

# Lattice Radiant Software 1.0 Installation Guide for Linux



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## Type Conventions Used in This Document

Convention	Meaning or Use
<b>Bold</b>	Items in the user interface that you select or click. Text that you type into the user interface.
<i>&lt;Italic&gt;</i>	Variables in commands, code syntax, and path names.
<b>Ctrl+L</b>	Press the two keys at the same time.
<code>Courier</code>	Code examples. Messages, reports, and prompts from the software.
<code>...</code>	Omitted material in a line of code.
<code>.</code> <code>.</code> <code>.</code>	Omitted lines in code and report examples.
[ ]	Optional items in syntax descriptions. In bus specifications, the brackets are required.
( )	Grouped items in syntax descriptions.
{ }	Repeatable items in syntax descriptions.
	A choice between items in syntax descriptions.

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# Lattice Radiant Software 1.0 Installation Guide for Linux

This document provides instructions on installing Lattice Radiant™ software in a Linux environment. Radiant software supports iCE40 UltraPlus™.

## Note

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The devices available vary depending on the type of license.

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## System Requirements

The following are the basic system requirements for Radiant software on Linux:

- ▶ Intel Pentium or Pentium-compatible PC, or AMD Opteron system support:  
For Radiant Programmer:
  - ▶ Radiant software contains a 64-bit driver to support the 64-bit system.
- ▶ Red Hat Enterprise Linux version 6.6 or 7 operating system.  
The host operating system can only be 64-bit.
  - ▶ Radiant software has 64-bit specific application programs to run on Red Hat 64 platforms.
  - ▶ Radiant software is available in a 64-bit version and can only be installed on a 64-bit system.
- ▶ Approximately 2 GB free disk space.

- ▶ Network adapter and network connectivity.

**Note**

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A floating license requires access to the license server, so both a network adapter and connectivity are required.

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- ▶ 1024 x 768 graphics display.
- ▶ JavaScript-capable Web browser.
- ▶ Adobe Acrobat Reader, or equivalent PDF reader.

## Contacting Technical Support

**FAQs** The first place to look. The [Answer Database](#) provides solutions to questions that many of our customers have already asked. Lattice Applications Engineers are continuously adding to the Database.

To access the Answer Database, go to [www.latticesemi.com](http://www.latticesemi.com) > **Support** > **Answer Database**.

**Telephone Support Hotline** Receive direct technical support for all Lattice products by calling Lattice Applications from 5:30 a.m. to 6 p.m. Pacific Time.

- ▶ For USA & Canada: 1-800-LATTICE (528-8423)
- ▶ For other locations: +1 503 268 8001

In Asia, call Lattice Applications from 8:30 a.m. to 5:30 p.m. Beijing Time (CST), +0800 UTC. Chinese and English language only.

- ▶ For Asia: +86 21 52989090

**E-mail Support**

- ▶ [techsupport@latticesemi.com](mailto:techsupport@latticesemi.com)

**For Local Support** Contact your nearest [Lattice Sales Office](#).

## Installer Contents

The Radiant software installation package is available for download from <http://www.latticesemi.com/latticeradiant>. Click the **Downloads** tab. Some documents and downloads are not visible to anonymous visitors. To view all items, please log in to your Lattice account. Follow the product download instructions and uncompress the software.

The following describes the contents of the Radiant software installer.

- ▶ The Lattice Radiant, Reveal, and Programmer Linux installer files have the following convention for 64-bit platforms.
  - ▶ `[version]_[product]_x64_lin.run` - 64-bit platform

- ▶ The Lattice Radiant, Reveal, and Programmer file names are as follows:
  - ▶ 1.0.0.350.6\_Radiant\_x64\_lin.run
  - ▶ 1.0.0.350.6\_Programmer\_x64\_lin.run
  - ▶ 1.0.0.350.6\_Reveal\_x64\_lin.run
- ▶ The Radiant software “base” installation file installs Radiant software and Synplify Pro for Lattice.
- ▶ The Lattice Reveal installation file installs the stand-alone Radiant Reveal Analyzer. It is not necessary to install this package if the Radiant software Base is installed. See “Installing Stand-Alone Reveal Analyzer” on page 12 for more information.
- ▶ The Radiant Programmer installation file installs the stand-alone Radiant Programmer. It is not necessary to install this package if the Radiant Base is installed. See “Installing Stand-Alone Radiant Programmer” on page 12 for more information.
- ▶ The Installation Notice contains installation and licensing information.

## Radiant Software Installed Directory Structure

Table 1 shows the Radiant software directory structure after installation:

**Table 1: The Radiant Software Directory Structure**

File or Directory	Description
bin/lin64/	This directory contains files for running the Radiant software 64-bit GUI.
cae_library/	This directory contains synthesis header libraries for Synplify Pro in both Verilog and VHDL formats. It also contains the libraries for interface kits (ispLSI <sup>®</sup> design and simulation libraries).
data/	This directory contains files for the Radiant software.
docs/	This directory contains Radiant software documentation, including manuals, tutorials, and the online Help.
examples/	This directory contains Lattice design examples.
ip/	This directory contains files, documentation, and example for the ip.
isfpfga/	This directory contains files for the Radiant software.
license/	This directory contains the license agreement.
programmer/	This directory contains files for Radiant Programmer.
qml/	This directory contains Qt libraries.
scripts/	This directory contains Lattice script files.

**Table 1: The Radiant Software Directory Structure (Continued)**

File or Directory	Description
synpbase/	This directory contains files for the Synplify Pro for Lattice software.
tcltk/	This directory contains tcl/tk related files.

## Installing Radiant Software on 64-Bit Platform

Download the installation files from the Lattice Semiconductor Web site. For more information on how to download Radiant software, go to <http://www.latticesemi.com/latticeradiant>. Click the **Downloads** tab. Some documents and downloads are not visible to anonymous visitors. To view all items, please log in to your Lattice account. Follow the product download instructions and uncompress the software.

Radiant software is installed with the **1.0.0.350.6\_Radiant\_x64\_lin.run** installation file. The file installs all Lattice Semiconductor FPGA devices on your 64-bit system, as well as Synplify Pro for Lattice. The following step guides you through the installation procedure.

### To install the Radiant software on 64-bit systems:

1. Go to Radiant software installers directory and execute the Radiant run file.

```

% cd <directory_with_RUN>
% ./1.0.0.350.6_Radiant_x64_lin.run

```
2. The Welcome To Lattice Radiant Software 1.0 Setup dialog box opens.
3. Click **Next** to open the Installation Folder dialog box.
4. The default destination folder is \$HOME/lsc/radiant/1.0. Click **Browse** to change the destination folder.
5. Click **Next** to open the Product Options dialog box.
6. Select the Radiant software components that you want to install by selecting or clearing each of the listed options.

The FPGAs product option has additional options for selecting the Lattice FPGA devices that you want to install. To set the additional options, select **FPGAs** and click the device.

Click **Next** to open the License Agreement dialog box.

7. Read the license agreement. If you agree, click **I accept the license** to continue the installation process.
8. Click **Next** to display the Ready to Install dialog box and review the current settings. If everything is correct, select **Install** to start the installation.

9. In the Installation Wizard Complete dialog box, read the confirmation note and click **Finish**.

#### Note

Do not close the installation window. The window automatically closes once the installation is completed.

If this is the first time you have installed software from Lattice, FlexNet License Finder dialog box will pop up to ask you for the license. Select the desired license option and click **Next** to complete the license installation.

**Figure 1: Flex License Finder**



## Radiant Software 1.0 System Library Dependencies

The Radiant software package depends on a set of packages that provide 64-bit system libraries. Some of these packages may depend on lower level packages, or indirect dependencies. To fulfill this dependency, these packages must be installed before Radiant software can be installed. Check which ones are already present on your system by entering the command `rpm -qa | grep <package name>` and confirming that the named package appears in the results.

The following are the packages 1.0.0.350.6\_Radiant\_x64\_lin.run depends on. This list does not include packages that are included with Radiant software 1.0. Indirect dependencies are listed with indented levels.

- ▶ glibc
  - ▶ nss-softokn-freebl
- ▶ libjpeg
- ▶ libtiff
  - ▶ zlib
- ▶ glib2
  - ▶ libseltlinux

- ▶ libusb
- ▶ libpng12
- ▶ freetype
- ▶ fontconfig
  - ▶ expat
- ▶ libX11
  - ▶ libxcb
    - ▶ libXau
    - ▶ libxlt
- ▶ libICE
  - ▶ libSM
- ▶ libuuid
- ▶ libXt
- ▶ libXext
- ▶ libXrender
- ▶ libXi
- ▶ libXft
- ▶ libxslt
- ▶ libXrandr
- ▶ libXfixes
- ▶ libXdamage
- ▶ libXcursor
- ▶ libXcomposite
- ▶ libGL
- ▶ libXinerama
- ▶ libXScrnSaver
- ▶ atk
- ▶ airo
- ▶ cairo
- ▶ pango
- ▶ pulseaudio

Installing the packages individually requires the parent package to be installed last. The package deepest in the tree must be installed first. For example, libICE package depends on libSM. The libSM package must be installed prior to libICE.

Two cyclic dependencies are found with Radiant software, glibc and nss-softokn-freebl, and glib2. Installing these packages requires the two RPM's to be specified on the same rpm command line.

## Installing Radiant Software Tools

This section describes how to install Radiant software tools including Stand-Alone Reveal Analyzer and Stand-Alone Programmer.

### Installing Stand-Alone Reveal Analyzer

Reveal Analyzer is included in the Radiant software installation, but can be used without installing the Radiant software. Use one of the following files to install the stand-alone version of Radiant Reveal Analyzer:

- ▶ `1.0.0.350.6_Reveal_x64_lin.run` for 64-bit systems.

#### To install the stand-alone Reveal Analyzer:

1. Close all applications before starting installation
2. Go to Radiant software installers directory and execute the Radiant Reveal run file.

```
% cd <directory_with_RUN>
% ./1.0.0.350.6_Reveal_x64_lin.run
```
3. The Welcome To Lattice Radiant Reveal setup dialog box opens.
4. Click **Next** to open the Installation Folder dialog box.
5. The default destination folder is `/home/lattice/lsc/reveal/1.0`. Click **Browse** to change the destination folder.
6. Click **Next** to open the Select Components dialog box.
7. Click **Next** to open the License Agreement dialog box.
8. Read the license agreement. If you agree, click **I accept the license** to continue the installation process.
9. Click **Next** to Ready to Install dialog box. Review the destination folder and components selected. If everything is correct, select **Install** to start the installation.
10. In the Installation Wizard Complete dialog box, read the note and click **Finish**.

### Installing Stand-Alone Radiant Programmer

Radiant Programmer is included in the Radiant software installation and consists of four tools:

- ▶ Radiant Programmer
- ▶ Deployment Tool
- ▶ Download Debugger
- ▶ Programming File Utility

If you want to use Radiant Programmer, Deployment Tool, Download Debugger, or Programming File Utility, without installing Radiant software, use one of the following files to install the stand-alone Radiant Programmer:

- ▶ `1.0.0.350.6_Programmer_x64_lin.run` for 64-bit systems.

#### To install the stand-alone Radiant Programmer:

1. Close all applications before starting installation
2. Go to Radiant software installers directory and execute the Radiant Programmer run file.  

```
% cd <directory_with_RUN>  
% ./1.0.0.350.6_Programmer_x64_lin.run
```
3. The Welcome To Lattice Radiant Programmer setup dialog box opens.
4. Click **Next** to open the Installation Folder dialog box.
5. The default destination folder is `/home/lattice/lscv/programmer/1.0`. Click **Browse** to change the destination folder.
6. Click **Next** to open the Select Components dialog box.
7. Click **Next** to open the License Agreement dialog box.
8. Read the license agreement. If you agree, click **I accept the license** to continue the installation process.
9. Click **Next** to Ready to Install dialog box. Review the destination folder and components selected. If everything is correct, select **Install** to start the installation.
10. In the Installation Wizard Complete dialog box, read the note and click **Finish**.

## Downloading and Installing Soft IP

Soft IP can be downloaded from the Lattice website. Use the **Install a User IP** feature of IP Catalog to install a Soft IP.

#### To download and install a Soft IP:

1. Using a web browser, download the Soft IP installer from the Lattice website.
2. In the Radiant IP Catalog, click on the **Install a User IP**  button.
3. In the **Select user IP package file to install** dialog box, browse to the Radiant Software IP Package (.ipk) file, and click **Open**.
  - ▶ The Soft IP will be installed into a folder in the user's personal directory. For example: `/home/Users/<username>/RadiantIPLocal/<IP_name>`.
  - ▶ The Soft IP will be added into the IP Catalog.

## Installing and Configuring USB Cables

This section provides information on USB cable installation and configuration. These instructions are applicable 64-bit Linux systems.

### Lattice USB2A USB Download Cable Configuration

Radiant Programmer software can directly access USB devices using libusb, which accesses the USB file system. To verify that you have the USB library installed, do the following:

1. Plug in the USB cable.
2. In the command line, type:

```
% /sbin/lssusb
```

You should see an entry similar to the following:

```
> Bus 002 Device 002: ID 1134:8001
```

3. If you receive an error when you type `/sbin/lssusb`, you probably do not have libusb installed. To install the libusb, go to:

<http://libusb.info/>

4. Unplug the USB cable.

#### Note

---

The USB cable must be disconnected from the PC when performing the installations. You must have root access and be able to log in as a super user.

---

### Driver Setup for Lattice USB2A and HW-USBN-2B (FTDI) USB Download Cable on Red Hat Linux Enterprise 7

#### Manual UDEV Method Configuration:

1. Find your username which is given in `/etc/group` file. Log out if required. For example :

```
username:x:1000:username
```

2. Create a working file called `10-local.rules`.

### 3. Add the following information to the 10-local.rules file:

```
#Lattice
SUBSYSTEM=="usb",ACTION=="add",ATTRS{idVendor}=="1134",ATTRS{idProduct}=="8001",MODE=="0660",GROUP=="username",SYMLINK+="lattice-%n"
#FTDI
SUBSYSTEM=="usb",ACTION=="add",ATTRS{idVendor}=="0403",ATTRS{idProduct}=="6010",MODE=="0666",GROUP=="username",SYMLINK+="ftdi-%n"
SUBSYSTEM=="usb",ATTRS{idVendor}=="0403",ATTRS{idProduct}=="6010",RUN+="/bin/sh -c 'basename %p > /sys/bus/usb/drivers/ftdi_sio/unbind'"
```

#### Note

---

Replace the username with your username in above rules.

---

### 4. Copy the file into the /etc/udev/rules.d/10-local.rules directory. If a file by this name already exists, simply append the working file to it. For example:

```
% sudo cp 10-local.rules /etc/udev/rules.d/ .
Or, if the file already exists:
% sudo cat 10-local.rules >>/etc/udev/rules.d/10-local.rules
```

### 5. Give permission to 10-local.rules as follows :

```
% sudo chmod 755 10-local.rules
```

### 6. Now reload the udev rules by adding the following:

```
% sudo udevadm control -reload-rules
```

### 7. Plug in the USB cable.

## Driver Setup for Lattice USB2A and HW-USBN-2B (FTDI) USB Download Cable on Red Hat Linux Enterprise 6

### Automated UDEV Method Configuration

1. Create an entry called "plugdev" in the /etc/group file, and then add anyone logging into the system into that group. Make sure /usr/bin/id shows you as a member of the plugdev group. Log out if required.

Example:

```
plugdev:x:501:username
```

2. Type the following command to execute the script:

```
% sudo <install_path>/data/vmdata/udevsetup_rh6
```

The script should terminate with a "Setup successful" output.

### Manual UDEV Method Configuration

1. Create an entry called "plugdev" in the /etc/group file, and then add anyone logging into the system into that group. Make sure /usr/bin/id

shows you as a member of the plugdev group. Log out if required. For example:

```
plugdev:x:501:username
```

2. Create a working file called 10-local.rules.
3. Add the following information to the 10-local.rules file:

```
#Lattice
BUS=="usb",ACTION=="add",SYSFS{idVendor}=="1134",SYSFS{idProduct}=="8001",MODE=="0660",
GROUP=="plugdev",SYMLINK+="lattice-%n"
#FTDI
BUS=="usb",ACTION=="add",SYSFS{idVendor}=="0403",SYSFS{idProduct}=="6010",MODE=="0660",
GROUP=="plugdev",SYMLINK+="ftdi-%n"
SUBSYSTEM=="usb",DRIVER=="ftdi_sio",ATTRS{idVendor}=="0403",SYSFS{idProduct}=="6010",A
TTR{bInterfaceNumber}=="00",RUN+="/bin/sh -c 'basename %p >/sys/bus/usb/drivers/
ftdi_sio/unbind'"
```

---

### Note

Each BUS and SUBSYSTEM entry must be a single line, or split using the “\” line continuation character.

---

4. Copy the file into the /etc/udev/rules.d/10-local.rules directory. If a file by this name already exists, simply append the working file to it. For example:

```
% sudo cp 10-local.rules /etc/udev/rules.d/.
```

Or, if the file already exists:

```
% sudo cat 10-local.rules >>/etc/udev/rules.d/10-local.rules
```

5. Make the new UDEV settings active, as follows:

```
% sudo /usr/bin/skill -HUP udevd
```

6. Plug in the USB cable.

## Licensing the Radiant Software

The Radiant software development tool is licensed software. In order for you to launch the tool you must configure a FLEXlm license. The license can be either node-locked to the local machine, or acquired from a license server accessible from a LAN connection.

---

### Note

Radiant software permits the creation of configuration bitstreams for all of Lattice Semiconductor's FPGAs. However, a license is required for some devices.

---

The default location of the license file is

`<install_path>/license/license.dat`. If this location is changed, you

must set the LM\_LICENSE\_FILE environment variable to include the new path name.

### Note

In order to change the LM\_LICENSE\_FILE variable, you may need to edit the .cshrc or .bashrc configuration file located in your home directory.

## License Management Versions

Table 2 lists the version numbers of the FLEXlm Imutil utility, the FLEXlm Imgrd utility, and the Lattice daemon used for license management for 64-bit systems.

**Table 2: License Management Utility Versions**

Filename	Version	Description
lmutil	11.13.1.3	FLEXlm license server utility
lmgrd	11.13.1.3	FLEXlm end-user utility
lattice	11.13.1.3	The Lattice Semiconductor licensing daemon

## Obtaining a License

### To register and license your Radiant software:

1. Obtain the host ID of your license server with the following command:

```
% <install_path>/ispfpga/bin/lin64/lmutil lmhostid
```

2. Go to the Licensing section of the Lattice Semiconductor Web site ([www.latticesemi.com/license](http://www.latticesemi.com/license)) and follow the on-screen instructions.

### Note

Lattice Semiconductor supports licensing for a single server or three redundant servers. If you are using three redundant servers, enter all three server host IDs on the License File/Registration Form.

Lattice Semiconductor will email your Radiant software license file (license.dat) to you within one working day. After you receive the license file, copy the license.dat file to the Radiant software license directory as follows:

```
% <install_path>/license/license.dat
```

## Editing the License File

You must edit a floating license file to specify the server name and the path to the Lattice daemon.

The following example shows part of a floating license file:

```
SERVER nodename 1234abcd 1710
DAEMON lattice daemon_path
FEATURE LSC_RADIANT lattice 10.0 01-jan-9999 100 \
85B686493C86
VENDOR_STRING=LSC_RADIANT
```

Edit the SERVER line by replacing the *nodename* with the host name and the port ID (1710). The port ID, 1710 in this example, must be assigned a TCP/IP port number that is not already in use on the server, so you might need to change it.

Edit the Lattice DAEMON line, replacing *daemon\_path* with the path to Radiant software. For lmgrd V11, the path is:

```
% <install_path>/ispfpga/bin64/lin64
```

When editing these lines, type them exactly as you received them. All entries are case-sensitive.

### Note

---

The encryption codes are in hexadecimal format (digits 0-9, and lower-case letters a-f or upper-case letters A-F).

\$HOME/.flexlmrc can be used to set LM\_LICENSE\_FILE variable, and you should do the cleanup if it's necessary.

---

## Starting the License Manager

Type the following command on one line to start the license manager daemon:

```
% <install_path>/ispfpga/bin/lin64/lmgrd
-l <install_path>/license/license.log
-c <install_path>/license/license.dat
```

Redirecting output to a log file is helpful when you debug licensing problems. The -l switch tells the license manager to send its output to a log file (license.log), and -c tells it which license to serve. The log file contains information on the status of the server and the daemon and TCP port in use. It also shows which users have checked out the license and the checkout time.

## Stopping the License Manager

If it is necessary to stop the FLEXlm license manager, follow this procedure:

1. Confirm that the daemon is running by typing the following command:

```
% ps -ef | grep lmgrd
```

2. If **lmgrd.exe** is running, type the following command on one line to stop the daemon:

For 64-bit systems:

```
% <install_path>/ispfpga/bin/lin64/lmutil lmdown -c
<install_path>/license/license.dat
```

The following prompt appears:

```
Shutting down FLEXlm on nodes: <hostname>
Are you sure? [y/n]:
```

3. Type **Y** and press **Enter** to shut down the license daemon.

## Installing and Running the License Manager on a Remote Server

You can install and run the License Manager from a location other than the default directory.

To install the License Manager to a different location, copy the files `lattice`, `lmgrd`, and `lmutil` from the following directory:

```
% <install_path>/ispfpga/bin/lin64/
```

to the desired location. For example:

```
% <remote_server_install_path>/my_machine/lattice_license/
```

## Starting the License Manager from a Remote Server

Type the following command on one line to start the license manager daemon:

```
% <remote_server_install_path>/lmgrd
-l <install_path>/license/license.log
-c <install_path>/license/license.dat
```

## Stopping the License Manager on a Remote Server

If it is necessary to stop the FLEXlm license manager running on a remote server, follow this procedure:

1. Confirm that the daemon is running by typing the following command:

```
% ps -ef | grep lmgrd
```

2. If `lmgrd.exe` is running, type the following command on one line to stop the daemon:

```
% <remote_server_install_path>/lmutil lmdown -c
<install_path>/license/license.dat
```

The following prompt appears:

```
Shutting down FLEXlm on nodes: <hostname>  
Are you sure? [y/n]:
```

3. Type **Y** and press **Enter** to shut down the license daemon.

## Setting Up a Floating License on Linux

The licensing steps outlined in the previous sections can be performed on a centralized license server. Then each client points to the license file on that machine.

To gain access to the licenses on the remote license server, you need to set the environment variable `LM_LICENSE_FILE` value to `license_port_number@linux_host_name`.

### Note

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Radiant software uses the following network communication ports (TCP/IP socket ports):

- ▶ Port 80 – This is the standard HTTP web access port. Radiant software uses this port in the following cases:
    - ▶ When the Radiant software has updates from the Lattice web site:
    - ▶ IP or reference designs are downloaded from the Lattice web site:
    - ▶ When message ID's are sent.
  - ▶ Port 7788 – This is the port used by the Radiant software to check the floating license between the software and license server. This port is configurable by changing the license files.
- 

## Troubleshooting a Floating License

The following procedures can be useful in troubleshooting common floating license issues.

### Check the Network

Use the ping command to check network status. For example, type:

```
% ping <license_server>
```

If the license server is running, you can expect a return as follows:

```
64 bytes from <license_server> <IP_address>
```

To end, type **CTRL+C**.

## Check License File with Imutil

Use the Imutil tool to troubleshoot the status of your license file. The Imutil tool is located in the following location:

```
<install_path>/isfpfga/bin/lin64
```

The **Imstat** command determines the features of your license file.

- ▶ The -a argument displays all information.
- ▶ The -c argument uses the specified license files.

The following is an example of using the **Imutil Imstat** command to check the license file status:

```
% ./lmutil lmstat -a -c <license_port>@<license_server>
```

The license status is returned, including feature lines, number of licenses issued, and licenses in use.

## Running the Radiant Software GUI

Radiant software has a graphical user interface (GUI). When you run the Radiant software 1.0 executable file, the software automatically performs the environment setup.

### To start the Lattice Radiant Software GUI:

1. Set up the license as follows:

If your license file (license.dat) is not under *<install\_path>/1.0/license*, you must set the LM\_LICENSE\_FILE variable to the location of your license file. For example:

For CSH users:

```
% setenv LM_LICENSE_FILE (/<license_directory>/license.dat
$LM_LICENSE_FILE)
```

For BASH users:

```
% export LM_LICENSE_FILE=$LM_LICENSE_FILE:/
<license_directory>/license.dat
```

2. Run the Radiant software executable file in the command line as follows:

```
% <install_path>/bin/lin64/radiant &
```

With the Radiant software script, you can also run the following tools in stand-alone mode.

To invoke stand-alone Reveal Analyzer, run:

```
% revealrva
```

Refer to the Radiant software online Help for more information about the Radiant software GUI.

## Finding the Installation History

The Radiant software records a log of your installation history. You can find the history in the Radiant software main window.

**To view the installation history:**

1. Open the Radiant software GUI.
2. Choose **Help > About Lattice Radiant Software**.

## Running Radiant Software from the Command Line

There are two ways to run the Radiant software from the command line:

- ▶ Through Radiant Tcl Console.
- ▶ By running executable files directly.

## Running Stand-Alone Radiant Tcl Console

Radiant software development environment includes Tcl Console, which allows you to run scripts for automating common tasks. Tcl Console is also available outside of the user interface in order to run custom scripts. To launch the stand-alone Tcl Console, enter the following on a command line:

```
% <install_path>/bin/lin64/radiantc
```

These commands configure the environment allowing all of the underlying design tools to be run. Refer to the online Help for more information about the command line.

## Running Using CSH or BASH Interpreters

BASH users must run the following commands:

```
% export bindir=<install_path>/bin/lin64  
% source $bindir/radiant_env
```

Next, you can run the executable files directly. For example, you can invoke the Radiant software GUI by using:

```
% pnmain &
```

Or, you can run Power Calculator by running:

```
% pwcmain &
```

## Running Synplify Pro for Lattice

To run Synplify Pro for Lattice, do the following:

1. Open the Radiant software GUI.
2. Open any project to enable the commands on the Tools menu.
3. Choose **Tools > Synplify Pro for Lattice**.

## Running Stand-Alone Radiant Reveal Analyzer

After the installation, you can invoke the stand-alone Radiant Reveal Analyzer in the command line:

```
% <install_path>/bin/lin64/revealrva &
```

## Running Stand-Alone Radiant Programmer

After the installation, you can invoke the stand-alone Radiant Programmer in the command line:

```
% <install_path>/bin/lin64/programmer &
```

## Running Stand-Alone Deployment Tool

After Programmer installation, you can invoke the stand-alone Deployment Tool in the command line:

```
% <install_path>/bin/lin64/deployment &
```

## Running Stand-Alone Debugger

After Programmer installation, you can invoke the stand-alone Debugger in the command line:

Running Download Debugger on 64-bit systems:

```
% <install_path>/bin/lin64/debugger &
```

## Running Stand-Alone Programming File Utility

After the installation, you can invoke the stand-alone Programming File Utility in the command line:

```
% <install_path>/bin/lin64/fileutility &
```

## Running Multiple Versions of Lattice Software

The Radiant software enables you to run FPGA designs on platforms on which the Radiant software and previous Lattice Diamond/ iCE are installed.

## Revision History

The following table gives the revision history for this document.

Date	Version	Description
02/20/2018	1.0	Initial Release.