



# Quartus® II Installation & Licensing for UNIX and Linux Workstations

Version 8.0



# QUARTUS® II

# Quartus® II

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## Installation & Licensing for UNIX and Linux Workstations

Version 8.0



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# Preface

The *Quartus® II Installation & Licensing for UNIX and Linux Workstations* manual provides comprehensive information for installing and licensing the Quartus II software and related software; includes additional workstation configuration information that allows you to properly configure a workstation for use with the Quartus II software; and includes information about other documentation and technical support.






# Documentation Conventions

The *Quartus II Installation & Licensing for UNIX and Linux Workstations* manual uses the following conventions to make it easy for you to find and interpret information.

## Typographic Conventions

Quartus II documentation uses the typographic conventions shown in the following table:

Visual Cue	Meaning
<b>Bold Initial Capitals</b>	Command names; dialog box, page, and tab titles; and button names are shown in bold with initial capital letters. For example: <b>Find Text</b> command, <b>Save As</b> dialog box, and <b>Start</b> button.
<b>bold</b>	Directory, project, disk drive, file, software utility, and software executable names; software utility names; and options in dialog boxes are shown in bold. For example: <b>quartus</b> directory, <b>d:</b> drive, and <b>license.dat</b> file.
Initial Capitals	Keyboard keys, user-editable application window fields, windows, views, and menu names are shown with initial capital letters. For example: Delete key and the Options menu.
“Subheading Title”	Subheadings within a manual section are enclosed in quotation marks. In manuals, titles of Help topics are also shown in quotation marks. For example: For more information, see “Exporting and Importing Version-Compatible Database Files” in Quartus II Help.
<i>Italic Initial Capitals</i>	Help categories, manual titles, section titles in manuals, and application note and brief names are shown in italics with initial capital letters. For example: <i>FLEXIm End Users Guide</i> .
<i>italics</i>	Variables are enclosed in angle brackets (<>) and shown in italics. For example: <file name> and <DVD-ROM drive>.
Courier font	Anything that must be typed exactly as it appears is shown in Courier. For example: <code>\quartus\bin\lmutil lmhostid</code> .
↵	Enter or return key.
■	Bullets are used in a list of items when the sequence of the items is not important.
✓	The checkmark indicates a procedure that is one step only.
	The hand points to information that requires special attention.

Visual Cue	Meaning
	The feet show you where to go for more information on a particular topic.
	The exclamation mark points to information or action that you take that can cause harm to your computer or cause you to lose data.

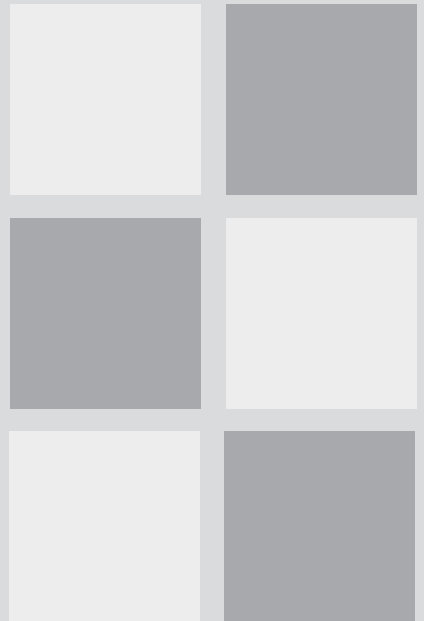
## Terminology

The following table shows terminology that is used throughout this manual:

Term	Meaning
click	Indicates a quick press and release of the left mouse button. Also indicates that you need to use a mouse or key combination to start an action.
double-click	Indicates two clicks in rapid succession.
select	Indicates that you must highlight text and/or objects or an option in a dialog box with a key combination or the mouse. A selection does not start an action. For example: Select <b>Chain Description File</b> , and then click <b>OK</b> .
point	Indicates that you must position the mouse pointer, without clicking, at an appropriate location on the screen, such as a menu or submenu. For example: On the Help menu, point to <b>Alterra on the Web</b> , and then click <b>Quartus II Service Request</b> .
turn on/turn off	Indicates that you must click a check box to turn a function on or off.

# Chapter One

## Installing the Quartus II Software



### What's in Chapter 1:

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# 1

# Introduction

This chapter describes the requirements and procedures for installing the Quartus II software and related software, which is available from the Download Center of the Altera website, and the Altera Complete Design Suite for UNIX and Linux, which is available by request on a DVD-ROM.

You can download the following software from the Download Center of the Altera website:

## UNIX Workstations (Solaris 8 and 9; 32-bit and 64-bit)

- Quartus II Subscription Edition Software v8.0 for UNIX Workstations (includes device information and IP Library)
- ModelSim-Altera v6.1g for Quartus II v8.0 for UNIX Workstations

## Linux Workstations (Red Hat Enterprise Linux 3.0 and 4.0 and SUSE Linux Enterprise Server 9; 32-bit and 64-bit)

- Quartus II Subscription Edition Software v8.0 for Linux Workstations (includes device information and IP Library)
- ModelSim-Altera v6.1g for Quartus II v8.0 for Linux Workstations
- Nios II Embedded Design Suite for Linux Workstations

The Altera Complete Design Suite for UNIX and Linux version 8.0 DVD-ROM includes all of the software in the preceding lists.

# Quartus II Software System Requirements

Your system must meet the following minimum requirements:

## Hardware

- One of the following workstations:
  - Sun Ultra workstation with 256 MB of system memory running Solaris version 8 or 9 (for 32-bit and 64-bit Solaris workstations).

- Intel Pentium III or compatible processor-based PC operating at 450 MHz or faster with 256 MB of system memory, running Red Hat Enterprise Linux 3.0 or 4.0 or SUSE Linux Enterprise Server 9 (for 32-bit Linux workstations).
  - 32-bit Linux workstations are capable of running the 32-bit version of the Quartus II software with access to virtual memory of up to 4 GB. If your Quartus II project requires addressability of virtual memory greater than 4 GB, you must use the 64-bit version of the Quartus II software on a 64-bit Linux workstation.
  - AMD64 processor or Intel EM64T processor or compatible processor-based PC with 1 GB memory, running Red Hat Enterprise Linux 3.0 or 4.0 or SUSE Linux Enterprise Server 9 (for 64-bit Linux workstations).
- Adequate disk space, as described in the **readme.txt** file, which is located in the top-level directory of the Altera Complete Design Suite DVD-ROM. After installation, the **readme.txt** file is available from the Quartus II Help menu and in the Altera Complete Design Suite system directory.
  - ISO 9660-compatible DVD-ROM drive (DVD-ROM installation only).
  - Color monitor.

### Cables and Ports

- 10/100 Mb Ethernet connection for connecting an EthernetBlaster download cable.
- Serial port for connecting a MasterBlaster™ communications cable.
- USB port for connecting a USB-Blaster™ download cable (Linux workstations only).
- Parallel port for connecting a ByteBlasterMV™ parallel port download cable (Linux workstations only).

### Software

- One of the following window managers:
  - Sun Solaris workstations: **dtwm**, **vuewm**, **mwm**, or **olwm**.
  - Linux workstations: **kde** or **gnome** (must be the version that is included with Red Hat Enterprise Linux 3.0 or 4.0 or SUSE Linux Enterprise Server 9).
- The native XServer software for Linux and Solaris platforms, which is required when running the Quartus II software.
- A web browser with an Internet connection is required for using Quartus II software Internet resources. Firefox, version 2.0 or later, or Microsoft Internet Explorer browser, version 5.0 or later, is required.

- One of the following Flash Players, for use of the Quartus II Interactive Tutorial:
  - Sun Solaris workstations: Flash Player 7.0 with Mozilla 1.4 or 1.7 (Solaris version 8 or 9).
  - Linux workstations: Flash Player 7.0 with Mozilla 1.2 or later (Red Hat Enterprise Linux 3.0 or 4.0 or SUSE Linux Enterprise Server 9).



For Information About	Refer To
Specific disk space and memory requirements	The <b>readme.txt</b> file, which is located in the top-level directory of the Altera Complete Design Suite DVD-ROM. After installation, the <b>readme.txt</b> file is available from the Quartus II Help menu and in the Quartus II system directory
Updated information about system requirements and the most current version of this manual	<i>Quartus II Installation &amp; Licensing for UNIX and Linux Workstations</i> manual on the Altera website
Latest information on new features, EDA interface support, and known issues and workarounds for the Quartus II software	<i>Quartus II Software Release Notes</i> document on the Altera website
Latest information about device support for the Quartus II software	<i>Quartus II Device Support Release Notes</i> document on the Altera website
Quartus II software features and how they work with your design flow	<i>Introduction to Quartus II Software</i> manual on the Altera website and the Quartus II Interactive Tutorial. After installation, the Quartus II Interactive Tutorial is available from the Quartus II Help menu and in the Quartus II system directory
Altera programming hardware	<i>ByteBlaster II Download Cable User Guide</i> , <i>ByteBlasterMV Download Cable User Guide</i> , <i>EthernetBlaster Download Cable User Guide</i> , <i>MasterBlaster Serial/USB Communications Cable User Guide</i> , and <i>USB-Blaster Download Cable User Guide</i> on the Altera website

# Uninstalling Previously Installed Versions of Altera Software

If you want, you can uninstall a previous version of the Quartus or Quartus II software before installing the current version of the Quartus II software.

To uninstall a previous version of the Quartus or Quartus II software, delete the Quartus II system directory (default name is **quartus**).

## Altera.com Website Download Center

You can download the following items from the Download Center of the Altera website:

- Quartus II software and related software listed in [“Introduction” on page 2](#)
- Altera Edition third-party software
- License daemons
- Intellectual property (IP) and tools
- Altera University Program software
- Altera Legacy Design software
- Programming software
- Altera board layout and test files

The Quartus II software for UNIX and Linux, and related software, uses a text-based installation script to install each software downloaded from the Download Center of the Altera website and automatically guides you through the installation process.

# Installing Downloaded Altera Software

You should be aware of the following information before you install the Quartus II software and related software:

- Commands that do not fit on a single line in this manual are indicated by indentations of subsequent lines.
- The UNIX environment is case sensitive. You must type directory names, file names, and file name extensions exactly as shown.
- By default, the Quartus II software, and related software, is installed in the `/opt/altera<version number>` directory, where `<version number>` is the number of the Quartus II software version directory. The installation procedure creates this directory, if it does not already exist. If you use a different directory name, substitute the appropriate name for `<Quartus II system directory>` in the installation steps.
- Ensure there is at least approximately 4 GB of free disk space to contain copies of the uncompressed versions of the installation files. An additional 5 GB of disk space is required for software installation.
- To run the Quartus II software using a network (multiuser) license, make sure that the license server uses version 8.0 or later of the FLEXlm License Manager Server software. By default, the Quartus II software installs version 9.5 of the FLEXlm License Manager Server software on the user workstation. For more information, refer to [“Upgrading or Setting Up a License Manager Server” on page 21](#).
- If you want to preserve project compilation databases from an earlier version of the Quartus II software before installing a newer version, Altera recommends that you open the design in the earlier version of the software and export a version-compatible database for the design by clicking **Export Database** on the Project menu. After you have installed a newer version of the Quartus II software, you can import the database in the new version by clicking **Import Database** on the Project menu. For more information about importing and exporting version-compatible databases, refer to the *Managing Quartus II Projects* chapter in volume 2 of the *Quartus II Handbook*. Version-compatible database files are available in Quartus II software version 4.1 and later.

To install downloaded Quartus II software and related software on a Solaris or Linux workstation, follow these steps:

1. Download the software listed in “Introduction” on page 2 from the Download Center of the Altera website.
2. Verify that you have sufficient free disk (approximately 4 GB) to contain copies of uncompressed versions of the software files.
3. To extract the Quartus II software, type the following command at the command prompt:

```
tar xvf 80_quartus_<operating system name>.tar
```

where *<operating system name>* can be `solaris` or `linux`.

4. To execute the installation script, type the following command at the command prompt:

```
<Quartus II system directory>/<operating system>/install
```

You are guided through the installation procedure.

5. Repeat steps 1 through 4 for each downloaded software you want to install.

## Altera Complete Design Suite

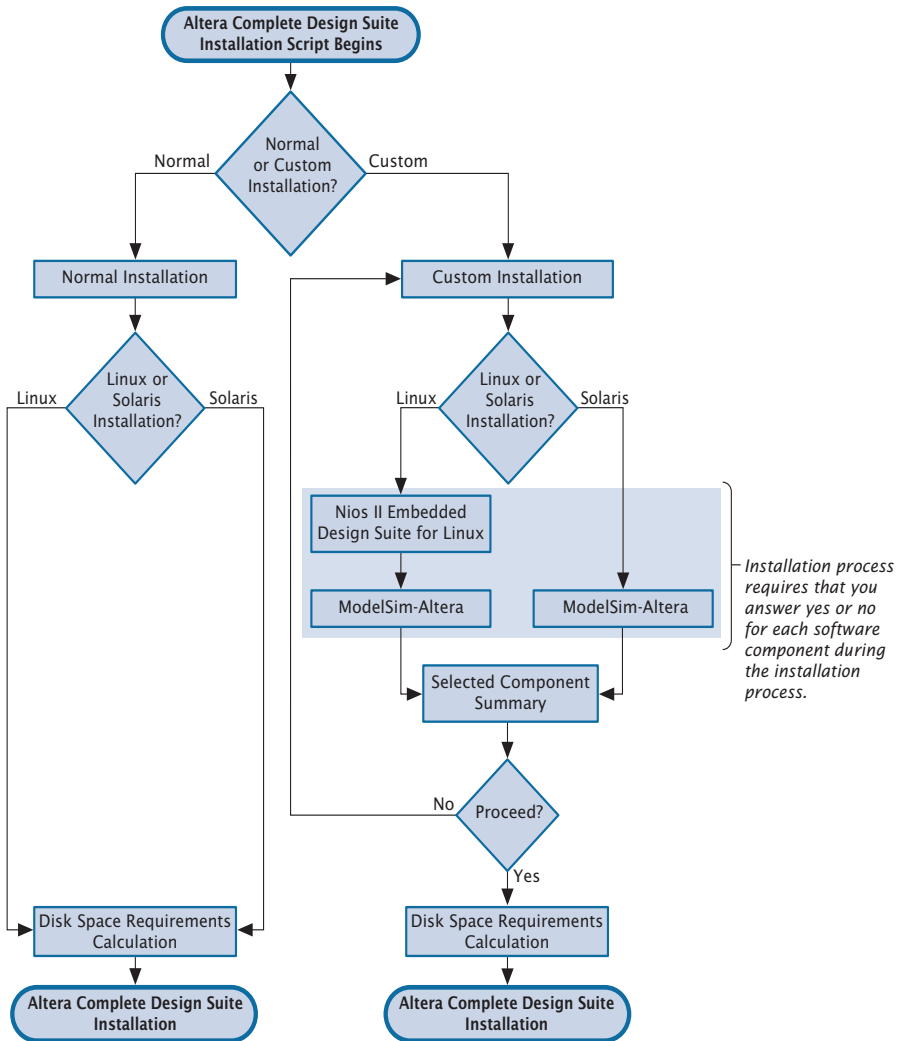
The Altera Complete Design Suite for UNIX and Linux version 8.0 includes an integrated software installation solution that allows you to install the Quartus II software and related software from one application or DVD-ROM, which is available by request.

The Altera Complete Design Suite for UNIX and Linux uses a text-based installation script that allows you to select the software you want to install and automatically guides you through the installation process.

You can choose to perform a normal or custom installation. A normal installation automatically installs all of the software included in the Altera Complete Design Suite using default settings and all program features. A custom installation allows you to select which software you want to install.

The Altera Complete Design Suite for UNIX and Linux installation script flow is shown in Figure 1.

**Figure 1. Altera Complete Design Suite Installation Flow**



# The Altera Complete Design Suite Installation Script

The Altera Complete Design Suite installation script installs the Quartus II software and related software.

You should be aware of the preinstallation information described in [“Installing Downloaded Altera Software” on page 6](#) before you install the Altera Complete Design Suite software.

## Installing the Altera Complete Design Suite on Solaris Workstations

You can install the Altera Complete Design Suite software on Sun Ultra workstations running Solaris 8 or 9.



### Before You Install the Altera Complete Design Suite

You must have superuser or “root” privileges to mount and unmount the DVD-ROM drive. If you are running Volume Manager, the DVD-ROM drive is mounted and unmounted automatically as `/dvdrom/dvdrom0` (you do not need to have root privileges to mount a DVD-ROM with the Volume Manager), and you need to perform only steps 1, 3, 5, and 6 and can skip the other steps.

To install the Altera Complete Design Suite software on a Solaris workstation, follow these steps:

1. Insert the Altera Complete Design Suite for UNIX and Linux version 8.0 DVD-ROM into your DVD-ROM drive.
2. Mount the DVD-ROM. For information about mounting DVD-ROMs on Solaris workstations, refer to [“Mounting and Unmounting DVD-ROMs on Solaris Workstations” on page 54 in Appendix B](#).
3. To install the Altera Complete Design Suite, type the following command at the command prompt:

```
/dvdrom/dvdrom0/install ←
```

You are guided through the installation procedure.

4. Unmount the DVD-ROM. For information about unmounting DVD-ROMs on Solaris workstations, refer to [“Mounting and Unmounting DVD-ROMs on Solaris Workstations”](#) on page 54 in Appendix B.

## Installing the Altera Complete Design Suite on Linux Workstations

You can install the Altera Complete Design Suite on Linux workstations running Red Hat Enterprise Linux 3.0 or 4.0 or SUSE Linux Enterprise Server 9.



### Before You Install the Altera Complete Design Suite

You must have superuser or “root” privileges to mount and unmount the DVD-ROM drive. If you are logged in on a console, you do not need to have root privileges to mount a DVD-ROM.

To mount the DVD-ROM drive and install the Altera Complete Design Suite and device information on a Linux workstation, follow these steps:

1. Insert the Altera Complete Design Suite for UNIX and Linux version 8.0 DVD-ROM into your DVD-ROM drive.
2. Mount the DVD-ROM into your DVD-ROM drive. For information about mounting DVD-ROMs on Linux workstations, refer to [“Mounting and Unmounting DVD-ROMs on Linux Workstations”](#) on page 55 in Appendix B.
3. To install the Altera Complete Design Suite, type the following command at the command prompt:

```
/mnt/dvdrom/install ←
```

You are guided through the installation procedure.

4. Unmount the DVD-ROM drive. For information about unmounting DVD-ROMs on Linux workstations, refer to “[Mounting and Unmounting DVD-ROMs on Linux Workstations](#)” on page 55 in [Appendix B](#).

## Using the 64-bit Version of the Quartus II Software on Solaris or Linux Workstations

If your project requires addressability of computer memory greater than 4 GB for the `quartus_map`, `quartus_fit`, `quartus_sta`, `quartus_tan`, and `quartus_cdb` executables, you can use a 64-bit version of the Quartus II software for Solaris or Linux workstations. Compiling designs with the 64-bit version of the Quartus II software requires more system memory. You may notice an increase in compilation times if there is not sufficient physical memory to accommodate the increased memory usage. You can mitigate this effect by increasing the total physical memory on the system.

When you install the Quartus II software, the 64-bit version of the Quartus II software is also installed automatically.



### Availability of 64-bit Processing Controls on 32-bit Systems

If the host system does not support 64-bit processing, the controls in the **Processing** page of the **Options** dialog box in the Quartus II software that turn on or off 64-bit processing are not available.

To turn on 64-bit processing in the Quartus II software, follow these steps:

1. Start the Quartus II software as described in the “[Starting the Quartus II Software](#)” on page 29.
2. On the Tools menu, click **Options**.
3. In the **Category** list, select **Processing** under **General**.
4. If you want to turn on 64-bit processing in the Quartus II software, select **Always use 64-bit processing**.

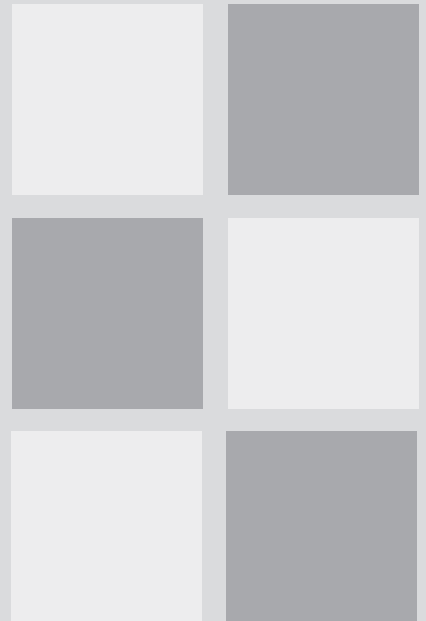
You can also turn on 64-bit processing using other methods:

- To turn on 64-bit processing using the `QUARTUS_64BIT` environment variable, refer to “[QUARTUS\\_64BIT](#)” on page 41.
- To turn on 64-bit processing using the `--64bit` option, refer to “[Other Workstation Configuration Information](#)” on page 42. Be aware that the **Always use 32-bit processing** or **Always use 64-bit processing** options in the **Processing** page override the settings specified with the `QUARTUS_64BIT` environment variable or the `--64bit` option.

# Chapter Two

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## Licensing the Quartus II Software



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# 2

# Introduction

This section describes how to license the Quartus II software and related software. To set up your license for the Quartus II software, you must follow these steps, which are described in more detail in this chapter:

1. Obtain a license file. The Quartus II software requires a **license.dat** license file for each server that supports a valid, unexpired network (multiuser) license or for each node-locked (single-user) license. This same license file can also enable the additional Altera synthesis and simulation tools included with Altera software subscriptions, as well as the MAX+PLUS II software.
2. If you have a network license (FLOATALL or ADD-FLOATALL), modify the license file.
3. Set up and configure the FLEXlm license manager server for a UNIX or Linux workstation.
4. Configure each workstation.
5. Configure each Quartus II user's environment.
6. Start the Quartus II software.
7. Specify the location of the license file.
8. Specify a web browser.
9. Register for an Altera.com account. (Optional)

# Obtaining a License File

When you start the Quartus II software, if the software cannot detect a valid license file, you are asked whether you want to run in evaluation mode for 30 days, perform an automatic license retrieval from the Altera website, or specify the correct location of a valid license file.

You can also obtain a license file, **license.dat**, from the Licensing section of the Altera website at **www.altera.com/licensing** if you have the following information:

- Your Altera ID, which is a six-digit number that is provided when you purchase the Quartus II software. If you request the Altera Complete Design Suite for UNIX and Linux Version 8.0 DVD-ROM, you can find this number on the packing list that is shipped with the software. You can also obtain your Altera ID from the mySupport website at **www.altera.com/mysupport**.
- The license server host ID number for UNIX or Linux network license servers. To find your UNIX or Linux network license server host ID number with FLEXlm utilities, type the following command at a command prompt (where *<operating system name>* represents `linux` or `solaris`):

```
<Quartus II system directory>/<operating system name>/lmutil  
lmhostid ←
```



## For Information About

## Refer To

Additional methods of finding your host ID number

Altera website at **www.altera.com**



## Saving Previous **license.dat** Files

Altera recommends that you save any previous **license.dat** file in a temporary directory, in case you need to refer to it later.

To obtain a license file, follow these steps:

1. Start the Quartus II software as described in the “Starting the Quartus II Software” on page 29.
2. Select **Perform automatic web license retrieval** to request a valid license file automatically from the Altera website. You are guided through the licensing procedure.

*or*

To request a license file at a later time, visit the Altera Software Licensing page at [www.altera.com/licensing](http://www.altera.com/licensing).

3. If you are using a network (multiuser) license, type your license server host ID.
4. Specify the requested information.
5. Specify the location of your license file. You will receive an e-mail from Altera with a **license.dat** file attached, as well as the license file text. You can either use the attached license file, or copy the lines from the attached license file to an existing license file. When you receive the license file text, save it in the **/usr/local/flexlm/licenses** directory. If you are using your **license.dat** file with both the Quartus II software and the MAX+PLUS II software, Altera recommends that you save it in a top-level directory named **flexlm**.

Figure 1 and Figure 2 show sample network license files for UNIX and Linux workstations that function as a single license server.

**Figure 1. Sample Network License File for a Single UNIX Workstation Server**

```

Server name | Server host ID number | Optional port number | | | Number of licenses requested | Authorization code
-----|-----|-----|-----|-----|-----|-----
SERVER alice 807f1034 1800
VENDOR alterad "/opt/altera/quartus80/solaris/alterad"
USE_SERVER
FEATURE altera_mainwin alterad 2008.12 permanent 5 391A92407D4B SIGN="0191 120C \
BB64 BC39 E5C8 EBBB 7894 E064 D348 61CC 5C6F 16DD 1269 F246 D07E 19C8 CAE3 \
E3E3 6965 E38D 1452 BB74 20E9 E6F6 5718 89AC 0E23 B5B2 1581 E453"
FEATURE quartus alterad 2008.12 permanent 5 7A496D25A602 SIGN="1C66 DAC6 1DAB C886 \
727B 65DF FAC2 B479 3E3C 656D 3561 E5D0 BBA3 C45C 4DDC 0F2F 68F5 4DF1 6F63 \
7785 2F5D 1480 1B0A 70DE 2220 1952 DDCD 9F4D 6D61 A177"
Feature name | Daemon name | Release date | Expiration date

```

**Figure 2. Sample Network License File for a Single Linux Workstation Server**

```

Server name | Server host ID number | Optional port number | | | Number of licenses requested | Authorization code
-----|-----|-----|-----|-----|-----|-----
SERVER alice 807f1034 1800
VENDOR alterad "/opt/altera/quartus80/linux/alterad"
USE_SERVER
FEATURE altera_mainwin_lnx alterad 2008.12 permanent 5 391A92407D4B SIGN="0191 \
120C BB64 BC39 E5C8 EBBB 7894 E064 D348 61CC 5C6F 16DD 1269 F246 D07E 19C8 \
CAE3 E3E3 6965 E38D 1452 BB74 20E9 E6F6 5718 89AC 0E23 B5B2 1581 E453"
FEATURE quartus alterad 2008.12 permanent 5 7A496D25A602 SIGN="1C66 DAC6 1DAB C886 \
727B 65DF FAC2 B479 3E3C 656D 3561 E5D0 BBA3 C45C 4DDC 0F2F 68F5 4DF1 6F63 \
7785 2F5D 1480 1B0A 70DE 2220 1952 DDCD 9F4D 6D61 A177"
Feature name | Daemon name | Release date | Expiration date

```

If you are using the Quartus II software with a node-locked (single-user) license, skip to [“Configuring Each Workstation” on page 25](#).

The FLEXlm licensing scheme also allows you to set up three redundant license servers to serve a network (multiuser) license. You can obtain a license file for redundant servers by performing the steps described earlier in this section for obtaining a license file. [Figure 3](#) shows a sample redundant server license file.

**Figure 3. Sample Redundant Server License File**

	<i>Server name</i>	<i>Server host ID number</i>	<i>Optional port number</i>		<i>Number of licenses requested</i>	<i>Authorization code</i>	
SERVER	alice	807f1043	1800				
SERVER	king	807f1042	1800				
SERVER	queen	807f1041	1800				
VENDOR	alterad "/opt/altera/quartus80/solaris/alterad"						
USE_SERVER							
FEATURE	altera_mainwin	alterad	2008.12	permanent	5	391A92407D4B	SIGN="0191 120C \
	BB64 BC39 E5C8 EBBB	7894 E064 D348 61CC 5C6F 16DD	1269 F246 D07E 19C8 CAE3 \				
	E3E3 6965 E38D 1452 BB74 20E9 E6F6 5718 89AC 0E23 B5B2 1581 E453 "						
FEATURE	quartus	alterad	2008.12	permanent	5	7A496B23A403	SIGN="1C66 DAC6 1DAB C886 \
	727B 65DF FAC2 B479 3E3C 656D 3561 E5D0 BBA3 C45C 4DDC 0F2F 68F5 4DF1 6F63 \						
	7785 2F5D 148C 1B0A 70DE 222C 1952 DDCD 9F4D 6D61 A177 "						
	<i>Feature name</i>	<i>Daemon name</i>	<i>Release date</i>	<i>Expiration date</i>			

# Modifying the License File

The `license.dat` file must be modified before it can be used by the license server.



## Node-Locked (Single-User) License

If you have a node-locked (single-user) license, you can skip this section and go to [“Starting the Quartus II Software” on page 29](#).

The first few lines of the license file are shown in the following example (your license file may not contain all the `VENDOR` entries, depending on which software you have enabled):

```
SERVER <host name> <8- or 12-character host or NIC ID> <port number>
VENDOR alterad "<path to daemon executable>"
VENDOR mgcld "<path to daemon executable>"
```

To modify the license file, follow these steps:

1. In the `license.dat` file, type the variables that are described in [Table 1](#). The host or NIC ID will already be entered in the license file.
2. Ensure the license file meets the following guidelines:
  - The license file name must have a `.dat` extension. If your text editor adds `.txt` or another extension to the file name, such as `license.dat.txt`, you must rename the file to have only a `.dat` extension.
  - The license file must have a carriage return at the end of the last `FEATURE` line.
  - Any `FEATURE` line that wraps to a second or third line must contain a backslash (`\`) at the end of the line to indicate that it continues.

**Table 1. Variables to Modify in the License File (license.dat)**

Variable Name	Description	Directory
<host name>	The host name of the server; for example, my_server.	
<port number> (1)	The port number for the license manager service on the server; for example, 1800. The port number is optional and should be different from the port number for any other service on the machine.	
alterad "<path to daemon executable>" (2)(3)	Path to the Altera vendor daemon executable <b>alterad</b> .	Solaris: /<Quartus II system directory>/solaris/alterad Linux: /<Quartus II system directory>/linux/alterad
mgcld "<path to daemon executable>" (2)(3)(4)	Path to the Mentor Graphics vendor daemon executable <b>mgcld</b> .	Solaris: /<ModelSim-Altera system directory>/sunos5aloem/mgls/lib/mgcld Linux: /<ModelSim-Altera system directory>/linuxaloem/mgls/lib/mgcld

**Notes:**

- (1) To prevent port number conflicts, you can specify a port number in the license file. If you do not specify a port number, the FLEXlm License Manager automatically chooses a free port between 27000 and 27009. If three redundant servers are in use, you must specify a port number greater than 1024. Port numbers less than 1024 are privileged port numbers on UNIX servers.
- (2) In some network environments, the license server does not have a software tool(s) installation that provides the necessary vendor daemon (**alterad** or **mgcld**). In this case, copy the required daemon from another machine that does have an installation of the software. Find the file in the directory location specified. Save the file in a similarly named directory or any other location on the license server. Specify the daemon location on the license server in the license file.
- (3) If the path server has spaces in it, enclose the full path in quotation marks.
- (4) If you are not using a license file for the ModelSim-Altera software, you may delete this line.



**For Information About**

The license file and modifying the license file for the Quartus II and MAX+PLUS II software and for other EDA tools

**Refer To**

AN 340: *Altera Software Licensing*, which is available from the Literature section of the Altera website at [www.altera.com/literature](http://www.altera.com/literature)

# Upgrading or Setting Up a License Manager Server

This section provides instructions for configuring network licensing for the Quartus II software on Sun Ultra workstations running Solaris 8 or 9, or Intel Pentium III or compatible processor-based Linux workstations running Red Hat Enterprise Linux 3.0 or 4.0 or SUSE Linux Enterprise Server 9.

## Upgrading the FLEXlm License Server Software

To support network licensing, the Quartus II software requires the FLEXlm License Manager server software version 8.0 or later. The installation script automatically installs version 9.5 of the FLEXlm License Manager server software on Solaris and Linux workstations, but you should also verify that the version of the FLEXlm License Manager software or the license server software is 8.0 or later. If the FLEXlm License Manager software is version 8.0 or later, skip to [“Rereading an Existing UNIX or Linux Workstation License File” on page 22](#).

- ✓ To determine which version of the FLEXlm License Manager server software you are using, type the following command at a command prompt on the computer running the FLEXlm License Manager server software:

```
/<FLEXlm system directory path>/lmgrd -v ↵  
/<FLEXlm system directory path>/alterad -v ↵
```

If the **lmgrd** or **alterad** daemons are not from the FLEXlm software version 8.0 or later, you must upgrade both daemons with the versions provided in the installation of the Quartus II software.

To upgrade an older version of the FLEXlm License Manager server software, follow these steps:

1. Make a backup copy your current **lmgrd** and **alterad** daemons.
2. Copy the new versions of the files to the computer running the license server over your current daemons. You may have to shut down the license server software to complete this step.

If you installed the FLEXlm License Manager server software using the installation script, the current version of the **lmgrd** and **alterad** daemons are located in the following directories:

```
/<Quartus II system directory>/<operating system name>/alterad  
/<Quartus II system directory>/<operating system name>/lmgrd
```

where *<operating system name>* can be **solaris** or **linux**.

3. Copy the FLEXlm software utility **lmutil** from the Quartus II system directory to the license server computer.
4. Restart the FLEXlm license server by typing the following commands at a command prompt:

```
/<FLEXlm system directory path>/lmutil -c lmdown <license file path> ↵  
/<FLEXlm system directory path>/lmgrd -c <license file path>  
[-l <optional log path>] ↵
```

## Rereading an Existing UNIX or Linux Workstation License File

The Quartus II software uses the FLEXlm software to administer licensing for single or multiple users in a network installation. If you have an existing FLEXlm license server with an existing license file for the MAX+PLUS II software or software from another vendor, and the FLEXlm license server is version 8.0 or later, you can copy and paste the Altera FEATURE lines from your Quartus II **license.dat** file into your existing license file. Paste the Quartus II FEATURE line as shown in the sample license file in [Figure 1 on page 17](#). Make sure you have also modified the license file according to the guidelines in [“Modifying the License File” on page 19](#).

If you make these changes to your license file, you must reread the license file or restart the license server before you can run the Quartus II software for the first time.

Refer to [“Upgrading the FLEXlm License Server Software” on page 21](#) to verify that you are using the latest supported version of the FLEXlm License Server software, or if you need to upgrade an older version of the FLEXlm License Server software.



### Configuring a New License Server

If you do not have an existing FLEXlm license server, and you need to configure a new license server, skip to “[Configuring a New UNIX or Linux Workstation License Server](#)” on page 23.

- ✓ To reread your license file on a license server, type the following command at a command prompt:

```
/<Quartus II system directory>/<operating system name>/lmutil  
lmreread ↵
```

where *<operating system name>* can be `solaris` or `linux`.

or

Restart the license server.

## Configuring a New UNIX or Linux Workstation License Server

The Quartus II software uses the FLEXlm software to administer licensing for single or multiple users in a network installation. If you do not have an existing FLEXlm license server, you must configure a new Solaris or Linux license server before starting the Quartus II software for the first time.

You should be aware of the following information before you configure a new license server:

- If you have an existing FLEXlm license server, refer to “[Rereading an Existing UNIX or Linux Workstation License File](#)” on page 22.
- Ensure you obtained a valid license file according to the guidelines in “[Obtaining a License File](#)” on page 15, and that you modified the license file according to the guidelines in “[Modifying the License File](#)” on page 19.
- These instructions assume that you have installed the `license.dat` file in the `/usr/local/flexlm/licenses` directory. If you have installed the license file in a different directory, substitute the appropriate path name for that directory.

- ✓ To configure a new license server, type the following command at a command prompt:

```
/<Quartus II system directory>/<operating system name>/lmgrd -c  
/usr/local/flexlm/licenses/license.dat ↵
```

where *<operating system name>* can be *solaris* or *linux*.



#### For Information About

#### Refer To

Configuring a new UNIX workstation license server

**readme.txt** file, which is located in the Quartus II system directory or the top level directory of the Altera Complete Design Suite DVD-ROM

## Installing the FLEXlm Software on Another License Server

You can install the FLEXlm software on an additional Solaris or Linux license server.

To install the FLEXlm software on another license server, perform the following steps:

1. Create a directory named */<Quartus II system directory>/<operating system name>* on the additional license server, where *<operating system name>* can be **solaris** or **linux**.
2. Copy the following files from the */<Quartus II system directory>/<operating system name>* directory of your original Quartus II software into the new */<Quartus II system directory>/<operating system name>* directory:
  - **lmgrd**
  - **lmutil**
  - **alterad**

# Configuring Each Workstation

Before starting the Quartus II software for the first time, you must configure each UNIX or Linux workstation that will run the Quartus II software.

## Configuring Each Solaris Workstation

For each Sun Solaris UNIX workstation that will run the Quartus II software, you must verify the required runtime patches and kernel configuration before starting the Quartus II software for the first time.



### Before You Configure a Solaris Workstation

You should be aware of the following information before you configure a Solaris workstation:

- You must have superuser or “root” privileges to install runtime patches or modify kernel configuration.
- Solaris 9 workstations do not require runtime patches.

## Verifying Required Runtime Patches (Solaris 8 Only)

Make sure that each workstation has the runtime and graphics card patches that are required to run the Quartus II software on a Solaris 8 UNIX workstation. The last two numbers of the patches represent the version number and can be substituted with a more recent version number. Refer to [Table 2](#) for a list of patches and descriptions.

- ✓ To determine which patch is installed on your system, type the following command at a command prompt:

```
showrev -a | grep <patch number> ↵
```

If the patches are not installed on your system, you should download the appropriate replacement patch from the Sun Microsystems support website at [sunsolve.sun.com](http://sunsolve.sun.com). Altera recommends checking the Support Center section of the Altera website at [www.altera.com](http://www.altera.com) for late-breaking information on required and optional operating system patches. In addition, the latest version of this manual, the *Quartus II Installation & Licensing for*

*UNIX and Linux Workstations* manual, which is available in PDF format from the Altera website at [www.altera.com/literature](http://www.altera.com/literature), may contain updated information on patches.

Table 2 lists the runtime patches for Solaris 8.

**Table 2. Solaris 8 Runtime Patches**

Runtime Patches	Description	Reason for Patch
109147-12 or later	SunOS 5.8 Linker patch	Correct dynamic load and unload of shared libraries

*Note:* If you are unable to install this runtime patch, the Quartus II software still functions, but online Help is not available and the graphical user interface performance and general stability may be affected.

## Verifying Kernel Configuration (Solaris Only)

If necessary, perform the following steps on a UNIX workstation running Solaris 8 or 9 to ensure that the system's kernel configuration meets the minimum system requirements to run the Quartus II software.

1. Verify the configuration parameters listed in Table 3 to ensure that the values listed in the **system** file, which is located in the **etc** directory, are greater than or equal to the recommended values listed in Table 3.

**Table 3. Solaris Configuration Parameters**

Solaris Parameter	Recommended Value
pt_cnt	200
shmmax	8388608
shmmni	1000
shmseg	16

2. If one or more of the parameters do not have the recommended values, change the values to the recommended values by adding one or more of the following lines to the **/etc/system** file:

```
set pt_cnt=200
```

```
set shmsys:shminfo_shmmax=8388608
set shmsys:shminfo_shmmni=1000
set shmsys:shminfo_shmseg=16
```

3. Restart the workstation.

## Configuring Each Linux Workstation

For each Linux workstation that will run the Quartus II software, you must verify the libraries and kernel configuration before starting the Quartus II software for the first time.



### Before You Configure Each Linux Workstation

You must have superuser or “root” privileges to install runtime patches or modify kernel configuration.

## Verifying Required Libraries (Linux Only)

To use the Visual MainWin software, which is required to run the Quartus II software on Linux workstations, the Linux workstation requires the GNU libc libraries (**glibc**). Table 4 lists the **glibc** versions required for each version of Linux supported by the Quartus II software.

**Table 4. Required glibc Version for Linux Workstations**

Red Hat Linux Version	glibc Version
Red Hat Linux Enterprise 3.0	<b>glibc 2.3.2-95</b>
Red Hat Linux Enterprise 4.0	<b>glibc 2.3.4-2</b>
SUSE Linux Enterprise Server 9	<b>glibc 2.3.3-98</b>

The GNU libc libraries are available at the Red Hat Linux website at [www.redhat.com](http://www.redhat.com).

## Verifying Kernel Configuration (Linux Only)

You should perform the following steps to ensure that the system's kernel configuration meets the minimum system requirements to run the Quartus II software:

1. Check the configuration parameters listed below to make sure that the values listed in the **limits.conf** file, which is located in the **/etc** directory, are greater than or equal to the recommended values listed in [Table 5](#).
2. If the parameters do not have the recommended values, change the values to the recommended values by adding one or more of the following lines to the **limits.conf** file:

**Table 5. Linux Configuration Parameters**

Linux Parameter	Recommended Value
hard nofile	32768
soft nofile	32768



### Asterisks (\*) in limits.conf File

The asterisks (\*) in the previous lines are part of the code and must be included in the **limits.conf** file.

3. Type the following command at the command prompt:

```
echo 356 40000 32 32000 > /proc/sys/kernel/sem ↵
```



### Adding Kernel Configuration Command to Linux Workstation Startup Scripts

The previous command takes effect immediately; however, Altera recommends that your system administrator also add the commands to the workstation's startup scripts, because the command is reset whenever you restart the workstation.

# Configuring Each User Environment

Ensure that you perform the following steps for each Quartus II software user before starting the Quartus II software for the first time:

1. Update each user's `PATH` environment variable in the `.cshrc` file, which is located in the home directory, to include the `bin` directory in the Quartus II system directory, which is usually the `/opt/altera/quartus<version number>/bin` directory. To update the `PATH` environment variable, type the following command at a command prompt:

```
setenv PATH ${PATH} : /<Quartus II system directory>/bin ↵
```

2. Save the changes to the `.cshrc` file, and then type the following commands at a command prompt:

```
cd ↵  
source .cshrc ↵
```

## Starting the Quartus II Software

After you have followed all the guidelines for configuring each workstation and each user environment, you can start the Quartus II software by typing the following command at a command prompt:

```
quartus ↵
```



### Avoid Starting the Quartus II Software from Platform-Specific Directories

Make sure you do not start the `quartus` command in the `/<Quartus II system directory>/<operating system name>` directory (for example, the `/<Quartus II system directory>/linux` directory or the `/<Quartus II system directory>/solaris` directory). If you start the Quartus II software in a platform-specific directory, the software may not function correctly. For more information, refer to “Configuring Each User Environment” on page 29.

When you start the Quartus II software, if a valid license file cannot be detected, the software prompts you to specify a valid license file.

If you want to enable the Internet connectivity features of the Quartus II software, you should also follow the guidelines in “[Specifying a Web Browser](#)” on page 34.

## Specifying the License File

Once you have obtained a license file and set up a license server, you must specify the location of the license file for each user (or “client”). You can specify the license file with either of the following methods, which are described in more detail in this section:

- Specify the license file with the Quartus II software
- Specify the license file with the `.cshrc` file on client workstations



### Specifying the License File with the ModelSim-Altera Software and MAX+PLUS II Software

If you are using the Altera-provided ModelSim-Altera simulation software, which is included with Altera software subscriptions, and/or you are using the MAX+PLUS II software, you should specify the license file with the `.cshrc` file.

## Specifying the License File within the Quartus II Software

To specify the license file within the Quartus II software, follow these steps on each workstation that will be running the Quartus II software:

1. If you have not already done so, start the Quartus II software, as described in “[Starting the Quartus II Software](#)” on page 29.



### Starting the Quartus II Software for the First Time

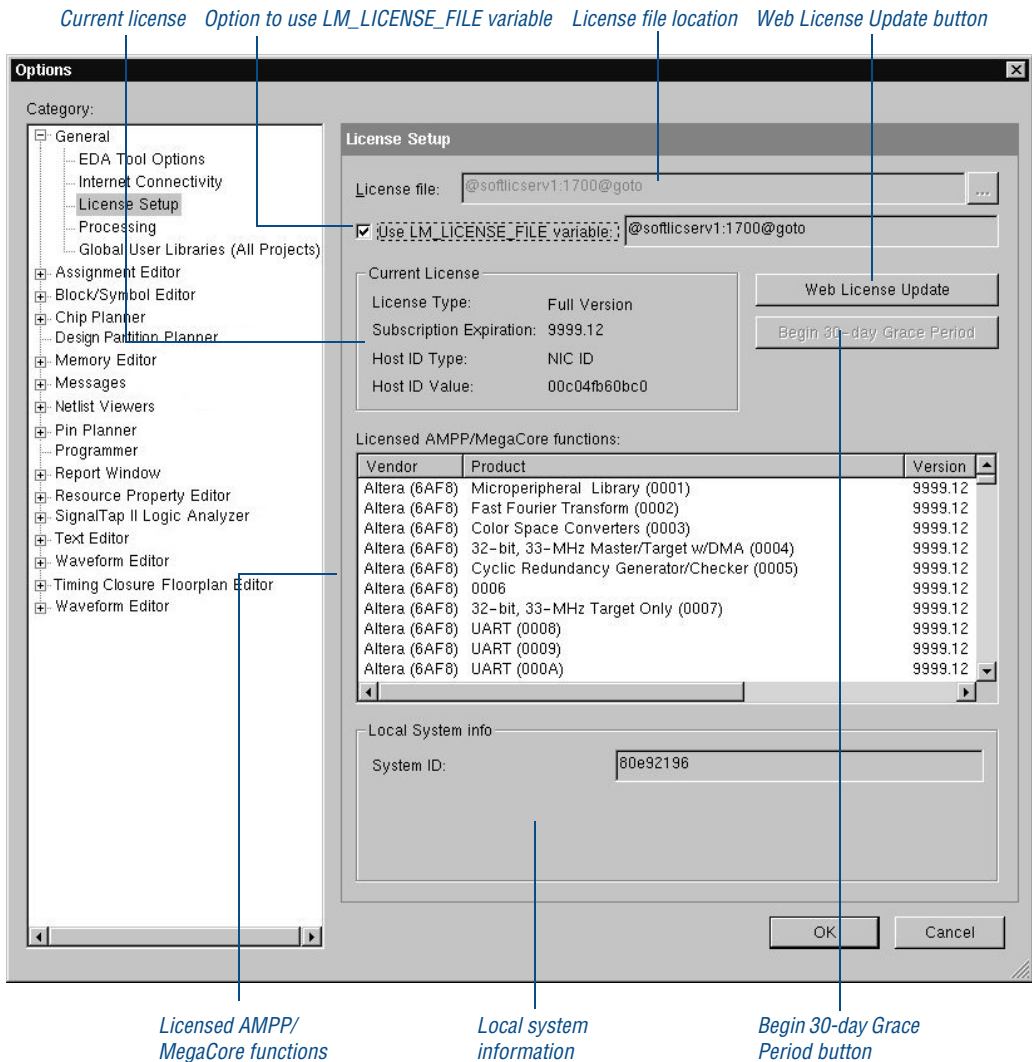
When you start the Quartus II software, if the software cannot detect a valid license file, you are asked whether you want to run in evaluation mode for 30 days, request a free renewable 150-day license file from the Altera website, or specify the correct location of a valid license file.

2. Select **If you have a valid license file, specify the location of your license file.** The **License Setup** page of the **Options** dialog box is displayed. **Figure 4** shows the **License Setup** page.

or

If you want to specify the license file later, click **License Setup** on the **Tools** menu. The **License Setup** page appears.

**Figure 4. License Setup Page of the Options Dialog Box**



3. In the **License file** box, specify the full path name of the **license.dat** file, or browse to locate the **license.dat** file. Altera recommends that you store the **license.dat** file in a directory named **/usr/local/flexlm/licenses**.

You can also specify the location of the license file by typing a name of the format `<port>@<host>` instead of a license file path name, where `<host>` is the name of the server where the license file is stored and `<port>` is the port listed in the **license.dat** file. See [Figure 1 on page 17](#) for a sample network license file to determine your port and server name, and refer to [Table 1 on page 20](#) for more information about port numbers. If there is no port listed in the **license.dat** file, you can simply specify `@<host>`.



#### Specifying Multiple License Files and/or Servers

If you have more than one license file or server, separate the port and host specifications with colons (:), with no spaces between the names and numbers. For example:

```
1800@king: /usr/local/lib/license.dat:270000@queen
```

If you want to use the current `LM_LICENSE_FILE` value specified in the `.cshrc` file, turn on **Use LM\_LICENSE\_FILE variable**.

4. If you want to check the Altera website for license file updates, click **Web License Update**.
5. If you want to use the Quartus II software in the “Subscription Expiration” grace period, click **Begin 30-day Grace Period**. The “Subscription Expiration” grace period allows you to use the Quartus II software with programming file support for 30 days. When the grace period expires, you must obtain an updated license file at the Altera website to continue using the Quartus II software with programming file support.
6. Click **OK**.

The **Licensed AMPP/MegaCore** functions list of the **License Setup** page lists all of the features and products that are available for the license.

## Specifying the License File in the .cshrc File on Client UNIX and Linux Workstations

To specify the license file in the `.cshrc` file on each client (user) workstation, make sure that you update the `LM_LICENSE_FILE` variable that is specified in the `.cshrc` file located in each user's home directory. You must edit this file for each user, or provide clear instructions that describe which lines the user needs to enter or edit:

- ✓ Make sure that each user has an `LM_LICENSE_FILE` variable that is set to the full directory path name of the license file. To update this variable, add the following line to the `.cshrc` file for each user:

```
setenv LM_LICENSE_FILE /usr/local/flexlm/licenses/  
license.dat
```



### Using the `setenv` Environment Variable with Multiple Applications

If more than one application uses this environment variable, separate the different paths with a colon (:) with no spaces between the path names. For example:

```
setenv LM_LICENSE_FILE /usr/local/flexlm licenses/license.dat:/  
tmp/license.xyz
```

or

If you want to specify the name of the server on which the license file is stored, add the following line to the `.cshrc` file for each user:

```
setenv LM_LICENSE_FILE <port>@<host>
```

where `<host>` is the name of the server and `<port>` is the port listed in the `license.dat` file. See [Figure 1 on page 17](#) for a sample network license file to determine your port and server name, and refer to [Table 1 on page 20](#) for more information about port numbers. If there is no port listed in the `license.dat` file, you can simply specify `@<host>`.



### Using the `setenv` Environment Variable with Multiple Applications

If you have more than one license file or server, separate the port and host specifications with colons (:), with no spaces between the names and numbers. For example:

```
1800@king:/usr/local/lib/license.dat:270000@queen
```

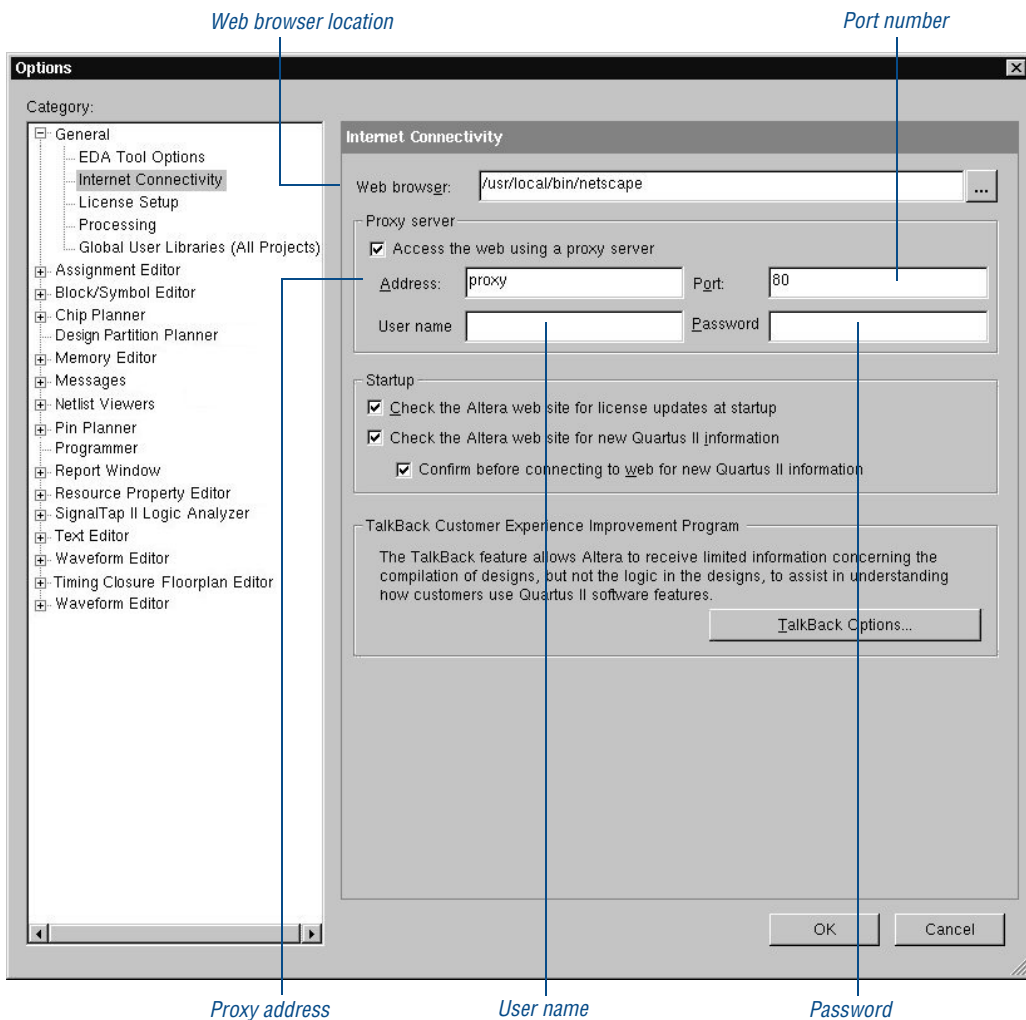
If you want the Quartus II software to use the `LM_LICENSE_FILE` setting from your `.cshrc` file, make sure **Use `LM_LICENSE_FILE` variable** is turned on in the **License Setup** page of the **Options** dialog box.

## Specifying a Web Browser

You must specify your web browser location in the **Options** dialog box to enable the Internet connectivity features of the Quartus II software. To specify your web browser location, follow these steps:

1. Start the Quartus II software.
2. On the Tools menu, click **Options**.
3. In the **Category** list, select **Internet Connectivity**. The **Internet Connectivity** page appears.
4. In the **Web browser** box, specify the full path name of your web browser.
5. If you are using a proxy server, specify the proxy address and port by performing the following steps:
  - a. Turn on **Access the web using a proxy server**.
  - b. In the **Address** box, type the proxy address or host name.
  - c. In the **Port** box, type the port number.
  - d. In the **User name** box, type the user name if required.
  - e. In the **Password** box, type the password if required.
6. Click **OK**.

**Figure 5. Internet Connectivity Page of the Options Dialog Box**



## Registering for an Altera.com Account

Your copy of the Quartus II software is registered at the time of purchase; however, in order to use the mySupport website to view and submit service requests, you must also register for an Altera.com account and an Altera user name. You can use your Altera user name to access your Altera.com account. Although use of the mySupport website requires you to have an Altera.com account, this account also makes it easier to use many other Altera website features, such as the Download Center, Licensing Center, Altera Technical Training online class registration, or Buy On-Line-Altera eStore features.

To register for an Altera.com account, follow these steps:

1. Go to the mySupport website:

To start your web browser and connect to the mySupport website while running the Quartus II software, on the Help menu, point to **Altera on the Web**, and then click **Quartus II Service Request**.

*or*

Point your web browser to the mySupport website at **www.altera.com/mysupport**.

2. Follow the instructions on the mySupport website to register for an Altera.com account.

If you are not a current Altera subscription user, you can still register for an Altera.com account.

## Licensing Related Software

In addition to licensing the Quartus II software, you must also license any other related Altera software you install. This section contains licensing procedures for the MegaCore IP Library, Nios II Embedded Design Suite, and ModelSim-Altera software.

## MegaCore IP Library

Once you purchase a license for any of the IP cores, you can request a license file from the Licensing section of the Altera website at [www.altera.com/licensing](http://www.altera.com/licensing) and install it on your computer.

If you have already installed a license for an IP core, and then you receive a new license file for a new IP core, you can either append the license file to your existing **license.dat** file, or you can specify the IP core's **license.dat** file in the Quartus II software.

## Nios II Embedded Design Suite

You can create, compile, and generate time-limited FPGA programming files for Nios II hardware systems without obtaining a license file. To generate non-time-limited FPGA programming files and flash programming files, you must obtain a license for the Nios II processor core in addition to the license for the Quartus II software. You do not need a license to develop software using only the Nios II IDE.

## ModelSim-Altera

You can request a ModelSim-Altera license file from the Licensing section of the Altera website at [www.altera.com/licensing](http://www.altera.com/licensing) and install it on your computer.

The ModelSim-Altera software supports licenses using the Mentor Graphics license daemon **mgld**. You can find the **mgld** daemon in the following directories:

- For Solaris Workstations:

*<modelsim-altera installation dir>/sunos5aloem*

*or*

*<Quartus II system directory>/solaris/sunos5aloem* (when installed using the Altera Complete Design Suite for UNIX and Linux DVD-ROM)

- For Linux Workstations:

**<modelsim-altera installation dir>/linuxaloem**

*or*

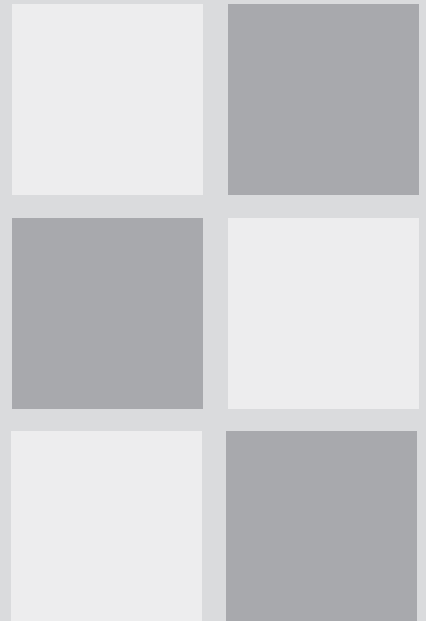
**<Quartus II system directory>/linux/linuxaloem** (when installed using the Altera Complete Design Suite for UNIX and Linux DVD-ROM)

Before starting the ModelSim-Altera software, you must set your ModelSim-Altera `LM_LICENSE_FILE` environment variable to the location and filename of the ModelSim-Altera license file. For example, the ModelSim-Altera `LM_LICENSE_FILE` environment variable should be set to the location and file name of your license file (**<modelsim-altera installation dir>/licenses/eda/license.dat**) or with the port@host notation (**1900@set**). Refer to [“Setting Environment Variables”](#) on page 40.

# Chapter Three

---

## More Configuration Information



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# 3

# Introduction

This section describes how to change additional workstation configuration items including Quartus II general environment variables, Quartus II NativeLink® environment variables, user names, language settings, and fonts.

## Setting Environment Variables

This section describes the environment variables that the Quartus II software uses to configure various options and locate files.

If you are using the C shell, environment variables are located in your `.cshrc` file, and have the following format:

```
setenv <environment variable> <value>
```

If you are using the Bourne or Korn shell, environment variables are located in your `.profile` file, and have the following format:

```
set <environment variable> = <value>
```

## Quartus II General Environment Variables

The Quartus II software installation process initializes the following variables, but you may wish to change them to optimize your system performance.

### QUARTUS\_ROOTDIR

The `QUARTUS_ROOTDIR` variable specifies the name of the Quartus II system directory. The default directory is `/opt/altera/quartus<version number>`. You should change this variable only if the system displays an error message indicating that Quartus II files cannot be found when you start the program.

## MWFONT\_CACHE\_DIR

The `MWFONT_CACHE_DIR` variable specifies the name of the Quartus II font cache directory. The default directory is `/<user's home directory>/mw`.

## QUARTUS\_MWWM

The `QUARTUS_MWWM` variable specifies how the Quartus II software should interact with the system's window manager. By default, the `QUARTUS_MWWM` environment variable is set to `allwm` (except for Linux workstations) and the Quartus II software operates normally with all supported window managers (refer to “[Quartus II Software System Requirements](#)” on page 2 for a list of supported window managers). If you are not using one of the default window managers, make sure you set the `QUARTUS_MWWM` environment variable to `allwm` to allow the Quartus II software to determine the most compatible mode.

## QUARTUS\_64BIT

The `QUARTUS_64BIT` variable specifies the 64-bit version of the Quartus II software. To turn on 64-bit processing in the Quartus II software, set the environment variable to `1` before running the Quartus II software. This variable is supported only in systems with 64-bit processing.

## QUARTUS\_LIBRARY\_PATHS

The `QUARTUS_LIBRARY_PATHS` variable specifies user-defined library paths. You can use this environment variable to define multiple library paths at the same time instead of manually adding each path to the user library individually.

# Quartus II NativeLink Environment Variables

The Quartus II software installation process initializes the following variables, but you must set them to use the NativeLink features of the Quartus II software.

## QUARTUS\_INIT\_PATH

The `QUARTUS_INIT_PATH` variable specifies the path(s) of the EDA tool(s) to be launched from within the Quartus II software. You must set this variable to launch other EDA tools from within the Quartus II software.

## QUARTUS\_INIT\_LIBPATH

The `QUARTUS_INIT_LIBPATH` specifies the `LD_LIBRARY_PATH` variable needed by some EDA tools. You should set this variable to the EDA tool's `LD_LIBRARY_PATH` if the EDA tool requires an `LD_LIBRARY_PATH` variable.

# Other Workstation Configuration Information

This section describes other workstation configuration information, including user names, language settings, fonts, printers, and 64-bit processing:

- If you want to change user names at a workstation using the `su` command, you must type the following command at the command prompt before starting the Quartus II software:

```
su - <username> ↵
```

Changing user names using the `su <username>` command (without the dash) causes the new user to use the environment settings from the previous user, which may cause the Quartus II software to stop responding.

- The Quartus II software does not support UNIX language settings other than English. The `LANG` variable must be set to `C` for the Quartus II software to function correctly.
- By default, generated fonts are saved to the `<user home directory>/.mw` directory; however, having the font cache saved to these directories for each user may cause unnecessary duplication of fonts.

You can avoid this problem by specifying a directory to contain all the generated fonts for the display. To specify this directory, type the following command at the command prompt:

```
setenv MWFONT_CACHE <new directory name> ←
```

- If the Quartus II software stops responding due to an internal error, determine whether any of the following processes are running:

<b>mwrpcss</b>	<b>quartus_sim</b>
<b>quartus</b>	<b>quartus_pow</b>
<b>quartus_map</b>	<b>quartus_stp</b>
<b>quartus_fit</b>	<b>quartus_pgm</b>
<b>quartus_tan</b>	<b>quartus_cpf</b>
<b>quartus_asm</b>	<b>quartus_sh</b>
<b>quartus_drc</b>	<b>quartus_cmd</b>
<b>quartus_cdb</b>	<b>quartus_sta</b>
<b>quartus_eda</b>	

You can determine which processes are running by typing the following command at the command prompt:

```
/usr/bin/ps -ef ←
```

You must then terminate these processes by typing the following command at the command prompt:

```
kill -9 <process ID number> ←
```

- You can use the **mwcleanup** utility to clean up system resources and terminate all MainWin applications by typing the following command at the command prompt:

```
mwcleanup ←
```

- You can enable 64-bit processing by passing the `--64bit` option to the **quartus\_map**, **quartus\_fit**, **quartus\_sta**, **quartus\_tan**, and/or **quartus\_cdb** executables. For example, you can enable 64-bit processing with the **quartus\_map** executable by typing the following at the command prompt:

```
quartus_map --64bit ←
```

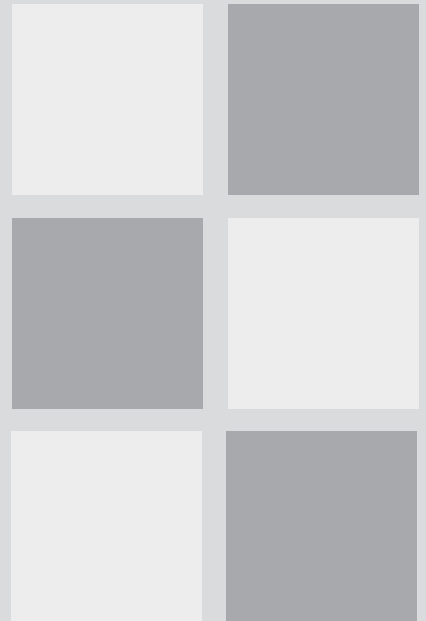
The `--64bit` option is supported in systems with 64-bit processing only.



# Chapter Four

---

## Documentation and Technical Support



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# 4

# Starting the Quartus II Interactive Tutorial

The Quartus II software includes the Flash-based Quartus II Interactive Tutorial. The modules of this tutorial teach you how to use the basic features of the Quartus II design software, including design entry, compilation, timing analysis, simulation, programming, and advanced topics.

This tutorial includes audio and Flash animation components. For best results, use the tutorial on a system that includes a sound card, speakers, and at least 1024x768 display resolution.

To start the Quartus II tutorial after you have successfully installed the Quartus II software:


- ✓ On the Help menu, click **Tutorial**.

Once you start the tutorial, you can jump immediately to any tutorial module by clicking **Contents**. Once you select a tutorial module, you can click **ShowMe**, **GuideMe**, or **TestMe** at any time to jump directly to the tutorial mode that best suits your learning style.

Your system must meet the requirements described in the [“Quartus II Software System Requirements” on page 2](#) to run the tutorial.

## Using Quartus II Help

The Quartus II software includes a platform-independent Help system that provides comprehensive documentation for the Quartus II software and more details about the specific messages generated by the Quartus II software. You can view Help in one of the following ways:

- Press F1 from a highlighted menu command or active dialog box for context-sensitive Help.
- Press Shift+F1 or click **Context-Sensitive Help**  on the toolbar. The pointer turns into a Help pointer. You can then point to a menu command or active window and click for context-sensitive Help.
- On the Help menu, click any of the following commands:
  - **Index**: The Index lets you search for and display all Help topics related to a keyword or phrase.

- **Search:** The Search finds a maximum of 500 topics containing the search keyword.
- **Contents:** The Contents outlines the design flow and groups related topics into folders, but does not list all the topics in Quartus II Help.
- **Messages:** The Messages list provides an alphabetical list of all messages and offers detailed Help on each message. To view Help on an individual message, in the Messages window, right-click the message on which you want to receive Help, and then click **Help**.
- **Glossary:** The Glossary list provides definitions to key terminology in the Quartus II software.



For Information About	Refer To
Using Quartus II Help	“Help Menu Commands” in Quartus II Help
	“Using Quartus II Help Effectively” in Quartus II Help

## Contacting Altera

You can contact Altera for technical support and product information.

**Table 1. Quartus II Technical Support Resources**

Resource	Description
<b>Altera website:</b>	<b>www.altera.com</b>
<b>mySupport website:</b>	<b>www.altera.com/mysupport</b>
	Or, on the Help menu, point to <b>Altera on the Web</b> , and then click <b>Quartus II Service Request</b> in the Quartus II software. This website allows you to submit, view, and update technical support service requests.
<b>Telephone:</b>	(800) 800-EPLD (7:00 a.m. to 5:00 p.m. Pacific time, M–F) You will need your 6-digit Altera ID to access the hotline.
	(408) 544-8767 (7:00 a.m. to 5:00 p.m. Pacific time, M–F)



### Registering for an Altera.com Account

In order to use the mySupport website to view and submit service requests, you must also register for an Altera.com account. An Altera.com account is required only for using the mySupport website; however, having an Altera.com account will also make it easier for you to use many other Altera website features, such as the Download Center, Licensing Center, Altera Technical Training online class registration, or Buy On-Line-Altera eStore features. For more information, refer to “Registering for an Altera.com Account” on page 36 in Chapter 2, “Licensing the Quartus II Software.”

## Product Information

If you need the latest Altera product information or literature, go to the Literature section of the Altera website at [www.altera.com/literature](http://www.altera.com/literature).

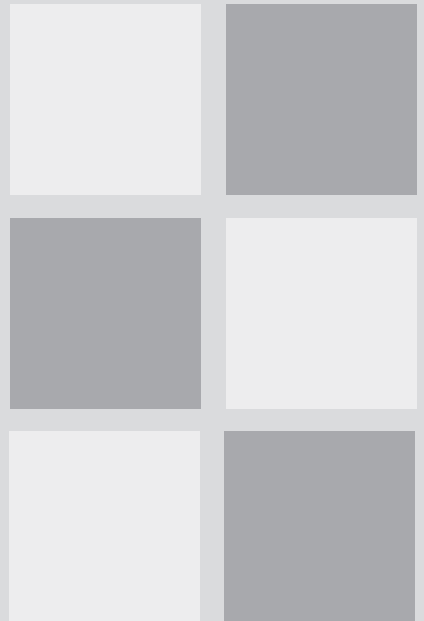


For Information About	Refer To
Altera technical support services	The Contact Altera section of the Altera website

# Appendix A

---

## Quartus II Software File Organization



# A

### What's in Appendix A:

Quartus II Software and Related  
Software File Organization

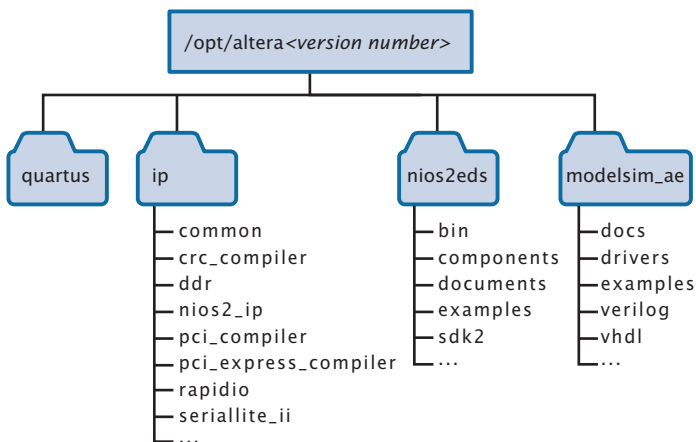
# Quartus II Software and Related Software File Organization

During the Quartus II software and related software installation, one top-level directory is created:

The `/opt/altera<version number>` directory (the main directory where the Quartus II software files are installed) contains system software and data files and includes the subdirectories shown in Figures 1 and 2.

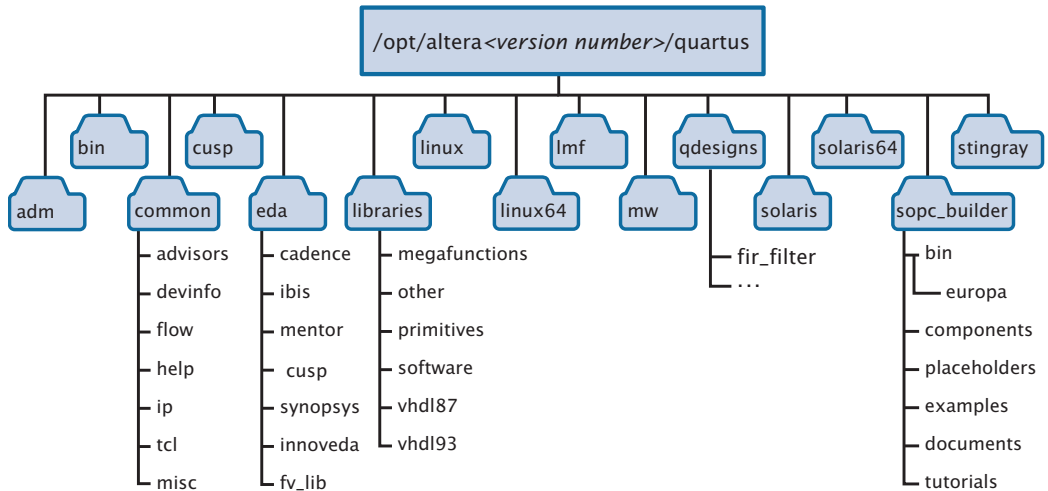
The `/opt/altera<version number>` directory includes the subdirectories listed and data files shown in Figure 1.

**Figure 1. Altera Software System Directory (`/opt/altera <version number>`)**



The `/opt/altera<version number>/quartus` directory includes the subdirectories and data files shown in [Figure 2](#).

**Figure 2. Quartus II Software System Directory (`/opt/altera <version number>/quartus`)**



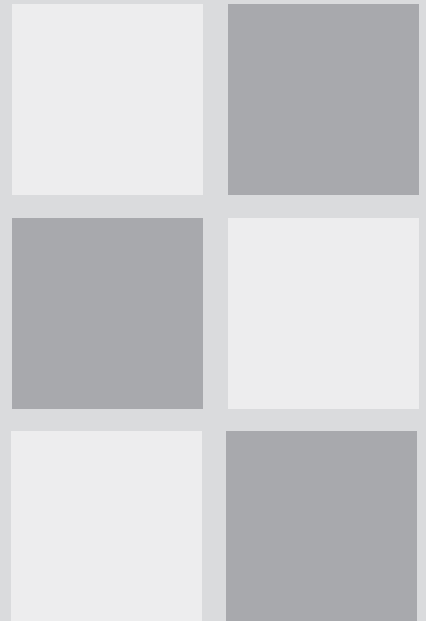


# Appendix

# B

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## Mounting and Unmounting DVD-ROMs



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# B

# Introduction

This appendix describes how to mount and unmount the Altera Complete Design Suite DVD-ROM on UNIX and Linux workstations.

## Mounting and Unmounting DVD-ROMs on Solaris Workstations



### Before You Mount a DVD-ROM

You must have superuser or “root” privileges to mount and unmount the DVD-ROM drive. If you are running Volume Manager, the DVD-ROM drive is mounted and unmounted automatically as **/dvdrom/dvdrom0** (you do not need to have root privileges to mount a DVD-ROM with the Volume Manager), and you do not need to perform the mounting and unmounting procedures.

To mount a DVD-ROM on a Solaris workstation, follow these steps:

1. Specify the directory where you want to mount the DVD-ROM drive. The DVD-ROM drive is usually placed in the top-level directory. To access this directory, type the following command at the command prompt:

```
dvd/ ←
```

2. To create the **/dvdrom/dvdrom0** directory, type the following command at the command prompt:

```
mkdir /dvdrom/dvdrom0 ←
```

3. If you have not already done so, insert the DVD-ROM into your DVD-ROM drive.

4. To mount the DVD-ROM drive, type the following command at the command prompt:

```
/sbin/mount -F hsfs -o ro /dev/dsk/  
<device name of DVD-ROM> /dvdrom/dvdrom0 ←
```

If you have previously mounted and unmounted this DVD-ROM, a number may be appended to the device name of the DVD-ROM, in which case you should use the complete name and number for *<device name of DVD-ROM>*. For example, if the device name appears as `model:sim`, use that name.

To unmount a DVD-ROM on a Solaris workstation, follow this step:

- ✓ To unmount the DVD-ROM drive, type the following command at the command prompt:

```
/sbin/umount /dvdrom/dvdrom0 ↵
```

To successfully unmount the DVD-ROM drive, you must make sure no one is accessing the directory structure at or below the **dvdrom** directory. If another user is using the DVD-ROM drive, you may receive the following message:

```
umount: cannot unmount /dvdrom/dvdrom0: Device busy
```

To determine whether you are accessing the DVD-ROM drive yourself, type the following command at the command prompt:

```
pwd ↵
```

You should see the `/` prompt on your screen. If you do not, you should type `dvd/ ↵` again.

## Mounting and Unmounting DVD-ROMs on Linux Workstations



### Before You Mount a DVD-ROM

You must have superuser or “root” privileges to mount and unmount the DVD-ROM drive. If you are logged in on a console, you do not need to have root privileges to mount a DVD-ROM.

To mount a DVD-ROM on a Linux workstation, follow these steps:

1. If the `/mnt/dvdrom` directory does not exist, type the following command at the command prompt:

```
mkdir /mnt/dvdrom ↵
```

2. If you have not already done so, insert the DVD-ROM into your DVD-ROM drive.
3. To mount the DVD-ROM drive, type the following command at the command prompt:

```
/bin/mount /mnt/dvdrom ↵
```

If you have previously mounted and unmounted this DVD-ROM, a number may be appended to the device name of the DVD-ROM, in which case you should use the complete name and number for *<device name of DVD-ROM>*. For example, if the device name appears as `modelsim`, use that name.

To unmount a DVD-ROM on a Linux workstation, follow this step:

- ✓ To unmount the DVD-ROM drive, type the following command at the command prompt:

```
/bin/umount /mnt/dvdrom ↵
```

To successfully unmount the DVD-ROM drive, you must make sure that no one is accessing the directory structure at or below the `dvdrom` directory. If another user is using the DVD-ROM drive, you may receive the following message:

```
umount:/mnt/dvdrom : Device busy
```

To determine whether you are accessing the DVD-ROM drive yourself, type the following command at the command prompt:

```
pwd ↵
```

You should see the `/` prompt on your screen. If you do not, you should type `dvd/ ↵` again.

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# Notes

# Notes



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