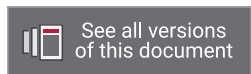


# SDAccel Development Environment

Release Notes, Installation, and Licensing Guide

UG1238 (v2019.1) July 26, 2019



# Revision History

The following table shows the revision history for this document.

Section	Revision Summary
07/26/2019 Version 2019.1	
<a href="#">What's New for 2019.1</a>	Added new and enhanced features for Alveo™ shells.
<a href="#">Changed Behavior</a>	Added new entry that describes requirements for BIOS.
<a href="#">Supported Shells in 2019.1</a>	Updated table for Beta shell changes.
<a href="#">System Requirements</a>	Clarified hard disk requirements.
<a href="#">Install Required CentOS/RHEL Packages</a>	Clarified final step for specific use case.
5/22/2019 Version 2019.1	
<a href="#">What's New for 2019.1</a>	Added new and enhanced features introduced in the 2019.1 release.
<a href="#">Changed Behavior</a>	Describes changed behavior in the 2019.1 release.
<a href="#">Supported Shells in 2019.1</a>	Updated the tables of available platform shells and their configuration and resources.
<a href="#">Known Issues</a>	Updated answer record number and link.
<a href="#">System Requirements</a>	Updated requirements.
<a href="#">Install Required CentOS/RHEL Packages</a>	Updated commands.
<a href="#">Installing the Packages on Ubuntu</a>	Updated commands.
<a href="#">Installing the Packages on CentOS/RedHat</a>	Updated commands.
<a href="#">Setting Up the Environment to Run SDAccel</a>	Updated commands.

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# Release Notes

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## What's New for 2019.1

The 2019.1 release of the SDAccel™ development environment introduces the following enhancements and features.

### Alveo™ Shell Enhancements

- Support for Alveo U280, built on the Xilinx® 16 nm UltraScale™ architecture with 8 GB of HBM2 of in-package memory capable of 460 GB/s data transfers
- New Queue DMA (QDMA) platform supports low-latency direct streaming between host and kernels
- DDR memory bandwidth have been optimized for large data transfers
  - DDR memory controller uses bank interleaving and close page policy with auto-precharge
- Addition of DQS BIAS attributes for DDR clocks
  - IOSTANDARD for DDR system clocks is explicit set to LVDS to align with clock distribution device.
- Deployment and Development files include build number
  - Filenames include build numbers for file download versioning
- Platforms with M2M IP improve the performance of the clEnqueueCopyBuffer API, allowing much faster transfers of buffers from one DDR bank to another (within the same device)
- Improved general interoperability with other acceleration cards that are also present on the server
- Updated Satellite Controller firmware to 4.2.0
  - Add custom I2C protocol support over OOB (Out-Of-Band)
  - Add support for multiple I2C slave address on OOB
  - Add FRU (Field Replaceable Unit) support on OOB
  - Adds support for v1.6 EEPROM with FRU
  - Decrease I2C timeout from 2 seconds to 1 second

- Stability fixes for finishing I2C transactions before going into BSL and reboot on fault ISR (FreeRTOS)
- The U200 XDMA shell now offers kernel FPGA Memory-to-Memory direct access (M2M) to move data between DDR banks and PCIe® Peer-to-Peer (P2P) to move data between PCIe endpoints without using host memory
- Alveo U250 shell floorplan has been enhanced to support Digital Rights Management (DRM)
  - Provides access from the user's dynamic region to connect DRM function residing in a kernel to FPGA Device DNA physical block
- Enabled U250 JTAG access for debugging

### Alveo Shell Resolved Issues

- Dynamic Region clocking fix for static DDR
  - Previously, clock domain crossing block was required to the static DDR

Performance degradation was observed when the kernel clock is slower than 250MHz. With the 18.3 tool enhancements, the CDC block has been removed.
- Improved robustness on Alveo Card being recognized during warm reboot
  - Card may not be recognized consistently during warm reboot, which required a secondary reboot. Improvements on reset handling and firmware interaction have been implemented to reduce the frequency of this occurrence.
- PCIe/XDMA parameter addition to pass PCI-SIG testing
  - Added PCIe parameter to improve compliance pass rate `CONFIG.enable_multipf_aer { true }`

- Newest shells now default to PCIe 64-bit Base Address Registers (BARs)
  - No mixing of 32-bit and 64-bit BARs
  - Extended support of High-end servers with multiple acceleration cards
  - Servers must have BIOS turned on above 4 GB PCIe addressing
  - Support for reconfigurable BAR size (in other words, 4 GB to 64 GB)

Resolves issue of card being recognized by the host during boot-up in a server configuration that has multiple PCIe cards

- Corrected LED contention issue from FPGA and Satellite Controller
  - The LEDs have limited visibility for lab specific debug conditions and may have contention issue when driven simultaneously by the FPGA and Satellite Controller.
  - Removed the ability for the Shell to drive LEDs from the FPGA

### SDAccel Tool Enhancements

- Support for QDMA development shells with direct host to kernel streaming
- Improved kernel-to-kernel streaming
  - Supports streaming in C++ kernels
  - New `--sc` option specifies kernel-to-kernel streaming connections for RTL and C++ kernels
  - Supports free-running RTL kernels, which do not require any start/done synchronization

**Note:** Control-free kernels with an `ap_ctrl_none` execution model should only be packaged through scripts generated from the RTL Kernel Wizard. You cannot use `package_xo` independently.
- Improved SDAccel application timeline trace integrating new streaming features and PCIe peer-to-peer
- The dataflow ping-pong buffers can be sized through the stream pragma

### Xilinx Runtime 2.2 (XRT)

- Support for PCIe peer-to-peer, QDMA, M2M
- New `xrt.ini` configuration file, which replaces `SDAccel.ini`
- New [examples](#) on the Xilinx Media Accelerator (XMA) GitHub repository
- For more information on the XRT 2.2 release, see the [changelog](#) on the XRT GitHub repository

## Changed Behavior

### Migrating from 2018.3

The following table specifies changes to existing flows and scripts that are required when using the 2019.1 release vs. the 2018.3 release.

Table 1: Migration Summary


Area	2018.3 Behavior	Changes for 2019.1
Buffer allocation in XRT	In previous releases, if the buffer could not be allocated on the designated bank, XRT would try to allocate a random buffer for the application.	If the buffer cannot be allocated on the designated bank, it will return an error.   <b>CAUTION!</b> <i>If the xclbin does not contain proper connectivity information, then some applications might fail.</i>

Table 1: Migration Summary (cont'd)

Area	2018.3 Behavior	Changes for 2019.1
Linking		<p>XRT adds an indirect dependency on a new shared library, <code>libxrt_coreutil.so</code>. Host applications linking with <code>libxilinxopencl.so</code> must be able to locate this new library during linking. Do this either by sourcing the XRT <code>setup.sh/.csh</code> file, as described in <a href="#">Installing Platform-Specific Packages</a>, or add the following to the <code>xocc</code> linker command line in your makefile:</p> <pre>-Wl, -rpath-link, \$(XILINX_XRT)/lib</pre>
BIOS		Servers must have BIOS turned on above 4 GB PCIe addressing.

### Prior Release Notes

For more information on prior changes, refer to the Release Notes for the release:

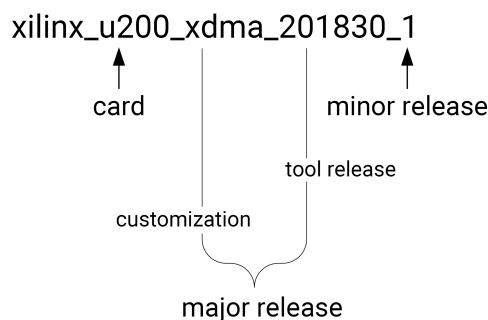
- [What's New in SDAccel for 2018.3](#)
- [What's New in SDAccel for 2018.2.xdf](#)
- [What's New in SDAccel for 2018.2](#)

## Shell Lifecycle Definitions

### Nomenclature

Alveo™ Linux package shell names adhere to the nomenclature depicted in the figure shown below. The example denotes a Xilinx shell designed for the U200 card with a main customization level `xdma`. The shell was created with the 2018.3 release of the tools and has a minor shell revision (release) level of 1

Figure 1: Alveo Shell Nomenclature Example



The Xilinx runtime (XRT) packages follow a similar nomenclature that also denotes the release number, such as `xrt_u200_xdma_201830_1`.

### Life Cycle for the Alveo XRT and Shells

- **Beta:** A pre-production version that is typically distributed through Xilinx-hosted secured web lounges. Alveo shells are marked *BETA* and otherwise *ES* for cards relying on engineering sample devices.
- **Production:** Production shells are available on <https://www.xilinx.com/>, under their respective card product web page. They are supported with the servers and OS combinations documented in *Getting Started with Alveo Data Center Accelerator Cards (UG1301)*.
- **Major Release:** The major release version of a shell is denoted in the customization substring of its file name. For example, the major release for the `xilinx_u200_xdma_201830_1` shell is `xdma_201830`. A major release can include new features or capabilities.
- **Minor Release:** Shell updates (bug fixes or enabling specific new features) have an incremented suffix (>1).

The minor release version of a shell is denoted in the customization substring of its file name. For example, the minor release for the `xilinx_u200_xdma_201830_1` shell is `_1`.

Whenever possible, it is recommended to update to the latest minor release of a shell.

- **Superseded:** Runtime or shells updated and replaced by a newer version, typically a minor release with backward compatibility.
- **Discontinued:** XRT or shells that are no longer supported.

### Alveo Shells and Tool Compatibility

- When developing applications, the XRT and the SDAccel development environment must have the same major release version.
- An Alveo shell for a given major release version can be used with the XRT and SDAccel development environment for the releases from the next calendar year. For example, 2018.3 shells will be supported with the XRT and SDAccel releases from 2019.
- A specific release of the SDAccel development environment and XRT supports the use shells with a major release version from the prior calendar year, although some additional setup may be required.



**Table 2: Alveo Shells and Tool Compatibility**

Same versions for shells and XRT and SDAccel	Older shell with newer versions of XRT and SDAccel	Newer shells and older versions of XRT and SDAccel
Supported	Supported <sup>1</sup>	Not supported

**Notes:**

1. A shell for a given release will be supported in the next calendar year's releases of XRT and the SDAccel development environment.

## Supported Shells in 2019.1

The following table shows the supported shells for the various Alveo cards.

**Table 3: Supported Shells for Alveo Cards**

Alveo Card	Shell	Version <sup>1</sup>	Notes	2018.3 Tools+XRT	2019.1 Tools+XRT
U200	XDMA	xilinx_u200_xdma_201820_1	-	Superseded	-
		xilinx_u200_xdma_201830_1	SLR Assignments/PLRAM	Production	Production
		xilinx_u200_xdma_201830_2	Bug Fixes/2019.1 Features (64b BAR, DRM)	Beta	Production
	QDMA	xilinx_u200_qdma_201830_1	QDMA (Stream+MM)	Beta	Superseded
		xilinx_u200_qdma_201910_1	QDMA (Stream+MM)	-	Beta
U250	XDMA	xilinx_u250_xdma_201820_1	-	Superseded	-
		xilinx_u250_xdma_201830_1	Profile + Debug	Production	Production
		xilinx_u250_xdma_201830_2	Bug Fixes/2019.1 Features (64b BAR, DRM)	Beta	Production
	QDMA	xilinx_u250_qdma_201910_1	QDMA (Stream+MM)	-	Beta
U280-ES1	XDMA	xilinx_u280-es1_xdma_201830_1	-	Beta	Superseded
		xilinx_u280-es1_xdma_201910_1	Bug Fixes/2019.1 Features (HBM ECC & Temp Mon)	-	Beta
U280	XDMA	xilinx_u280_xdma_201910_1	-	-	Production

**Notes:**

1. Xilinx Runtime and SDAccel tools releases must be aligned. Older shells can be used with newer tools, but xclbin kernels must be recompiled.

The `platforminfo` command line utility can be used to report platform meta-data for platforms installed on the host machine. The meta-data includes information on interface, clock, valid super logic regions (SLRs) and allocated resources, and memory in a structured format. This information can be referenced when allocating kernels to SLRs or memory resources, for instance.

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## Known Issues

Known Issues for the SDAccel development environment are available in [AR#72237](#).

# SDAccel Development Environment Requirements and Setup

The 2019.1 SDAccel™ development environment consists of the SDx™ development environment and command-line tools for Data Center and PCIe®-based accelerator systems. It also includes the Vivado® Design Suite, which is used for programming the target devices.

The Xilinx Runtime (XRT), deployment shell, and development shell are all delivered as separate installable Linux packages for each supported platform. Users who simply wish to install an accelerator card, and deploy applications to run on an accelerator card, should refer to *Getting Started with Alveo Data Center Accelerator Cards* (UG1301). However, users who want to use the SDAccel development environment for programming, compiling, and debugging accelerated applications, must do a full installation as described in [Chapter 4: SDAccel Environment Installation](#).



**TIP:** The version of the Vivado® tools installed by the SDx™ environment installation is the standard version of the Vivado Design Suite that can be installed as a separate product. If you are using both the SDAccel environment and the Vivado tools, then just install the SDAccel environment.

## System Requirements

The SDAccel development environment runs on the Linux operating systems only, and does not support Windows. To install and run on a computer, your system must meet the following minimum requirements:

Table 4: Minimum System Requirements

Component	Requirement
Operating System	Linux, 64-bit: <ul style="list-style-type: none"> <li>• Ubuntu 16.04.5 LTS, 18.04.1 LTS</li> <li>• CentOS 7.4, 7.5, 7.6</li> <li>• RHEL 7.4, 7.5, 7.6</li> </ul>
System Memory	For deployment installations, a minimum of 16 GB plus application memory requirements is required. For development installations, a minimum of 64 GB of device memory is required, but 80 GB is recommended.

Table 4: Minimum System Requirements (cont'd)

Component	Requirement
Internet Connection	Required for downloading drivers and utilities
Hard disk space	Satisfy the minimum system requirements for your operating system.

## Install Required CentOS/RHEL Packages

For CentOS or RedHat, you must install the Extra Packages for Enterprise Linux (EPEL), as well as additional packages. The initial setup commands depend on your operating system. For more information, see <https://fedoraproject.org/wiki/EPEL>.

### 1. Install EPEL.

On RedHat:

- a. To enable an additional repository on your system, open a terminal window, and enter the following command:

```
sudo yum-config-manager --enable rhel-7-server-optional-rpms
```

- b. To install EPEL, enter the following command:

```
sudo yum install -y https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm
```

On CentOS:

- a. Open a terminal window, and enter the following command:

```
sudo yum install epel-release
```

### 2. To install kernel headers and kernel development packages, run the following two commands:

```
$ sudo yum install kernel-headers-`uname -r`
$ sudo yum install kernel-devel-`uname -r`
```

**Note:** Ensure that `uname` is surrounded by backticks ( ``` ) and not single quotes ( `'` ).

### 3. After step 2 completes, cold reboot your system.



**TIP:** To verify that you have installed all required packages on your machine, use this script: [https://github.com/Xilinx/XRT/blob/master/src/runtime\\_src/tools/scripts/xrtdeps.sh](https://github.com/Xilinx/XRT/blob/master/src/runtime_src/tools/scripts/xrtdeps.sh).

## Install Required Ubuntu Packages

You do not need to install additional Ubuntu packages. The packages installed by the OS and by the XRT, deployment and development shells, and the SDAccel development environment provide everything the tool needs.

## Create a Licensing File to Enable Software

This section describes the steps to obtain a license for the SDx™ development environment. The software tools and IP product entitlements you have purchased are presented as selectable options in a table to include for licensing.

1. To create or manage your licenses, go to [Product Licensing](#).

If prompted to, sign in with your Xilinx.com credentials and confirm any necessary information to continue.

2. Under Certificate Based Licenses, select an environment product license.

Certificate Based Licenses

Product	Type	License	Available Seats	Status	Subscription End Date
<input type="checkbox"/> <a href="#">Model Composer : 90-day Evaluation License</a>	Certificate - Evaluation	Node	1/1	Current	90 days
<input type="checkbox"/> <a href="#">Vivado Design Suite: 30-Day Evaluation License</a>	Certificate - Evaluation	Node	1/1	Current	30 days
<input type="checkbox"/> <a href="#">SDSoC Environment, 60 Day Evaluation License</a>	Certificate - Evaluation	Node	1/1	Current	60 days
<input type="checkbox"/> <a href="#">SDAccel OpenCL Development Environment: 30 Day Node Locked Evaluation Lice...</a>	Certificate - Evaluation	Node	1/1	Current	30 days
<input type="checkbox"/> <a href="#">Vivado Design Suite: HL WebPACK 2015 and Earlier License</a>	Certificate - No Charge	Node	1/1	Current	None
<input type="checkbox"/> <a href="#">ISE WebPACK License</a>	Certificate - No Charge	Node	1/1	Current	None
<input type="checkbox"/> <a href="#">Xilinx MicroBlaze/All Programmable SoC Software Development Kit – Standalone</a>	Certificate - No Charge	Node	1/1	Current	None
<input type="checkbox"/> <a href="#">PetaLinux Tools License</a>	Certificate - Evaluation	Node	1/1	Current	365 days
<input type="checkbox"/> <a href="#">Vivado HLS Evaluation License</a>	Certificate - Evaluation	Node	1/1	Current	30 days

**Note:** The table displays options based on what licenses you have purchased or redeemed. Xilinx also offers an evaluation license for the SDAccel development environment, which you can see in your available license list.

3. After selecting the environment, generate a license.

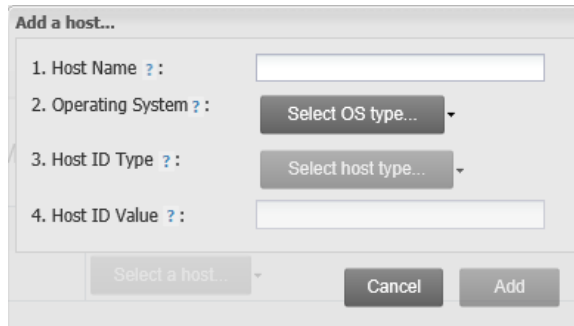
A new window is displayed where you define the product and system that you are generating the license for.

4. Under System Information, click **Select a host**, and then click **Add a host**.

## 2 SYSTEM INFORMATION

License	Node
Host ID * ?	Select a host... ▾

5. Enter information about the host.



- a. Enter a host name.
- b. For Operating System, select **Linux 64-bit**.
- c. Select the host identification type.
- d. Enter the Host ID.

The easiest way to obtain the Host ID of your machine is to run Xilinx® License Configuration Manager on the machine you want to license.

- e. Click **Add**.
6. Accept the licensing agreement.

You will receive an email from `xilinx.notification@entitlenow.com` with the license file, which you must save to your machine.

7. To enable the software, set the `XILINXD_LICENSE_FILE` environment variable to point to the location of the license file on your system.

# SDAccel Environment Installation

With the delivery of the Xilinx<sup>®</sup> Alveo™ Data Center accelerator cards, you can configure your system for deploying applications only, or for development. The latter enables you to develop and debug applications, in addition to deploying them, but requires additional software installation.

## Deployment Systems

A deployment system allows you to deploy accelerated applications. To deploy accelerated applications, install the accelerator card into a system, along with the Xilinx Runtime (XRT) and deployment shell. For more information on the installation procedures, see *Getting Started with Alveo Data Center Accelerator Cards* ([UG1301](#)).

## Development Systems

A development system is necessary to design and develop accelerated applications. It does not require an accelerator card (although, you *can* install one), but it does require XRT and a deployment shell, as well as a development shell. These packages are a required part of the SDAccel™ development environment to support a specific accelerator card in the tool.

To configure your system, use this workflow:

1. Install the SDAccel environment software, as described in [Install With the Installation File](#).
2. For each acceleration platform that you want to develop for, install the platform-specific packages, as described in [Installing Platform-Specific Packages](#).

**Note:** For multiple accelerator cards, repeat the installation of platform-specific packages.

---

## Prepare to Install the Tools

You *must* perform these actions prior to installation.



**TIP:** To reduce installation time, disable anti-virus software.

1. Ensure your system meets the system requirements, as described in [System Requirements](#).
2. Close all open programs.

---

## Download the Installation File

1. Go to the [Xilinx Downloads Website](#).
2. Click an installation file to download.
  - **Web Installer:** The Web Installer is the recommended installation method, because it reduces download time and saves significant disk space.

When you use the Web Installer, you choose the design tools, device families, and installation options at the time of installation. The only files that are downloaded and installed are files necessary to support those options.

This method also mitigates issues such as network outages by resuming installation from where it stopped, instead of starting over.

- **Single File Download (SFD):** The SFD installation download is an image containing all devices and tool options that can be used for installation at a later time. This option is useful for installing all files on a network drive, or for providing maximum flexibility to users when they install the environment.

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## Install With the Installation File

Use the downloaded installation file to install the SDAccel development environment.

1. Run the installation file, which opens SDx IDE Installer.
2. Click **Next**.
3. Enter your account credentials.
4. Select **Download and Install Now**, and then click **Next**.
5. Read and accept the license agreements.
  - To indicate that you accept the Xilinx Inc. End User License Agreement, click **I Agree**.
  - To indicate that you understand and accept the WebTalk Terms and Conditions, click **I Agree**.
  - To indicate that you accept the Third Party Software End User License Agreement, click **I Agree**.
6. After accepting all license agreements, click **Next**.
7. Customize the installation by selecting and clearing options in the tree.

To add to this installation later, click **Vivado** → **Help** → **Add Design Tools or Devices**.
8. Click **Next**.



9. Select the installation directory.



**CAUTION!** *The installation directory path must not contain any spaces.*

10. (Optional) Select shortcut and file association options.

11. Click **Next**.

An Installation Summary window is displayed, describing the following information:

- Devices
- Design tools
- Installation options
- Installation locations
- Download locations
- Disk space requirements

12. After reviewing the installation summary, click **Install**.

---

## Install With the Single File Download

If you downloaded the full product installation, decompress the file, and then run `xsetup` to launch the installation.

### Configuring Batch Mode Installation Flow

The installer can run in an unattended batch process. To run the installer unattended, you must do one of the following.

- Specify a standard edition and installation location
- Include a configuration file that provides the installer with the install location and the tools, devices, and options you want to install



**RECOMMENDED:** *Generate this reference for each new 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 `xsetup -b ConfigGen`.

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

```
1. SDx Development Environments
```

```
Please choose:
```

Type 1, and then press **Enter**.

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.
Modules=Built-in Platforms and associated devices for SDSoc:1,Zynq
UltraScale+ MPSoc:1,Virtex UltraScale+ HBM ES:0,Zynq-7000:1,Kintex
UltraScale+ ES:0,Kintex UltraScale+:1,ARM Cortex-A53:1,Spartan-7:1,ARM
Cortex-A9:1,ARM Cortex R5:1,Virtex UltraScale+ ES:0,System Generator for
DSP:0,Artix-7:1,Built-in Platforms and associated devices for
SDAccel:1,DocNav:1,Kintex-7:1,Virtex UltraScale+:1,Model Composer:0,Zynq
UltraScale+ RFSoc ES:0,Kintex UltraScale:1,Engineering Sample Devices
for Custom Platforms:0,Virtex UltraScale:1,Zynq UltraScale+ MPSoc
ES:0,MicroBlaze:1,Virtex-7:1

# 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 (that is, all devices have a value of 0). To install a device, you *must* change the value to 1.

## Running the Installer

After editing your configuration file to reflect your installation preferences, you can run the installer. During the command line installation, you must indicate your acceptance of the [Xilinx End-User License Agreement](#) and [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.

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

If you want to use one of the Xilinx 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.

```
xsetup --agree 3rdPartyEULA,WebTalkTerms,XilinxEULA
--batch Install --edition "SDx Development Environments" --location "/home/
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 installer can also uninstall and upgrade (add additional tools and devices). For the full list of the options in the installer batch mode, run `xsetup -h` or `xsetup --help`.

## Resolve Internet Connection Issues

The installer connects to the Internet through the system proxy. The installer uses Firefox browser proxy settings (when explicitly set) to determine connectivity.

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. 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.

---

## Installing Platform-Specific Packages

To develop FPGA-accelerated applications in the SDAccel environment, you must install the following three platform-specific packages for each platform that you want to develop applications for:

- **Xilinx Runtime (XRT):** The 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.
- **Deployment Shell:** The deployment shell is the communication layer for the accelerator card, and is needed both to build applications with SDAccel and to run them on the corresponding accelerator card.
- **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.

Before you install platform-specific packages, download the Xilinx Runtime (XRT), the Deployment Shell, and the Development Shell for your specific card from these product pages:

- [Alveo U200 Data Center Accelerator Card](#)
- [Alveo U250 Data Center Accelerator Card](#)
- [Alveo U280 Data Center Accelerator Card](#)

All software installations use standard Linux RPM and Linux DEB distribution files, and root access is required for all software and firmware installations.

Your operating system might require additional packages to be installed prior to installing the XRT and shells. To verify that you have installed all required packages on your machine, use this script: [https://github.com/Xilinx/XRT/blob/master/src/runtime\\_src/tools/scripts/xrtdeps.sh](https://github.com/Xilinx/XRT/blob/master/src/runtime_src/tools/scripts/xrtdeps.sh).



**IMPORTANT!** *The installation packages found on the product pages are updated regularly, and the file names specified in this document might be different. Make sure to update file names in commands to match the packages that you actually downloaded.*



**RECOMMENDED:** *If you are installing these packages for use with just the SDAccel development environment, you can ignore any message asking you to flash the accelerator card. However, if you are installing these packages for use with an installed accelerator card, you must follow the instructions in [Getting Started with Alveo Data Center Accelerator Cards \(UG1301\)](#).*

## Installing the Packages on CentOS/RedHat

To install and use the XRT on CentOS/RedHat, ensure that you have installed all required packages and recommended libraries, as described in [Install Required CentOS/RHEL Packages](#).

To successfully install XRT, you must have kernel-headers and kernel-devel packages installed on your machine. On CentOS/RedHat, XRT supports Linux kernel up to 4.x.

Use the following commands to install the packages for your specific platform.

Where `<rpm-dir>` is the directory where the packages were downloaded in the previous step, and `<version>` is the latter part of the XRT file name.

```
sudo yum install <rpm-dir>/xrt-<version>.rpm
sudo yum install <rpm-dir>/xilinx-<card>-<shell>-<version>.rpm
sudo yum install <rpm-dir>/xilinx-<card>-<shell>-dev-<version>.rpm
```

## Installing the Packages on Ubuntu

Use the following commands to install the packages for your specific platform.

Where `<deb-dir>` is the directory where the packages were downloaded to, `<version>` is the latter part of the XRT file name, and `<os>` is the operating system.

```
sudo apt install <deb-dir>/xrt-<version>.deb
sudo apt install <deb-dir>/xilinx-<card>-<shell>-<version>-<os>.deb
sudo apt install <deb-dir>/xilinx-<card>-<shell>-<version>-dev-<os>.deb
```

---

## Setting Up the Environment to Run SDAccel

To set up the environment to run the SDx tools: source the file below so that the elements of the SDAccel development environment are in the `PATH`, and other variables that are required are also set up.



---

**IMPORTANT!** For the SDAccel development environment, you must set up both the SDAccel tool and the XRT that was installed as part of [Installing Platform-Specific Packages](#).

---

### C Shell:

```
source <XRT_INSTALL_DIR>/settings64.csh
source <XRT_INSTALL_DIR>/xrt/setup.csh
```

### Bash:

```
source <XRT_INSTALL_DIR>/settings64.sh
source <XRT_INSTALL_DIR>/xrt/setup.sh
```

# Additional Resources and Legal Notices

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## Xilinx Resources

For support resources such as Answers, Documentation, Downloads, and Forums, see [Xilinx Support](#).

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## 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.

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## References

1. *SDAccel Environment Release Notes, Installation, and Licensing Guide* ([UG1238](#))

2. *SDAccel Environment Profiling and Optimization Guide* ([UG1207](#))
3. *SDAccel Environment Getting Started Tutorial* ([UG1021](#))
4. [SDAccel™ Development Environment web page](#)
5. [Vivado® Design Suite Documentation](#)
6. *Vivado Design Suite User Guide: Designing IP Subsystems using IP Integrator* ([UG994](#))
7. *Vivado Design Suite User Guide: Creating and Packaging Custom IP* ([UG1118](#))
8. *Vivado Design Suite User Guide: Partial Reconfiguration* ([UG909](#))
9. *Vivado Design Suite User Guide: High-Level Synthesis* ([UG902](#))
10. *UltraFast Design Methodology Guide for the Vivado Design Suite* ([UG949](#))
11. *Vivado Design Suite Properties Reference Guide* ([UG912](#))
12. [Khronos Group web page](#): Documentation for the OpenCL standard
13. [Xilinx® Alveo™ web page](#)

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