

MATLAB[®]

The Language of Technical Computing

Computation

Visualization

Programming

Installation Guide for UNIX

Version 5.1

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Installation Guide for Unix

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About this Book

This book provides general guidelines for the installation of the MATLAB 5 software and MATLAB toolboxes. MATLAB 5 is distributed on CD-ROM. Users with Internet access may also obtain MATLAB distributions directly via FTP.

This book is designed to be used in conjunction with the online file `README.fi rst`. `README.fi rst` provides operating system specific information that may be crucial for a successful installation of MATLAB on your computer.

Introduction

This guide contains instructions for installing the MATLAB® software and its license manager, FLEXlm, a product of GLOBETrotter Software, Inc. These instructions assume that you have a basic working knowledge of UNIX. If you are not familiar with the UNIX environment, please seek the assistance of your local system administrator.

Distribution

MATLAB is distributed on CD-ROM or over the Internet via FTP. The CD-ROM media contains:

- The MATLAB program
- Related utility files
- Any program options you purchased, such as toolboxes
- Demonstration software
- The MATLAB Help Desk

For a detailed list of the files, see Chapter 3, “MATLAB Directory Structure.”

Licensing

The MathWorks licenses MATLAB on a per-user or a per-computer basis.

- If licensed per-user, MATLAB can execute concurrently on any computer in a network for a specified number of users. This license type is called a floating license.
- If licensed per-computer, MATLAB operates only on a specified CPU or CPUs. This license type is called node-locked. Node-locked licenses allow either a fixed number or an unlimited number of users to access MATLAB concurrently.

Documentation

The full set of MATLAB documentation is available on the distribution CD-ROM. You can view the documentation either on the CD-ROM before installation or on your hard disk after installation. MATLAB does not have to be running to view the documentation. You will need to view the README. first document before you can complete your MATLAB installation.

Viewing Documentation Without Running MATLAB

CD-ROM Distribution. After the MATLAB distribution CD-ROM is mounted on your system, you can view the documentation with the command

```
/cdrom/doc* (on HP systems: /cdrom/DOC*)
```

If you have already installed MATLAB, but it is not running, use the command

```
matlabdoc
```

to view the documentation. The `matlabdoc` shell script resides in the MATLAB root directory. During installation you can create a symbolic link to `matlabdoc` so that it can be accessed from any place on your path.

Both document viewing commands have several options:

<i>command</i> -help	Command usage
<i>command</i>	View HTML-formatted user documentation
<i>command</i> -ascii	View ASCII README files
<i>command</i> -man	View man pages

FTP Distribution. For FTP installation (see “Installing MATLAB via FTP” on page 1-20), extracting just `boot.ftp` allows full access to README files in HTML or ASCII form. You must complete the installation to gain access to the remainder of the online documentation.

Viewing Documents While Running MATLAB

The documentation commands available at the MATLAB command prompt are:

help	Displays function help at command line
helpwin	Function help displayed in a separate window
helpdesk	MATLAB Help Desk; full documentation set including HTML and PDF formatted documents

The MATLAB Help Desk provides access to the MATLAB 5 user documentation in HTML and PDF formats. The Help Desk is available after

MATLAB installation. The Help Desk cannot be used to view documents residing on the CD-ROM.

Viewing the HTML files on the Help Desk requires the use of a Web browser, either Netscape Navigator or Microsoft Internet Explorer. The MathWorks does not redistribute these products. You can obtain them directly from the companies that developed them. If you have Web access, you can find additional information at www.netscape.com or www.microsoft.com.

Viewing the PDF files requires the use of Adobe Acrobat Reader, which is available for the Sun, IBM, SGI, and HP platforms on the MATLAB distribution CD-ROM. Additional information about Acrobat Reader is available at www.adobe.com.

To install Acrobat Reader on your platform:

1 Mount the CD-ROM. (See Step 3 under “CD-ROM Installation Procedure” on page 1-9 for the mount instructions for your platform.)

2 Move to the acrobat directory.

```
cd /cdrom/acrobat (Sun, IBM, and SGI platforms) , or  
cd /cdrom/ACROBAT (HP platform)
```

A detailed Acrobat Reader *Installation Guide* in ASCII form is available as:

```
instguid.txt (Sun, IBM, and SGI platforms)  
INSTGUID.TXT* (HP platform)
```

3 Run the install script and answer the install questions.

```
./install* (Sun, IBM, and SGI platforms)  
./INSTALL* (HP platform)
```

System Requirements

This section describes hardware and software requirements for running the MATLAB software and the FLEXlm license manager.

Minimum system resources are:

- 40 MB disk space
- 16 MB memory
- 64 MB swap space

Other minimum system requirements depend upon the particular platform on which you are running MATLAB.

MATLAB users require access to both the C++ and FORTRAN run-time shared libraries. These are usually provided as part of the operating system installation. For Digital UNIX, however, the C++ shared libraries are part of the base installation package, but the FORTRAN shared libraries are on a separate disk called the “Associated Products CD.” MATLAB users running under Digital UNIX should install both the C++ and FORTRAN run-time shared libraries.

Sun SPARC (SunOS 4)

- SPARC-based workstation
- SunOS 4.1.4
- OpenWindows version 3.0 or X Windows (X11R5)

Sun SPARC (Solaris 2)

- SPARC-based workstation
- Solaris 2.5 (SunOS 5.5)
- OpenWindows version 3.5 or X Windows (X11R5)

HP 9000

- HP 9000 PA-RISC workstation
- HP-UX 10.01
- X Windows (X11R5)

DEC Alpha

- DEC Alpha workstation
- Digital UNIX 4.0
- DECwindows or X Windows (X11R5)

IBM RS/6000

- IBM RS/6000 workstation
- AIX 4.2
- X Windows (X11R5)

Silicon Graphics (SGI)

- SGI (R4000) MIPS-based workstation
- IRIX 6.2
- X Windows (X11R5)

Silicon Graphics (SGI64)

- SGI (R8000/R10000) MIPS-based workstation
- IRIX64 6.2
- X Windows (X11R5)

Linux

- 80486 or Pentium PC
- Linux 2.0.18 kernel (Red Hat 4.0 distribution)
- X Windows (X11R6)

MATLAB Installation Procedure

The MATLAB software is ordinarily installed on a single file system. This can be an individual user's computer in the case of a stand-alone workstation, or a central file server for networked installations.

The instructions that follow describe how to install MATLAB on a single system in either a stand-alone workstation or file server environment.

Obtaining License Passcodes

Before you begin installing MATLAB, you must have a valid set of license passcodes from The MathWorks. License passcodes include feature and archive passcodes for all the products in the MATLAB family for which you are licensed. License passcodes are stored in a License File called `license.dat` on your disk.

Passcodes for the License File are usually supplied by e-mail or fax. The MathWorks prefers to send passcodes by e-mail because that saves you from entering the passcodes by hand.

If you already have your License File passcodes, please proceed to the installation instructions. If you do not, contact The MathWorks immediately and request your passcodes:

- Via e-mail at service@mathworks.com
- Via telephone at 508-647-7000, ask for Customer Service
- Via fax at 508-647-7001

MATLAB Access members can obtain their License File via the Web (www.mathworks.com). Click on the MATLAB Access item and log in to the Access home page. MATLAB Access membership is free of charge.

Please have ready, or include in your e-mail or fax, the following three items:

- 1 Your License Number:
 - a If you have not previously installed MATLAB at your site, you can find your License Number (Site ID) on the upper right-hand corner of the

packing slip. Customers outside North America may obtain Site ID information from their local distributor.

- b If you are updating an existing MATLAB installation and MATLAB is running, type `license` or `ver` at the MATLAB prompt.
- c If MATLAB is not running due to a license manager issue, use the `cat` command on the file `$MATLAB/toolbox/local/license.m`.

(`$MATLAB` is a variable identifying the MATLAB root directory.)

- 2 The `hostid` for the server on which you will execute the MATLAB license manager. On Sun workstations, you can obtain the `hostid` by logging onto the server and executing the UNIX command `hostid`. For other UNIX platforms, log onto your server and follow the instructions in the section “Determining Your Hostid” on page 1-8. *Be sure to provide your server `hostid`, not your client workstation `hostid`.*
- 3 Your e-mail address (if you have one).

Once you have obtained your License File passcodes, you can begin the installation procedure.

CD-ROM Installation Procedure

To install MATLAB on your UNIX workstation from CD-ROM:

- 1 Log in to your file server.

Superuser status is required to install the symbolic links that add MATLAB to your users' paths. Superuser status is also required to edit the system boot script to start the MATLAB license manager automatically at system boot time. If you do not have superuser status, you can still install MATLAB, but MATLAB programs must be invoked using absolute pathnames, and the

MATLAB license manager must be started manually each time the system is rebooted.

- 2 Create a directory to be the mount point for the CD-ROM.

```
mkdir /cdrom
```

Place the MATLAB CD-ROM, label face up, into the CD-ROM caddy. Make sure the arrow on the caddy is pointing towards the CD-ROM drive. Insert the caddy into the drive.

- 3 Execute the command to mount the CD-ROM on your system. Use the table below to determine the correct command for your system. Note that the actual device name you use may depend on the SCSI port to which your CD-ROM drive is attached.

Platform	Mount Command
Sun (SunOS 4.x)	<code>mount -t hfsfs -r /dev/sr0 /cdrom</code>
Sun (Solaris 2.x)	<code>mount -F hfsfs -o ro /dev/sr0 /cdrom</code>
HP 9000 (HP-UX)	<code>mount -F cdfs -r /dev/dsk/cdrom /cdrom</code>
DEC Alpha (Digital UNIX)	<code>mount -t cdfs -r -o noversion /dev/rz3c /cdrom</code>
IBM RS/6000 (AIX)	<code>mount -v cdrfs -r /dev/cd0 /cdrom</code>
SGI (IRIX/IRIX64)	<code>mount -t iso9660 -o setx /dev/scsi/sc0dn10 /cdrom</code>
Linux	<code>mount -t iso9660 /dev/cdrom /cdrom</code>

- 4 Use the command

```
/cdrom/doc* (/cdrom/DOC* on HP systems)
```

to review the README. first file. Use the `-asci i` option if you do not have access to a Web browser. See “Viewing Documentation Without Running MATLAB” on page 1-4 for more information.

- 5 If you are installing MATLAB 5 for the first time, choose a new location for MATLAB on your file system. Do not install MATLAB 5 over MATLAB 4 or

over any prerelease version of MATLAB 5. Current MATLAB 5 users who are updating to a shipping (not prerelease) MATLAB 5 version should install into their existing MATLAB 5 area unless told otherwise in the `README.first` file.

To start the installation process, move to the installation location using the `cd` command. For example, if you are going to install into the location `/usr/local/matlab5`, use the commands:

```
cd /usr/local
mkdir matlab5 (needed for first time installation only)
cd matlab5
```

Subsequent instructions in this book refer to this directory as `$MATLAB`.

- 6 If you are installing MATLAB 5 for the first time, use your text editor to create a file named `license.dat`, which will become your License File. If you received your license passcodes by e-mail, copy the license passcodes from your e-mail system into the License File now. If you received your license passcodes on paper or by fax, enter the license passcodes manually line-by-line into the License File. The installation program automatically moves the License File to `$MATLAB/etc` during installation.

If you are updating an existing version of MATLAB 5, move the current License File to `$MATLAB`:

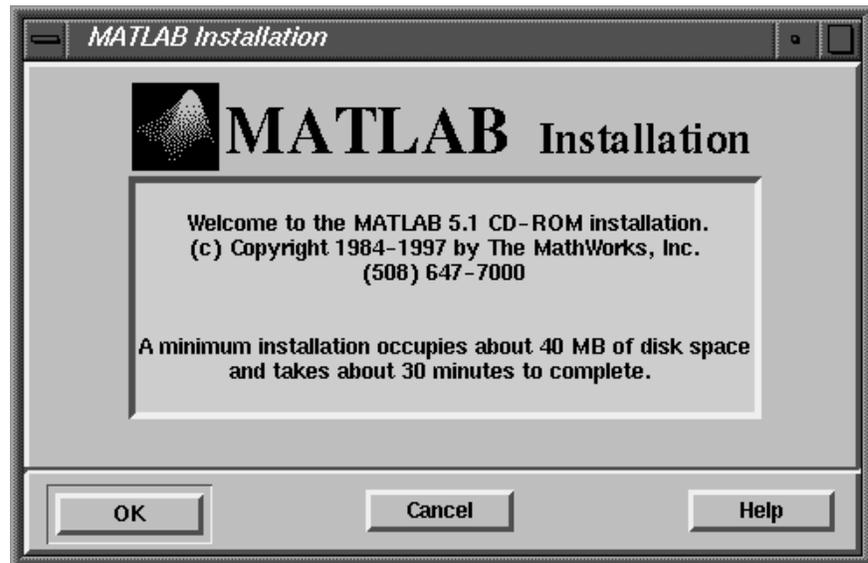
```
mv etc/license.dat license.dat
```

If you have received only a partial License File meant to update your existing file, open your License File in your text editor and merge in the new information. Otherwise, copy the new License File over the existing one.

- 7** Run the CD-ROM install script. Use either the upper-case or lower-case version as appropriate for your platform.

`/cdrom/install*` & (Sun, DEC, IBM, SGI, and Linux platforms), or
`/cdrom/INSTALL*` & (HP platform)

The installation script displays a welcome screen.



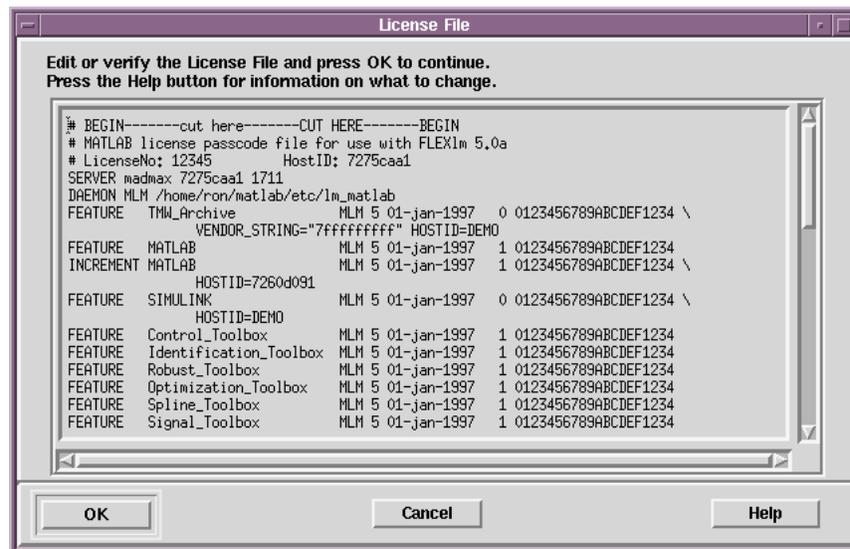
Select **OK** to proceed with the installation.

- 8** Accept or reject the software licensing agreement displayed. If you accept the terms of the agreement, you may proceed with the installation.

- 9 The **MATLAB Root Directory** screen is displayed. Select **OK** if the pathname for the MATLAB root directory is correct.



- 10 The **License File** screen is displayed.



If you received your passcodes by e-mail and copied the passcodes to the license.dat file in Step 6, check the License File to make sure the FEATURE

lines match the passcodes provided by e-mail. If the passcodes and FEATURE lines match, select the **OK** button to continue.

If the FEATURE lines do not match the passcodes provided in e-mail or if you received your passcodes by fax, edit the License File directly on this screen until the FEATURE lines match the information provided on the passcode printout, fax, or e-mail that you received from The MathWorks. The specific items you must match for each FEATURE line are:

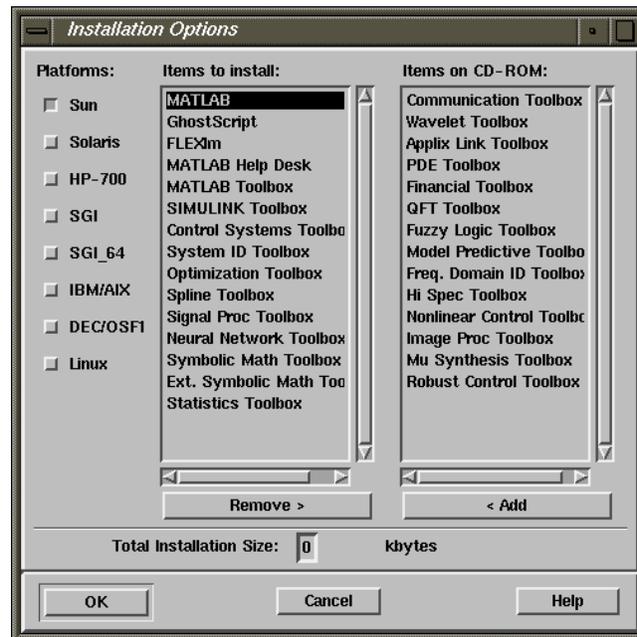
- Expiration date
- Number of keys
- Passcode
- Hostid (if a feature is CPU-locked)

Ensure that all the lines in the License File that begin with the word FEATURE end with either " ", DEMO, or a hostid number. Electronic mail programs frequently cause lines to wrap in the wrong places. Do not use tabs to separate the different fields of the License File.

To avoid warning messages appearing in the log file upon startup, delete all FEATURE lines associated with products that you are not using. For more information see the complete description of the License File that appears in "License Manager Administration" in Chapter 2. After you have finished editing the License File, press the **OK** button to continue.

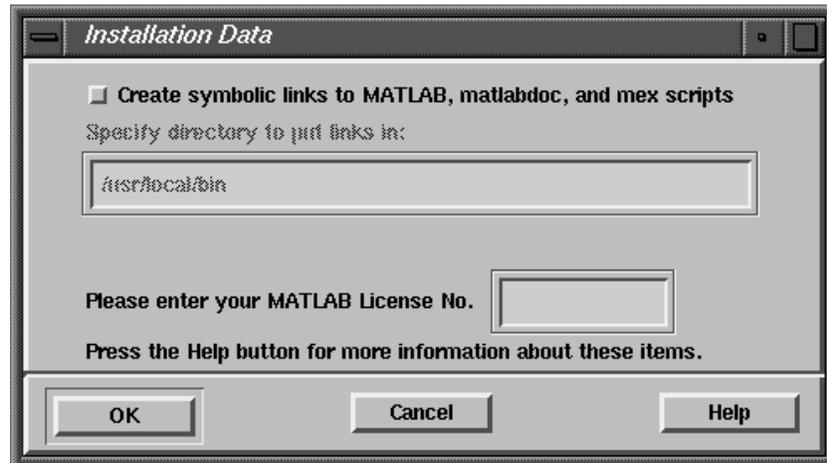
Note If you prefer to use your own editor, press **Cancel** and then invoke your editor on the License File to make the changes.

11 The **Installation Options** screen is displayed.



Select any additional platforms needed at your site if you have a floating network license. Remove or add any software options by highlighting the item(s) and pressing the appropriate button.

12 The **Installation Data** screen is displayed.



Specify the location in your file system for symbolic links to the `matlab`, `matlabdoc`, and `mex` scripts. Choose a directory such as `/usr/local/bin` that is common to all your users' paths.

Enter your MATLAB License Number. This number is provided on your packing list (look for your *Site ID* number) or with your License File. If you do not know what this number is, enter the word `unknown`.

Note The License Number allows The MathWorks to reference your account when you call for technical support or other service. The `MATLAB license` command displays its value. If you need to change the value at a later time, simply reinstall or edit the file `$MATLAB/toolbox/local/license.m`.

Select **OK** to continue.

- 13** The **Start Installation** screen is displayed. Select **OK** to start the installation. After the installation is complete, the **Installation Complete** screen is displayed, assuming your MATLAB installation is successful. Select **Exit** to exit from the setup program.
- 14** If you want to start the license manager daemons automatically at boot time, follow the directions in Table 1-1 to insert a Bourne shell code fragment into a UNIX boot script on your system. Create any indicated files that do not already exist. You must be superuser to perform this step.

Within the boot scripts provided, replace *username* by an actual user name other than the name associated with superuser. For security reasons the license manager daemons cannot be owned by superuser.

The fragment for SPARCstations looks like this:

```
#
#MATLAB FLEXlm Network License Manager Daemon
#
if [-f /etc/lmboot_TMW5]; then
    /etc/lmboot_TMW5 -u username && echo 'MATLAB_lmgrd'
fi
```

Table 1-1: Bourne Shell Code Fragments

Platform	Procedure
Sun (SunOS 4.x)	<p>Get the code fragment from \$MATLAB/etc/rc.lm.</p> <p>Place the code fragment at the end of /etc/rc.local.</p> <p>Replace <i>username</i> in the code fragment with an actual user name.</p>
Sun (Solaris 2.x)	<p>Get the code fragment from \$MATLAB/etc/rc.lm.sol2.</p> <p>Place the code fragment at the beginning of /etc/init.d/lmgrd.</p> <p>Replace <i>username</i> in the code fragment with an actual user name.</p> <p>If file (link) /etc/rc3.d/S17lmgrd does not exist, create it with:</p> <pre>cd /etc/rc3.d ln -s ../init.d/lmgrd S17lmgrd</pre>

Table 1-1: Bourne Shell Code Fragments (Continued)

Platform	Procedure
HP 9000 (HP-UX)	<p>Execute the commands:</p> <pre>cd \$MATLAB/etc cp rc.lm.hp /sbin/init.d/flexm chmod 555 /sbin/init.d/flexm</pre> <p>Replace <i>username</i> in the code fragment with an actual user name.</p> <p>Create the file <code>/etc/rc.config.d/flexm</code> containing the one line <code>FLEXm_MATLAB=1</code>. Then create the links:</p> <pre>cd /sbin/rc3.d ln -s /sbin/init.d/flexm S900flexm cd /sbin/rc2.d ln -s /sbin/init.d/flexm K100flexm</pre>
DEC Alpha (Digital UNIX)	<p>Execute the commands:</p> <pre>cd \$MATLAB/etc cp rc.lm.alpha /sbin/init.d/flexm chmod 555 /sbin/init.d/flexm</pre> <p>Replace <i>username</i> in the code fragment with an actual user name.</p> <p>Then execute the commands:</p> <pre>cd /sbin/rc3.d ln -s /sbin/init.d/flexm S56flexm</pre>
IBM RS/6000 (AIX)	<p>Get the code fragment from <code>\$MATLAB/etc/rc.lm.ibm_rs</code>.</p> <p>Place the code fragment at the end of <code>/etc/rc.nfs</code>.</p> <p>Replace <i>username</i> in the code fragment with an actual user name.</p>
SGI (IRIX/IRIX64)	<p>Execute the commands:</p> <pre>cd \$MATLAB/etc cp rc.lm.sgi /etc/init.d/lm chmod 555 /etc/init.d/lm</pre> <p>Replace <i>username</i> in the code fragment with an actual user name.</p> <p>Then execute the commands:</p> <pre>cd /etc/rc2.d ln -s /etc/init.d/lm S45lm</pre>

Table 1-1: Bourne Shell Code Fragments (Continued)

Platform	Procedure
Linux	<p data-bbox="461 343 1059 373">Get the code fragment from <code>\$MATLAB/etc/rc.ln</code>.</p> <p data-bbox="461 395 1191 425">Place the code fragment at the end of <code>/etc/rc.d/rc.local</code>.</p> <p data-bbox="461 447 1270 477">Replace <i>username</i> in the code fragment with an actual user name.</p>

- 15** Before you can start MATLAB, the license manager daemons must be running, except for demo and CPU-locked unlimited user licenses. If the daemons are not running, start them by rebooting your system or by executing `lmstart`. The `lmstart` script is in the `$MATLAB/etc` directory.

Note Any time you make changes to the `license.dat` file, you must restart the license daemons by running `lmstart`. `lmstart` brings down any currently running daemons and starts new ones.

- 16** The M-file `printopt.m` in the directory `$MATLAB/toolbox/local` contains the options for the `print` command that MATLAB uses to spool graphics hardcopy. You can edit this file to set an appropriate site-wide default for device type and location.
- 17** The M-file `docopt.m` in the directory `$MATLAB/toolbox/local` contains options that control viewing of the MATLAB online documentation. It is configured for Netscape Navigator. You can modify this file if you want to specify an alternative Web browser, additional initial browser options, or a different initial path to the viewable documentation.
- 18** The M-file `matlabrc.m` in `$MATLAB/toolbox/local` is invoked automatically each time a user starts MATLAB. You can include welcome messages, default definitions, or any MATLAB expressions that you want to run for all users.
- 19** Start MATLAB by executing `matlab` if you placed symbolic links into a directory on your path during installation. Otherwise, type `$MATLAB/bin/matlab`.

Post Installation Procedures

Successful Installation. If MATLAB executes properly after Step 19, you will have complete access to the MATLAB Help Desk and all provided documentation.

Enter the command `hel pdesk` to view the online user documentation. The Help Desk provides access to most of the MATLAB 5 documentation in PDF and HTML formats. The MATLAB Function Reference, a compendium of all MATLAB 5 commands and functions, is available only in HTML format.

Unsuccessful Installation. If MATLAB does not execute correctly after installation:

- 1 Refer to “Troubleshooting” on page 1-25. To learn more about the MATLAB license manager, read “License Manager Administration” in Chapter 2.
- 2 Review the online release documentation by starting the `matl abdoc` script at the UNIX prompt. `matl abdoc` allows you to view the release documentation even if MATLAB itself has not been successfully installed.
- 3 Check the MATLAB *Late Breaking News* manual to see if there is any last minute information concerning installation.
- 4 If you have Web access, connect to The MathWorks home page (www.mathworks.com). Look for license manager and installation information under the Tech Notes/FAQ link under Tech Support Info.

Installing MATLAB via FTP

Authorized users with access to the Internet can obtain distributions of MATLAB and toolboxes by downloading the software via FTP. This process avoids the delay inherent in waiting for The MathWorks to ship products on CD-ROM. You need a MathWorks-supplied password to log in to The

MathWorks FTP server and obtain your software. If you have not yet received your password, contact The MathWorks:

- Via e-mail at `service@mathworks.com`
- Via telephone at 508-647-7000, ask for Customer Service
- Via fax at 508-647-7001

- 1 Log onto The MathWorks FTP account with the password previously provided:

```
ftp ftp.mathworks.com
Name: login_name
Password: password
```

When you reach The MathWorks FTP server (`ftp.mathworks.com`), you can obtain an invisible file entitled `README.unix`. This document contains the complete information you need to install MATLAB via FTP. Use the information provided in this book to help you get started.

- 2 Transfer a copy of the `README.unix` document to your local computer:

```
ftp> asci i
ftp> get README.unix
ftp> bye
```

`README.unix` contains complete installation information, details of which are summarized below. Review especially the “What’s New” section.

- 3 If you are installing MATLAB 5 for the first time, choose a new location for MATLAB on your file system. Do not install MATLAB 5 over MATLAB 4 or over any prerelease version of MATLAB 5. Current MATLAB 5 users who are updating to a shipping (not prerelease) MATLAB 5 version should install into their existing MATLAB 5 area unless told otherwise in the `README.unix` file.

To start the installation process, move to the installation location using the `cd` command. For example, if you are going to install into the location `/usr/local/matlab5`, use the commands:

```
cd /usr/local
mkdir matlab5 (needed for first time installation only)
cd matlab5
```

4 Place a copy of the License File in the MATLAB 5 root directory and call it `license.dat`. See Chapter 2 for a complete discussion of the license manager and the License File.

5 Reconnect to The MathWorks FTP server, change to the `unix` directory
`ftp> cd unix`

All files are invisible.

6 Set the FTP server to binary mode:

```
ftp> binary
```

and transfer the appropriate files from the FTP server to your system using FTP commands. If you are not sure what to download, download just the file `boot.ftp`:

```
ftp> get boot.ftp  
ftp> bye
```

Now, extract the file using the command `tar -xvf boot.ftp`. Then run `install_matlab -w` to generate a file called `files.ftp` in the MATLAB root directory. This file contains a list of files you need to download from our FTP server. Then reconnect to The MathWorks FTP server and download the remaining files in binary mode.

Unless specifically instructed otherwise, *all* files should be downloaded to the MATLAB root directory at the top level. For example, the file `matlab.sun4`, which is located at `sun4/matlab.sun4` on the FTP server, should appear after downloading it as `matlab.sun4` at the top level of the

MATLAB root directory. Do not create a subdirectory called `sun4` in the MATLAB root directory and place the file there.

Do not use the FTP server compress feature to download these files unless there are instructions to do so. Each `tar` file is composed of files that are already compressed.

7 Log out from the FTP server:

```
ftp> bye
```

8 Extract `boot.ftp` if you have not done so earlier.

Leave all the other files as is in the MATLAB root directory. Do not extract them unless you need to delete the downloaded files before installation to save space. The installation script extracts them for you and saves them in the `ftp` subdirectory below the MATLAB root directory.

9 Execute the MATLAB installation script:

```
./install_matlab
```

Be prepared to provide your License Number (Site ID).

10 Start the license manager:

```
cd ./etc  
./lmstart
```

You must be on the host specified by the `SERVER` line in your License File.

Installing Additional Toolboxes

After initial installation, you can purchase optional toolboxes that extend MATLAB and provide additional application-specific capabilities. To install these additional toolboxes:

- 1 Stop the license manager with the `lmdown` command. (See “License Administration Tools” in Chapter 2 for information about this and other license manager commands.)
- 2 Edit your License File to add FEATURE line(s) for any new toolboxes and replace the `TMW_Archive` FEATURE line with an updated version. The `TMW_Archive` line encodes the products you are licensed to install.
- 3 Perform the installation process.
- 4 Restart the license manager with the `lmstart` command.

Individual toolboxes may have additional installation requirements. Consult the documentation that came with your toolbox for any information specific to the installation that toolbox.

Verifying the TMW-Archive Line

To verify the correctness of your `TMW_Archive` line:

CD-ROM Installation. Mount the CD-ROM and from the `$MATLAB` directory, enter the command:

```
/cdrom/install* -f (Sun, DEC, IBM, SGI, and Linux platforms), or  
/cdrom/INSTALL* -f (HP platform)
```

FTP Installation. From the `$MATLAB` directory enter the command
`install_matlab -f`.

These command will display a list of the products you are licensed to install.

Troubleshooting

File Permission Problems

During installation, certain files are checked for world (or other) access permissions. If any of the permissions are incorrect, you should exit from the installation procedure, set the user mask (umask) correctly, extract the distribution, and then reinstall MATLAB.

During installation the user mask is checked for a correct range of values. If the user mask is outside of the correct range, you are prompted for an alternative. This provides correct permissions to any files created during the installation.

For the MATLAB system to execute correctly for the general user, the suggested file permissions are:

Scripts and directories	chmod 755
Executable images	chmod 755
All other files	chmod 644

CD-ROM Problems

The CD-ROM installation program depends upon the machine it runs on. It expects that the CD-ROM drive is connected or properly mounted to the MATLAB server. You cannot transfer the contents of the CD-ROM to the MATLAB server and run the installation program because the program contains environment variables related to the CD-ROM drive. Remote installation will not succeed if the CD-ROM drive is mounted to a machine with an architecture different from that of the MATLAB server.

Use the following checklist if you encounter difficulties with the CD-ROM installation.

- 1 Determine if you are running the correct system software as in the examples shown below.

Platform	System Software
Sun SPARC (SunOS)	OpenWindows 3.0 with a patch for Motif
Sun SPARC (Solaris)	Solaris 2.5
IBM RS/6000 (AIX)	AIX 4.1 with Motif 1.2 libraries

Verify that the device is mounted correctly by checking the mount command table in the “CD-ROM Installation Procedure” section.

- 2 If the CD-ROM drive is located on a remote system, follow these instructions. You must be logged in as superuser to perform all steps.
 - a Mount the CD-ROM on the remote system using the appropriate mount command listed in the mount command table in the “CD-ROM Installation Procedure” section.
 - b Configure the remote system so that the CD-ROM drive is available for mounting on your local system (i.e., exporting). Choose the appropriate export instructions for your platform from the table:

Platform	Export Instructions
Sun (SunOS 4.x)	<p>Add the line to the exports file, /etc/exports:</p> <pre>/cdrom -ro</pre> <p>Export this information by executing:</p> <pre>exportfs -av</pre>
Sun (Solaris 2.x)	<p>Execute:</p> <pre>share -F nfs -o ro -d <cd-rom device> /cdrom</pre>
HP 9000 (HP-UX)	<p>Add the line to the exports file, /etc/exports:</p> <pre>/cdrom -ro</pre> <p>Export this information by executing:</p> <pre>exportfs -av</pre>
DEC Alpha (Digital UNIX)	<p>Add the line to the exports file, /etc/exports:</p> <pre>/cdrom -ro</pre>
IBM RS/6000 (AIX)	<p>Add the line to the exports file, /etc/exports:</p> <pre>/cdrom -ro</pre> <p>Export this information by executing:</p> <pre>exportfs -av</pre>
SGI (IRIX/IRIX64)	<p>Add the line to the exports file, /etc/exports:</p> <pre>/cdrom -ro</pre> <p>Export this information by executing:</p> <pre>exportfs -av</pre>
Linux	<p>Add the line to the exports file, /etc/exports:</p> <pre>/cdrom -ro</pre> <p>Export this information by executing:</p> <pre>kill -s SIGHUP <i>pid_of_rpc.mountd</i> <i>pid_of_rpc.nfsd</i></pre> <p>The <i>pid</i>s are taken from the output of the command <code>ps -agx</code>.</p>

- 3** Mount the CD-ROM on your computer using the appropriate mount instructions listed below. `cdrom_host` is the hostname for the remote system connected to the CD-ROM drive.

Platform	Mount Instructions
Sun (SunOS 4.x)	<code>mkdi r /cdrom</code> <code>mount -r cdrom_host: /cdrom /cdrom</code>
Sun (Solaris 2.x)	<code>mkdi r /cdrom</code> <code>mount -F nfs -r cdrom_host: /cdrom /cdrom</code>
HP 9000 (HP-UX)	<code>mkdi r /cdrom</code> <code>mount cdrom_host: /cdrom /cdrom -r</code>
DEC Alpha (Digital UNIX)	<code>mkdi r /cdrom</code> <code>mount -r -t nfs cdrom_host: /cdrom /cdrom</code>
IBM RS/6000 (AIX)	<code>mkdi r /cdrom</code> <code>mount -r cdrom_host: /cdrom /cdrom</code>
SGI (IRIX/IRIX64)	<code>mkdi r /cdrom</code> <code>mount -r cdrom_host: /cdrom /cdrom</code>
Linux	<code>mkdi r /cdrom</code> <code>mount -r cdrom_host: /cdrom /cdrom</code>

This table lists commonly used commands and instructions. Your site may require additional options that are not listed here. Contact your system administrator for information about site-specific options.

- 4** Verify that the CD-ROM device file has the correct read and execute permissions using the UNIX command:

```
ls -l device
```

where *device* is the device name for your CD-ROM drive. To change permissions, log in as superuser and invoke the UNIX command:

```
chmod 555 device
```

- 5** Check the file `$MATLAB/install_matlab.out` for error messages.
- 6** To display additional diagnostic messages, rerun the installation procedure

License Management

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License Manager Administration

To manage the per-computer or per-user licensing, MATLAB uses a license manager called FLEXlm, a product of GLOBETrotter Software, Inc. (Additional information is available online at www.globetrotter.com). FLEXlm consists of a *license manager daemon* and a *vendor daemon* that run on a server node. The server node is usually the file server on which MATLAB is installed.

The license manager and vendor daemons run in the background on the server node. They are responsible for checking in and out license *keys* as users invoke and quit MATLAB.

Throughout this section, references to the \$MATLAB directory refer to the directory in which the contents of the MATLAB distribution are installed.

Understanding License Types

Three types of licenses are available:

- Floating
- Node-locked
- Demo

Floating License

A floating license specifies the maximum number of concurrent MATLAB users allowed. These users are not restricted to any particular host. Because the license manager must keep track of the number of actual MATLAB users, the license manager must run if you have this type of license.

Node-Locked License

A node-locked license requires that MATLAB run on a specific CPU. There are two types of node-locked licenses:

- Limited-user node-locked licenses, which allow up to a predetermined number of users to use MATLAB or toolboxes concurrently on a designated MATLAB server. Because the license manager must keep track of the number of actual MATLAB users, the license manager must run if you have this type of license.
- Unlimited user node-locked licenses, which do not set any predetermined limit on the number of people to use MATLAB or toolboxes concurrently on

a single host. With no set number of users to account for, the license manager does not have to run if you have this type of license. However, you must set up the License File correctly (see below).

Demo License

A demo license is a temporary license, equivalent to a floating license for an unlimited number of users. You do not have to run the license manager along with this type of license, but you do have to set up the License File properly.

Understanding the License File

The ASCII License File `$MATLAB/etc/license.dat` contains configuration information, including the number of license keys and the hostids of the licensed CPUs:

```
# MATLAB license passcode file for use with FLEXlm 5.0a
# LicenseNo: 12345          HostID: 7275caal
SERVER madmax 7275caal 1711
DAEMON MLM /usr/local/matlab/etc/lm_matlab
FEATURE  TMW_Archive      MLM 5 01-jan-1997 0 0123456789ABCDEF1234 \
VENDOR_STRING="7fffffff" HOSTID=DEMO
FEATURE  MATLAB          MLM 5 01-jan-1997 1 0123456789ABCDEF1234
INCREMENT MATLAB        MLM 5 01-jan-1997 1 0123456789ABCDEF1234 \
HOSTID=7260d091
FEATURE  SIMULINK        MLM 5 01-jan-1997 0 0123456789ABCDEF1234 \
HOSTID=DEMO
FEATURE  Control_Toolbox MLM 5 01-jan-1997 1 0123456789ABCDEF1234
```

The file includes

- Two comment lines (beginning with the character #) indicating license version, License Number, and hostid information:

```
# MATLAB license passcode file for use with FLEXlm 5.0a  
# LicenseNo: 12345          HostID: 7275caa1
```

- A SERVER line that describes the license manager daemon:

```
SERVER madmax 7275caa1 1711
```

The SERVER line has the general format:

```
SERVER hostname hostid TCP_PortNumber
```

The 1711 at the end of the SERVER line specifies the TCP port number to use for communication with the daemons. Do not change this number unless you know it conflicts with other software. You can use any port number; however, to run the daemons from a nonroot account, the port number must be greater than 1024.

If your network is running NIS (Network Information Services, formerly Sun Yellow Pages) and you prefer to consolidate TCP port number assignments, you can remove the number from the end of the SERVER line and add it to the file `/etc/services` on the NIS server by inserting

```
license 1711/tcp
```

Propagate the services map to the network by typing

```
cd /var/yp  
make
```

- A DAEMON line that describes the vendor daemon:

```
DAEMON MLM /usr/local/matlab/etc/lm_matlab
```

- A TMW_Archive FEATURE line with archive passcodes, used only during the installation process:

```
FEATURE    TMW_Archive    MLM 5 01-jan-1997    0 0123456789ABCDEF1234\  
            VENDOR_STRING="7fffffff" HOSTID=DEMO
```

- Several more FEATURE lines that itemize the products you are licensed to use, for example, MATLAB, Simulink, and any toolboxes you have purchased:

```

FEATURE  MATLAB                MLM 5 01-j an-1997  1 0123456789ABCDEF1234
FEATURE  SIMULINK              MLM 5 01-j an-1997  0 0123456789ABCDEF1234 \
                                     HOSTID=DEMO
FEATURE  Control_Tool box    MLM 5 01-j an-1997  1 0123456789ABCDEF1234
FEATURE  I d e n t i f i c a t i o n _ T o o l b o x  MLM 5 01-j an-1997  1 0123456789ABCDEF1234

```

When installing MATLAB, make certain that the FEATURE lines in your License File exactly match the information provided you by The MathWorks. To avoid unnecessary warning messages from appearing in the log file upon startup, delete all FEATURE lines associated with products you are not using. If you upgrade your license or need to move the license server to a different workstation, The MathWorks can give you new information by e-mail, fax, or telephone. If you change the License File, be sure to restart the daemons by running `lmstart`.

Note In creating your License File, avoid creating line breaks in FEATURE lines.

- One or more INCREMENT lines, which incrementally add to a prior FEATURE or INCREMENT line in the file. If you want to have additional copies of the same feature, you must use multiple INCREMENT lines.

```

FEATURE  MATLAB                MLM 5 01-j an-1997  1 0123456789ABCDEF1234
INCREMENT MATLAB              MLM 5 01-j an-1997  1 0123456789ABCDEF1234 \
                                     HOSTID=7260d091

```

Floating License FEATURE Lines

The FEATURE line for a floating license has the form:

```
FEATURE feature MLM 5 expirdate users passcode
```

The *users* field corresponds to the number of keys purchased for this feature. Because it is a floating license, the line does not specify a *hostid*.

This example of a floating license includes four keys to MATLAB:

```
FEATURE MATLAB MLM 5 01-j an- 1997 4 0123456789ABCDEF1234
```

Node-Locked License FEATURE Lines

The FEATURE lines for both limited and unlimited user node-locked licenses specify the *hostid* of the node to which the license is restricted. A FEATURE line for a node-locked license has the form:

```
FEATURE feature MLM 5 expirdate users passcode HOSTID=hostid
```

For an unlimited user license, the *users* field is 0. In the next example, the two FEATURE lines allow an unlimited number of MATLAB users (*users* field is 0) on host 7260d0g1 and a single Control Toolbox user (*users* field is 1) on the same host.

```
FEATURE MATLAB MLM 5 01-j an- 1997 0 0123456789ABCDEF1234 \
HOSTID=7260d091
FEATURE Control_Tool box MLM 5 01-j an- 1997 1 0123456789ABCDEF1234 \
HOSTID=7260d091
```

When requesting a License File for a node-locked license from The MathWorks, you need to supply the *hostid* for the computer that will be running your copy of MATLAB. See “Determining Your Hostid” for complete information on this subject.

Demo License FEATURE Lines

The FEATURE line for a demo license has the form:

```
FEATURE feature MLM 5 expirdate 0 passcode HOSTID=DEMO
```

Because this type of license allows an unlimited number of users to run on any CPU in the network, the *users* field is set to 0, and *hostid* is set to DEMO. Here is an example of a demo license for Simulink expiring on January 1, 1997.

```
FEATURE SIMULINK MLM 5 01-j an- 1997 0 0123456789ABCDEF1234 \
HOSTID=DEMO
```

Increment Lines

Using INCREMENT lines, you can have more than one entry for the same FEATURE in your License File. For example, if most of your users use MATLAB on a single computer on your network, you can request an unlimited license to run

MATLAB on that computer plus a small number of keys to float among the other workstations in your network. This licensing arrangement is represented in your License File by a `FEATURE` line for an unlimited user node-locked license followed by an `INCREMENT` line for a four-user floating license, as in:

```
FEATURE MATLAB          MLM 5 01-j an- 1997 0 0123456789ABCDEF1234 \
                        HOSTID=7260d091
INCREMENT MATLAB       MLM 5 01-j an- 1997 4 0123456789ABCDEF1234
```

License Manager Tools and Configuration

A number of license administration tools are available in `$MATLAB/etc`.

Tool	Description
<code>l mboot</code>	Start license daemons at boot time.
<code>l mcksum</code>	Produce <code>license.dat</code> file checksums.
<code>l mdebug</code>	Generate diagnostic report, and optionally e-mail to The MathWorks, to troubleshoot license manager problems.
<code>l mdi ag</code>	Diagnose problems when a license cannot be checked out.
<code>l mdown</code>	Shut down all license daemons.
<code>l mhost i d</code>	Display <code>hostid</code> of computer on which you are running.
<code>l mremove</code>	Return license to license pool.
<code>l mstart</code>	Start license daemons.
<code>l mstat</code>	Show status of all network licensing activities. See the script for a complete set of options.
<code>l mver</code>	Display version number of license manager.

The file `/usr/tmp/l m_TMW5.log`, where the license daemon's output is usually redirected, contains a log of all license check-outs, check-ins, and denials. The license manager appends a new entry to the log each time a license transaction occurs. To save file space, delete information from the file occasionally. You can view the file with the command `l mstart -e`, or use the UNIX `cat` command.

The file `.matlab5rc.sh` in `$MATLAB/bin` sets the environment variable `LM_LICENSE_FILE` to contain the pathname of License File, normally `$MATLAB/etc/license.dat`. If necessary, you can change this environment variable to point to some other location.

Determining Your Hostid

There are two ways to determine your server hostid if MATLAB is already installed:

- Log in to the computer where you execute the license manager and run the script `lmhostid` in the `$MATLAB/etc` directory.
- Start MATLAB and enter the `hostid` command at the MATLAB prompt.

There are two ways to determine your server hostid if MATLAB is *not* installed:

- Log in to your server, mount the CD-ROM, and enter the `install* -l` (Sun, DEC, IBM, SGI, and Linux platforms) or `INSTALL* -l` (HP platform) command.
- Use a native operating system command from the next table to determine your hostid.

Hardware Platform	Hostid Description	How to Obtain the Hostid	Sample Hostid
Sun SPARC	32-bit hostid	Enter the <code>hostid</code> command.	170a3472
HP 9000	32-bit hostid Ethernet address	<code>echo `uname -i` 16o p dc</code> <code>lanscan</code> (use station address without leading 0x)	778DA4550 070020005532
DEC Alpha	Ethernet address	<code>/usr/sbin/netstat -i</code> Look under address and remove all colons (:) from entry associated with <code>ln0</code> .	080020005532
SGI	32-bit hostid	<code>echo ` /etc/sysinfo -s` 16o p dc</code>	90D40225
IBM RS/6000	32-bit hostid	Enter the <code>uname -m</code> command. Remove the last two digits and use the lowest eight digits ignoring any high level zeros.	00249477
Linux	Ethernet address	<code>/sbin/ifconfig eth0</code> Use the string to the right of <code>HWaddr</code> and remove all colons (:).	00400516E525

The MATLAB license manager uses different hostid formats for different hardware platforms because some hardware platforms, such as Sun, have a unique hostid, while others do not. For this reason, the Ethernet address is used on some platforms as the unique hostid. An Ethernet address is 6-bytes long and each byte is specified as two hex digits. Specify all 12 hex digits when using an Ethernet address as the hostid. For example, if the Ethernet address is 8:0:20:0:5:AC, specify the hostid as 080020005AC.

Running MATLAB on a Heterogeneous Network

You can run MATLAB on a heterogeneous network, with workstations of different architectures running off the same license server. For example, if you have a network with two SPARC workstations, an Alpha workstation, and an HP 9000, and you are licensed for three floating keys and multiple platforms, you can select any of your computers as the license server for all four computers. The three keys will float among all four computers.

To implement a heterogeneous licensing configuration, select one of the machines to be the license server. Request The MathWorks to generate a License File using this machine's `hostid`. Place the License File in `$MATLAB/etc/license.dat`. Be sure the MATLAB root directory is available (mounted) on all workstations. Start the license manager on the machine selected as the license server.

Running MATLAB with Other FLEXlm Applications

If you have another application that uses the FLEXlm license manager, you can share a single license server, or run separate license servers either on the same or different hosts.

To share a license server, combine the `DAEMON` and `FEATURE` lines from both License Files into a single License File with the appropriate `SERVER` line and install a license server on a single host. If MATLAB and the other application are using different versions of the FLEXlm software, run the newer version of the license server.

If you share a license server and you centralize the license information in a License File other than `$MATLAB/etc/license.dat`, you must indicate to MATLAB where the file is located. You can define the file location to MATLAB by performing one of the following steps:

- Create `$MATLAB/etc/license.dat` as a symbolic link to the central License File
- Redefine the `LM_LICENSE_FILE` in the `$MATLAB/bin/matlab5rc.sh` script.

To run separate license servers, use separate License Files. If you are running them on the same host, be sure to use a different TCP port number on the `SERVER` line in each License File.

Creating a Local Options File

You can instruct the FLEXlm license manager to

- Reserve one or more keys for a user, group of users, host, or group of hosts.
- Specify the users, groups of users, hosts, or groups of hosts that have permission to access one or more products.

To use these options, you or your users can create a `local.options` file and list its pathname as the fourth field on the `DAEMON` line in the License File.

Depending on the length of your paths, this line can get quite long. This example shows the line on two lines; however, you must type it on one line (or use the continuation character `\` at the end of the first line):

```
DAEMON MLM /usr/local/matlab/etc/lm_matlab \
/usr/local/matlab/etc/local.options
```

A `local.options` file is not required. If it does exist, it can have one or many lines. The license manager allocates keys according to these options until all keys are in use. If you try to reserve more than the authorized number of keys in the options file, a warning message appears in the `license.log` file.

A local options file might look something like the following:

```
RESERVE          1  MATLAB USER  patricia
RESERVE          3  MATLAB HOST  pegasus
RESERVE          1  CONTROL_Tool box GROUP  devels
RESERVE          3  CONTROL_Tool box HOST_GROUP  hosts

INCLUDE SIGNAL_Tool box HOST  ori on
INCLUDE SIGNAL_Tool box USER  tom
EXCLUDE SIMULINK GROUP  devels
EXCLUDE SIMULINK HOST_GROUP  hosts
GROUP  devels andrea tom fred
HOST_GROUP  hosts cygnus sirrus
```

The lines that begin with `RESERVE` contain the number of product keys set aside for a specific user, user group, host, or host group. This does not limit the number of keys; it simply ensures that a key will be available when you want it (unless the specified number of reserved keys has already been reached).

The lines starting with `INCLUDE` contain the products to be restricted to a particular user, user group, host, or host group; only that user, user group, host, or host group is allowed to use this product. You can have multiple `INCLUDE` lines for the same feature, including different users, user groups, hosts, or host groups.

The lines starting with `EXCLUDE` contain the features to be restricted from a particular user, user group, host, or host group; that user, user group, host, or host group is not allowed to use that product. You can have multiple `EXCLUDE` lines for the same feature, excluding different users, user groups, hosts, or host groups.

Any line starting with `GROUP` defines the users in that group name. If a user group name is used in a `RESERVE`, `INCLUDE`, or `EXCLUDE` line, the group membership must be defined in a `GROUP` line. Any line starting with `HOST_GROUP` defines the hosts in that host group name. If a host group name is used in a `RESERVE`, `INCLUDE`, or `EXCLUDE` line, the group membership must be defined in a `HOST_GROUP` line.

Configuring Redundant License Servers

If a large number of licenses are governed by a single license server, failure of the server becomes a major event. To prevent problems, you may want to set up redundant servers so that, if one server goes down, the license manager can still function.

In the redundant server configuration, three machines are designated to be license servers. All three machines must be running at the time the license manager is started. However, once the license manager is running, only two machines need to be running at once; this is called a quorum. As long as a quorum exists, the license manager can continue to run.

Selecting Servers

The first step in configuring the license manager is choosing the servers. The servers should be chosen with these two criteria in mind:

- The servers should be able to handle the network traffic associated with license management. A primary server must be chosen. This is the machine to which clients connect first and which receives the majority of the network traffic. The primary server is the first server listed in the License File. If this machine fails, the next server listed in the License File becomes primary.
- The servers should be running supported versions of their operating systems.

Determine hostids

Once you have chosen the servers, you need to determine the hostid of each server. You must submit all three servers' hostids for the passcodes to be properly generated. Use the information on page 2-8 to determine hostids.

Installing License Passcodes

Once you have submitted the hostids for the servers, you will receive a License File. In this example, with servers `pooh`, `piglet`, and `rabbit`, the License File looks like the sample below:

```
# MATLAB license passcode file for use with FLEXlm 5.0a
# LicenseNo: 12345          HostID: 7260d091
#                          HostID: 7275caa1
#                          HostID: 72701448
SERVER pooh 7260d091 1705
SERVER piglet 7275caa1 1705
SERVER rabbit 72701448 1705
DAEMON MLM /usr/local/matlab/etc/lm_matlab
FEATURE TMW_Archive MLM 5 01-jan-1997 0 0123456789ABCDEF1234 \
        VENDOR_STRING="3" HOSTID=DEMO
FEATURE MATLAB MLM 5 01-jan-1997 2 0123456789ABCDEF1234
FEATURE SIMULINK MLM 5 01-jan-1997 1 0123456789ABCDEF1234
```

Note that the License File must have three `SERVER` lines, one for each hostid with which the passcodes were created. This License File must be available on each server machine. The MATLAB script defines the environment variable `LM_LICENSE_FILE` to be `$MATLAB/etc/license.dat`, the default License File location. This definition is contained in `$MATLAB/bin/.matlab5rc.sh`. You can use this file to customize the environment variables associated with MATLAB.

If you want to change the location of the License File, you can either edit `$MATLAB/bin/.matlab5rc.sh` and change the location definition for `LM_LICENSE_FILE`, or you can replace `$MATLAB/etc/license.dat` with a link of the same name pointing to the correct location of the License File. If you edit the `.matlab5rc.sh` file, you need to specify the new location in the license manager options file `$MATLAB/etc/lmopts.sh` before calling `lmstart`.

Starting License Manager Daemons

To run the three license managers for this example interactively, log in to each machine with any valid user name but not as superuser. To maintain program security, you cannot start a license manager if you are logged in as superuser. Run the `lmstart` script.

For example, if the MATLAB root directory is `/usr/local/matlab`:

1 Log in to pooh:

```
cd /usr/local/matlab/etc
lmstart
```

2 Log in to piglet:

```
cd /usr/local/matlab/etc
lmstart
```

3 Log in to rabbit as:

```
cd /usr/local/matlab/etc
lmstart
```

If you change the definition of `LM_LICENSE_FILE` in `.matlab5rc.sh`, you need to edit the license manager options file `$MATLAB/etc/lmopts.sh` to change the `LM_FILE` variable assignment. For example, if you change the location of the License File to `/usr/licenses/license.dat`, use the assignment:

```
LM_FILE=/usr/licenses/license.dat
```

in the license manager options file.

Wait for the license manager daemons on the three machines to synchronize with each other. This may take a few minutes. If, for some reason, the license manager daemons do not connect, take the daemons down on each machine, and rerun the procedure. Network traffic may affect the synchronization, so it may require several attempts to establish a proper connection. Again, all three machines must connect for the license manager to begin serving keys. Once the daemons are up and connected on all three machines, only two machines are needed for a quorum; the loss of any one machine will not cause any licenses to be revoked.

Starting the License Manager at Boot Time

If you want the license manager to start automatically when rebooting the machine, place a Bourne Shell code fragment into the appropriate boot script by following the directions in the table Bourne Shell Code Fragments on page 1-17. You must supply a valid user name (not superuser) when configuring the boot script.

In addition, on each server, a link must exist between `/etc/lmboot_TMW5` and `$MATLAB/etc/lmboot`. This link is normally created during the MATLAB installation process. However, when running multiple license servers, some or all of the systems may not have MATLAB installed. To create this link on a given server, first log in to the server as root, then enter the following UNIX commands:

```
cd /etc
ln -s $MATLAB/etc/lmboot lmboot_TMW5
```

Troubleshooting

If you encounter difficulties with the operation of the license manager and you have Web access, you may find a solution to your problem if you connect to The MathWorks home page (www.mathworks.com). Look for license manager and installation information under the Tech Notes/FAQ link under Tech Support Info.

If you still are having problems, follow these general steps.

On the license manager server (usually the file server):

1 Determine whether the license daemons are operating:

```
cd $MATLAB/etc
lmstat -a
```

If either the license server or vendor daemon is not running, restart the daemons by running `lmstart` in the same `$MATLAB/etc` directory. If the license server and the vendor daemons still don't start, check the end of the log file, usually `/usr/tmp/lm_TMW5.log`, for errors. If the error message is confusing, refer to the section "License Manager Error Messages" on page 2-18. A suggested action accompanies each message.

If the problem is caused by mistakes in your License File, correct the file and restart the daemons by running `lmstart`.

If the problem appears to be caused by network software, contact your system administrator or your system vendor to resolve the problem.

Instead of running `lmstat`, you can use the UNIX `ps` command to check for running processes. On computers running Berkeley UNIX, enter

```
ps -agx | grep lm
```

On computers running System V UNIX, enter

```
ps -ef | grep lm
```

Check the output to determine if both the license manager daemon (`lm_TMW5.lm`) and the vendor daemon (MLM) are running. Only one version of each process should be running. Remove all duplicate daemons manually. To

stop processes, you must be logged in as superuser; then execute the command:

```
kill -9 pid_of_daemon
```

Restart the daemons by running `lmstart`. Follow the previous instructions if the daemons fail to start.

Verify that all the features and keys for which you are licensed are recognized by the license manager. To do this, look at the output of `lmstat -a`. Make any changes necessary to the License File and restart the daemons by running `lmstart`. The output from the log file, usually `/usr/tmp/lm_TMW5.log`, should be checked for messages.

- 2 Verify that your client workstation can connect to the license manager daemons by executing the following commands on your client workstation (not the server):

```
cd $MATLAB/etc  
lmstat -a
```

If either the license server daemon or vendor daemon is not running on your local computer but is running correctly on the license server, the problem is usually caused by network software. The network software is either not running correctly or is not configured correctly. Look for the error message in the section License Manager Error Messages. A suggested action accompanies each message. In addition, you may need to contact your system administrator or system vendor to resolve the problem.

- 3 Start MATLAB and, if problems continue, refer again to the section License Manager Error Messages.

Diagnostic Report

If these troubleshooting steps do not resolve the problem you are experiencing, you should execute the script `lmdebug` in the `$MATLAB/etc` directory and send its diagnostic results to The MathWorks Technical Support department. The `lmdebug` script e-mails its results to the Technical Support group automatically if you are connected to the Internet. If you are not, you should fax the results

to The MathWorks at the number listed below. For fax reports, it is also helpful to include

- The exact error message(s) received
- A copy of your License File

You should also feel free to contact The MathWorks Technical Support department by phone or e-mail.

To reach The MathWorks Technical Support:

E-mail: support@mathworks.com

Phone: 508-647-7000

Fax: 508-647-7201

License Manager Error Messages

Some common license manager error messages are listed below. The error messages are listed in alphabetical order and appear in bold followed by suggested troubleshooting steps.

Cannot connect to license server. This error is displayed when starting MATLAB.

- Determine whether the license manager daemons are running on the license server by running `$MATLAB/etc/lmstat` on the license server. If the license daemons are not running, execute `$MATLAB/etc/lmstart`. If the license manager does not start, check the log file, usually `/usr/tmp/lm_TMW5.log`, for diagnostic messages.
- If the license manager is running on the license server and this message is displayed on your host, ensure that the TCP/IP network software is running on the computer. Even for stand-alone computers, the license manager requires TCP/IP. Enter the UNIX `telnet hostname` command where *hostname* is the name of the license server computer. If telnet does not return a successful session on *hostname*, there is a problem with your network configuration. The system administrator must resolve this problem before you can run MATLAB.

Invalid returned data from license server. This error occurs when incompatible daemons are running. Most often this error is due to an installation update of MATLAB (in the same directory as the previous version) where the daemons

were not shut down before the update was installed. If the daemons are not shut down, then an update of MATLAB will not replace the daemon files.

To fix this problem, shut down the currently running daemons and reinstall only the license manager files.

Encryption code in license file is inconsistent. See the log file, usually `/usr/tmp/lm_TMW5.log`. It should indicate the specific FEATURE line for which it found bad codes in your License File, usually `$MATLAB/etc/license.dat`.

- Check the 20-digit passcode closely for typographical errors. This is most likely the problem. There should be zeros and not the letter O. Make sure Bs are not 8s and vice versa.

The date format in your License File may be incorrect, e.g., `01-mar-97` instead of `01-mar-1997`. The date format should always match the passcodes that were sent by e-mail or faxed to you.

Feature not yet available. Feature ... is not enabled yet (Logfile version of message).

Check for typographical errors in the 20-digit passcode of the FEATURE lines in your License File. The date on your system may be incorrect. To check the date, use the UNIX `date` command at the UNIX prompt.

Environment variable `LM_LICENSE_FILE` is not defined and the default license file, `$MATLAB/etc/license.dat`, does not exist. Check to make sure that MATLAB has been properly installed on your machine. This error is displayed when starting MATLAB.

- Check the directory where you are running MATLAB. Make sure that you are running the script `$MATLAB/bin/matlab`.
- Check that you are running the correct version of the operating system as specified in the “System Requirements” section of Chapter 1.

Invalid hostid for this CPU.

- Make sure the hostid on the fax or e-mail matches the hostid on the SERVER line in your License File.
- Make sure the hostid on the SERVER line is correct for the hostname that is also on the SERVER line in your License File.
- Execute the `$MATLAB/etc/lmhostid` command to make sure that the hostid given to The MathWorks is correct. If the hostid given is incorrect, contact The MathWorks for new passcodes.

license.dat is corrupted. See “Encryption code in license file is inconsistent.”

(mgrd) license manager: Not a valid server host, exiting. This message is displayed in the log file, usually /usr/tmp/lm_TMM5.log.

Make sure that the hostname in the SERVER line of the License File, usually \$MATLAB/etc/license.dat, is correctly spelled and resolvable. See also the error message “MLM: cannot find SERVER hostname in network database.”

MATLAB cannot be started. Invalid returned data from license server. This error is displayed when starting MATLAB. It occurs if you are running incompatible versions of the license manager daemon.

You need to execute \$MATLAB/etc/lmstart to start the license manager and vendor daemons corresponding to the current version of MATLAB.

MATLAB cannot be started. License server does not support this feature. This error is displayed when starting MATLAB.

- Check that the license manager was restarted after making changes to your License File.
- See if there is a typographical error in a FEATURE line of your License File.

MATLAB is not allowed on this host. This error is displayed when starting MATLAB.

- Run \$MATLAB/etc/lmhostid and make sure that the hostid matches the passcodes.
- Make sure your computer is running TCP/IP, which is the network software required by the license manager.

See “Invalid hostid for this CPU.”

MLM: cannot find SERVER hostname in network database. This error commonly occurs when the license server and the client running MATLAB are in different domains. The local hostname listed in the License File cannot be resolved on the remote domain. To allow access across separate domains, do the following:

- 1 All domains (including the license server) must be able to resolve the fully qualified name for the license server through the host table, DNS, or Yellow

Pages. You may need to place an alias in the license server's local host table for the fully qualified name.

- 2 To verify that the server name can be resolved, use telnet to log in remotely to the server computer (using the fully qualified name) from itself and from a client. If the telnet connection succeeds, then the fully qualified name is resolvable.
- 3 Insert the fully qualified name for the server on the SERVER line of the License File.
- 4 Invoke `$MATLAB/etc/lmstart` to force the license manager to reread the License File.

No features to serve! MLM daemon found no features. Please correct license file and re-start daemons. This may be due to the fact that you are using a different license file from the one you expect. Check to make sure that: `"/usr/tmp/lm_TMW.dat"` is the license file you want to use. This message is displayed in the log file, usually `/usr/tmp/lm_TMW5.log`. In most instances, this error can be ignored since it shows up in the log file in a CPU-locked multiuser license. The error message "there are truly no features to serve" means that the number of keys on each FEATURE line is zero. You should still be able to run MATLAB successfully.

No TCP license server exists. This error is displayed when starting MATLAB.

- Ensure that the TCP/IP network software is running on your computer. The license manager requires TCP/IP even for stand-alone computers. Enter the UNIX `telnet hostname` command where *hostname* is the name of the computer running the license server. If the `telnet` command does not connect to the specified *hostname* computer, there is a problem with your network configuration. The system administrator must resolve this problem before you can run MATLAB.
- A TCP port number such as 1711 may be missing at the end of the SERVER line in your License File, or your `/etc/services` file may not be configured correctly.

Not a valid server host. See "Invalid hostid for this CPU."

Socket bind error.

- `lmdown` did not work correctly, and not all license daemons were killed. Manually kill these daemons as outlined in Step 1 of the “Troubleshooting” section, and then restart the daemons with `$MATLAB/etc/lmstart`.
- The TCP port number 1711 may be in use by some other program, including another license manager. The TCP port number 1711 is at the end of the `SERVER` line in the your License File. Check with your system administrator for another port number that you can use in your License File.

`xxx` is not currently licensed. This error message is displayed when attempting to access a MATLAB toolbox, where `xxx` is the name of the toolbox or feature name, e.g., `Signal_Toolbox`.

There may be a typographical error in the `FEATURE` line indicated by the error. For example, this error will occur if `Signal_Toolbox` is entered as `signal_toolbox`. Check the error message for typographical errors and case sensitivity in the name of the feature. Make sure the `FEATURE` line matches the passcodes as generated by The MathWorks.

Other License Manager Problems

Changes to License File Unread by License Manager

If you change the License File, you must restart the license manager using `$MATLAB/etc/lmstart`.

The `lmstart` script calls the `lmdown` script to shut down the license manager daemon. Sometimes the `lmdown` script does not succeed at its task. A sure way to shut down the license manager daemons is to use the UNIX `ps` command to check for running processes and terminate them manually using the UNIX `kill` command. See the beginning of the “Troubleshooting” section for more information.

MATLAB Can't Find `LM_LICENSE_FILE`.

MATLAB is installed on a file server, e.g., in `/usr/local/matlab`. The install script defines `$MATLAB` as `/usr/local/matlab/bin/matlab5rc.sh`. If MATLAB is automounted on other workstations in directories other than `/usr/local/matlab`, MATLAB fails at startup because it cannot find `LM_LICENSE_FILE`. `LM_LICENSE_FILE` is determined by `$MATLAB`.

Edit `$MATLAB/bin/matlab5rc.sh` and comment out the line that defines the variable `MATLAB`. If this line is not found in `matlab5rc.sh`, `$MATLAB` is determined automatically when `MATLAB` is started.

License Key Unusable on Crashed Node

When running `MATLAB` on a node that crashes, the license key sometimes remains unusable (i.e., it is never released back to the license manager). To release the key without restarting the license manager, use the `$MATLAB/etc/lmremove` utility. This script allows you to remove a single user's license for a specified feature by returning the license to the pool of available licenses. Refer to the script for the exact usage.

Shell Escape to Start Another FLEXlm Application Fails

If the value of `LM_LICENSE_FILE` is correct in the environment before you start `MATLAB`, the following edit can be done to the `$MATLAB/bin/matlab5rc.sh` file to make it available inside `MATLAB`. Under the appropriate architecture, edit the `LM_LICENSE_FILE` line so that it reads:

```
LM_LICENSE_FILE=' $MATLAB/etc/license.dat ': $LM_LICENSE_FILE"
```

This edit simply concatenates the string `": $LM_LICENSE_FILE"` with evaluation (using double quotes) to the end of the line. Don't forget the colon and the double quotes.

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MATLAB Directories and Files

The MATLAB directory refers to the directory where you installed the MATLAB software. It contains these subdirectories and files.

<code>/app-defaults</code>	Files containing keyboard mapping and default window parameters for MATLAB and Simulink
<code>/bin</code>	Scripts for executing the MATLAB system and computer-specific subdirectories for the binary images
<code>/etc</code>	All files associated with the license manager, including <code>license.dat</code> and computer-specific subdirectories
<code>/toolbox</code>	Toolbox subdirectories
<code>/extern</code>	Subdirectory containing subdirectories for source, include files, and libraries for the Application Program Interface
<code>/help</code>	MATLAB Help Desk
<code>/man</code>	UNIX man pages for the MATLAB system
<code>/install</code>	Install scripts and files
<code>README.install</code>	Installation information in ASCII format
<code>matlabdoc</code>	Script to start online documentation
<code>installguide.ps</code>	PostScript copy of this Installation Guide
<code>install_matlab</code>	The top-level script that installs the MATLAB system

\$MATLAB/bin

<code>matlab</code>	Script to invoke MATLAB
<code>.matlab5rc.sh</code>	Script used by MATLAB to customize behavior
<code>mex</code>	Script to create C, C++, and Fortran MEX-files
<code>mexopts.sh</code>	Script to customize mex behavior for C and Fortran
<code>cxxopts.sh</code>	Script to customize mex behavior for C++ and Fortran
<code>gccopts.sh</code>	Script to customize mex behavior for GNU C and GNU Fortran

\$MATLAB/etc

<code>license.dat</code>	ASCII file with license manager passcode information
<code>license.dat.skel</code>	Template for generating License Files
<code>rc.lm</code>	Code segment to include in a system file to restart the daemons at boot time. Platform-specific versions have extensions, for example, <code>rc.lm.hp</code> .
<code>lmdebug</code>	Script to generate installation diagnostics
<code>lmerror</code>	MATLAB license manager failure script
<code>lmboot</code>	Script to start license manager at boot time
<code>lmstart</code>	Script to start license manager
<code>lmdown</code>	Script to bring down license manager
<code>lmstat</code>	Script to display current status of license manager
<code>lmhostid</code>	Script to display unique host identification number used by license manager
<code>lmgrd</code>	Script to invoke license manager daemon
<code>lm_matlab</code>	Script to invoke MATLAB-specific license manager daemon
<code>lmver</code>	Script for reporting FLEXlm version

<code>lmcksum</code>	Script for producing License File checksums
<code>lmdiag</code>	Script for diagnosing problems when you cannot check out a license
<code>lmdl og</code>	Script for starting diagnostic log file
<code>lmopts. sh</code>	Script used by license manager to customize behavior
<code>/util</code>	Special utilities required by license manager scripts
<code>/arch</code>	Directory with license manager binaries
<code>README. license</code>	Online copy of the troubleshooting notes

\$MATLAB/toolbox

<code>/matlab</code>	MATLAB Toolbox M-files
<code>/local</code>	Local environment M-files
<code>/other</code>	Any other toolboxes you may have installed

\$MATLAB/extern

<code>/include</code>	Include files for C language programs with prototype declarations
<code>/lib</code>	Object libraries with compiled versions of the Application Program Interface routines beneath an architecture-specific name (for example, sun4)
<code>/src</code>	Source code for example programs that demonstrate the use of routines in the Application Program Interface Library

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