferred method is as follows:

1. Save the `license.dat` file (if required).
2. Delete the MATRIXx software after stopping the license daemon.
3. Reinstall MATRIXx in the new directory location.
4. Copy the `license.dat` file to the new directory location.
5. Restart the license daemon.
Troubleshooting Your Installation

If you try to perform one of the following tasks and receive an error message, you may be able to correct it by identifying the cause as described in Table 4-2.

Table 4-2. Error Message Definitions

<table>
<thead>
<tr>
<th>Command</th>
<th>Error Message or Problem</th>
<th>Cause or Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>lmdiag</td>
<td>On HP systems, <code>lmdiag</code> reports an incorrect Ethernet address (although <code>lanscan</code> suggests that the Ethernet address is correct).</td>
<td>As root, enter the following command:</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>chmod a+r /dev/lan0</code></td>
</tr>
<tr>
<td>lmdiag</td>
<td><code>lmdiag</code> reports that the hostid is correct, but the license daemon has not been started.</td>
<td>Kill all <code>lmgrd</code> processes started for the <code>license.dat</code> file (they are trying to use the same TCP/IP port) and start a new <code>lmgrd</code> process.</td>
</tr>
<tr>
<td>lmreread -c license_file</td>
<td></td>
<td>You have changed the server name or port number. Kill the old daemon, then restart the license daemon using <code>install-dir/ISILM/lm_startup</code>.</td>
</tr>
<tr>
<td>INSTALLMX</td>
<td>Message: <code>Invalid keys</code>.</td>
<td>You have entered the wrong authorization keys or checksum, or, if you have an Evaluation License, the keys have expired.</td>
</tr>
<tr>
<td>INSTALLLM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FLEXlm Licensing Tools

This chapter describes the FLEXlm licensing utilities. This includes explaining how to troubleshoot common license manager problems and describing messages from the daemon log file. For additional licensing documentation, see the FLEXlm End User Manual from Macrovision Corporation on the MATRIXx documentation CD.

FLEXlm Utilities

MATRIXx version 6.X uses FLEXlm for its license server. FLEXlm provides the following utilities to help manage the licensing activities on the network:

- **lmstat**: Helps you monitor the status of all network licensing activities.
- **lmdiag**: Lets you diagnose problems when you cannot check out a license.
- **lmdown**: Provides the means for an orderly shutdown of license daemons.
- **lmgrd**: Starts the license daemon.
- **lmhostid**: Reports the host ID of a system.
- **lmreread**: Causes the license daemon to reread the license file and start any new vendor daemons.
- **lmver**: Reports the FLEXlm version of a library or a binary.

**lmgrd**

*lmgrd* is the main daemon program for FLEXlm. When you invoke *lmgrd*, it looks for the license file. The license file contains information about vendors and features. Syntax is:

```
lmgrd [ -c license_file ] [ -t timeout ] [ -s interval ]
[ -b ] [ -l logfile ]
```
where:

- 
  -c license_file
  Uses the specified license file. If this option is not specified, lmgrd looks for the environment variable LM_LICENSE_FILE. If that environment variable is not set, lmgrd looks for the file /usr/local/flexlm/licenses/license.dat.

- 
  -t timeout
  Sets a timeout interval, in seconds, during which redundant daemons must complete their connections to each other. The default value is 10 seconds. A larger value may be needed if the daemons are being run on busy systems or a heavily loaded network.

- 
  -s interval
  Specifies the logfile timestamp interval, in minutes. The default is 360 minutes.

- 
  -b
  Specifies backward compatibility.

- 
  -l logfile
  Specifies the pathname to the log file. If this option is not specified, the log will be sent to standard output.

Imstat

The lmstat utility helps you monitor the status of all network licensing activities, including:

- Which daemons are running
- Users of individual features
- Users of features served by a specific daemon

Syntax is:

lmstat [-a] [-S [DAEMON]] [-f [feature]] [-s [server_name]]
[-t value] [-c license_file][-A] [-l [regular expression]]

where:

- 
  -a
  Displays everything.

- 
  -A
  Lists all active licenses.

- 
  -c license_file
  Uses license_file.
-S [DAEMON] Lists all users of the specified daemon’s features.
-f [feature_name] Lists users of the specified feature(s).
-l [regular expression] Lists users of matching license(s).
-s [server_name] Displays status of server node(s).
-t value Sets lmstat time-out to value.

lmreread

The lmreread utility causes the license daemon to reread the license file and start any new vendor daemons that have been added. Additionally, all pre-existing daemons will be signaled to reread the license file for changes in feature licensing information. Syntax is:

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

**Note** If you use the -c option, the license file specified will be read by lmreread, not by lmgrd; lmgrd rereads the file it read originally. Also, lmreread cannot be used to change server node names or port numbers. Vendor daemons will not reread their option files as a result of lmreread.

lmhostid

The lmhostid utility reports the host ID of a system. Syntax is:

```
lmhostid [ether | long]
```

The output of this command appears as follows:

```
lmhostid - Copyright (c) 1989, 199x Highland Software, Inc. The FLEXlm host ID of this machine is "69021c89"
```

The ether option causes lmhostid to print the Ethernet address on Hewlett-Packard (HP) systems. On HP systems, the long option prints the value of the HP ID module. These options are only available in FLEXlm v2.21 or later. The default is long for FLEXlm v2.21 or earlier, and ether for FLEXlm v2.4 or later.
**lmdown**

The `lmdown` utility allows an orderly shutdown of license daemons (both `lmgrd` and its vendor daemon) on all nodes. Syntax is:

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

where the `-c license_file_path` argument specifies the location of the license file to be shut down.

⚠️ **Caution** The system administrator should protect the execution of `lmdown`, because shutting down the license daemons will cause loss of access to licenses; current users may lose data.

**lmdiag**

`lmdiag` allows you to diagnose problems when you cannot check out a license.

Usage is:

```
lmdiag [-c license_file] [-n] [feature]
```

where `-c license_file` path to file to diagnose. `-n` run in noninteractive mode; `lmdiag` will not prompt for any input in this mode. In this mode, extended connection diagnostics are not available. `feature` diagnose this feature only.

If no feature is specified, `lmdiag` will operate on all features in the license file(s) in your path. `lmdiag` will first print information about the license, then attempt to check out each license. If the checkout succeeds, `lmdiag` will indicate this. If the checkout fails, `lmdiag` will give you the reason for the failure. If the checkout fails because `lmdiag` cannot connect to the license server, then you have the option of running “extended connection diagnostics.”

These extended diagnostics attempt to connect to each port on the license server node, and can detect if the port number in the license file is incorrect. `lmdiag` will indicate each port number that is listening, and if it is an `lmdiag` process, `lmdiag` will indicate this as well. If `lmdiag` finds the vendor daemon for the feature being tested, then it will indicate the correct port number for the license file to correct the problem.
Imver

Imver reports the FLEXlm version of a library in binary. Usage is:

```
Imver [filename]
```

where filename can be mtxlmd or lmgrd.

Resolving Problems

This section offers some general debugging tips, and discusses information you should gather before contacting support. The Troubleshooting License Manager Problems section lists common license manager problems users have encountered before.

General Debugging Tips

The following are tips for debugging:

- Examine the $ISIHOME/ISILM/isi.log file.
- If you cannot check out a feature, run:
  
  `$ISIHOME/ISILM/lmdiag -c $ISIHOME/ISILM/license.dat`

- If the license daemon appears to have started correctly (which you should be able to determine from the isi.log file), try running lmstat to see if that program has the same problem as your application.
  
  `lmstat -a -c $ISIHOME/ISILM/license.dat`

Support Issues

When you make a support call, please be prepared to answer the following questions:

- What kind of machine is your license daemon running on? What version of the operating system is the application running on?
- What version of FLEXlm does the program use? Use the following command on your mtxlmd vendor daemon and application:
  
  `$ISIHOME/ISILM/lmver $ISIHOME/ISILM/bin.platform/mtxlmd`

- What error or warning messages appear in the log file? Did the daemon start correctly? Look for a message such as:
  
  `server xyz started for: feature1 feature2.`
What is the output from running `lmstat -a`?

Are you running other products which are also licensed by FLEXlm?
National Instruments does not support combined license files.

Troubleshooting License Manager Problems

This section lists areas of FLEXlm administration that have given customers difficulty in the past. Categories are Host ID Problems, Connection Problems, and Other Client Problems.

Host ID Problems

**symptom**
When I run the license manager on my machine, it tells me it is the wrong host ID.

**cause**
The vendor daemon checks the host ID listed on the server line in the license file; if it does not match the host ID of the machine it is running on, this message will be printed.

Possible causes include:

1. You are trying to run the license daemon on a different machine from the machine the file was made for.

2. The host ID of the machine you are running on changed (for example, the HP ID module was moved, or the CPU board was replaced).

3. The host ID in the license file was modified.

**solution**
Verify that the host ID of the machine where the vendor daemon (or node-locked client program) is being run matches the host ID specified in the license file (on the server line for the vendor, or on the feature line for a node-locked client). You can run the `lmhostid` program to see what FLEXlm thinks the host ID is. You cannot modify the host ID in the license file. If the host ID of your server machine changes, you will have to get a new license file from your software vendor.
Connection Problems

**symptom** The application program (or `lmstat`) can’t connect to the server to check out a license.

**cause** The FLEXlm routines in the application are unable to make a TCP connection to the server and port specified in the license file. Possible reasons for this are:

1. The wrong license file is being referenced by the application program.
2. The server machine specified in the license file is down.
3. The vendor daemon specified in the license file is not running.
4. The hostname in the license file is not recognized by the system.
5. The network between the client machine and the server machine is down.
6. TCP is not running on your machine.

**solution** Verify that the application is using the proper license file. Verify that the specified server machine is up and reachable by executing another command that uses TCP, such as `rsh` or `rlogin`, from the client to the server. Verify that the vendor daemon is running (you can use the `ps` command on the server to look for it). Examine the license log file to see if any problems are reported, particularly messages indicating that the vendor daemon has quit. Run `lmstat -a` from the server machine to verify that the vendor daemon is alive. Run `lmstat -a` from the client machine to verify the connection from client to vendor daemon across the network. Try using: `telnet hostname portnum` where `hostname` and `portnum` are the same as on the server line in your license file.
Other Client Problems

symptom When I run my application program (or vendor daemon), I get the error **bad code**.

cause Possible causes for this are:
1. The license file was modified (either the host ID on a server line or anything on the feature line was changed).
2. The vendor used the wrong version of his license creation program to generate your license file (or there is a bug in that process).

solution You cannot modify the license file. If you need to change something in your license file, you must get a new license from National Instruments.

symptom When the second user tries to check out a license, the vendor daemon prints an error concerning **Parameter mismatch** in the log file and refuses the license.

cause The most likely cause of this problem is that you are simultaneously trying to run two different versions of the application program, and the software vendor has not specifically set up the new version for this kind of compatibility. Check the license server log file for a **comm version mismatch** warning message; this indicates that someone is running a V1.5 client with a V2.1 or later license server.

solution Run only the new version of the application (or only the old version).

Other Server Problems

symptom When I start **lmgrd**, it says **Retrying socket bind** (address in use: port xxxx).

cause The license server listens on the port xxxx that has already been used by another server program. 99.44% of the time, if it’s in use, it’s because **lmgrd** from NI or another vendor is already running on the port, or was recently killed, and the port isn’t freed yet.
solution  In the license.dat file NI has put 27000 at the end of the SERVER line as the port number. You can remove it to let lmgrd scan for a free port from 27000 to 27009. You can also specify a port number selected by yourself for other concerns like farewell.

⚠️ Warning  The portscan feature of lmgrd is only available for FLEXlm v6+ licenses. You cannot drop the port numbers when configuring redundant servers.

symptom  When I start up lmgrd, it says exec1 failed on my vendor daemon.

cause  lmgrd uses exec1 to start each vendor daemon running. If there is a problem starting the vendor daemon, this message is output to the log file. This error is typically caused by one of the following:

1. There is no executable at the location referred to by the license file (and printed out in the log file).
2. The executable does not have the proper protection to be run (the file does not have the x bit set, or one of the directories in the path is not readable).
3. There was an error building the executable, and it cannot be run.
4. The executable is for a different machine architecture.

solution  Verify that the path to the vendor daemon is absolute (that is, starts with slash (/), and that it points to the executable program itself, not the containing directory (for FLEXlm v1.5)). Ensure that the file exists by doing an ls -l of the vendor daemon filename(s) specified in the log file. Make sure you do this as the same user that started lmgrd. Verify that the file is executable. If you are running as root and using an NFS-mounted file system, the relevant protection bits are the other bits (not the user bits), even if the file is owned by root. Run a whatis on the file. whatis should tell you the file is an executable for the machine you are trying to run it on. Run the vendor daemon directly from the command line. If the vendor daemon is properly linked, it will tell you that it must be run from lmgrd; if it crashes or fails to execute, then it is not properly linked.
symptom The license server keeps reporting lost lock errors in the log file and exiting.

cause The lockfile (normally placed in /usr/tmp) is being removed by someone else. There could be another daemon running, or the system administrator (or a script) could have deleted the file.

solution Check to see if there is more than one copy of the daemon running: use the command `ps -aux` | `grep isi` to search for it. Check for more than one `lmgrd` running as well, since it will restart your vendor daemon when it is killed. If more than one `lmgrd` is running, kill them all (using simple `kill` commands, not `kill -9` etc.), then kill any remaining vendor daemons (try a simple kill before trying `kill -9`) and start one fresh copy of `lmgrd`. Check to see whether a shell script is running that cleans out `/tmp` (or `/usr/tmp`). If so, try modifying it so that it does not delete zero length files.

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Daemon Log File

Daemons generate log files with **DAEMON NAME** messages where:

<table>
<thead>
<tr>
<th>DAEMON NAME</th>
<th>Either license daemon or the string from the <strong>DAEMON</strong> line that describes your daemon. In the case where a single copy of the daemon cannot handle all of the requested licenses, an optional underscore followed by a number indicates that this message comes from a forked daemon.</th>
</tr>
</thead>
<tbody>
<tr>
<td>message</td>
<td>The text of the message.</td>
</tr>
</tbody>
</table>

The log file is available as `$ISIHOME/ISILM/isi.log`. The log files can be used to:

- Inform users when they need to purchase additional application software licenses.
- Diagnose configuration problems.
- Diagnose daemon software errors.
Informational Messages

These messages are only informational and do not necessarily indicate an error or a problem.

<table>
<thead>
<tr>
<th>Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connected to node.</td>
<td>This daemon is connected to its peer on node node.</td>
</tr>
<tr>
<td>CONNECTED, master is name.</td>
<td>The license daemons log this message when a quorum is up and everyone has selected a master.</td>
</tr>
<tr>
<td>DENIED: N feature to user (N licenses)</td>
<td>user was denied access to N licenses of feature.</td>
</tr>
<tr>
<td>EXITING DUE TO SIGNAL nnn. EXITING with code nnn.</td>
<td>All daemons list the reason that the daemon has exited.</td>
</tr>
<tr>
<td>EXPIRED: feature.</td>
<td>feature has passed its expiration date.</td>
</tr>
<tr>
<td>IN: feature by user (N licenses).</td>
<td>user has checked back in N licenses of feature.</td>
</tr>
<tr>
<td>License Manager server started.</td>
<td>The license daemon was started.</td>
</tr>
<tr>
<td>Lost connection to host.</td>
<td>A daemon can no longer communicate with its peer on node host, which can cause the clients to have to reconnect, or cause the number of daemons to go below the minimum number, in which case clients may start exiting. If the license daemons lose the connection to the master, they will kill all the vendor daemons; vendor daemons will shut themselves down.</td>
</tr>
<tr>
<td>Lost quorum.</td>
<td>The daemon lost quorum, so it will only process connection requests from other daemons.</td>
</tr>
<tr>
<td>MULTIPLE xxx servers running. Please kill, and restart license daemon.</td>
<td>The license daemon has detected that multiple copies of vendor daemon xxx are running. The user should kill all xxx daemon processes and restart the license daemon.</td>
</tr>
<tr>
<td>OUT: feature by user (N licenses).</td>
<td>user has checked out N licenses of feature</td>
</tr>
<tr>
<td>RESERVE feature for HOST name. RESERVE feature for USER name.</td>
<td>A license of feature is reserved for either user name or host name.</td>
</tr>
<tr>
<td>REStarted xxx (internet port nnn)</td>
<td>Vendor daemon xxx was restarted at internet port nnn.</td>
</tr>
</tbody>
</table>
### Configuration Problem Messages

<table>
<thead>
<tr>
<th>Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrying socket bind (address in use).</td>
<td>The license servers try to bind their sockets for approximately 6 minutes if they detect “address in use” errors.</td>
</tr>
<tr>
<td>Selected (EXISTING) master node.</td>
<td>This license daemon has selected an existing master (node) as the master.</td>
</tr>
<tr>
<td>SERVER shutdown requested.</td>
<td>A daemon was requested to shut down through a user-generated kill command.</td>
</tr>
<tr>
<td>[NEW] Server started for: feature-list</td>
<td>A (possibly new) server was started for the features listed.</td>
</tr>
<tr>
<td>Shutting down xxx</td>
<td>The license daemon is shutting down the vendor daemon xxx.</td>
</tr>
<tr>
<td>SIGCHLD received. Killing child servers.</td>
<td>A vendor daemon logs this message when a shutdown was requested by the license daemon.</td>
</tr>
<tr>
<td>Started name.</td>
<td>The license daemon logs this message whenever it starts a new vendor daemon.</td>
</tr>
<tr>
<td>Trying connection to node.</td>
<td>The daemon is attempting a connection to node.</td>
</tr>
<tr>
<td>hostname: Not a valid server host, exiting</td>
<td>This daemon was run on an invalid hostname.</td>
</tr>
<tr>
<td>hostname: Wrong hostid, exiting</td>
<td>The host ID is wrong for hostname.</td>
</tr>
<tr>
<td>BAD CODE for feature-name</td>
<td>The specified feature name has a bad encryption code.</td>
</tr>
<tr>
<td>CANNOT OPEN options file file</td>
<td>The options file specified in the license file could not be opened.</td>
</tr>
<tr>
<td>license daemon: lost all connections</td>
<td>This message is logged when all the connections to a daemon are lost, which often indicates a network problem.</td>
</tr>
<tr>
<td>lost lock, exiting</td>
<td>Error closing lock file.</td>
</tr>
</tbody>
</table>
### Daemon Software Error Messages

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to re-open lock file</td>
<td>The vendor daemon has a problem with its lock file, usually because of an attempt to run more than one copy of the daemon on a single node. Locate the other daemon that is running via a \texttt{ps} command, and kill it with \texttt{kill -9}.</td>
</tr>
<tr>
<td>NO DAEMON line for daemon</td>
<td>The license file does not contain a \texttt{DAEMON} line for \texttt{daemon}.</td>
</tr>
<tr>
<td>No license service found</td>
<td>The TCP \texttt{license} service did not exist in \texttt{/etc/services}.</td>
</tr>
<tr>
<td>No license data for feat, feature unsupported</td>
<td>There is no feature line for \texttt{feat} in the license file.</td>
</tr>
<tr>
<td>No features to serve!</td>
<td>A vendor daemon found no features to serve. This could be caused by bad data in the license file.</td>
</tr>
<tr>
<td>UNSUPPORTED FEATURE request: feature by user</td>
<td>The \texttt{user} has requested a feature that this vendor daemon does not support. This can happen for a number of reasons: the license file is bad, the feature has expired, or the daemon is accessing the wrong license file.</td>
</tr>
<tr>
<td>Unknown host: hostname</td>
<td>The hostname specified on a \texttt{SERVER} line in the license file does not exist in the network database (probably \texttt{/etc/hosts}).</td>
</tr>
<tr>
<td>NO DAEMON lines, exiting</td>
<td>The license daemon logs this message if there are no \texttt{DAEMON} lines in the license file. Since there are no vendor daemons to start, there is nothing to do.</td>
</tr>
<tr>
<td>NO DAEMON line for name</td>
<td>A vendor daemon logs this error if it cannot find its own \texttt{DAEMON} name in the license file.</td>
</tr>
</tbody>
</table>

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The table above lists some common daemon software error messages along with their descriptions.
Technical Support and Professional Services

Visit the following sections of the National Instruments Web site at ni.com for technical support and professional services:

- **Support**—Online technical support resources include the following:
  - **Self-Help Resources**—For immediate answers and solutions, visit our extensive library of technical support resources available in English, Japanese, and Spanish at ni.com/support. These resources are available for most products at no cost to registered users and include software drivers and updates, a KnowledgeBase, product manuals, step-by-step troubleshooting wizards, conformity documentation, example code, tutorials and application notes, instrument drivers, discussion forums, a measurement glossary, and so on.
  - **Assisted Support Options**—Contact NI engineers and other measurement and automation professionals by visiting ni.com/support. Our online system helps you define your question and connects you to the experts by phone, discussion forum, or email.

- **Training**—Visit ni.com/training for self-paced tutorials, videos, and interactive CDs. You also can register for instructor-led, hands-on courses at locations around the world.

- **System Integration**—If you have time constraints, limited in-house technical resources, or other project challenges, NI Alliance Program members can help. To learn more, call your local NI office or visit ni.com/alliance.

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