

# Single System

## Stage 1 of 3: Installing the Distributed Computing Products on One UNIX Computer

Follow these instructions to install the Distributed Computing Toolbox and MATLAB® Distributed Computing Engine (MDCE).

### Step 1: Create a License File

In this step, you create a License File from the licensing information you received in your license e-mail messages from The MathWorks. Follow these instructions:

- 1 Open a plain text file, using any text editor, such as emacs or vi.
- 2 Open both e-mail messages you received from your sales representative with the subjects “Your MATLAB Distributed Computing Engine Software Purchase (or Trial)” and “Your MathWorks Software Trial,” or follow the instructions given to you by your MathWorks sales representative on how to obtain your licensing information.

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**Note** Make sure to open the messages, not just view it in the preview pane of your e-mail reader. Copying and pasting from the preview pane can result in licensing errors.

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- 3 In the e-mail messages, select all the information from the BEGIN line to the END line, inclusive. Make sure to copy all the information in this section, including the comment lines.
- 4 Copy all license information from both e-mail messages and paste it into the open text file.

In general, do not edit the licensing information; you may invalidate a license. However, note the following:

- Make sure you remove any line breaks that your e-mail program may have inserted between the start and end of an INCREMENT line. If an INCREMENT line must continue onto more than one line, use the \ (backslash) character, as in the following:

```
INCREMENT MATLAB_Distrib_Comp_Engine MLM 14 01-oct-2005 8 \  
BD5301E0E84ECED9D04A SN=DEMO
```

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- Make sure that there is a space between each field in the INCREMENT line.  
Do not use tabs to separate these fields.
  - License Files are case sensitive.
- 5** Save the text file, naming it `license.dat`.

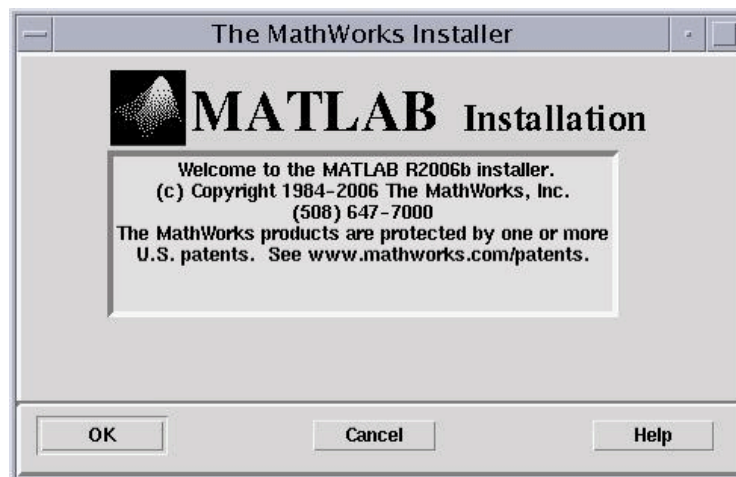
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## Step 2: Install Distributed Computing Products and MATLAB from R2006b CDs

- 1 Create a destination directory and place the `license.dat` file that you created in Step 1 “Create Your License File” into this directory. Henceforth, this directory will be referred to as *matlabroot*.
- 2 Navigate to the *matlabroot* directory.
- 3 Make sure the installation program can open an XWindow on your display. For example, start `xcalc`.
- 4 Run the following installation script:  

```
install &
```

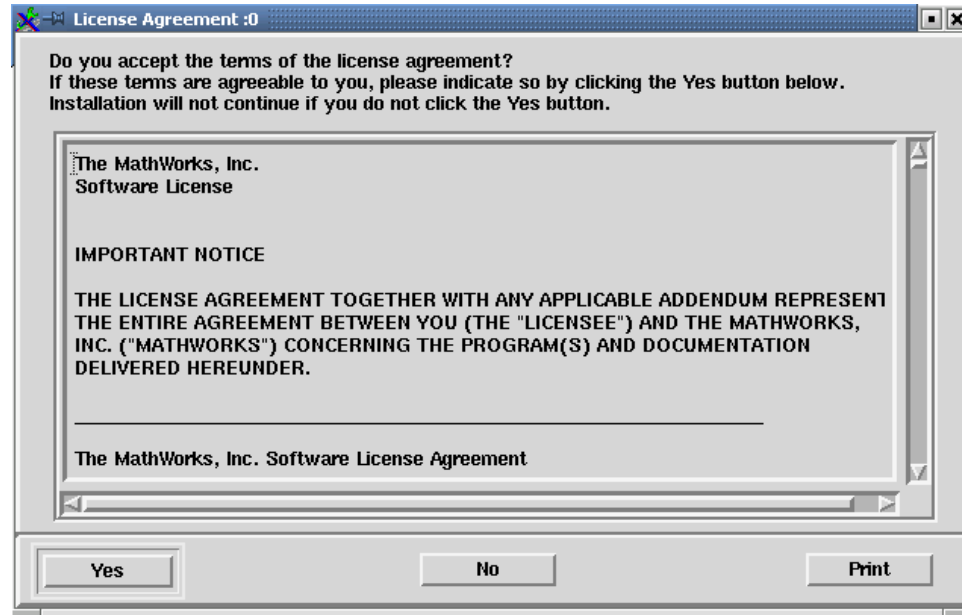
The installer displays the following welcome screen. Click **OK** to start the installation.



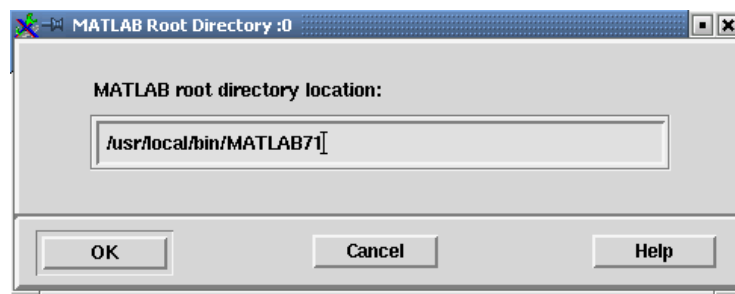
For help, contact the MathWorks install support team at 1-508-647-7000 or [http://www.mathworks.com/support/contact\\_us/](http://www.mathworks.com/support/contact_us/).

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- 5 Review the license agreement. If you accept the terms of the agreement, click **Yes** to proceed with the installation.



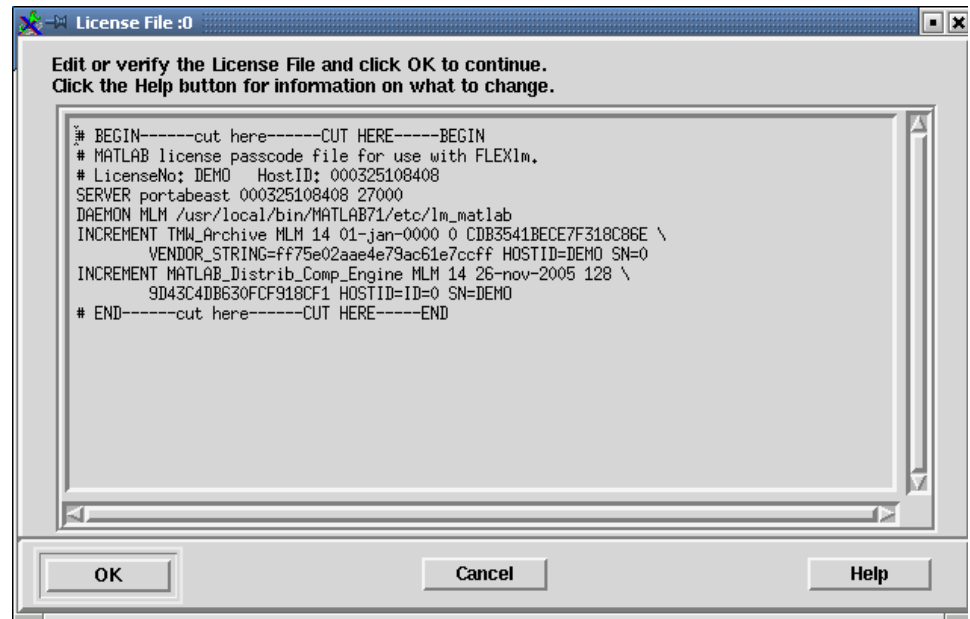
- 6 Verify the name of the installation directory in the **MATLAB Root Directory** dialog box and then click **OK**.



For help, contact the MathWorks install support team at 1-508-647-7000 or [http://www.mathworks.com/support/contact\\_us/](http://www.mathworks.com/support/contact_us/).

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- 7 Verify your License File in the **License File** dialog box and click **OK**. This is the `license.dat` file you placed in the `matlabroot` directory in step 1 of this procedure.



- 8 Select all the platforms and all the products you want to install in the **Installation Options** dialog box.

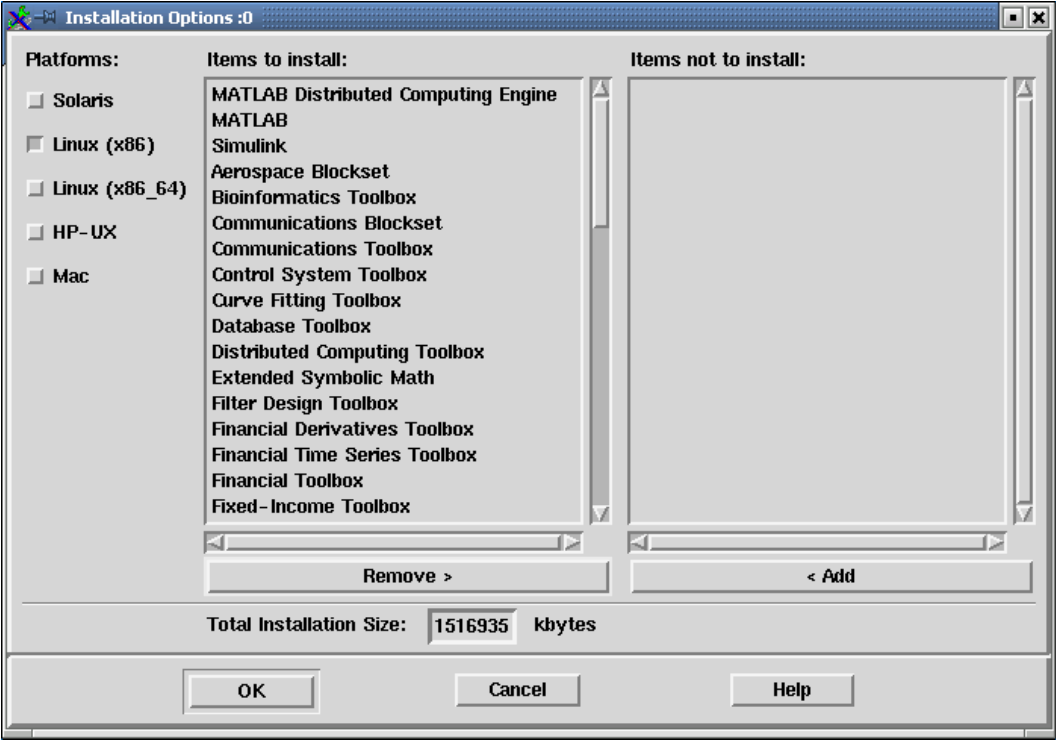
The **Platforms** column identifies which product binary files are installed. By default, the check box identifying the platform on which you are running the installer is preselected.

In the **Items to install** list, make sure to include the MATLAB Distributed Computing Engine, MATLAB. (MATLAB is a prerequisite for the MDCE), and the Distributed Computing Toolbox. In addition, make sure to include

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the FLEXlm license manager, which appears at the end of the list of products.

**Note** The MathWorks highly recommends installing all the products. This ensures that the MDCE will be able to run code for any toolboxes you may have.



For help, contact the MathWorks install support team at 1-508-647-7000 or [http://www.mathworks.com/support/contact\\_us/](http://www.mathworks.com/support/contact_us/).

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- 9 The installer displays the **Begin Installation** dialog box. Click **OK** to begin the installation. The installer displays a dialog box indicating the progress of the installation. The installer may prompt you to insert one of the other CDs during the installation.



- 10 When the installation is complete, the installer displays the **Installation Complete** dialog box. Click **Exit** to finish the installation.



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## Step 3: Start the License Manager

To run the MDCE, the license manager must be running.

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**Note** You cannot start the license manager with root privileges.

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- 1 Navigate to the `matlabroot/etc` directory.
- 2 Type the following command to start the license manager.  

```
./lmstart
```

## Step 4: Test Worker Licensing

To verify that MATLAB workers can start correctly and perform a license checkout, perform the following procedure.

- 1 Run the following command:

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**Note** You must have write privileges in the current directory.

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```
matlabroot/bin/matlab -logfile output.txt -dmlworker -nodisplay  
-r exit
```

- 2 Look at the file `output.txt`. If the MATLAB worker was able to check out a license, the file should look similar to this:  
Warning:  
MATLAB is starting without a display, using internal event queue.  
You will not be able to display graphics on the screen.

```
< M A T L A B >  
Copyright 1984-2006 The MathWorks, Inc.  
Version 7.3.0.267 (R2006b)  
August 03, 2006
```

To get started, type one of these: `helpwin`, `helpdesk`, or `demo`.

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For product information, visit [www.mathworks.com](http://www.mathworks.com).

If the license checkout failed, the file output.txt should look similar to this:

```
License Manager Error ...
Feature:          MATLAB_Distrib_Comp_Engine
...
FLEXlm error: ...
For further information, refer to the FLEXlm End User Manual,
available at "www.macrovision.com".
```

For more information, see The MathWorks Support page at <http://www.mathworks.com/support> and search for "license manager error -1"

## Step 5: Configure License Manager to Start Automatically at Boot Time (Optional)

Although this step is not required, it is helpful in case of a system crash. If you choose to skip this step, you will have to start the license manager manually every time you reboot your machine.

The following sections provide instructions for editing the boot script on these platforms:

- “Debian Linux”
- “Red Hat and SUSE”
- “Sun (Solaris 2.x)”

### Debian Linux

**1** Create the following links, if they do not already exist:

```
ln -s matlabroot/etc/lmboot /etc/lmboot_TMW12
ln -s matlabroot/etc/lmdown /etc/lmdown_TMW12
```

**2** Create a copy of the boot script file.

```
cp matlabroot/etc/rc.lm.linux /etc/init.d/flexlm
```

**3** Change permissions of the copy of the boot script file.

```
chmod 555 /etc/init.d/flexlm
```

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**4** Replace the username in the boot script file with an actual username, other than root.

**5** Look in `/etc/inittab` for the default run level. Create a link in the `rc` directory associated with that run level. For example, if the run level is 5, then execute these commands:

```
cd /etc/rc5.d;  
ln -s ../init.d/flex1m S90Flex1m
```

## Red Hat and SUSE

**1** Create the following links, if they do not already exist:

```
ln -s matlabroot/etc/lmboot /etc/lmboot_TMW12  
ln -s matlabroot/etc/lmdown /etc/lmdown_TMW12
```

**2** Create a copy of the boot script file.

```
cp matlabroot/etc/rc.lm.glnx86 /etc/rc.d/init.d/flex1m
```

**3** Change permissions of the copy of the boot script file.

```
chmod 555 /etc/init.d/flex1m
```

**4** Replace the username in the boot script file with an actual username, other than root.

**5** Look in `/etc/inittab` for the default run level. Create a link in the `rc` directory associated with that run level. For example, if the run level is 5, then execute these commands:

```
cd /etc/rc.d/rc5.d;  
ln -s ../init.d/flex1m S90Flex1m
```

## Sun (Solaris 2.x)

**1** Copy the code from `matlabroot/etc/rc.lm.sol2` and paste it at the beginning of `/etc/init.d/lmgrd`. Create this file if it doesn't already exist.

**2** Edit `/etc/init.d/lmgrd`, replacing the username with an actual username, other than root.

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- 3 If the file (link) `/etc/rc3.d/S171mgrd` does not exist, create it, using this code:

```
cd /etc/rc3.d
ln -s ../init.d/lmgrd S171mgrd
```

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## Stage 2 of 3: Configuring the MATLAB Distributed Computing Engine for Use with Job Manager

The mdce service must be running on a computer being used for job managers or workers. This service manages the other MATLAB Distributed Computing Engine processes. One major task of the mdce service is to recover job manager and worker sessions after a system crash, so that jobs and tasks are not lost as a result of such accidents.

Throughout this section, *matlabroot* refers to the location of your installed MATLAB Distributed Computing Engine. Where you see this term used in the instructions that follow, substitute the path to your location or a link that points to it.

### Step 1: Start the mdce Service

- 1 Log in as root.
- 2 Start the mdce service by typing the commands

```
cd matlabroot/toolbox/distcomp/bin
./mdce start
```

### Step 2: Start the Job Manager

To start the job manager, enter the following commands.

- 1 Go to the directory with the startup scripts.

```
cd matlabroot/toolbox/distcomp/bin
```
- 2 Start the job manager, using any unique text you want for the name `<MyJobManager>`. Enter this text on a single line.

```
startjobmanager -name <MyJobManager> -v
```
- 3 Verify that the manager is running.

```
nodestatus
```

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**Note** If you have more than one job manager on your cluster, each must have a unique name.

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## Step 3: Start the Workers

- 1 Go to the directory with the startup scripts.

```
cd matlabroot/toolbox/distcomp/bin
```

- 2 Start the workers, using the text for <MyJobManager> that identifies the name of the job manager you want this worker registered with. Enter this text on a single line.

```
startworker -jobmanagerhost <job manager hostname>  
-jobmanager <MyJobManager> -v
```

To run more than one worker session on the same machine, give each worker a unique name with the `-name` option.

```
startworker ... -name <worker1>  
startworker ... -name <worker2>
```

- 3 Verify that the worker is running. Repeat this command for each worker node.

```
nodestatus
```

## Step 4: Install the mdce Service to Start Automatically at Boot Time

Although this step is not required, it is helpful in case of a system crash. Once installed, the mdce service starts running each time the machine reboots. The mdce service continues to run until explicitly stopped or uninstalled, regardless of whether a job manager or worker session is running.

You must have root privileges to do this step.

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## Debian Platform

Register the mdce service as a known service and configure it to start automatically at system boot time by following these steps:

- 1 Create the following link, if it does not already exist:

```
ln -s matlabroot/toolbox/distcomp/bin/mdce /etc/mdce
```

- 2 Create the following link to the boot script file:

```
ln -s matlabroot/toolbox/distcomp/bin/mdce /etc/init.d/mdce
```

- 3 Set the boot script file permissions:

```
chmod 555 /etc/init.d/mdce
```

- 4 Look in /etc/inittab for the default run level. Create a link in the rc directory associated with that run level. For example, if the run level is 5, execute these commands:

```
cd /etc/rc5.d;  
ln -s ../init.d/mdce S99MDCE
```

## All Other UNIX Platforms (Red Hat, Suse, Solaris)

Register the mdce service as a known service and configure it to start automatically at system boot time by following these steps:

- 1 Create the following link, if it does not already exist:

```
ln -s matlabroot/toolbox/distcomp/bin/mdce /etc/mdce
```

- 2 Create the following link to the boot script file:

```
ln -s matlabroot/toolbox/distcomp/bin/mdce /etc/rc.d/init.d/mdce
```

- 3 Set boot script file permissions:

```
chmod 555 /etc/init.d/mdce
```

- 4 Look in /etc/inittab for the default run level. Create a link in the rc directory associated with that run level. For example, if the run level is 5, execute these commands:

```
cd /etc/rc.d/rc5.d;  
ln -s ../init.d/mdce S99MDCE
```

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## Stage 3 of 3: Testing Your Installation of the MATLAB Distributed Computing Engine with a Job Manager

This procedure verifies that your distributed computing products are installed and configured correctly.

### Step 1: Verify the Connection

To verify the connection from the client session to the job manager, follow these instructions.

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**Note** In these instructions, *matlabroot* refers to the directory where MATLAB is installed on the your computer.

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- 1 Open a shell and go to the control script directory.

```
cd matlabroot/toolbox/distcomp/bin
```

- 2 Run `nodestatus` to verify your configuration and connection.

```
nodestatus
```

If successful, you should see the status of your job manager. Otherwise, refer to the troubleshooting section of the MATLAB Distributed Computing Engine System Administrator's Guide.

### Step 2: Run a Distributed Job

- 1 Start MATLAB on the computer where you installed the Distributed Computing Toolbox.
- 2 At the MATLAB prompt, enter the following command, replacing the text `MyJobManager` with the name you gave your job manager when you started it, and replacing `JobManagerHostname` with the hostname of your computer. You still need the quotes around the name and host of your job manager. Enter this text on a single line.

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```
results = dfeval(@sum, {[1 1] [2 2] [3 3]},  
'jobmanager', 'MyJobManager', 'LookupURL', 'JobManagerHostname')
```

If you get the following output, your installation is configured and operating correctly.

```
results =  
    [2]  
    [4]  
    [6]
```

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