SDAccel Development Environment

Release Notes, Installation, and Licensing Guide

UG1238 (v2018.2.xdf) October 2, 2018
# Revision History

The following table shows the revision history for this document.

<table>
<thead>
<tr>
<th>Section</th>
<th>Revision Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10/02/2018 Version 2018.2.xdf</strong></td>
<td></td>
</tr>
<tr>
<td>SDAccel Development Environment What’s New for 2018.2 XDF</td>
<td>Added an “Important!” note regarding the separate delivery and installation of the deployment files for SDAccel platforms, and the software installation of the SDAccel development environment.</td>
</tr>
<tr>
<td>Supported Platforms in 2018.2.xdf</td>
<td>Added a table of the available platform DSAs and their configuration and resources.</td>
</tr>
<tr>
<td>Software Installation</td>
<td>Added instructions for locating and installing the XRT, deployment DSA, and development DSA to support the deployment of the SDAccel platforms.</td>
</tr>
<tr>
<td><strong>07/10/2018 Version 2018.2</strong></td>
<td></td>
</tr>
<tr>
<td>Chapter 1: Release Notes</td>
<td>Added sections for Known Issues and Release Notes from Previous Versions.</td>
</tr>
<tr>
<td><strong>07/02/2018 Version 2018.2</strong></td>
<td></td>
</tr>
<tr>
<td>Document restructure</td>
<td>This document has been made specific to SDAccel™. For the SDSoC™ release information, refer to SDSoC Environments Release Notes, Installation, and Licensing Guide (UG1294).</td>
</tr>
<tr>
<td><strong>06/06/2018 Version 2018.2</strong></td>
<td></td>
</tr>
<tr>
<td>Chapter 1: Release Notes</td>
<td>Added information about updates to SDx™ for 2018.2.</td>
</tr>
<tr>
<td><strong>04/04/2018 Version 2018.1</strong></td>
<td></td>
</tr>
<tr>
<td>SDSoC - SDAccel Common Updates for 2018.1</td>
<td>Added information about updates to SDx™ for 2018.1.</td>
</tr>
<tr>
<td>SDSoC Development Changes for 2018.1</td>
<td>Added details about feature changes for 2018.1.</td>
</tr>
<tr>
<td>SDAccel Development Environment Changes for 2018.1</td>
<td>Added details about feature changes for 2018.1.</td>
</tr>
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Chapter 1

Release Notes

SDAccel Development Environment What's New for 2018.2 XDF

The 2018.2 XDF release of the SDAccel development environment provides support for the Xilinx Alveo™ U200 and U250 Data Center accelerator cards.

IMPORTANT! In the 2018.2 XDF release, the Xilinx runtime (XRT), the deployment shell to program the card, and the development shell to develop applications, are delivered as separate installable Linux packages for each supported platform. Users who simply wish to deploy an application to run on an accelerator card may now get started as described in Getting Started with Alveo Data Center Accelerator Cards (UG1301). Users who want to use the complete SDAccel development environment for programming, compiling, and debugging accelerated applications, must do a full installation as described in Chapter 4: Installing the SDAccel Environment.

Supported Platforms in 2018.2.xdf

Table 1: U200 v201820.1

<table>
<thead>
<tr>
<th>Area</th>
<th>SLR 0</th>
<th>SLR 1</th>
<th>SLR 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information</td>
<td>SLR description</td>
<td>SLR description</td>
<td>SLR description</td>
</tr>
<tr>
<td>SLR description</td>
<td>Bottom of device; dedicated to dynamic region.</td>
<td>Middle of device; shared by dynamic and static region resources.</td>
<td>Top of device; dedicated to dynamic region.</td>
</tr>
<tr>
<td>Dynamic region pblock name</td>
<td>pfm_top_i_dynamic_region_pblock_dynamic_SLR0</td>
<td>pfm_top_i_dynamic_region_pblock_dynamic_SLR1</td>
<td>pfm_top_i_dynamic_region_pblock_dynamic_SLR2</td>
</tr>
<tr>
<td>Compute unit placement syntax</td>
<td>set_property CONFIG.SLR_ASSIGNMENTS SLR0 [get_bd_cells ]</td>
<td>set_property CONFIG.SLR_ASSIGNMENTS SLR1 [get_bd_cells ]</td>
<td>set_property CONFIG.SLR_ASSIGNMENTS SLR2 [get_bd_cells ]</td>
</tr>
<tr>
<td>Global memory resources available in dynamic region</td>
<td>Memory channels; system port name</td>
<td>Memory channels; system port name</td>
<td>Memory channels; system port name</td>
</tr>
<tr>
<td></td>
<td>bank0 (16GB DDR4)</td>
<td>bank1 (16GB DDR4, in static region)</td>
<td>bank3 (16GB DDR4)</td>
</tr>
<tr>
<td>Approximate available fabric resources in dynamic region</td>
<td>Bank LUT</td>
<td>Bank LUT</td>
<td>Bank LUT</td>
</tr>
<tr>
<td>CLB LUT</td>
<td>365K</td>
<td>162K</td>
<td>365K</td>
</tr>
</tbody>
</table>
### Table 1: U200 v201820.1 (cont’d)

<table>
<thead>
<tr>
<th>Area</th>
<th>SLR 0</th>
<th>SLR 1</th>
<th>SLR 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLB Register</td>
<td>746K</td>
<td>339K</td>
<td>746K</td>
</tr>
<tr>
<td>Block RAM Tile</td>
<td>695</td>
<td>376</td>
<td>695</td>
</tr>
<tr>
<td>URAM</td>
<td>320</td>
<td>160</td>
<td>320</td>
</tr>
<tr>
<td>DSP</td>
<td>2275</td>
<td>1317</td>
<td>2275</td>
</tr>
</tbody>
</table>

Table footnotes:

1. By default, dynamic platforms will place a kernel in the same SLR as the memory bank that the kernel accesses. Details on how kernel placement can be manually controlled are provided in the "User-specified SLR Assignments for Kernels" section of the SDAccel Environment User Guide (UG1023).

2. Approximately 20K CLB LUTs and 20K CLB Registers are required for each mapped memory channel (except for bank1 in the static region). A minimum of 12K CLB LUTs, and 18K CLB Registers are also required for the SmartConnect network, with additional resources required for each mapped memory channel, and each compute unit.

### Table 2: U250 v201820.1

<table>
<thead>
<tr>
<th>Area</th>
<th>SLR 0</th>
<th>SLR 1</th>
<th>SLR 2</th>
<th>SLR 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLR description</td>
<td>Shared by dynamic and static region resources.</td>
<td>Shared by dynamic and static region resources.</td>
<td>Shared by dynamic and static region resources.</td>
<td>Shared by dynamic and static region resources.</td>
</tr>
<tr>
<td>Dynamic region pblock name</td>
<td>pfm_top_i_dynamic_region_pblock_dynamic_SLR0</td>
<td>pfm_top_i_dynamic_region_pblock_dynamic_SLR1</td>
<td>pfm_top_i_dynamic_region_pblock_dynamic_SLR2</td>
<td>pfm_top_i_dynamic_region_pblock_dynamic_SLR3</td>
</tr>
<tr>
<td>Compute unit placement syntax</td>
<td>set_property CONFIG.SLR_ASSIGNMENTS SLR0 [get_bd_cells ]</td>
<td>set_property CONFIG.SLR_ASSIGNMENTS SLR1 [get_bd_cells ]</td>
<td>set_property CONFIG.SLR_ASSIGNMENTS SLR2 [get_bd_cells ]</td>
<td>set_property CONFIG.SLR_ASSIGNMENTS SLR3 [get_bd_cells ]</td>
</tr>
<tr>
<td>Global memory resources available in dynamic region</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory channels; system port name</td>
<td>DDR[0] (16GB DDR4)</td>
<td>DDR[1] (16GB DDR4)</td>
<td>DDR[2] (16GB DDR4)</td>
<td>DDR[3] (16GB DDR4)</td>
</tr>
<tr>
<td>Approximate available fabric resources in dynamic region</td>
<td>338K</td>
<td>332K</td>
<td>332K</td>
<td>339K</td>
</tr>
<tr>
<td>CLB LUT</td>
<td>693K</td>
<td>680K</td>
<td>680K</td>
<td>696K</td>
</tr>
<tr>
<td>Block RAM Tile</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>URAM</td>
<td>320</td>
<td>320</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td>DSP</td>
<td>2877</td>
<td>2877</td>
<td>2877</td>
<td>2877</td>
</tr>
</tbody>
</table>

**TIP:** The term and acronym Device Support Archive (DSA) has been deprecated in the 2018.2.xdf release. The term DSA is replaced by:

- **Deployment Shell** for users who will simply run applications on the accelerator card.
• **Development Shell** for users who will develop an application using the SDAccel development environment.

## Changes to Existing Behavior

The following table specifies changes to existing flows and scripts which are required when using the 2018.2.xdf release vs. the earlier 2018.2 release.

### Table 3: SDAccel Migration Summary

<table>
<thead>
<tr>
<th>Area</th>
<th>2018.2 Behavior</th>
<th>Changes for 2018.2.xdf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>xbinst and xbsak utilities were used to install and manage accelerator cards.</td>
<td>xbutil replaces both xbsak and xbinst for installing and managing accelerator cards.</td>
</tr>
<tr>
<td>Command-line flow</td>
<td>Source settings64.sh as needed to setup the environment for running the SDAccel GUI or command-line tools.</td>
<td>Source both settings64.sh and /opt/xilinx/xrt/setup.sh for proper command-line compilation.</td>
</tr>
<tr>
<td>Linking</td>
<td>The --sp option requires specifying DDR banks using bank0, bank1...</td>
<td>The --sp option has been changed to specify the DDR banks as DDR[0], DDR[1]...</td>
</tr>
</tbody>
</table>

For more information on prior changes, refer to the Release Notes for the 2018.2. or 2017.4 releases:


## Known Issues

Known Issues for the SDx™ Environment are available in [AR#71223](https://www.xilinx.com/support/answer/answer_details.aspx?answer_id=71223).
Introduction to the SDAccel Development Environment

About the SDx Environments

The 2018.2.xdf SDx™ environment software release consists of the SDAccel™ development environment for Data Center and PCIe®-based accelerator systems. The SDAccel environment also includes the Vivado® Design Suite for programming the target devices and for developing custom hardware platforms.

System Requirements

To be installed, and run on a computer, the SDAccel development has the following minimum requirements:

Table 4: Minimum System Requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Linux, 64-bit:</td>
</tr>
<tr>
<td></td>
<td>• Ubuntu 16.04.4</td>
</tr>
<tr>
<td></td>
<td>• CentOS 7.4, 7.5</td>
</tr>
<tr>
<td></td>
<td>• RHEL 7.4, 7.5</td>
</tr>
<tr>
<td>System Memory</td>
<td>Xilinx requires 64 GB (80 GB is recommended).</td>
</tr>
<tr>
<td>Internet Connection</td>
<td>Required for driver, utilities, and demonstration installation</td>
</tr>
<tr>
<td>Hard disk space</td>
<td>100 GB</td>
</tr>
</tbody>
</table>

In addition, the 2018.2.xdf SDAccel™ development environment supports the Xilinx® Alveo U200 and U250 Data Center accelerator cards, that can be installed for use with the software. Refer to Getting Started with Alveo Data Center Accelerator Cards (UG1301) for the specific hardware requirements of those cards.
Additional platforms are available from partners. For more information, visit the SDAccel Developer Zone: https://www.xilinx.com/products/design-tools/software-zone/sdacccel.html.

Required Linux Packages

The SDAccel™ Environment runs on the Linux operating systems only, and does not support Windows. In addition to the base operating system, you must install the following packages for the specified OS.

CentOS/RHEL Package List

You can install the EPEL repository using the instructions at https://fedoraproject.org/wiki/EPEL. In addition, the following packages should be installed with the `yum` install command.

- ocl-icd
- ocl-icd-devel
- opencl-headers
- kernel-headers-$(uname -r)
- kernel-devel
- gcc-c++
- gcc
- gdb
- glibc-devel.x86_64
- glibc-utils.x86_64
- libstdc++-static
- make
- opencv
- libjpeg-turbo-devel
- libpng12-devel
- libtiff-devel
- compat-libtiff3
- python
- git
- dmidecode
- pciutils
strace
perl
boost-devel
boost-filesystem
gnuplot
cmake
lm_sensors
unzip
redhat-lsb
libuuid
libuuid-devel
mokutil
wget
openssl
libuuid-devel

Ubuntu Package List

The following packages should be installed with `apt-get install` command.

ocl-icd-libopencl1
opencl-headers
ocl-icd-opencl-dev
linux-headers
linux-libc-dev
g++
gcc
gdb
glibc-devel.x86_64
glibc-utils.x86_64
make
libopencv-core
• opencv
• libjpeg-dev
• libpng-dev
• libtiff5-dev
• python
• git
• dmidecode
• pciutils
• strace
• perl
• libboost-dev
• libboost-filesystem-dev
• gnuplot
• cmake
• lm-sensors
• lsb
• unzip
• linux-headers-$(uname -r)
• python3-sphinx-rtd-theme
• sphinx-common
• python3-sphinx
• libuuid1
• uuid-dev
• mokutil
• wget
• openssl
• openssl

**Recommended Libraries**

Xilinx recommends that you install the following libraries on your operating system.
• Independent JPEG Group’s JPEG runtime library (version 6.2).

```bash
sudo apt-get install libjpeg62 libjpeg62-dev
```

Xilinx recommends the following packages should be installed on CentOS 7.x

• PNG reference library.

```bash
sudo yum install libpng12
```

• The Linux Standards Base (LSB) library. The redhat-lsb package provides utilities needed for LSB Compliant Applications.

```bash
sudo yum install redhat-lsb
```

• The `libtiff3` package, an older version of `libtiff` library for manipulating TIFF (Tagged Image File Format) image format files.

```bash
sudo yum install redhat-lsb
```

## Required Dependencies

### RedHat and CentOS

The following dependencies are required for XRT and shell installation on RedHat and CentOS systems:

<table>
<thead>
<tr>
<th>Package</th>
<th>Minimum Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>ocl-icd-devel</td>
<td>2.2</td>
</tr>
<tr>
<td>boost-devel</td>
<td>1.53</td>
</tr>
<tr>
<td>boost-filesystem</td>
<td>1.53</td>
</tr>
<tr>
<td>libuuid-devel</td>
<td>2.23.2</td>
</tr>
<tr>
<td>dkms</td>
<td>2.5.0</td>
</tr>
<tr>
<td>protobuf-devel</td>
<td>2.5.0</td>
</tr>
<tr>
<td>protobuf-compiler</td>
<td>2.5.0</td>
</tr>
<tr>
<td>ncurses-devel</td>
<td>5.9</td>
</tr>
<tr>
<td>redhat-lsb-core</td>
<td>N/A</td>
</tr>
<tr>
<td>rhel-7-server-optional-rpms</td>
<td>N/A</td>
</tr>
<tr>
<td>libxml2-devel</td>
<td>2.9.1</td>
</tr>
<tr>
<td>libyaml-devel</td>
<td>0.1.4</td>
</tr>
</tbody>
</table>
Ubuntu

The following dependencies are required for XRT and shell installation on Ubuntu systems:

Table 6: Required Dependencies for Ubuntu

<table>
<thead>
<tr>
<th>Package</th>
<th>Minimum Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>ocl-icd-opencl-dev</td>
<td>2.2.0</td>
</tr>
<tr>
<td>libboost-dev</td>
<td>1.58</td>
</tr>
<tr>
<td>libboost-filesystem-dev</td>
<td>1.58</td>
</tr>
<tr>
<td>uuid-dev</td>
<td>2.27.1</td>
</tr>
<tr>
<td>dkms</td>
<td>2.2.0</td>
</tr>
<tr>
<td>libprotobuf-dev</td>
<td>2.6.1</td>
</tr>
<tr>
<td>protobuf-compiler</td>
<td>2.6.1</td>
</tr>
<tr>
<td>libncurses5-dev</td>
<td>6.0</td>
</tr>
<tr>
<td>lsb-release</td>
<td>2.9.1</td>
</tr>
<tr>
<td>libxml2-dev</td>
<td>2.9.1</td>
</tr>
<tr>
<td>libyaml-dev</td>
<td>0.1.6</td>
</tr>
</tbody>
</table>
Obtain a License on the Xilinx Licensing Site

This section describes the steps to obtain a license for the SDx™ development environment.

1. Sign in to the Xilinx® licensing website: https://www.xilinx.com/getproduct. See the following figure.

   Figure 1: Xilinx Licensing Site Sign-in Screen

   Sign In

   Username*

   Password*

   Forgot your username or password?

   Sign In

   New to Xilinx? Create your account

2. In the account drop-down menu, select XILINX - SDAccel Environment.

   Note: This only shows up if you have purchased or redeemed an SDAccel license.

3. From the Certificate Based Licenses menu, select SDAccel Environment, Node-Locked License.
4. Click **Generate node-locked license**.
5. Enter a Host ID in the **License Generation** screen, and then click **Next**.
6. Verify that the Host ID for the license is correct, and then click **Next**.
7. Accept the licensing agreement.

   You will receive an email from xilinx.notification@entitlenow.com with the license file.

8. Set the `XILINXD_LICENSE_FILE` environment variable to point to the location of the license file on your system.
Chapter 4

Installing the SDAccel Environment

The delivery of the Xilinx® Alveo™ U200 and U250 Data Center accelerator cards, and the required supporting software, enables two different configurations of systems to be used in developing, debugging, and running FPGA accelerated applications using the SDAccel™ development environment.

- Deployment Systems - To run accelerated applications, you can install the U200 or U250 accelerator card into a system, and then install the required Xilinx Runtime (XRT) and deployment shell to support running applications. The installation of the accelerator card and the required software for a deployment system is described in the Getting Started with Alveo Data Center Accelerator Cards (UG1301).

- Development Systems - You can also configure a system for developing FPGA accelerated applications using the SDAccel development environment. A development system does not require the actual accelerator card, but does require the XRT and deployment shell, as well as a development shell. These packages are a required part of the SDAccel™ development environment to support a specific Alveo™ Data Center accelerator card in the tool. The installation instructions for those items are included here.

Installing the SDAccel development environment involves the following steps:

1. Install the SDAccel environment software as described in Installing the SDAccel Environment.

2. For each acceleration platform that you want to develop for:
   a. Install the Xilinx Runtime (XRT) as described in Installing the Xilinx Runtime.
   b. Install the Deployment Shell for the specified OS, as described in Installing the Deployment Shell.
   c. Install the Development Shell for the specified OS, as described in Installing the Development Shell.

3. Repeat step 2 to add platform support in the SDAccel development environment for multiple accelerator cards.

This chapter explains the installation process for the SDAccel development environment.
Preparing to Install the Tools

*Note:* Before starting installation, you must complete the following steps:

1. Make sure your system meets the requirements described in the following topics:
   - System Requirements
   - Required Linux Packages
   - Recommended Libraries
2. To reduce installation time, disable anti-virus software.
3. Close all open programs before you begin installation.

Installing the SDAccel Environment

The SDAccel development environment installation is available on the [Xilinx® Downloads Website](https://www.xilinx.com).

There is no separate Vivado® version of the installation. There are only the stand-alone and SDx™ installations. Any difference in the installation happens if you use a different xsetup installer than the one from SDx or Vivado® Design Suite.

*Note:* The SDx xsetup installer is a super-set of the Vivado System Edition version. If you run the SDx xsetup installer, you would get the same programs and options as if you ran the 2018.2 Vivado xsetup installer.

Using the Web Installer

Xilinx recommends using the web installer.

Using the web installer, you can pick and choose what you would like to install before proceeding, and that is the only data that you need to download for installation. Also, in the case of a network failure, you can resume from where you last stopped, instead of starting again from the beginning.

*Note:* The following devices are preselected in the individual installers:

- For the combined SDx™ SFD (single file download) image, no devices are preselected.
Downloading and Installing the Full Installation File

If you downloaded the web installer client, launch the downloaded file. You are prompted to log in and use your regular Xilinx login credentials to continue with the installation process.

- The **Download and Install Now** choice allows you to select specific tools and device families on following screens, downloads only the files required to install those selections, and then installs them for you. After entering your credentials, you can select between a traditional web-based installation or a full image download.

- The **Download Full Image** requires you to select a download destination and to choose whether you want a Windows-only, Linux-only, or an install that supports both operating systems. There are no further options to choose with the **Download Full Image** selection, and installation needs to be done separately by running the xsetup application from the download directory.

### Batch Mode Installation Flow

The installer can run in an unattended batch process. To run unattended, a standard edition and install location must be specified, or a configuration file must be present that provides the installer with the install location and the tools, devices, and options you want to install. The installer has a mode in which it can generate a reference option file for you based on common configurations, which you can further edit to customize your installation.

**RECOMMENDED:** Generate this reference for each new quarterly release, so that new devices, tools, options, or other changes will be accounted for in your options file.

To begin using batch mode, open a command shell, and change to the directory where you have stored your extracted installer.

### Generate a Configuration File

1. Run:

   ```bash
   xsetup -b ConfigGen
   ```

   This will put you in an interactive mode where you will see the following menu:

   ```
   1. SDx Development Environments
   Please choose:
   ```

   Choose the SDx™ IDE for SDAccel development environment edition.
2. After you make a selection, you will be prompted with the location/file name for your configuration file and the interactive mode exits. Below is a sample configuration file:

```
Edition=SDx Development Environments

# Path where Xilinx software will be installed.
Destination=/opt/Xilinx

# Choose the Products/Devices the you would like to install.

# Choose the post install scripts you'd like to run as part of the finalization step. Please note that some of these scripts may require user interaction during runtime.
InstallOptions=Acquire or Manage a License Key:0, Enable WebTalk for SDK to send usage statistics to Xilinx:1, Enable WebTalk for Vivado to send usage statistics to Xilinx (Always enabled for WebPACK license):1

## Shortcuts and File associations ##

# Choose whether Start menu/Application menu shortcuts will be created or not.
CreateProgramGroupShortcuts=1

# Choose the name of the Start menu/Application menu shortcut. This setting will be ignored if you choose NOT to create shortcuts.
ProgramGroupFolder=Xilinx Design Tools

# Choose whether shortcuts will be created for All users or just the Current user. Shortcuts can be created for all users only if you run the installer as administrator.
CreateShortcutsForAllUsers=0

# Choose whether shortcuts will be created on the desktop or not.
CreateDesktopShortcuts=1

# Choose whether file associations will be created or not.
CreateFileAssociation=1
```

Each option in the configuration file matches a corresponding option in the GUI. A value of 1 means that option is selected; a value of 0 means the option is unselected.

*Note:* In this configuration file, by default, there are no devices selected for installation (all devices have a value of 0). You must update a device to a value of 1 in order to install that device.
Running the Installer

After editing your configuration file to reflect your installation preferences, you can run the installer. As part of the command line installer, you must indicate your acceptance of the Xilinx® End-User License Agreement Xilinx End-User License Agreement and Third Party End-User License Agreement Third Party End-User License Agreement, and confirm you understand the WebTalk Terms and Conditions.

WebTalk Terms and Conditions

The WebTalk Terms and Conditions, which you must agree to when running the installer, is below:

By indicating I AGREE, I also confirm that I have read Section 13 of the terms and conditions above concerning WebTalk and have been afforded the opportunity to read the WebTalk FAQ posted at https://www.xilinx.com/webtalk. I understand that I am able to disable WebTalk later if certain criteria described in Section 13(c) apply. If they don't apply, I can disable WebTalk by uninstalling the Software or using the Software on a machine not connected to the internet. If I fail to satisfy the applicable criteria or if I fail to take the applicable steps to prevent such transmission of information, I agree to allow Xilinx to collect the information described in Section 13(a) for the purposes described in Section 13(b).

When using the command line, use the command-line switch, -a or --agree, to indicate your agreement to each of the above. If one of the above is left out of the list, or the agree switch is not specified, the installer exits with an error and does not install.

Batch Mode Installation

This is an example of the command line for a typical new installation using a configuration file.

```bash
xsetup --agree XilinxEULA,3rdPartyEULA,WebTalkTerms --batch Install --config install_config.txt
```

If you wish to use one of Xilinx's default Edition configurations, you do not have to specify the --config option, but since the destination directory is included in the configuration file, you will be required to specify this on the command line.

```bash
xsetup --agree 3rdPartyEULA,WebTalkTerms,XilinxEULA --batch Install --edition 'SDx Development Environments' --location "C:\Xilinx"
```

The above command uses the default configuration options for the edition specified. To see the default configuration options, use the -b ConfigGen mode as described above. The batch mode of the SDx™ installer can also perform uninstallation and upgrades (adding additional tools and devices). For the full list of the options in the installer batch mode, run xsetup -h or xsetup --help.
Verify Connectivity

The installer connects to the internet through the system proxy settings in Windows. These settings can be found in Control Panel → Network and Internet → Internet Options. For Linux users, the installer uses Firefox browser proxy settings (when explicitly set) to determine connectivity.

*Figure 3: Internet Connectivity*

![Could Not Connect To Internet](image)

If there are connectivity issues, verify the following:

1. If you are using alternate proxy settings to the ones referred to, select the Manual Proxy Configuration option to specify the settings.

2. Check whether your company firewall requires a proxy authentication with a user name and password. If so, select the Manual Proxy Configuration option in the dialog box above.

3. For Linux users, if either the Use System settings or the Auto detect settings option is selected in the Firefox browser, then you must manually set the proxy in the installer.

Accepting License Agreements

Carefully read the license agreements before continuing with the installation. If you do not agree to the terms and conditions, cancel the installation and contact Xilinx.
Selecting SDAccel Tool and Device Options

Customize the installation by choosing the design tools, device families and installation options. Selecting only what you need helps to minimize the time taken to download and install the product. You will be able to add to this installation later by clicking Add Design Tools or Devices, from either the operating system Start Menu or the Vivado → Help menu.

When you launch the installer for the product you want to use, the devices are preselected for you.
Setting Destination Directory and Installation Options

Define the installation directory for the software, as shown below.

**Note:** The installation directory name must not contain any spaces in any part of the directory path.

You can customize the creation of the program group entries (Start Menu) and the creation of desktop shortcuts. The shortcut creation and file association options can be applied to the current user or all users.
Figure 6: Destination Directory and Installation Options

Reviewing the Installation Details

Review the installation details shown in the Installation Summary screen.
When you click **Install**, the installation process takes several minutes to complete.

### Setting Up the Environment to Run SDAccel

To set up the environment to run SDx, source the file below so that the `sdx` command is in the `PATH`.

For Linux:

```
C Shell: source <SDX_INSTALL_DIR>/settings64.csh
Bash: source <SDX_INSTALL_DIR>/settings64.sh
```
Installing the Xilinx Runtime

The following details the procedures for installing the Xilinx Runtime (XRT) on RedHat/CentOS and Ubuntu operating systems. All software installations use standard Linux RPM and Linux DEB packages.

The Xilinx Runtime (XRT) is implemented as a combination of user-space and kernel driver components. XRT supports PCIe based boards, and provides a software interface to Xilinx FPGAs.

Your operating system might require additional dependencies before installing XRT and the deployment shell. See Required Dependencies for a list of these packages.

**IMPORTANT!** Root access is required for all software and firmware installations.

XRT Installation for RedHat/CentOS

Use the following steps to download and install the Xilinx® Runtime (XRT) using an RPM installation package.

**IMPORTANT!** The installation packages referenced here are being updated regularly and the file names frequently change. If you copy and paste any commands from this user guide, be sure to update the placeholders in those commands to match the downloaded packages.

1. The Xilinx runtime (XRT) installation requires Extra Packages for Enterprise Linux (EPEL) and a related repository. The initial setup depends on whether you are using RedHat or CentOS.

   - For Redhat:
     1. Open a terminal window and enter the following command:

     ```
     $ sudo subscription-manager repos --enable=rhel-7-server-optional-rpms
     ```

     This enables an additional repository on your system.

     2. Enter the following command to install EPEL:

     ```
     ```

   - For CentOS, enter the following command in a terminal window:

     ```
     $ sudo yum install epel-release
     ```
This installs and enables the repository for Extra Packages for Enterprise Linux (EPEL).

2. Download both the XRT and deployment shell installation packages associated with your card from one of the following locations:
   
   - Alveo U200 Product Page
   - Alveo U250 Product Page

3. Install the XRT installation package using the following command, where `<rpm-dir>` is the directory where the RPM packages were downloaded in the previous step, and `<version>` is the latter part of the XRT file name.

   
   ```bash
   $ sudo yum install <rpm-dir>/xrt_<version>.rpm
   ```

   This will install the XRT and its necessary dependencies. Follow the instructions when prompted throughout the installation.

   **TIP:** Note, when running the SDAccel™ development environment from the command line, you need to source the setup file for the XRT to set the `XILINX_XRT` environment variable:

   ```bash
   source <SDX_INSTALL_DIR>/xrt/setup.sh
   ```

**XRT Installation for Ubuntu**

Use the following steps to download and install the software using a DEB installation package.

**IMPORTANT! The installation packages referenced here are being updated regularly and the file names frequently change. If you copy and paste any commands from this user guide, be sure to update the placeholders in those commands to match the downloaded packages.**

For deployment only, the installation is now complete. You can go directly to Card Bring-Up and Validation to validate the installation.

1. Download the Xilinx® runtime (XRT) and deployment shell installation packages associated with your card from one of the following locations:

   - Alveo U200 Product Page
   - Alveo U250 Product Page

2. Install the XRT installation package using the following command, where `<deb-dir>` is the directory where the DEB packages were downloaded in the previous step and `<version>` is the latter part of the XRT file name.

   ```bash
   $ sudo apt install <deb-dir>/xrt_<version>.deb
   ```
This will install the XRT along with any necessary dependencies. Follow the instructions when prompted throughout the installation.

**TIP:** Note, when running the SDAccel™ development environment from the command line, you need to source the setup file for the XRT to set the `XILINX_XRT` environment variable:

```
source <SDX_INSTALL_DIR>/xrt/setup.sh
```

## Installing the Deployment Shell

The following details the procedures for installing the deployment shell on RedHat/CentOS and Ubuntu operating systems. All software installations use standard Linux RPM and Linux DEB packages.

The Deployment Shell is needed both to build applications with SDAccel and to run them on the corresponding accelerator card.

Your operating system might require additional dependencies before installing XRT and the deployment shell. See Required Dependencies for a list of these packages.

**IMPORTANT! Root access is required for all software and firmware installations.**

### Deployment Shell Installation for RedHat/CentOS

Use the following steps to download and install the deployment shell using an RPM installation package.

**IMPORTANT! The installation packages referenced here are being updated regularly and the file names frequently change. If you copy and paste any commands from this user guide, be sure to update the placeholders in those commands to match the downloaded packages.**

1. Install the deployment shell installation package required for the card.
   - For U200:
     ```
     $ sudo yum install <rpm-dir>/xilinx-u200-xdma-<version>.rpm
     ```
   - For U250:
     ```
     $ sudo yum install <rpm-dir>/xilinx-u250-xdma-<version>.rpm
     ```
The deployment software sources are now installed on the system. The installation of the drivers, runtime software, and utilities are in the `/opt/xilinx/` directory and contains the `xrt` and `dsa` sub-directories. Note that the `dsa` folder contains the deployment shell installation.

2. After installing the deployment shell, the terminal output instructs you to flash the card by running a command. **Do not run this command.**

**TIP: This is not required unless you are installing the accelerator card, in which case you should be following Getting Started with Alveo Data Center Accelerator Cards (UG1301).**

### Deployment Shell Installation for Ubuntu

Use the following steps to download and install the software using a DEB installation package.

**IMPORTANT!** The installation packages referenced here are being updated regularly and the file names frequently change. If you copy and paste any commands from this user guide, be sure to update the placeholders in those commands to match the downloaded packages.

1. Install the deployment shell installation package required for the card that you downloaded in the XRT section.

   - For U200:
     ```
     $ sudo apt install <deb-dir>/xilinx_u200_xDMA_<version>.deb
     ```
   
   - For U250:
     ```
     $ sudo apt install <deb-dir>/xilinx_u250_xDMA_<version>.deb
     ```

   The deployment software sources are now installed and deployed on the system. The installation of the drivers, runtime software, and utilities are in the `/opt/xilinx/` directory and contains the `xrt` and `dsa` sub-directories. Note that the `dsa` folder contains the deployment shell installation.

2. After installing the deployment shell, the terminal output instructs you to flash the card by running a command. **Do not run this command.**

**TIP: This is not required unless you are installing the accelerator card, in which case you should be following Getting Started with Alveo Data Center Accelerator Cards (UG1301).**

### Installing the Development Shell

**IMPORTANT!** The XRT and deployment shell must be installed prior to installing the development shell.
To develop and deliver accelerated applications in the SDAccel development environment, you must install the development shell. The development shell includes platform information necessary for compiling and debugging new acceleration applications.

**IMPORTANT!** Root access is required for all software and firmware installations.

### Development Shell Installation Procedures on RedHat and CentOS

Use the following steps to download and install the development shell using an RPM installation package.

**IMPORTANT!** The installation packages referenced here are being updated regularly and the file names frequently change. If you copy and paste any commands from this user guide, be sure to update the file names in those commands to match the downloaded packages.

1. Depending on your card, download the development RPM installation package from one of the following locations:
   - Alveo U200 Product Page
   - Alveo U250 Product Page
2. Install the package using the following command, where `<rpm-dir>` is the directory where the RPM package was downloaded in the previous step:

   ```
   $ sudo yum install <rpm-dir>/xilinx-u200-xdma-<version>-dev.rpm
   ```

   This installs the development shell along with any necessary dependencies.

### Development Shell Installation Procedures on Ubuntu

Use the following steps to download and install the development shell using a DEB installation package.

**IMPORTANT!** The installation packages referenced here are being updated regularly and the file names frequently change. If you copy and paste any commands from this user guide, be sure to update the file names in those commands to match the downloaded packages.

1. Depending on your card, download the development DEB installation package from one of the following locations:
   - Alveo U200 Product Page
   - Alveo U250 Product Page
2. Install the package using the following command, where `<deb-dir>` is the directory where the DEB package was downloaded in the previous step:

```
$ sudo apt install <deb-dir>/xilinx-u200-xdma-<version>-dev.deb
```

This installs the development shell along with any necessary dependencies.
Appendix A

Additional Resources and Legal Notices

Xilinx Resources

For support resources such as Answers, Documentation, Downloads, and Forums, see Xilinx Support.

Documentation Navigator and Design Hubs

Xilinx® Documentation Navigator (DocNav) provides access to Xilinx documents, videos, and support resources, which you can filter and search to find information. DocNav is installed with the SDSoC™ and SDAccel™ development environments. To open it:

- On Windows, select Start → All Programs → Xilinx Design Tools → DocNav.
- At the Linux command prompt, enter docnav.

Xilinx Design Hubs provide links to documentation organized by design tasks and other topics, which you can use to learn key concepts and address frequently asked questions. To access the Design Hubs:

- In DocNav, click the Design Hubs View tab.
- On the Xilinx website, see the Design Hubs page.

Note: For more information on DocNav, see the Documentation Navigator page on the Xilinx website.
References

1. SDAccel Environments Release Notes, Installation, and Licensing Guide (UG1238)
2. SDAccel Environment User Guide (UG1023)
3. SDAccel Environment Profiling and Optimization Guide (UG1207)
4. SDAccel Environment Tutorial: Introduction (UG1021)
5. SDAccel Development Environment web page
6. Vivado® Design Suite Documentation
8. Vivado Design Suite: Creating and Packaging Custom IP (UG1118)
13. Khronos Group web page: Documentation for the OpenCL standard
14. Xilinx Virtex UltraScale+ FPGA VCU1525 Acceleration Development Kit
15. Xilinx Kintex UltraScale FPGA KCU1500 Acceleration Development Kit

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