Lattice Propel 2024.1 Installation for Linux

User Guide

FPGA-AN-02089-1.0

June 2024

Disclaimers

Lattice makes no warranty, representation, or guarantee regarding the accuracy of information contained in this document or the suitability of its products for any particular purpose. All information herein is provided AS IS, with all faults, and all associated risk is the responsibility entirely of the Buyer. The information provided herein is for informational purposes only and may contain technical inaccuracies or omissions, and may be otherwise rendered inaccurate for many reasons, and Lattice assumes no obligation to update or otherwise correct or revise this information. Products sold by Lattice have been subject to limited testing and it is the Buyer's responsibility to independently determine the suitability of any products and to test and verify the same. LATTICE PRODUCTS AND SERVICES ARE NOT DESIGNED, MANUFACTURED, OR TESTED FOR USE IN LIFE OR SAFETY CRITICAL SYSTEMS, HAZARDOUS ENVIRONMENTS, OR ANY OTHER ENVIRONMENTS REQUIRING FAIL-SAFE PERFORMANCE, INCLUDING ANY APPLICATION IN WHICH THE FAILURE OF THE PRODUCT OR SERVICE COULD LEAD TO DEATH, PERSONAL INJURY, SEVERE PROPERTY DAMAGE OR ENVIRONMENTAL HARM (COLLECTIVELY, "HIGH-RISK USES"). FURTHER, BUYER MUST TAKE PRUDENT STEPS TO PROTECT AGAINST PRODUCT AND SERVICE FAILURES, INCLUDING PROVIDING APPROPRIATE REDUNDANCIES, FAIL-SAFE FEATURES, AND/OR SHUT-DOWN MECHANISMS. LATTICE EXPRESSLY DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY OF FITNESS OF THE PRODUCTS OR SERVICES FOR HIGH-RISK USES. The information provided in this document is proprietary to Lattice Semiconductor, and Lattice reserves the right to make any changes to the information in this document or to any products at any time without notice.

Inclusive Language

This document was created consistent with Lattice Semiconductor’s inclusive language policy. In some cases, the language in underlying tools and other items may not yet have been updated. Please refer to Lattice’s inclusive language FAQ 6878 for a cross reference of terms. Note in some cases such as register names and state names it has been necessary to continue to utilize older terminology for compatibility.

Contents

1. About Lattice Propel™ 2024.1

Lattice Propel™ 2024.1 software is a complete set of graphical and command-line tools to create, analyze, compile, and debug both FPGA-based hardware and software processor systems.

2. System Requirement

The basic system requirements for installing and running Lattice Propel 2024.1 software on Linux are:

- Complex instruction set system based on x86 64-bit architecture
- Red Hat Enterprise Linux 64-bit Operating System
  - During the installation of RHEL 7.9, two environments are required on the SOFTWARE SELECTION installation page. Select Base Environment/Server with GUI and Add-Ons for Selected Environment/System Administration Tools.
  - During the installation of RHEL 8.8, two environments are required on the SOFTWARE SELECTION installation page. Select Base Environment/Server with GUI and Add-Ons for Selected Environment/System Administration Tools.
- Ubuntu LTS Operating System
  - Ubuntu 20.04/22.04 LTS
- Free Disk Space: approximately 8 GB
- Network adapter and network connectivity for IP server access

3. Lattice Propel 2024.1 on Linux

Lattice Propel software is installed with the Propel2024.1_lin.run installation file. Follow steps below to install Lattice Propel 2024.1 software:

3.1. Installing Lattice Propel 2024.1 via Graphic User Interface (GUI)

Launch GUI installation:

1. Go to Propel software installers directory and execute the Propel installation file.

   ```
   $ cd <directory_with_run>
   $ ./Propel2024.1_lin.run
   ```

2. The **Install Lattice Propel 2024.1** dialog box opens.
3. Click **Next**. The Select Installation Folder dialog appears.
4. The default installation folder is */*home*/<user_id>*/lscc/propel/2024.1. Click the **Browse** button to change to a desired folder for the installation.
5. Click **Next.** The Select Component(s) dialog opens. Select Propel 2024.1. The Propel 2024.1 component must be installed.
6. Click **Next**. The License Agreement dialog opens.
7. Read the license agreement. If you agree, choose **I accept the licenses** option. You must accept the terms contained in these agreements before continuing with the installation.
8. Click **Next**. The Ready to Install dialog opens.
9. Review the current settings, the destination folder and the selected components. If everything is correct, click **Install** to start the installation.
10. When the installation is completed, the Lattice Propel 2024.1 Installation Completed Wizard pops up.
11. In the Installation Completed Wizard dialog box, read the confirmation note and click **Finish**.

    Note:

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

3.2. Installing Lattice Propel 2024.1 via Console Mode Command Line

Console Mode Command Line installation:

```
$ cd <directory_with_run>
$ ./Propel2024.1_lin.run --console --prefix /<target_installation_folder>/
```

Note:

Installer needs write permission to target installation folder and sufficient access permission to the upper folders.

4. Licensing for Lattice Propel 2024.1

By obtaining Lattice Propel 2024.1 license, you can access all the related features in Lattice Diamond and Lattice Radiant software.

To obtain a license file for your Propel 2024.1 software:

1. Go to Propel Licensing Form.
2. Follow the instructions step-by-step.
3. Place license.dat under the <*install_path*>\license\directory where your Propel is installed.

Note:

If you saved the license.dat file in a directory other than the default one mentioned above, change LM_LICENSE_FILE variable accordingly pointing to the exact directory where you place license.dat by using the command line:

```
$ export LM_LICENSE_FILE=/<license_file_path>/license.dat
```

Before invoking Lattice Propel 2024.1, make sure the environment variable is correctly set.

5. Lattice Propel Software 2024.1 System Library Dependencies

The Lattice Propel software package depends on a set of 64-bit system libraries packages. Some of these system library packages may depend on lower-level packages or indirect dependencies. To fulfill the dependencies, all these packages must be installed before Lattice Propel software to be installed. You can use the Command Line to install these packages.

5.1. Installing System Library Packages on RHEL 64-bit Operating System

You can type the following command to determine the required libraries:

$ <*install_path*>/check_systemlibrary_propel.bash

And you can check what packages are already in your system by entering the following command in the Command Prompt:

```
$ rpm -qa | grep <package name>
```

Compare the result you got with the packages listed in the following table. You need all the following packages installed before you run the Propel 2024.1 installation package, Propel_2024.1_lin.run.

Package Type	Package Name
System Library Package for Propel SDK	gtk3
	"*Development Tools*"
System Library Package for Propel Builder	glibc
	libjpeg
	libieee1284
	libusb
	libX11
	libICE
	libSM
	libXt
	libXext
	libXrender
	libXi
	libXft
	libxslt
	libXrandr
	libXfixes
	libXdamage
	libXcursor
	libXcomposite
	libGL
	libXinerama
	libXScrnSaver
	atk
	cairo
	pango
	pulseaudio
	nss
	xcb-util-wm
	xcb-util-image
	xcb-util-keysyms
	xcb-util-renderutil

Package Type	Package Name
	libxkbcommon-x11
System Library Package for ModelSim	glibc.i686
	libXext.i686
	libXft.i686
	libgcc.i686

Any package missing, use the following command to install that package:

```
$ sudo yum install <package name>
```

You can install multiple packages at one time by adding all the desired packages after the command line:

```
$ sudo yum install <package name> <package name> <package name> …
```

5.1.1. Installing System Library Packages for Propel SDK

```
$ sudo yum install gtk3
$ sudo yum groupinstall "Development Tools"
```

5.1.2. Installing System Library Packages for Propel Builder

```
$ sudo yum install glibc libjpeg libieee1284 libusb libX11 libICE libSM libXt libXext
libXrender libXi libXft libxslt libXrandr libXfixes libXdamage libXcursor libXcomposite
libGL libXinerama libXScrnSaver atk cairo pango pulseaudio nss xcb-util-wm xcb-util-
image xcb-util-keysyms xcb-util-renderutil libxkbcommon-x11
```

5.1.3. Installing System Library Packages for QuestaSim

```
$ sudo yum install glibc.i686 libXext.i686 libXft.i686 libgcc.i686
```

5.2. Installing System Library Packages on Ubuntu LTS Operating System

You can type the following command to determine the required libraries.

```
$ <install_path>/check_systemlibrary_propel.bash
```

And you can check what packages are already in your system by entering the following command in the Command Prompt:

```
$ dpkg -l | grep <package name>
```

Compare the result you got with the packages listed in the following table. You need all the following packages installed before you run the Propel 2024.1 installation package, Propel_2024.1_lin.run.

Package Type	Package Name
System Library Package for Propel SDK	build-essential
System Library Package for Propel Builder	libxcb-image0
	libxcb-shm0
	libxcb-util-dev
	libxcb-keysyms1
	libxcb-render-util0
	libxcb-render0
	libxcb-xinerama0
	libxcb-xkb-dev
	libxcb-xinput-dev
	libxkbcommon-x11-0
	libxkbcommon-dev
	libnss3

Package Type	Package Name
	libxcursor1
	libxss1
System Library Package for QuestaSim	bzip2:i386
	libexpat1:i386
	libfontconfig1:i386
	libfreetype6:i386
	libncurses5:i386
	zlib1g:i386
	libxft2:i386
	libxrender1:i386
	libpng16-16:i386
	libuuid1:i386
	libx11-6:i386
	libxau6:i386
	libxcb1:i386
	libxext6:i386
	libstdc++6:i386

Any package missing, use the following command to install that package:

```
$ sudo apt-get install <package name>
```

You can install multiple packages at one time by adding all the desired packages after the command line:

```
$ sudo apt-get install <package name> <package name> <package name> …
```

5.2.1. Installing System Library Packages for Propel SDK

```
$ sudo apt-get install build-essential
```

5.2.2. Installing System Library Packages for Propel Builder

```
$ sudo apt-get install libxcb-image0 libxcb-shm0 libxcb-util-dev libxcb-keysyms1
libxcb-render-util0 libxcb-render0 libxcb-xinerama0  libxcb-xkb-dev libxcb-xinput-dev
libxkbcommon-x11-0 libxkbcommon-dev libnss3 libxcursor1 libxss1
```

5.2.3. Installing System Library Packages for QuestaSim

```
$ sudo apt-get install bzip2:i386 libexpat1:i386 libfontconfig1:i386 libfreetype6:i386
libncurses5:i386 zlib1g:i386 libxft2:i386 libxrender1:i386 libpng16-16:i386
libuuid1:i386 libx11-6:i386 libxau6:i386 libxcb1:i386 libxext6:i386 libstdc++6:i386
```

6. Installing and Configuring USB Cables

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

6.1. Prerequisite: Check and Setup USB library

To verify that you have the USB library installed, do the following:

1. Plug in the USB cable.
2. In the Command Prompt, enter:

   ```
   $ lsusb
   ```

   You should see the entry similar to the following:

   ```
   > Bus 001 Device 015: ID 0403:6010 Future Technology Devices International, Ltd FT2232C/D/H
   Dual UART/FIFO IC
   ```
3. If you get an error after you enter lsusb, you probably do not have libusb installed. To install libusb, go to: http://libusb.sourceforge.net/, and download a right version for your linux system.
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.

6.2. Setup HW-USBN-2B (FTDI) USB Drivers by Unloading Incompatible VCP Driver

Repeat following steps every time after USB cable hot plugged, because the configuration expires when cable unplugged.

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

   ```
   $ lsusb
   ```

   You should see an entry similar to the following:

   ```
   > Bus 001 Device 015: ID 0403:6010 Future Technology Devices International, Ltd FT2232C/D/H
   Dual UART/FIFO IC
   ```
3. This means the FTDI chip is in Bus 001 and device 015. Grant execute permissions to the device. In the Terminal window, type:

   ```
   $ sudo chmod 666 -R /dev/bus/usb/001/015
   ```
4. In Linux, the VCP driver and D2XX driver are incompatible with each other. When a FTDI device is plugged in, the VCP driver must be unloaded before a D2XX application can be run.

   Use the remove module (rmmod) command to do this:

   ```
   $ sudo /sbin/rmmod ftdi_sio
   $ sudo /sbin/rmmod usbserial
   ```

6.3. Setup HW-USBN-2B (FTDI) USB Drivers by UDEV Method

Note:

This is a permanent method, so you only need to do it once before the cable is plugged in.

Automated UDEV Method Configuration:

Type the following command to execute the script:

```
% sudo <install_path>/sdk/data/vmdata/udevsetup_ubuntu
```

The script should terminate with a “Setup successful” output.

Manual UDEV Method Configuration:

1. Execute the following command to create a working file named 70-persistent-net.rules with the rules:

   ```
   $ cat << EOF > 70-persistent-net.rules
   #FTDI
   SUBSYSTEM=="usb", ACTION=="add", ATTRS{idVendor}=="0403", \
   ATTRS{idProduct}=="6010", MODE="0666"
   SUBSYSTEM=="usb", ATTRS{idVendor}=="0403", ATTRS{idProduct}=="6010", \
   RUN+="/bin/sh -c 'basename %p >/sys/bus/usb/drivers/ftdi_sio/unbind'"
   EOF
   ```

2. Copy 70-persistent-net.rules created in Step 1 to /etc/udev/rules.d/:

   ```
   $ sudo cp 70-persistent-net.rules /etc/udev/rules.d/
   ```

   If a file with the same name 70-persistent-net.rules already exists in the directory, simply append the working file to it using the following command:

   ```
   $ sudo cat 70-persistent-net.rules >>/etc/udev/rules.d/70-persistent-net.rules
   ```

3. Give permission to 70-persistent-net.rules as follows:

   ```
   $ sudo chmod 755 70-persistent-net.rules
   ```

4. Reload the udev rules by executing the following:

   ```
   $ sudo udevadm control --reload
   ```

5. Plug in the USB cable.

7. Running Lattice Propel 2024.1 Software

Propel 2024.1 software Linux version has a graphical user interface (GUI). After Lattice Propel 2024.1 software is installed, you can open it via command line.

To invoke Propel 2024.1:

```
$ <install_path>/launch_propel.sh
```

To invoke Propel Builder 2024.1:

```
$ <install_path>/launch_builder.sh
```

Revision History

Revision 1.0, June 2024

Section	Change Summary
All	Production release.

www.latticesemi.com