Quartus® II

Programmable Logic Development System

Installation & Licensing for UNIX Workstations

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Documentation Conventions

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

Terminology

The following terminology is used throughout the *Quartus II Installation & Licensing for UNIX Workstations* manual:

Term:	Meaning:
"click"	Indicates a quick press and release of the left mouse button.
"double-click"	Indicates two clicks in rapid succession.
"choose"	Indicates that you need to use a mouse or key combination to start an action.
"select"	Indicates that you need to 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 **Chain Description File**, and click **OK**.
"turn on"/"turn off"	Indicates that you must click a check box to turn a function on or off.

Typographic Conventions

Quartus II documentation uses the following typographic conventions:

Visual Cue:	Meaning:
Bold Initial Capitals	Command names, dialog box titles, and button names are shown in bold, with initial capital letters. For example: **Find Text** command, **Save As** dialog box, and **Start** button.

Visual Cue:	Meaning:
bold	Directory names, project names, disk drive names, file names, file name extensions, software utility names, tab names, and options in dialog boxes are shown in bold. Examples: **quartus** directory, **d:** drive, **license.dat** file.
Initial Capitals	Keyboard keys, user-editable application window fields, and menu names are shown with initial capital letters. For example: Delete key, 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.
Italic Initial Capitals	Help categories, manual titles, section titles in manuals, and application note and brief names are shown in italics with initial capital letters. For example: *FLEXlm End User Manual*.
italics	Variables are enclosed in angle brackets (< >) and shown in italics. For example: *<file name>*, *<CD-ROM drive>*.
`Courier font`	Anything that must be typed exactly as it appears is shown in Courier. For example: `/quartus/qdesigns/fir_filter`.
■	Bullets are used in a list of items when the sequence of the items is not important.
✓	The checkmark indicates a procedure that consists of one step only.
☞	The hand points to information that requires special attention.
👣	The feet show you where to go for more information on a particular topic.
↵	Enter or return key.

Installing the Quartus II Software

This section describes the requirements and procedures for installing the Altera® Quartus® II software on Sun Ultra workstations running Solaris version 2.6, 7, or 8, or on HP 9000 Series 700/800 workstations running HP-UX version 10.2 or 11.0.

System Requirements

Your system must meet the following minimum requirements:

- One of the following workstations:
  - Sun Ultra workstation running Solaris version 2.6, 7, or 8
  - HP 9000 Series 700/800 workstation running HP-UX version 10.2 with Additional Core Enhancements (ACE) dated December, 1999 or later
  - HP 9000 Series 700/800 workstation running HP-UX version 11.0 with ACE dated November, 1999 or later
- ISO 9660–compatible CD-ROM drive
- Color monitor
- Serial port for use with the MasterBlaster™ communications cable
- A valid X-Windows display, which is required when running the Quartus II software
- A web browser with an Internet connection, which is required to enable the Quartus II software Internet connectivity features

☞ Refer to the **readme.txt** file, which is located in the top-level directory of the Quartus II Programmable Logic Development Software for UNIX Workstations CD-ROM, for specific information about disk space, memory, and web browser requirements for the current version of the Quartus II software. After installation, the **readme.txt** file is available from the Quartus II Help menu and in the **/usr/quartus** directory.

In addition, the most current version of the *Quartus II Installation & Licensing for UNIX Workstations* manual is available in Adobe Portable Document Format (PDF) from the

Altera web site at **http://www.altera.com** and the Quartus II support web site at **https://websupport.altera.com**, and may contain updated information about system requirements.

Uninstalling Previous Versions of the Quartus & ObjectStore Software

If you have installed a previous version of the Quartus® software, Altera recommends that you uninstall that software before installing the new version of the software. However, it is not necessary to uninstall it.

To uninstall a previous version of the Quartus software:

✓ Delete the **quartus** directory.

If you installed a version of the Quartus software prior to version 2000.09, you also installed the ObjectStore database software. This software is no longer required for use with the Quartus II software, so you can delete it if you want to make more disk space available. However, if you want to use a version of the Quartus software prior to version 2000.09, do not uninstall the ObjectStore software.

☞ The ObjectStore software was provided only with versions of the Quartus software prior to version 2000.09, and not the Quartus II software.

To uninstall the ObjectStore database software from a workstation running Solaris version 2.6, 7, or 8, follow these steps:

1. Remove **ostore*** from the **tmp** directory.

2. Remove all symbolic links that match `libos*` from the **/usr/lib** directory.

3. Remove the **S80ostore4** and **K80ostore4** files from the **/etc/rc2.d** directory.

To uninstall the ObjectStore database software from a workstation running HP-UX version 10.2 or 11.0, follow these steps:

1.   Remove **ostore*** from the **tmp** directory.

2.   Remove all symbolic links that match `libos`* from the **/usr/lib** directory.

3.   Remove the **S900ostore** file from the **/sbin/rc2.d** directory.

The Quartus II Installation Script

The Quartus II software installation script installs the Quartus II software.

These installation instructions assume the following conditions:

■   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 enter directory names, file names, and file name extensions exactly as shown.
■   The default CD-ROM directory is **/cdrom/cdrom0**. If you use a different CD-ROM directory, substitute the appropriate name in the installation steps.
■   By default, the Quartus II software is installed in the **/usr/quartus** directory. The installation procedure creates this directory, if it does not already exist. If you use a different directory name, substitute the appropriate name in the installation steps.
■   Your workstation must have drivers capable of supporting an ISO 9660 CD-ROM drive.
■   If necessary, you can rerun the Install script to install additional components of the software.

Mounting the CD-ROM Drive & Installing the Quartus II Software (Solaris Only)

To run the Quartus II software on a Sun Solaris workstation, you must first mount the CD-ROM drive and then install the Quartus II Programmable Logic Development Software for UNIX Workstations (Solaris only) CD-ROM.

After you have installed the Quartus II Programmable Logic Development Software for UNIX Workstations CD-ROM, you must unmount the CD-ROM drive and remount it with the Quartus II Device Information for UNIX Workstations CD-ROM, which contains support for Altera devices. You should then install the Quartus II Device Information for UNIX Workstations CD-ROM and unmount the CD-ROM drive again.

To mount the CD-ROM drive and install the Quartus II software and device information, follow these steps:

☞ You must have superuser or "root" privileges to mount and unmount the CD-ROM drive. If you are running Volume Manager, the CD-ROM drive is mounted and unmounted automatically as **/cdrom/cdrom0**, and you do not need to perform steps 1-6 for mounting and unmounting the CD-ROM drive.

1. Specify a directory on which to mount the CD-ROM drive. The CD-ROM drive is usually placed in the top-level directory. To access this directory, type the following command at the command prompt:

   `cd /` ↵

2. To create the **/cdrom/cdrom0** directory, type the following command at the command prompt:

   `mkdir /cdrom/cdrom0` ↵

3. Insert the Quartus II Programmable Logic Development Software for UNIX Workstations (Solaris only) CD-ROM into your CD-ROM drive.

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

   `/sbin/mount -F hsfs -o ro /dev/dsk/<`*device name of CD-ROM*`> /cdrom/cdrom0` ↵

5. To install the Quartus II software, type the following command at the command prompt:

   `/cdrom/cdrom0/install` ↵

   You are guided through the installation procedure. If necessary, you can rerun the Install script to install additional components of the software.

6.   To unmount the CD-ROM drive, type the following command at the command prompt:

```
/sbin/umount /cdrom/cdrom0 ↵
```

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

```
unmount: cannot unmount /cdrom/cdrom0: Device busy
```

To determine whether you are accessing the CD-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 `cd /` again.

7.   Insert the Quartus II Device Information for UNIX Workstations CD-ROM into your CD-ROM drive.

8.   Repeat steps 1-6 to mount and install the Quartus II device information and unmount the CD-ROM drive.

☞   You must install support for the EP20K100 device if you want to run the Quartus II tutorial.

Mounting the CD-ROM Drive & Installing the Quartus II Software (HP-UX Only)

To run the Quartus II software on an HP-UX workstation, you must first mount the CD-ROM drive and then install the appropriate Quartus II Programmable Logic Development Software for UNIX Workstations CD-ROM for your operating system:

■   HP-UX 10.2
■   HP-UX 11.0

After you have installed the Quartus II Programmable Logic Development Software for UNIX Workstations CD-ROM, you must unmount the CD-ROM drive and remount it with the Quartus II Device Information for UNIX Workstations CD-ROM, which contains support for Altera devices. You should then install the Quartus II Device Information for UNIX Workstations CD-ROM and unmount the CD-ROM drive again. You must have superuser or "root" privileges to mount and unmount the CD-ROM drive.

To mount the CD-ROM drive and install the Quartus II software and device information, follow these steps:

1. Specify a directory on which to mount the CD-ROM drive. The CD-ROM drive is usually placed in the top-level directory. To access this directory, type the following command at the command prompt:

    `cd / ↵`

2. Find the device ID for the CD-ROM drive so you can mount the correct device. To view a list of the possible device IDs, type the following command at the command prompt:

    `/usr/sbin/ioscan -fn -C disk ↵`

    Figure 1 shows sample output from this command, including sample device IDs.

Figure 1. Sample Device ID Output from ioscan Command

CD-ROM ID code

```
disk   0  10/0/14/0.0.0   sdisk CLAIMED
   DEVICE    TEAC    CD-532E-B CDROM  /dev/dsk/c0t0d0   /dev/rdsk/c0t0d0

disk   1  10/0/15/1.5.0   sdisk CLAIMED
   DEVICE    QUANTUM ATLAS10K-18LVD   /dev/dsk/c3t5d0   /dev/rdsk/c3t5d0

disk   2  10/0/15/1.6.0   sdisk CLAIMED
   DEVICE    QUANTUM ATLAS10K-18LVD   /dev/dsk/c3t6d0   /dev/rdsk/c3t6d0
```

The `-fn` option allows the `ioscan` command to show an extended information set, and the `-C` option filters the output to show only I/Os of disk type.

3. To create the **cdrom** directory, type the following command at the command prompt:

```
mkdir /cdrom ↵
```

4. Insert the appropriate Quartus II Programmable Logic Development Software for UNIX Workstations CD-ROM (either HP-UX 10.2 or HP-UX 11.0) into your CD-ROM drive.

5. To mount the CD-ROM drive, type the following command at the command prompt:

```
/sbin/mount -o cdcase /dev/dsk/<device name of CD-ROM>
      /cdrom ↵
```

The `-o cdcase` option creates lowercase file names in the CD file system. This command is followed by the device ID, and the directory on which you are mounting the CD-ROM drive.

6. To install the Quartus II software, type the following command at the command prompt:

```
/cdrom/install ↵
```

You are guided through the installation procedure. If necessary, you can rerun the Install script to install additional components of the software.

7. To unmount the CD-ROM drive, type the following command at the command prompt:

```
/sbin/umount /cdrom ↵
```

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

```
unmount: cannot unmount /cdrom : Device busy
```

To determine whether you are accessing the CD-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 `cd /` again.

8. Insert the Quartus II Device Information for UNIX Workstations CD-ROM into your CD-ROM drive.

9. Repeat steps 1-7 to mount and install the Quartus II device information and unmount the CD-ROM drive.

☞ You must install support for the EP20K100 device if you want to run the Quartus II tutorial.

Setting Up Licensing for the Quartus II Software

This section describes how to set up licensing for the Quartus II software. To set up your license for the Quartus II software, you must perform the following steps, each of which are described in more detail in this section:

1. If necessary, obtain a license file. The Quartus II software requires a **license.dat** license file for each server that supports a multiuser network 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. Set up and configure the FLEXlm license manager server for a UNIX workstation.

3. Start the Quartus II software for the first time.

4. Specify the location of the license file.

5. Specify a web browser.

6. If necessary, register additional Quartus II users.

Obtaining a License File

You can obtain an ASCII license file, **license.dat**, from the Quartus II support web site at **https://websupport.altera.com** if you have the following information:

■   Your Altera ID, which is a six-digit number that is provided when you purchase the Quartus II development system. This number can be found on the packing list that is shipped with the Quartus II software.

■ Your serial number, which is printed on the side of the Quartus II software shipping box, and on the *Registration & License File Request Form*, which is also included with the Quartus II software package. This number begins with the letter G, and is followed by five digits (G*xxxxx*).

■ The host ID number, for UNIX network license servers. To find your UNIX network license server host ID by using FLEXlm utilities, type the following command at a command prompt (where *<operating system>* represents `hp` or `solaris`):

`/usr/quartus/<operating system>/lmutil lmhostid` ↵

For information about additional methods of finding your host ID number, refer to the Solutions Database, which is available from the Support section of the Altera web site at **http://www.altera.com**. For complete information about using the FLEXlm utilities, you should refer to the *FLEXlm End User Manual*, which is available at **http://www.globetrotter.com/manual.htm**.

To obtain a license file, follow these steps:

1. Point your web browser to the Quartus II support web site at **https://websupport.altera.com**.

2. Click the **License Request** icon.

3. Enter the requested information on the "License File Request" forms.

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

4. When you receive the license file text, save it with the file name **license.dat** in the **/usr/local/flexlm/licenses** directory.

   ☞ If you plan to use any of the Altera-provided synthesis and simulation software tools included with Altera software subscriptions, such as the Exemplar Logic® LeonardoSpectrum™-Altera synthesis software, the Model Technology™ ModelSim® -Altera synthesis software, or the Synopsys® FPGA *Express*™ synthesis software, you must obtain a license file by pointing your web browser to the Altera web site at

http://www.altera.com, clicking the **Licensing** icon, and specifying the requested information, rather than requesting the license file from the Quartus II support web site.

Figure 2 shows a sample network license file for a UNIX workstation that functions as a single license server.

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


```
SERVER alice 807f1034 1800
VENDOR alterad "/usr/quartus/solaris/alterad"
USE_SERVER
FEATURE altera_mainwin alterad 2001.01 permanent 5 4432968595AB
FEATURE quartus alterad 2001.01 permanent 5 7A496D25A602
```

If you are using the Quartus II software with a node-locked (single-user) license, skip to "Starting the Quartus II Software for the First Time" on page 19.

Obtaining a Redundant Server License File

The FLEXlm licensing scheme allows you to set up three redundant license servers to serve a multiuser license. You can obtain a license file to support three redundant license servers by performing the steps described in "Obtaining a License File" on page 11. Figure 3 on page 14 shows a sample redundant server license file.

Figure 3. Sample Redundant Server License File

```
         Server      Server ID   Port
         name        number      number


SERVER alice 807f1043 1800
SERVER king 807f1042 1800
SERVER queen 807f1041 1800
VENDOR alterad "/usr/quartus/solaris/alterad"
USE_SERVER
FEATURE altera_mainwin alterad 2001.01 permanent 5 4432968595AB
FEATURE quartus alterad 2001.01 permanent 5 7A496B23A403



          Feature    Daemon   Version  Expiration  Number of   Authorization
          name       name              date        licenses    code
                                                   requested
```

For additional information about setting up and administering license servers, including setting up three redundant license servers, refer to the *FLEXlm End User Manual*, which is available at **http://www.globetrotter.com/manual.htm**.

Specifying an Optional Port Number

System administrators can specify a port number in the **license.dat** file to be used by the license server and client workstations. If a port number is not specified in the **license.dat** file, the FLEXlm utility automatically uses the next available port number in the range 27000 to 27009. However, to prevent port number conflicts, you can specify a port number. If three redundant license servers are being used, you must specify a port number. For more information about redundant license servers, see "Obtaining a Redundant Server License File" on page 13.

Choose a port number greater than 1024, because port numbers less than 1024 are privileged port numbers on UNIX servers. See "Setting Up a License Server" on page 15 for more information about setting up a UNIX license server.

Setting Up a License Server

This section provides instructions for configuring network licensing for the Quartus II software on Sun Ultra workstations running Solaris 2.6, 7, or 8, HP 9000 Series 700/800 workstations running HP-UX version 10.2 with ACE dated December, 1999 or later, or HP 9000 Series 700/800 workstations running HP-UX version 11.0 dated November, 1999 or later.

Configuring an Existing UNIX Workstation License Server

The Quartus II software uses the FLEXlm software to administer licensing for single users or for 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, you can add, by copying and pasting, 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 2 on page 13.

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 the **readme.txt** file, which is located in the top-level directory of the Quartus II Programmable Logic Development Software for UNIX Workstations CD-ROM, to verify that you are using the latest supported version of the FLEXlm license software.

☞ 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 Workstation License Server" on page 17.

Rereading Your License File on a Solaris License Server

To reread your license file on a Solaris license server:

✓ Type the following command at a command prompt:

`/usr/quartus/solaris/lmutil lmreread` ↵

or

✓ Restart the license server.

Rereading Your License File on an HP-UX License Server

To reread your license file on an HP-UX license server:

✓ Type the following command at a command prompt:

`/usr/quartus/hp/lmutil lmreread` ↵

or

✓ Restart the license server.

For complete information about using the FLEXlm utilities to administer and troubleshoot the FLEXlm License Manager software, refer to the *FLEXlm End User Manual*, which is available at **http://www.globetrotter.com/manual.htm**.

Configuring a New UNIX Workstation License Server

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

☞ 1. If you have an existing FLEXlm license server, refer to "Configuring an Existing UNIX Workstation License Server" on page 15.

2. 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.

Configuring a New Solaris License Server

To configure a new Solaris license server:

✓ Type the following command at a command prompt:

```
/usr/quartus/solaris/lmgrd -c /usr/local/flexlm/
     licenses/license.dat ↵
```

Configuring a New HP-UX License Server

To configure a new HP-UX license server:

✓ Type the following command at a command prompt:

```
/usr/quartus/hp/lmgrd -c /usr/local/flexlm/
     licenses/license.dat ↵
```

For more specific information about configuring a new UNIX workstation license server, refer to the **readme.txt** file, which is located in the top-level directory of the Quartus II Programmable Logic Development Software for UNIX Workstations CD-ROM. For additional information about setting up

and administering license servers, including setting up three redundant license servers, refer to the *FLEXlm End User Manual*, which is available at **http://www.globetrotter.com/manual.htm**.

Installing the FLEXlm Software on Another License Server

You can install the FLEXlm software on an additional Solaris or HP-UX license server.

Installing the FLEXlm Software on Another Solaris License Server

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

1.   Create a directory named **/usr/quartus/solaris** on the additional license server.

2.   Copy the following files from the **/usr/quartus/solaris** directory of your original Quartus II software into the new **/usr/quartus/solaris** directory:

     lmgrd
     lmutil
     alterad

Installing the FLEXlm Software on Another HP-UX License Server

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

1.   Create a directory named **/usr/quartus/hp** on the additional license server.

2. Copy the following files from the **/usr/quartus/hp** directory of your original Quartus II software into the new **/usr/quartus/hp** directory:

lmgrd
lmutil
alterad

Starting the Quartus II Software for the First Time

After you have installed the Quartus II software and set up the license server, you can start the Quartus II software. You must follow a few preliminary steps for each workstation and each user before starting the Quartus II software for the first time.

Configuring Each UNIX Workstation (Solaris Only)

To configure each Sun Solaris UNIX workstation that will run the Quartus II software before starting the Quartus II software for the first time:

☞ You must have superuser or "root" privileges to perform this step.

✓ Make sure that each workstation has the runtime patches that are required to run the Quartus II software on a Solaris 2.6 or 7 UNIX workstation. (Solaris 8 UNIX workstations do not require any runtime patches to run the Quartus II software.) The last two numbers of the patches represent the version number and can be substituted with a more recent version number. Refer to Table 1 or Table 2 on page 20 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 web site at **http://sunsolve.sun.com**. Altera recommends checking the Solutions Database, which is available from the Support section of the Altera web site at **http://www.altera.com** for late-breaking information on required and optional operating system patches. In addition, the latest version of the *Quartus II Installation & Licensing for UNIX Workstations* manual, which is available in Adobe Portable Document Format (PDF) from the Altera web site, may contain updated information on patches.

Table 1 and Table 2 list the runtime patches for Solaris 2.6 and 7.

Table 1. Solaris 2.6 Runtime Patches

Runtime Patches	Description	Reason for Patch
105181-16	SunOS 5.6: kernel update patch	Fixes kernel thread problems
105633-32	Xsun patch	Xserver not thread safe
Note: If you are unable to install these runtime patches, the Quartus II software still functions, but online Help will not be available and the graphical user interface performance and general stability may be affected.		

Table 2. Solaris 7 Runtime Patches

Runtime Patches	Description	Reason for Patch
Either 108376-01 or 107078-18	OpenWindows 3.6.1: Xsun patch	Xserver not thread safe
Note: If you are unable to install this runtime patch, the Quartus II software still functions, but online Help will not be available and the graphical user interface performance and general stability may be affected.		

In addition to the runtime patches, you should install the appropriate graphics card patch for your system, as shown in Table 3 and Table 4.

Table 3. Solaris 2.6 Graphics Card Patches

Patches	Description	Reason for Patch
105362-24	PGX 2.6: M64 graphics patch	M64 graphics card
105363-24 and 105361-10	Elite3D 2.6: AFB graphics patch	Elite3D graphics card
105492-02	SunOS 5.7: Cgsix graphics patch	Cgsix graphics card
105360-28 and 105361-10	Creator 2.6: FFB graphics patch	Creator graphics card
106391-01	TCX 2.6: graphics patch	TCX graphics card
Note: If you do not install the appropriate graphics card patch, the Quartus II software still functions, but may have user interface problems; for example, fonts may not display correctly.		

Table 4. Solaris 7 Graphics Card Patches

Patches	Description	Reason for Patch
106144-12	SunOS 5.7: Elite3D AFB graphics patch	Elite3D graphics card
106145-12	SunOS 5.7: Creator 7 FFB graphics patch	Creator graphics card
106146-10	SunOS 5.7: M64 graphics patch	M64 graphics card
107851-01	SunOS 5.7: Raptor GFX graphics patch	Raptor GFX graphics card
107716-12	SunOS 5.7: PGX32 graphics patch	PGX32 graphics card
Note: If you do not install the appropriate graphics card patch, the Quartus II software still functions, but may have user interface problems; for example, fonts may not display correctly.		

Configuring Each UNIX Workstation (HP-UX Only)

For each HP-UX UNIX workstation that will run the Quartus II software, follow these steps before starting the Quartus II software for the first time:

☞ You must have superuser or "root" privileges to perform the following steps.

1. Make sure that each workstation has the runtime patches that are required to run the Quartus II software on an HP-UX 10.2 or 11.0 UNIX workstation. Each patch may be listed under one of several possible names (for example, PHCO_19434 or PHCO_17187). Refer to Table 5 and to Table 6 on page 23 for a list of required patches and descriptions. To determine which patch is installed on your system, type the following command at the command prompt:

   `/usr/sbin/swlist -v | grep` *<patch name and number>* ↵

   If one of the patches in each set of required patches is not installed on your system, you must download the appropriate replacement patch:

   a. Back up your UNIX workstation before installing a patch.

   b. Download the patch from the Hewlett-Packard support web site at **http://us-support.external.hp.com**.

   c. Copy the patch to the **tmp** directory.

   d. Type the following commands from the **tmp** directory:

      `cd /tmp` ↵
      `sh` *<patch name and number>* ↵

   e. To start the SD Install program, type the following command:

      `swinstall` ↵

   f. Select the path to the patch.

   g. To install the patch, choose **Install** (Actions menu).

   ☞ Altera recommends visiting the Solutions Database, which is available from the Support section of the Altera web site at **http://www.altera.com** for late-breaking information on required operating system patches. In addition, the latest version of the *Quartus II Installation & Licensing for*

UNIX Workstations manual, which is available in Adobe Portable Document Format (PDF) from the Altera web site, may contain updated information on patches.

Table 5 and Table 6 list the required runtime patches for HP-UX 10.2 and 11.0.

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Table 5. HP-UX 10.2 Runtime Patches

Runtime Patches	Description	Reason for Patch
Either PHCO_19434 or PHCO_17187	s700_800 10.2 csh(1) cumulative patch	Fixes crash of csh exit of Mainwin
PHSS_22603 or PHSS_17159	s700_800 10.2 Xserver cumulative patch	Fixes X server crash with multiple-rectangle
PHSS_22354 or PHSS_17872 *(1)*	s700_800 10. X HP aC++ runtime libraries (aCC A.01.21)	Runtime for compiler A.01.21
PHSS_19739	s700_800 10.2 HP DCE/9000 1.5 cumulative patch	Problems with threads
Note (1): This patch is automatically included when you are using HP-UX 10.2 with Addtional Core Enhancements (ACE) dated December, 1999 or later.		

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Table 6. HP-UX 11.0 Runtime Patches

Runtime Patches	Description	Reason for Patch
Either PHSS_22514 or PHSS_21947 or PHSS_19866 *(1)*	s700_800 11.00 Id(1) and linker tools cumulative patch	Linker patch
Note (1): This patch is automatically included when you are using HP-UX 11.0 with Addtional Core Enhancements (ACE) dated November, 1999 or later.		

2.   Check to see whether the system's kernel configuration meets the minimum system requirements to run the Quartus II software:

a.   Back up your UNIX workstation before modifying your kernel configuration.

b. Type the following command at the command prompt:

    ```
    sam ↵
    ```

c. In the **SAM Areas** folder, double-click the **Kernel Configuration** icon.

d. In the **Kernel Configuration** folder, double-click the **Configurable Parameters** icon.

e. Choose **Apply Tuned Parameter Set** (Actions menu). The **Tuned Kernel Parameter Sets** dialog box appears.

f. In the **Select a Tuned Parameter Set** list, select the appropriate default parameter for your operating system:

    ✓   If you are using HP-UX 10.2, select **Enhanced Technical Workstation Parameters.**

    or

    ✓   If you are using HP-UX 11.0, select **CAE/ME/General Eng. Workstation 64-Bit Kernel**.

g. Click **OK**.

h. In the **Configurable Parameters** list in the **Kernel Configuration** dialog box, scroll to view the configuration parameters and change them to the recommended settings, if necessary:

    ✓   If you are using HP-UX 10.2, check the configuration parameters listed below to make sure that the values shown in the **Current Values** column in the **Kernel Configuration** dialog box are greater than or equal to the recommended values listed below. If they are not, change the values to the recommended values.

HP-UX 10.2 Parameter:	Recommended Value:
eqmemsize	4500
maxswapchunks	2048
ninode	1500

or

✓ If you are using HP-UX 11.0, check the configuration parameters listed below to make sure that the values shown in the **Current Values** column in the **Kernel Configuration** dialog box are greater than or equal to the recommended values listed below. If they are not, change the values to the recommended values.

HP-UX 11.0 Parameter:	Recommended Value:
semmnu	1000
semume	100

i. To close the **Configurable Parameters** list, choose **Exit** (File menu). The **Create a New Kernel** dialog box appears.

j. Click **Create New Kernel Now**.

k. Click **OK**. The system creates a new kernel, and then restarts.

☞ If you receive an error message pertaining to `sem_lock` or `sem_unlock`, you must increase the `semmnu` parameter to a value larger than `1000` and the `semume` parameter to a value larger than `100`.

Configuring Each Quartus II User's Environment (Solaris & HP-UX)

Make sure that the following steps have been performed 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 **/usr/quartus/bin** directory. To update the `PATH` environment variable, type the following command at a command prompt:

```
setenv PATH $PATH:/usr/quartus/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 each workstation and each user, you can start the Quartus II software by typing the following command at a command prompt:

```
quartus ↵
```

In order to use the Quartus II software, you must follow the guidelines in "Specifying the License File," next, and "Specifying a Web Browser" on page 30.

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 using the Quartus II software
■ Specify the license file using the **.cshrc** file on client workstations

☞ If you are using any of the Altera-provided synthesis and simulation software tools included with Altera software subscriptions, such as the Exemplar Logic LeonardoSpectrum-Altera synthesis software, the Model Technology ModelSim-Altera synthesis software, or the Synopsys FPGA *Express* synthesis software, and/or you are using the MAX+PLUS II software, you should specify the license file with the **.cshrc** file.

Altera Corporation

Specifying the License File Using 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 for the First Time" on page 19.

2. Choose **License Setup** (Tools menu). Figure 4 on page 28 shows the **License Setup** tab of the **Options** dialog box.

3. In the **License file** box, specify the full path name of the **license.dat** file. You can click **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 on which the license file is stored and *<port>* is the port listed in the **license.dat** file. See Figure 2 on page 13 for a sample network license file to determine your port and server name, and refer to "Specifying an Optional Port Number" on page 14 for more information about port numbers. If there is no port listed in the **license.dat** file, you can simply specify @*<host>*.

   ☞ 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
   ```

4. Click **OK**.

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

Figure 4. License Setup Tab of the Options Dialog Box

License type *License file location* *Host ID* *Licensed AMPP/ MegaCore functions*

System information
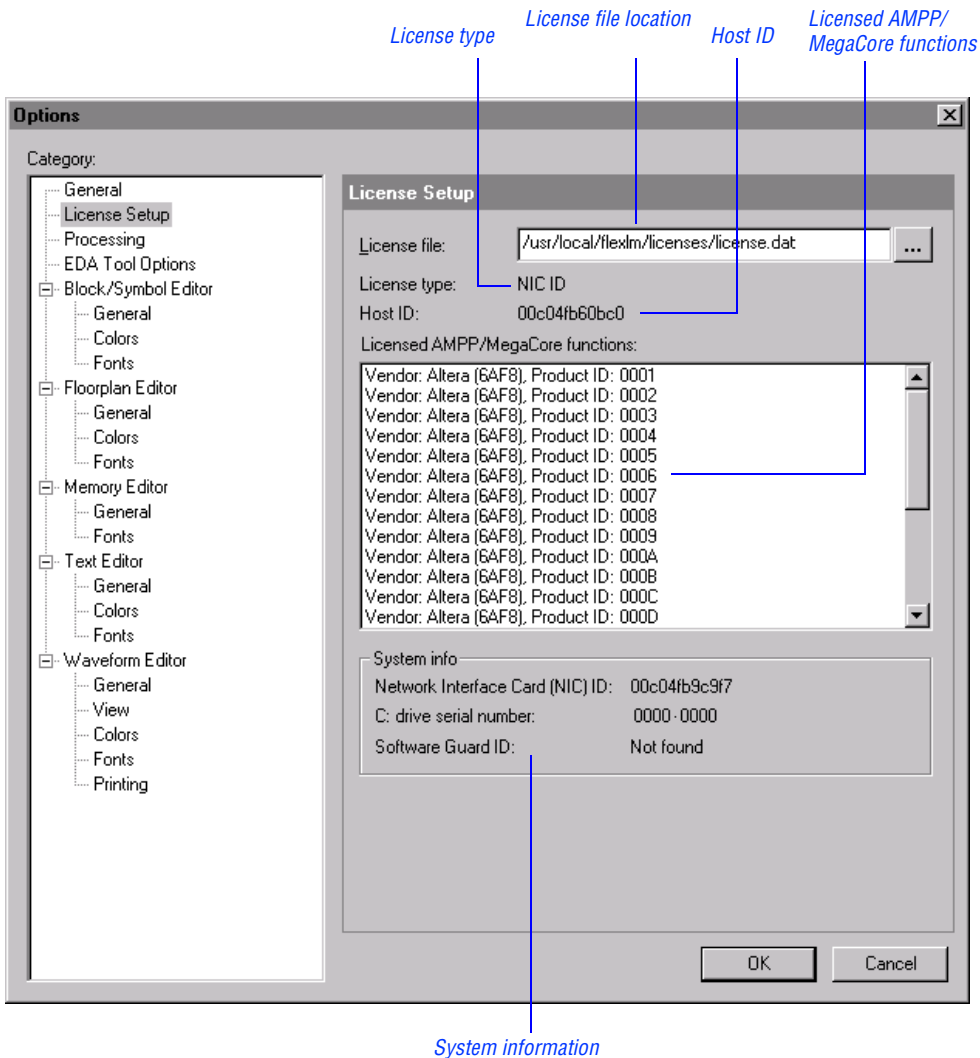
Specifying the License File in the .cshrc File on Client UNIX Workstations

To specify the license file in the **.cshrc** file on each client (user) workstation, follow these steps:

1. 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 ↵
   ```

   ☞ 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 2 on page 13 for a sample network license file to determine your port and server name, and refer to "Specifying an Optional Port Number" on page 14 for more information about port numbers. If there is no port listed in the **license.dat** file, you can simply specify `@`*<host>*.

☞ 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:27000@queen
```

2. After saving the changes to each user's **.cshrc** file, type the following commands at the command prompt:

```
cd ↵
source .cshrc ↵
```

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. Choose **Options** (Tools menu). The **General Options** tab of the **Options** dialog box appears automatically. Figure 5 on page 31 shows the **General Options** tab of the **Options** dialog box.

3. In the **Web browser** box, specify the full path name of your web browser. You can click **Browse** to locate your web browser.

4. If you are using a proxy server, specify the proxy address and port:

   a. Turn on **Access the web using a proxy server (UNIX platforms only)**.

   b. In the **Address** box, type the proxy address.

   c. In the **Port** box, type the port number.

5. Click **OK**.

Figure 5. General Options Tab of the Options Dialog Box

Web browser location

Proxy address   Port number
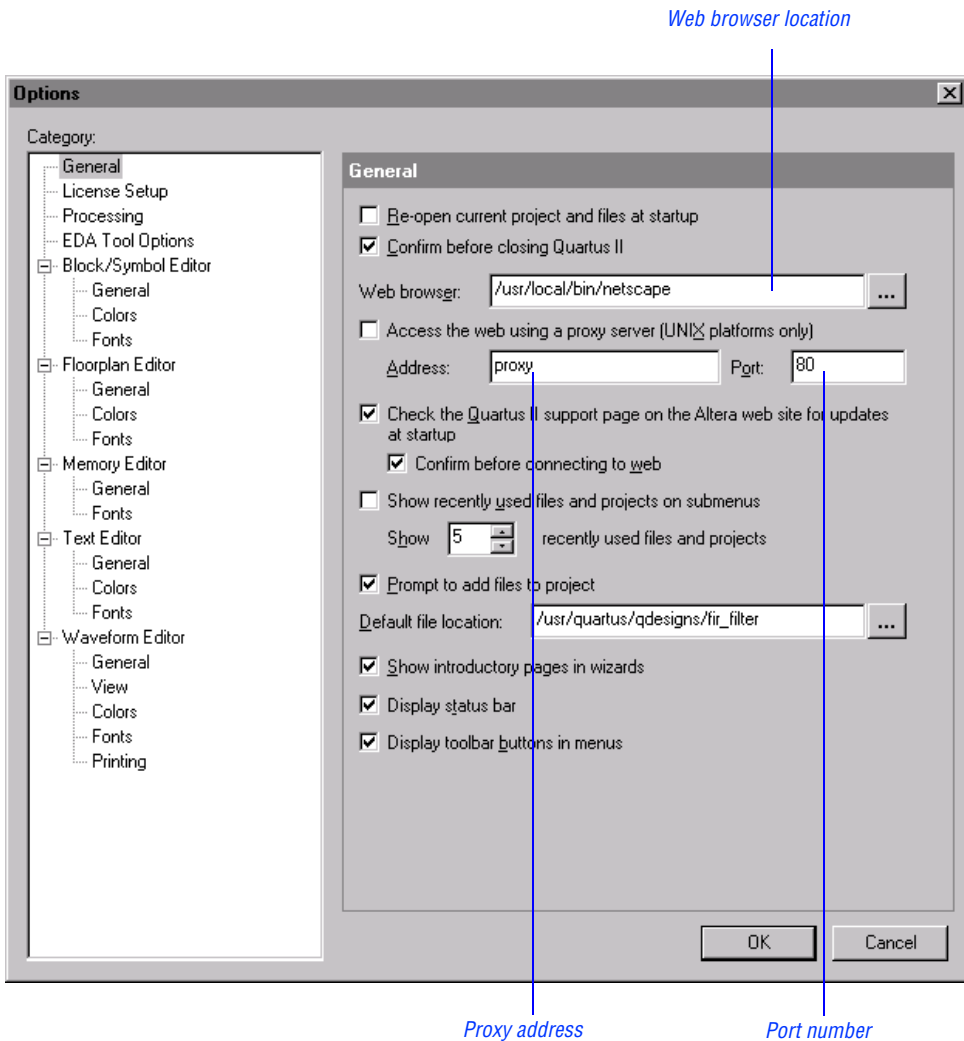
Registering Additional Quartus II Users

Your copy of the Quartus II software is registered at the time of purchase. Additional users can also register themselves as Quartus II users, which allows them to submit service requests, but does not provide additional licenses.

To register as an additional Quartus II user, follow these steps:

1. To start your specified web browser and connect to the Quartus II support web site while running the Quartus II software, choose **Altera on the Web > Quartus II Home Page** (Help menu).

    or

    Point your web browser to the Quartus II support web site at **https://websupport.altera.com**.

2. Follow the instructions on the Quartus II support web site to register as a new user.

☞ Each user is assigned an Altera ID number. Copy this number and save it; it will be helpful when you are submitting service requests, regenerating license files, and updating your user information.

Installing Programming Hardware

This section describes how to install the MasterBlaster communications cable. This section also describes alternate methods for programming Altera devices. Refer to "Using Alternate Programming Methods" on page 35 for more information.

Installing the MasterBlaster Serial/USB Communications Cable

The UNIX version of the Quartus II software currently supports the MasterBlaster communications cable only for the serial port.

You can use the MasterBlaster Serial/USB communications cable to download configuration data to APEX™, ARM®-based Excalibur™, FLEX® 6000, or Mercury™ devices, or to perform in-system programming of EPC2 or EPC16 configuration devices, or to perform SignalTap® logic analysis.

You can connect the MasterBlaster cable to an RS-232 serial port. The MasterBlaster cable can receive power from either of the following sources:

■ 5.0-V or 3.3-V circuit boards
■ A DC power supply, which is supplied with the MasterBlaster cable

To install and set up the MasterBlaster cable for device configuration or programming, follow these steps:

1. With a standard RS-232 cable, connect one end of the cable to the MasterBlaster cable, and connect the other end of the cable to the appropriate port on the computer.

2. Connect the 16-pin female header end of the cable to the 16-pin male MasterBlaster port, and the 10-pin female end of the cable to the 10-pin male header on the target printed circuit board. Figure 6 on page 34 shows the MasterBlaster communications cable.

Figure 6. MasterBlaster Serial/USB Communications Cable

10-pin female connector (connects to target printed circuit board 10-pin male header)

16-pin female connector (connects to MasterBlaster 16-pin male connector)
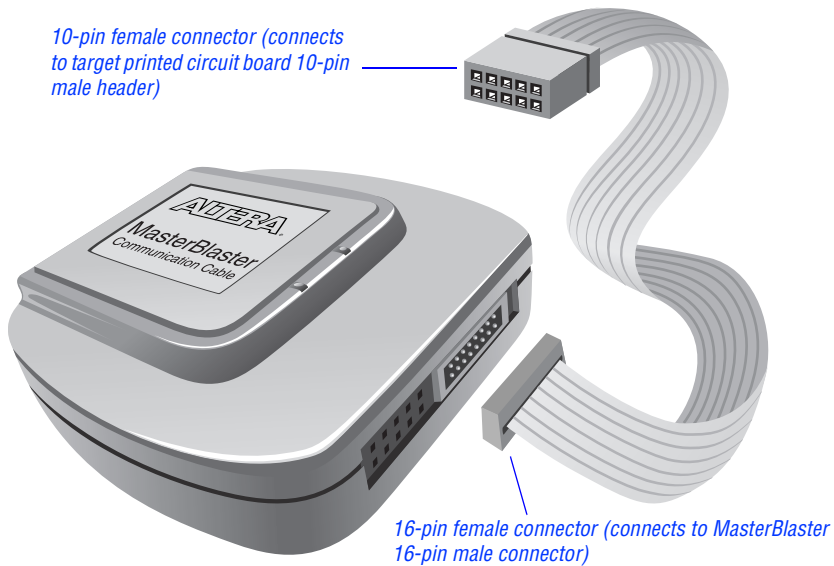
3. Open the Quartus II Programmer:

    ✓ Choose **Open Programmer** (Processing menu).

    or

    ✓ Choose **New** (File menu). Click the **Other Files** tab, select **Chain Description File**, and click **OK**.

4. In the Programmer window, under **Programming Hardware**, click **Setup**.

5. In the **Hardware Setup** dialog box, select **MasterBlaster** in the **Hardware Type** list.

6. In the **Port** box, type the path and name of the appropriate serial port.

7. In the **Baud rate** list, select a baud rate that is appropriate for your computer.

8. Click **OK**.

For more information about the MasterBlaster cable, refer to the *MasterBlaster Serial/USB Communications Cable Data Sheet*, which is available from the Altera web site at **http://www.altera.com**. For more information about SignalTap logic analysis with the MasterBlaster cable, refer to "Selecting the Communications Cable for the SignalTap Logic Analyzer" in Quartus II Help.

Using Alternate Programming Methods

You can also use one of the following software/hardware combinations to download configuration data to APEX, ARM-based Excalibur, FLEX 6000, or Mercury devices, or to perform in-system programming of EPC2 or EPC16 configuration devices using programming files that are generated with the current UNIX version of the Quartus II software:

■ The PC version of the Quartus II software, with either the MasterBlaster or ByteBlasterMV™ programming hardware.
■ The MAX+PLUS II version 10.0 software for PCs, with the MasterBlaster, ByteBlasterMV, or Master Programming Unit (MPU) programming hardware.
■ The Altera Stand-Alone Programmer (ASAP2) software for PCs, which is available from the Altera web site at **http://www.altera.com**, with the MasterBlaster, ByteBlasterMV, or Altera MPU programming hardware.

Refer to the *Quartus II Installation & Licensing for PCs* manual or the *MAX+PLUS II Getting Started* manual for information about installing programming hardware on a PC. Both manuals are available from the Altera web site at **http://www.altera.com**. Refer to the Quartus II and MAX+PLUS II online Help for more information about programming Altera devices.

Additional Workstation Configuration Information

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 home directory. The default directory is **/usr/quartus**. 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>*/ windows**.

Quartus II NativeLink Environment Variable

The Quartus II software installation process initializes the following variable, but you must set it 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 Configuration Information

This section describes other workstation configuration information, including user names, language settings, and fonts.

■   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.

■   This version of 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 windows subdirectory within your home directory; however, having the font cache saved to this directory 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 the **rpcss**, **quartus_dbc**, **quartus_cmp**, or **quartus_cmd** processes are running. 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>* ↵

Starting the Quartus II Tutorial

The online tutorial introduces you to the basic features of the Quartus II programmable logic development system. It shows you how to create and process your own logic designs quickly and easily. The tutorial guides you through the steps required to create and process a sample finite impulse response (FIR) filter design, called **fir_filter**. The tutorial's modular design allows you to learn as little, or as much, as you need about using the Quartus II software.

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

✓ Choose **Tutorial** (Help menu).

After you start the tutorial, the Quartus II window resizes to allow you to view the Tutorial window and the Quartus II software simultaneously.

☞ You must have installed support for the EP20K100 device if you want to run the tutorial. If you did not install support for this device, refer to "Mounting the CD-ROM Drive & Installing the Quartus II Software (Solaris Only)" on page 5 or "Mounting the CD-ROM Drive & Installing the Quartus II Software (HP-UX Only)" on page 7.

Quartus II File Organization

During the Quartus II software installation, the following directories are created on your workstation:

■ The **/usr/quartus** directory (the main directory where the Quartus II software files are installed) contains system software and data files and includes the subdirectories described in Tables 7 through 10.
■ The **/usr/quartus/qdesigns** directory contains tutorial and sample files and includes the subdirectories described in Table 10 on page 42.

The **/usr/quartus** directory includes the subdirectories listed in Table 7.

Table 7. Quartus II System Directory (quartus) Structure

Directory	Description
./adm	Contains system administration scripts.
./bin	Contains the executable software program files and device files.
./eda	Contains libraries for use with other EDA tools. Refer to Table 8 on page 41 for information on the subdirectories of this directory.
./hp	Contains platform-specific files for HP-UX UNIX workstation installations.
./libraries	Contains the Quartus II software directory for "self-contained" libraries. Refer to Table 9 on page 41 for information on the subdirectories of this directory.
./lmf	Contains Library Mapping Files (**.lmf**).
./mw	Contains files needed for the MainWin software.
./objective_studio	Contains files needed for Objective Studio software.
./qdesigns	Contains tutorial and sample files. Refer to Table 10 on page 42 for information on the subdirectories of this directory.
./solaris	Contains platform-specific files for Solaris UNIX workstation installations.
./tcl	Contains files needed for the Tool Command Language (Tcl) feature of the Quartus II software.

The **/usr/quartus/eda** directory includes the subdirectories described in Table 8.

Table 8. Quartus II EDA Directory (eda) Structure

Directory	Description
./cadence	Contains technology libraries for Cadence EDA tools.
./h	Contains header files for software interfaces to other EDA tools.
./lib	Contains library files for software interfaces to other EDA tools.
./mentor	Contains technology libraries for Mentor Graphics EDA tools.
./sim_lib	Contains VHDL and Verilog HDL simulation libraries that are compatible with EDA tools from other vendors.
./synopsys	Contains technology libraries for Synopsys EDA tools.
./innoveda	Contains technology libraries for Innoveda EDA tools.

The **/usr/quartus/libraries** directory includes the subdirectories described in Table 9.

Table 9. Quartus II Library Directory (libraries) Structure

Directory	Description
./megafunctions	Contains megafunctions, including Library of Parameterized Modules (LPM) functions, corresponding Include Files (**.inc**) that contain their AHDL Function Prototypes, and corresponding Block Symbol Files (**.bsf**).
./others	Contains libraries of logic functions that provide compatibility between the Quartus II software and the MAX+PLUS II software.
./primitives	Contains Block Symbol Files (**.bsf**) for Quartus II primitives.
./vhdl87	Contains the library of IEEE Std. 1076–1987 VHDL packages.
./vhdl93	Contains the library of IEEE Std. 1076–1993 VHDL packages.

The **/usr/quartus/qdesigns** work directory includes the subdirectories described in Table 10.

Table 10. Quartus II Work Directory (qdesigns) Structure

Directory	Description
./tutorial	Contains the completed project and design files for the tutorial. This directory includes a **readme.txt** file that contains important information about the tutorial.
./fir_filter	Directory in which you should create the **fir_filter** project if you are completing the Design Entry module. Use this directory to prevent accidental changes to the original design files in the **/qdesigns/ tutorial** directory.
./fir_filter/compile	Contains the **compile_fir_filter** project for use when completing the Compilation module independently or nonsequentially.
./fir_filter/timing	Contains the **timing_fir_filter** project for use when completing the Timing Analysis module independently or nonsequentially.
./fir_filter/simulate	Contains the **simulate_fir_filter** project for use when completing the Simulation module independently or nonsequentially.
./fir_filter/program	Contains the **program_fir_filter** project for use when completing the Programming module independently or nonsequentially.

Contacting Altera

If you have any additional questions about Altera products, contact Altera for technical support and product information.

Technical Support

If you need technical support, call or fax the Altera Applications Department Monday through Friday.

Tel:	(800) 800-EPLD	(6:00 a.m. to 6:00 p.m. Pacific Time)
	(408) 544-7000	(7:30 a.m. to 5:30 p.m. Pacific Time)
Fax:	(408) 544-6401	

You can also e-mail the Altera Applications Department at **support@altera.com.**

In addition, you can visit the Solutions Database, which is available from the Support section of the Altera web site at **http://www.altera.com**.

For additional technical support for the Quartus II software, refer to the Altera Quartus II support web site by choosing **Altera on the Web > Quartus II Home Page** (Help menu), or by pointing your browser to **https://websupport.altera.com**. This web site provides information on how to register your software and obtain license information, and also provides other support information.

Product Information

If you need the latest Altera product information or literature, use the Altera web site, which is available 24 hours a day, seven days a week.

Altera web site: **http://www.altera.com**

Go to "Contacting Altera" in Quartus II Help for complete information on Altera technical support services.

Revision History

The information contained in Quartus II Installation & Licensing for UNIX Workstations 1.0 Revision 3 supercedes information published in previous versions.

Revision 3

Minor typographical corrections were made to the original version.

Updated HP-UX patch information in pages 22-25, including changes in Tables 5-6.

Updated Solaris patch information in page 21 in Table 4.

Updated instructions for configuring the Quartus II user's environment on page 25.

Revision 2

Minor typographical corrections were made to the original version.

Updated the version numbers of the Sun Solaris operating system.

Updated patch information in pages 19-21, including changes in Tables 1-4.

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