

# Alveo U30 Data Center Accelerator Card

## *Installation and User Guide*

UG1425 (v1.0) June 16, 2020



# Revision History

The following table shows the revision history for this document.

Section	Revision Summary
<b>06/16/2020 Version 1.0</b>	
Initial release.	N/A

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## Introduction

This document provides hardware and software installation procedures for the Alveo™ U30 Data Center accelerator card.

The half-height, half-length U30 Alveo data center accelerator card has a bifurcated Gen3 x8 to form two independent Gen3 x4 PCI Express® (PCIe) compliant interfaces. It features two Zynq® UltraScale+™ MPSoCs to accelerate HD video transcoding and analytics. It targets high density video transcoding application, capable of decoding, scaling, and encoding up to eight 1080p60 streams. The U30 card provides superb power and cost performance for such video applications.

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## Minimum System Requirements

The minimum system requirements for running the Alveo™ U30 Data Center accelerator cards are listed below:

*Table 1: Minimum System Requirements*

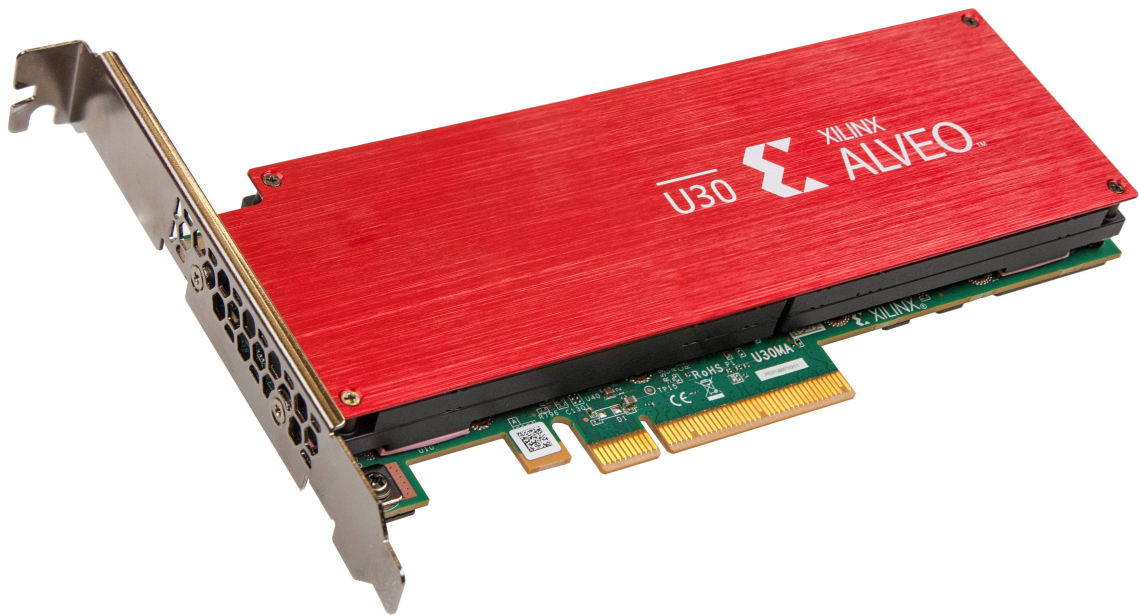
Component	Requirement
Motherboard	Can be used with either PCI Express®-compliant Gen3x16 or Gen3x8 with x4x4 bifurcation enabled in the BIOS.
System Power Supply	75W
Operating System	Linux, 64-bit: <ul style="list-style-type: none"><li>• Ubuntu 16.04</li></ul>
System Memory	For deployment installations, a minimum of 16 GB is required.
Internet Connection	Required for downloading drivers and utilities.
Hard disk space	Satisfy the minimum system requirements for your operating system.
Licensing	None required for application deployment.

For details on the acceptable environmental conditions, see *Alveo U30 Data Center Accelerator Cards Data Sheet (DS970)*.

# Card Interfaces and Details

The Xilinx<sup>®</sup> Alveo<sup>™</sup> U30 data center accelerator card, shown in the following figure, is a single slot, half-height, half-length, low profile form factor passively-cooled card operating up to a 75W maximum power limit.

*Figure 1: Alveo U30 Card with Full-Height Bracket*



For card specifications, dimensions, list of card features, and block diagram, see *Alveo U30 Data Center Accelerator Cards Data Sheet (DS970)*.

# Card Installation Procedures

To reduce the risk of fire, electric shock, or injury, always follow basic safety precautions.



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**CAUTION!** You must always use an ESD strap or other antistatic device when handling hardware.

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**ATTENTION!** Il est fortement recommandé d'utiliser un bracelet ESD ou autres dispositifs antistatiques.

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**VORSICHT!** Beim Umgang mit Hardware müssen sie immer ein Erdungs Armband oder ein anderes antistatisches Gerät verwenden.

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## Safety Instructions

### Safety Information

To ensure your personal safety and the safety of your equipment:

- Keep your work area and the computer/server clean and clear of debris.
- Before opening the computer/system cover, unplug the power cord.

### Dispositif de Sécurité

Pour assurer votre sécurité personnelle et la sécurité de votre équipement:

- Maintenez votre zone de travail et l'ordinateur/serveur propre et dégagé de débris.
- Avant d'ouvrir le capot de l'ordinateur/système, débranchez le cordon d'alimentation.

### Sicherheitsinformation

Um ihre persönliche Sicherheit und die Sicherheit ihrer Ausrüstung zu gewährleisten:

- Halten sie ihren Arbeitsbereich und den Computer / Server sauber und frei von Ablagerungen.
- Ziehen sie vor dem Öffnen der Computer / Systemabdeckung das Netzkabel ab.

## Electrostatic Discharge Caution

Electrostatic discharge (ESD) can damage electronic components when they are improperly handled, and can result in total or intermittent failures. Always follow ESD-prevention procedures when removing and replacing components.

To prevent ESD damage:

- Use an ESD wrist or ankle strap and ensure that it makes skin contact. Connect the equipment end of the strap to an unpainted metal surface on the chassis.
- Avoid touching the card against your clothing. The wrist strap protects components from ESD on the body only.
- Handle the card by its bracket or edges only. Avoid touching the printed circuit board or the connectors.
- Put the card down only on an antistatic surface such as the bag supplied in your kit.
- If you are returning the card to Xilinx Product Support, place it back in its antistatic bag immediately.

## Attention aux Décharge Électrostatique (ESD)

L'ESD peut endommager les composants électroniques lorsqu'ils sont mal manipulés, et peut entraîner des défaillances totales ou intermittentes. Suivez toujours les procédures de prévention contre les ESD lors du retrait et remplacement des composants.

Pour prévenir les dommages dus aux ESD:

- Utilisez une sangle de poignet ou de cheville anti-ESD et assurez-vous qu'elle est en contact avec la peau. Branchez l'extrémité du câble de la sangle à une surface métallique non peinte du châssis et à la masse.
- Évitez de mettre en contact la carte de circuit imprimé ou les connecteurs avec vos vêtements. La sangle de poignet protège la carte ou connecteurs contre les ESD du corps seulement.
- Manipulez la carte uniquement par son support ou par ses bords. Évitez de toucher la carte de circuit imprimé ou les connecteurs.
- Ne posez la carte de circuit imprimé ou les connecteurs que sur une surface antistatique telle que le sac anti-statique fourni avec la carte.
- Si vous retournez la carte à Xilinx, remettez-la dans son sac antistatique immédiatement.

## Vorsicht Elektrostatische Entladung

Elektrostatische Entladung (ESD) kann elektronische Bauteile beschädigen, wenn sie unsachgemäß behandelt werden, und es kann zu totalen oder zeitweiligen Ausfällen kommen. Befolgen sie beim Entfernen und Austauschen von Komponenten stets die ESD-Schutzmaßnahmen.



So verhindern sie ESD-Schäden:

- Verwenden sie einen ESD-Handgelenk-oder Knöchelriemen und stellen sie sicher, dass er Hautkontakt hat. Verbinden sie das Ende des Riemens mit einer unlackierten Metalloberfläche am Gehäuse.
- Berühren sie die Karte nicht mit ihrer Kleidung. Der Riemen schützt Komponenten nur vor ESD am Körper.
- Fassen sie die Karte nur an der Halterung oder an den Kanten an. Berühren sie nicht die Leiterplatte oder die Anschlüsse.
- Legen sie die Karte nur auf einer antistatischen Oberfläche ab, z.B. dem antistatischen Beutel der mit dem Kit mitgeliefert wurde.
- Wenn sie die Karte an den Xilinx Product Support zurücksenden, legen Sie sie bitte sofort wieder in den antistatischen Beutel.

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## Before You Begin




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**IMPORTANT!** *Alveo™ cards are delicate and sensitive electronic devices; equipment is to be installed by a qualified technician only. This equipment is intended for installation in a Restricted Access Location.*

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**IMPORTANT!** *Les cartes Alveo™ sont des appareils électronique sensibles et fragiles; l'équipement doit être installé par un technicien certifié seulement. Cet équipement est destiné à être installé dans un lieu d'accès restreint.*

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**WICHTIG!** *Die Karten Alveo™ sind sensible und empfindliche elektronische Geräte. Das Gerät darf nur von einem qualifizierten Techniker installiert werden. Dieses Gerät ist für die Installation an einem Ort mit begrenztem Zugang vorgesehen.*

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- Verify that the minimum card space is available to install your card. Card specifications and dimensions can be found in *Alveo U30 Data Center Accelerator Cards Data Sheet (DS970)*.
- Check for card compatibility with the system. Also check for proper system requirements such as power, bus type, and physical dimensions to support the card.

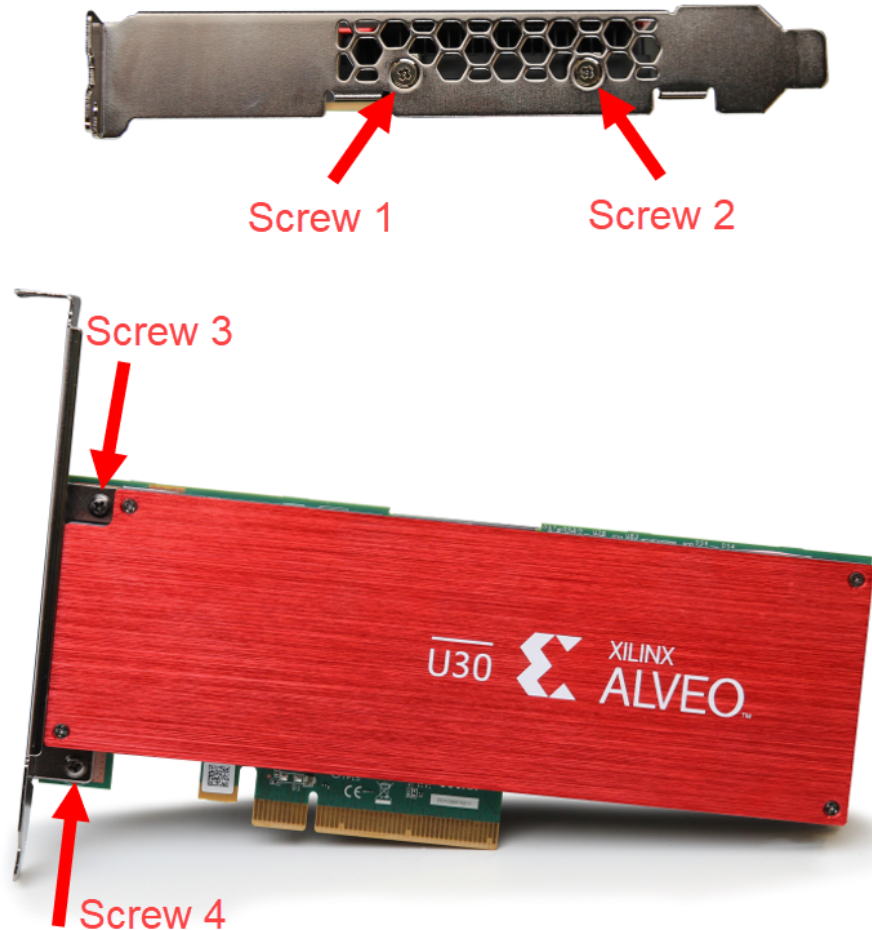
## Replacing the Bracket

The Alveo U30 card can be used with either a full-height or half-height bracket. Depending on your system, it may be necessary to switch between the full and half-height bracket on the card. The bracket is secured to the card with four screws, as shown in the figure below. To replace the bracket, follow the instructions below.

1. Remove screws 1 and 2 from the card.
2. Remove screws 3 and 4 from the card.

3. Remove the bracket from the card.
4. Place the new bracket on the card and align it with the card's connectors and screw locations.
5. Replace screws 1 and 2 on the new bracket.
6. Replace screws 3 and 4 on the new bracket.

*Figure 2: Screw Locations on Bracket*



## Installing the Card

The following procedure is a guide for the Xilinx® Alveo™ U30 Data Center accelerator card installation. Consult your computer documentation for additional information.

**Note:** For use with UL Listed Servers or ITE.

If you encounter any issues during installation, see [Chapter 6: Troubleshooting](#).

1. Shut down the host computer and unplug the power cord.
2. Open your computer by removing the casing.
3. If necessary, remove the adjacent PCIe® slot cover corresponding to the PCIe slot in which you are installing the Alveo card.
4. Plug the Alveo card into the PCIe x8 or x16 slot on the motherboard.
5. Re-install the computer casing.
6. Connect the power cord and turn on the computer.



**WARNING!** Do not power-on a passively cooled card without adequate forced airflow across the card with proper air flow direction, otherwise the card can be damaged. This card can heat up after use in the server. Use caution when handling. For more information, see Alveo U30 Data Center Accelerator Cards Data Sheet (DS970).

7. To verify that the device has been installed correctly, enter the following Linux command in the terminal:

```
$ sudo lspci -vd 10ee:
```

If the card is successfully installed and found by the operating system, a message similar to the one below will be displayed.

There will be two management and two user functions displayed because the U30 card has two Zynq® UltraScale+™ MPSoCs. See <https://xilinx.github.io/XRT/master/html/platforms.html> for additional details.

```
d9:00.0 Processing accelerators: Xilinx Corporation Device 503d (rev 02)
Subsystem: Xilinx Corporation Device 000e
Flags: bus master, fast devsel, latency 0, IRQ 298, NUMA node 1
Memory at f8000000 (32-bit, non-prefetchable) [size=32M]
Memory at fa020000 (32-bit, non-prefetchable) [size=64K]
Capabilities: [40] Power Management version 3
Capabilities: [60] MSI-X: Enable+ Count=32 Masked-
Capabilities: [70] Express Endpoint, MSI 00
Capabilities: [100] Advanced Error Reporting
Capabilities: [1c0] #19
Kernel driver in use: xocl
Kernel modules: xocl
d9:00.1 Processing accelerators: Xilinx Corporation Device 503c (rev 02)
Subsystem: Xilinx Corporation Device 000e
Flags: bus master, fast devsel, latency 0, NUMA node 1
Memory at f6000000 (32-bit, non-prefetchable) [size=32M]
Memory at fa000000 (32-bit, non-prefetchable) [size=128K]
Capabilities: [40] Power Management version 3
Capabilities: [60] MSI-X: Enable+ Count=32 Masked-
Capabilities: [70]t Express Endpoint, MSI 00
Capabilities: [100] Advanced Error Reporting
Kernel driver in use: xclmgmt
Kernel modules: xclmgmt
da:00.0 Processing accelerators: Xilinx Corporation Device 503d (rev 02)
Subsystem: Xilinx Corporation Device 000e
Flags: bus master, fast devsel, latency 0, IRQ 250, NUMA node 1
Memory at f2000000 (32-bit, non-prefetchable) [size=32M]
Memory at f4020000 (32-bit, non-prefetchable) [size=64K]
Capabilities: [40] Power Management version 3
```

```
Capabilities: [60] MSI-X: Enable+ Count=32 Masked-
Capabilities: [70] Express Endpoint, MSI 00
Capabilities: [100] Advanced Error Reporting
Capabilities: [1c0] #19
Kernel driver in use: xocl
Kernel modules: xocl
da:00.1 Processing accelerators: Xilinx Corporation Device 503c (rev 02)
Subsystem: Xilinx Corporation Device 000e
Flags: bus master, fast devsel, latency 0, NUMA node 1
Memory at f0000000 (32-bit, non-prefetchable) [size=32M]
Memory at f4000000 (32-bit, non-prefetchable) [size=128K]
Capabilities: [40] Power Management version 3
Capabilities: [60] MSI-X: Enable+ Count=32 Masked-
Capabilities: [70] Express Endpoint, MSI 00
Capabilities: [100] Advanced Error Reporting
Kernel driver in use: xclmgmt
Kernel modules: xclmgmt
```

If you do not see a similar message, see [Chapter 6: Troubleshooting](#).

# Installing the Deployment Software

This chapter details the procedures for installing deployment software and running the FFmpeg application on the Ubuntu operating system. All software installations use standard Linux DEB packages and require root access.

The deployment software consists of the following software packages:

**Note:** `<version>` will be different for different packages. For example the XRT version string could be different from `xcdr`.

- **XRT - Host based Runtime Software Stack:** `xrt-<version>.deb`
- **XSA File:** `xsa/<version>.xsabin`
- **MPSoC based Encoder and Decoder XMA Plugins:** `xmpsoccodecs-<version>.deb`
- **Xilinx Multi-Scaler XMA Plugin:** `xmultiscaler-<version>.deb`
- **Xilinx Modified FFmpeg 4.1:** `xffmpeg-<version>.deb`
- **Xilinx MPSoC Transcoding Application (XCDR):** `xcdr-<version>.deb`
- **Installation Script:** `install.sh`

To view more information about a package, enter the following command:

```
$ dpkg-deb --info ./xmpsoccodecs-<version_string>.deb
new debian package, version 2.0.
...
<snip>
Depends: xrt (>= <xrt_version>)
Installed-Size: 255
Description: Description: Xilinx MPSoC H264/HEVC Encoder and Decoder Plugins
```

The installation package can be downloaded from the [Alveo U30 Product Page](#).

If you encounter any issues during installation, see [Chapter 6: Troubleshooting](#).



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

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**IMPORTANT!** *L'accès Root est requis pour toutes les installations logicielles et firmware.*

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**WICHTIG!** *Root-Zugriff ist für alle Software- und Firmware-Installationen erforderlich.*

To install the packages, run the following bash script with sudo rights. This script needs to be run in the directory containing the packages:

```
$ ./install.sh
```

After successfully installing the deployment software, proceed with sourcing the setup script by running the following command to set the environment to use the Xilinx utilities.

Use the following command in csh shell:

```
$ source /opt/xilinx/xdcr/setup.csh
```

Use the following command in bash shell:

```
$ source /opt/xilinx/xdcr/setup.sh
```

## Validate Install

After successfully running the setup script, use the following steps to validate the installation.

1. Run the following command to validate the Alveo card(s) installed on the system.

```
$ sudo /opt/xilinx/xrt/bin/xbutil scan
```

You will see an output similar to the following. The bottom of the log will display the installed cards. In this example, four cards are displayed. Confirm that the number of cards displayed from the `xbutil scan` command match the number installed in your system.

```
$ xbutil scan
INFO: Found total 4 card(s), 4 are usable
~~~~~
~~~~~
System Configuration
OS name: Linux
Release: 4.15.0-66-generic
Version: #75~16.04.1-Ubuntu SMP Tue Oct 1 14:01:08 UTC 2019
Machine: x86_64
Model: X11DPi-N(T)
CPU cores: 16
Memory: 31824 MB
Glibc: 2.23
Distribution: Ubuntu 16.04.6 LTS
Now: Fri Apr 3 15:37:53 2020
~~~~~
~~~~~
XRT Information
Version: 2.5.2
Git Hash: 59ba825ea6a39358ab1f0d86666e9afd79e6fafd
Git Branch: master-merge
Build Date: 2020-03-17 17:12:22
XOCL: 2.5.2,59ba825ea6a39358ab1f0d86666e9afd79e6fafd
XCLMGMT: 2.5.2,59ba825ea6a39358ab1f0d86666e9afd79e6fafd
~~~~~
~~~~~
```

```

~~~~~
[0] 0000:18:00.0 xilinx_U30_xdma_1_1(ID=0x5e7a31f8) user(inst=128)
[1] 0000:19:00.0 xilinx_U30_xdma_1_1(ID=0x5e7a31f8) user(inst=129)
[2] 0000:b0:00.0 xilinx_U30_xdma_1_1(ID=0x5e7a31f8) user(inst=131)
[3] 0000:af:00.0 xilinx_U30_xdma_1_1(ID=0x5e7a31f8) user(inst=130)
    
```

- Use the following command to confirm that the `xFFmpeg` package is located under the directory, `/opt/xilinx/ffmpeg/bin/ffmpeg`.

```
$ which ffmpeg
```

The deployment software installation is complete.

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## FFmpeg Command Usage

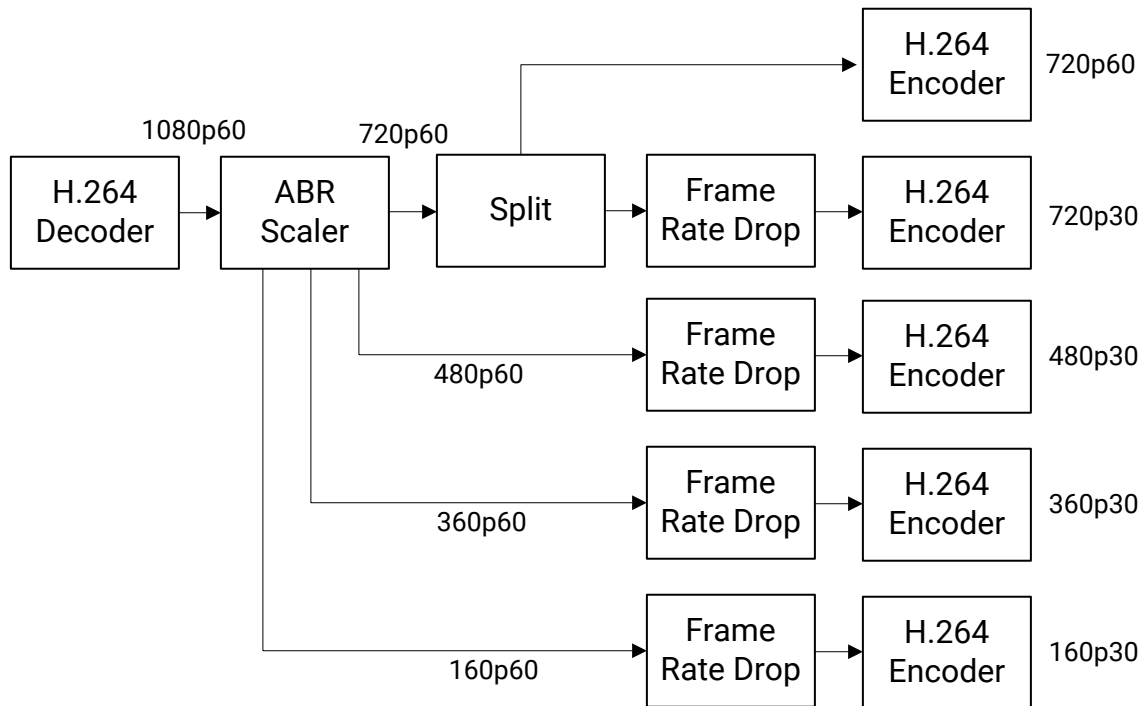
This section describes how to run the `FFmpeg` command using the Alveo U30 card to accelerate the application. The following example scripts run `ffmpeg` as an application that uses the VCU encoder, decoder, and multi-scaler IPs from the Zynq UltraScale+ MPSoC. For background information, refer to the `ffmpeg` documentation for the Alveo U200 card at: [https://github.com/Xilinx/ABR-video-transcode/blob/2018.2\\_XDF/ffmpeg-integration.md](https://github.com/Xilinx/ABR-video-transcode/blob/2018.2_XDF/ffmpeg-integration.md). Although this document is specific to the Alveo U200 card, most of the details apply to the U30 as well.

### ABR Transcoding Ladder

The `xcdr` package installs an example script that performs decoding, scaling, and encoding. The following script performs the decode, scale, and encode operation as shown in the ABR transcoding ladder figure below. One input is decoded and scaled with five encoded outputs at different resolutions.

```
$ /opt/xilinx/xcdr/scripts/ffmpeg_scale_transcode_x1.sh user_clip.h264
```

Figure 3: ABR Transcoding Ladder



X23796-032720

### Decode and Encode

The following example performs decoding and encoding only (no scaling).

```
$ /opt/xilinx/xcdr/scripts/ffmpeg_transcode_only_x1.sh user_clip.h264
```

### Encode Only

The following example encodes a raw 1080p YUV file (encoder only).

```
$/opt/xilinx/xcdr/scripts/ffmpeg_encode_raw_1080p_yuv_x1.sh <1080p YUV file>
```



# Multiple Devices and YAML Configuration

The `ffmpeg` application uses a YAML configuration file to define several fields used by the application. The file is located at: `/opt/xilinx/xcdr/yaml/xmacfg.yaml` and can be edited, however, `sudo` permission is required.

Currently only the `device_id_map` field can be modified. The `device_id_map` field needs to match the number of devices installed in the system. Each Alveo U30 card can accommodate two devices. For instance, if you have a system with eight cards, you will need to set `device_id_map` to 16.

Below is an example of setting the `device_id_map` for a system with one Alveo U30 card.

```
device_id_map: [0,1]
```

Similarly, the following is an example of setting the `device_id_map` for a system with three Alveo U30 cards.

```
device_id_map: [0,1,2,3,4,5]
```

# Troubleshooting

The following table lists potential issues, causes, and fixes related to card installation.

**Table 2: Card Troubleshooting**

Issue	Potential Cause	Fix
Card not found.	Card not correctly installed.	Reinstall the card following the installation instructions. Check if the card shows up by typing the following Linux command: <code>lspci -vd 10ee:</code>
	Card not compatible with server.	Use qualified server. For system capabilities, see <i>Alveo U30 Data Center Accelerator Card Data Sheet</i> (DS970).
	Kernel version is incompatible.	Run <code>uname -r</code> to check the kernel version. Ensure that the kernel version matches the version listed for your OS in <a href="#">Chapter 4: Installing the Deployment Software</a> .
lspci no longer recognizes the card.	Card is overheating.	Ensure that operating ambient conditions do not exceed specifications and passive cards are in a system that provides adequate airflow.

---

## Known Issues

The following table lists known issues.

Table 3: Known Issues

Area	Description	Comments/Recommendations
XRT Installation Warning	When trying to install the XRT debian package, there is an error seen during the installation of a python Open CL package. The error may look like this: <pre data-bbox="659 464 1057 726"> DEPRECATION: Python 2.7 will reach the end of its life on January 1st, 2020. ... WARNING: The directory '/home/rathaval/.cache/pip/http' or its parent directory ... WARNING: The directory '/home/rathaval/.cache/pip' or its parent directory ... ERROR: Could not install packages due to an EnvironmentError: [Errno 13] ...                     </pre>	Consider using the <code>-user</code> option or check permissions.
ffprobe for xFFmpeg does not work	Trying to use <code>/opt/xilinx/ffmpeg/bin/ffprobe</code> leads to an error or crash because it does not use <code>xma_initialize()</code> .	
xbutil validate is not supported	Unlike other Alveo cards, the <code>xbutil validate</code> command is currently not supported on the U30.	Use <code>lspci --vd 10ee</code> to confirm the card is seen by the OS. Also validate installation by following the steps in <a href="#">Validate Install</a> .
xbutil reset is not supported	Resetting the Alveo U30 from the host using <code>xbutil reset</code> is not supported.	Two different resets are available via the <code>xbmgmt</code> tool which requires sudo access. These include: <ul style="list-style-type: none"> <li>• <b><code>xbmgmt reset --softkernel:</code></b> Performs a reset to the relaunch daemon SKD and ZOCL drivers that are embedded on the PS side. If you are seeing incorrect output data, try using this reset.</li> <li>• <b><code>xbmgmt reset -ert:</code></b> This reset will relaunch the embedded PS operating system (inside the Zynq UltraScale+ MPSoC). Perform this reset after stopping an application via CTRL-C.</li> </ul> If the recommendations explained above do not work, a cold reboot of the host machine may be necessary to reset the Alveo U30 card.
In case the board PCIe does not link up on the host (lspci does not show Xilinx devices)		If the red LED on the card is illuminated, it indicates that the golden flash image is corrupt. It is necessary to manually re-flash the golden image and cold-reboot. Contact Xilinx customer support for assistance.

# Changing XRT and Target Platform Versions

The Alveo™ Data Center Accelerator card target platform revisions can change significantly between releases. XRT upgrade procedure is described below.

---

## Ubuntu

During upgrading, downgrading, or uninstalling, it can be useful to list the currently installed Alveo packages.

To list the currently installed XRT package, run the following command:

```
$ apt list --installed | grep xrt
```

## Upgrading XRT

You can upgrade the XRT and deployment platform on your Alveo card by following these steps. Currently, both packages must be upgraded concurrently.

You can upgrade the XRT on your Alveo card by following these steps.

1. Download the desired XRT packages.
2. Install the XRT installation package by running the following command from within the directory where the installation packages reside. `<version>` is the latter part of the installation package file name.

```
$ sudo apt install ./xrt-<version>.deb
```

This will install the XRT along with any necessary dependencies. Follow the instructions when prompted throughout the installation.

## Uninstalling Packages

To completely uninstall the Alveo XRT and deployment platform packages, run the following command in a Linux terminal. Uninstalling XRT also uninstalls the deployment platform.

```
$ sudo apt remove ./<xrt_package_name>
```

**Note:** Make sure that all of the target platform packages are displayed in the output terminal after running the command. If not, manually list the packages using the `list` command at the beginning of this section, then delete the remaining packages using the `remove` command.

# Regulatory and Compliance Information

This product is designed and tested to conform to the European Union directives and standards described in this section.

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## Safety Compliance

The following table shows the safety standards that apply to the Alveo U30 cards.

*Table 4: Safety Standards*

Safety Standard	Alveo U30
IEC 62368-1:2014 (Second Edition)	✓
CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements)	✓
EN 60950-1:2006+A11:2009+A1:2012+A12:2011+A2:2013 (European Union)	✓
IEC 60950-1:2005 (2nd Edition); Am 1:2009 (International)	✓
EU LVD Directive 2014/35/EC	✓

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## EMC Compliance

The following tables show the EMC standards that apply to the Alveo U30 cards.

### Class A Products

*Table 5: EMC Standards*

Standard	Alveo U30
FCC Part 15 - Radiated & Conducted Emissions (USA)	✓
CAN ICES-3(A)/NMB-3(A) - Radiated & Conducted Emissions (Canada)	✓
CISPR 32 - Radiated & Conducted Emissions (International)	✓

Table 5: EMC Standards (cont'd)

Standard	Alveo U30
EN55032: 2015 – Radiated & Conducted Emissions (European Union)	✓
EN55024: 2010 +A1:2001+A2:2003 – Immunity (European Union)	✓
EMC Directive 2014/30/EC	✓
VCCI (Class A)– Radiated & Conducted Emissions (Japan)	✓
CNS13438 – Radiated & Conducted Emissions (Taiwan)	✓
CNS 15663 - RoHS (Taiwan)	✓
AS/NZS CISPR 32 – Radiated and Conducted Emissions (Australia/New Zealand)	✓
Article 58-2 of Radio Waves Act, Clause 3 (Korea)	✓

## Regulatory Compliance Markings

The following table shows the product certification markings that are provided, when required, with the Alveo U30 cards.

Table 6: Product Certification Markings

Product Certification Markings	Alveo U30
UL Listed Accessories Mark for the USA and Canada	✓
CE mark	✓
FCC markings	✓
VCCI marking	✓
Australian C-Tick mark	✓
Korea MSIP mark	✓
Taiwan BSMI mark	✓
German GS mark	✓

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## CE Directives

2014/35/EC, *Low Voltage Directive (LVD)*

2014/30/EC, *Electromagnetic Compatibility (EMC) Directive*

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## CE Standards

EN standards are maintained by the European Committee for Electrotechnical Standardization (CENELEC). IEC standards are maintained by the International Electrotechnical Commission (IEC).

## Electromagnetic Compatibility

EN:55032:2015, *Information Technology Equipment Radio Disturbance Characteristics – Limits and Methods of Measurement*

EN:55024:2015, *Information Technology Equipment Immunity Characteristics – Limits and Methods of Measurement*

This is a Class A product. In a domestic environment, this product can cause radio interference, in which case the user might be required to take adequate measures.

## Compliance Markings

The information in this section only applies to Alveo U30 cards.



In August of 2005, the European Union (EU) implemented the EU Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC and later the WEEE Recast Directive 2012/19/EU. These directives require Producers of electronic and electrical equipment (EEE) to manage and finance the collection, reuse, recycling and to appropriately treat WEEE that the Producer places on the EU market after August 13, 2005. The goal of this directive is to minimize the volume of electrical and electronic waste disposal and to encourage re-use and recycling at the end of life.

Xilinx has met its national obligations to the EU WEEE Directive by registering in those countries to which Xilinx is an importer. Xilinx has also elected to join WEEE Compliance Schemes in some countries to help manage customer returns at end-of-life.

If you have purchased Xilinx-branded electrical or electronic products in the EU and are intending to discard these products at the end of their useful life, please do not dispose of them with your other household or municipal waste. Xilinx has labeled its branded electronic products with the WEEE Symbol to alert our customers that products bearing this label should not be disposed of in a landfill or with municipal or household waste in the EU.

This product complies with Directive 2002/95/EC on the restriction of hazardous substances (RoHS) in electrical and electronic equipment.

## Other Compliance Statements

The following sections only apply to Alveo U30 cards.



## FCC Class A User Information

The Class A products listed above comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.




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**IMPORTANT!** *This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.*

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**IMPORTANT!** *Cet équipement a été testé et jugé conforme à la Class A digital device, conformément à la règle 15 du standard FCC. Ces limites sont conçues pour fournir des protections contre des interférences nuisibles lorsque l'équipement est utilisé dans un environnement commercial. Cet équipement génère, utilise et peut émettre des énergies de radio-fréquence et, s'il n'est pas installé et utilisé conformément aux instructions, peut nuire aux communications radio. L'exploitation de cet équipement dans une zone résidentielle est susceptible de causer des interférences nuisibles, auquel cas l'utilisateur peut être tenu de prendre des mesures adéquates à ses propres frais.*

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**WICHTIG!** *Dieses Gerät wurde getestet und entspricht den Grenzwerten für digitale Geräte der Klasse A gemäß Teil 15 der FCC-Bestimmungen. Diese Grenzwerte bieten einen angemessenen Schutz gegen schädliche Interferenzen, wenn das Gerät in einer gewerblichen Umgebung betrieben wird. Dieses Gerät erzeugt und verwendet Hochfrequenzenergie und kann diese abstrahlen. Wenn es nicht gemäß den Anweisungen installiert und verwendet wird, kann dies Funkstörungen verursachen. Der Betrieb dieses Geräts in einem Wohngebiet kann schädliche Interferenzen verursachen. In diesem Fall muss der Benutzer die Interferenz auf eigene Kosten beheben.*

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**CAUTION!** *If the device is changed or modified without permission from Xilinx, the user may void his or her authority to operate the equipment.*

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**ATTENTION!** *Si l'appareil est modifié sans l'autorisation de Xilinx, l'utilisateur peut annuler son ability à utiliser l'équipement.*

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**VORSICHT!** *Wenn das Gerät ohne Erlaubnis von Xilinx geändert wird, kann der Benutzer seine Berechtigung zum Betrieb des Geräts verlieren.*

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## Canadian Compliance (Industry Canada)

CAN ICES-3(A)/NMB-3(A)

## VCCI Class A Statement

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を構ずるよう要求されることがあります。 VCCI-A

## KCC Notice Class A (Republic of Korea Only)

<p>A급 기기 (업무용 방송통신기기)</p> <p><b>CLASS A device</b> (commercial broadcasting and communication equipment)</p>	<p>이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.</p> <p>This device has been approved by EMC registration. Distributors or users pay attention to this point. This device is usually aimed to be used in other area except at home</p>
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## BSMI Class A Notice (Taiwan)

警告使用者:

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適對的對策。

## Manufacturer Declaration European Community



### Manufacturer Declaration

Xilinx declares that the equipment described in this document is in conformance with the requirements of the European Council Directive listed below:

- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- RoHS 3 Directive 2011/65/EU, 2015/863

These products follow the provisions of the European Directive 2014/53/EU.

Dette produkt er i overensstemmelse med det europæiske direktiv 1999/5/EC.

Dit product is in navolging van de bepalingen van Europees Directief 1999/5/EC.

Tämä tuote noudattaa EU-direktiivin 1999/5/EC määräyksiä.

Ce produit est conforme aux exigences de la Directive Européenne 1999/5/EC.

Dieses Produkt entspricht den Bestimmungen der Europäischen Richtlinie 1999/5/EC.

Þessi vara stenst reglugerð Evrópska Efnahags Bandalagsins númer 1999/5/EC.

Questo prodotto è conforme alla Direttiva Europea 1999/5/EC.

Dette produktet er i henhold til bestemmelsene i det europeiske direktivet 1999/5/EC.

Este produto cumpre com as normas da Diretiva Européia 1999/5/EC.

Este producto cumple con las normas del Directivo Europeo 1999/5/EC.

Denna produkt har tillverkats i enlighet med EG-direktiv 1999/5/EC.

This declaration is based upon compliance of the Class A products listed above to the following standards:

EN 55032 (CISPR 32 Class A) RF Emissions Control.

EN 55024:2010 (CISPR 24) Immunity to Electromagnetic Disturbance.

EN 60950-1:2006/A11:2009 A1:2010/A12:2011 Information Technology Equipment- Safety- Part 1: General Requirements.

EN 50581:2012 - Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.



**CAUTION!** *In a domestic environment, Class A products may cause radio interference, in which case the user may be required to take adequate measures.*



**ATTENTION!** *Dans un environnement domestique, les produits de Classe A peuvent causer des interférences radio, auquel cas l'utilisateur peut être tenu de prendre des mesures adéquates.*



**VORSICHT!** *In einer häuslichen Umgebung können Produkte der Klasse A Funkstörungen verursachen. In diesem Fall muss der Benutzer möglicherweise geeignete Maßnahmen ergreifen.*

## Responsible Party

Xilinx, Inc.  
2100 Logic Drive, San Jose, CA 95124  
United States of America  
Phone: (408) 559-7778

# 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. To open DocNav:

- From the Vivado® IDE, select **Help** → **Documentation and Tutorials**.
- 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

These documents provide supplemental material useful with this guide:

1. *Vitis Unified Software Platform Documentation: Application Acceleration Development* ([UG1393](#))
2. *Vitis Unified Software Platform Documentation: Embedded Software Development* ([UG1400](#))
3. [Vitis 2020.1 Software Platform Release Notes](#) in the *Vitis Unified Software Platform Documentation* ([UG1416](#))
4. *Vitis Application Acceleration Development Flow Tutorials* ([GitHub](#))

### Alveo Documents

1. *Alveo U30 Data Center Accelerator Card Data Sheet* ([DS970](#))

### Additional Xilinx Resources

1. Xilinx licensing website: <https://www.xilinx.com/getproduct>
2. Vitis Developer Zone: <https://www.xilinx.com/products/design-tools/vitis/vitis-platform.html>
3. Xilinx Community Forums: <https://forums.xilinx.com>
4. [Xilinx Third-Party End User License Agreement](#)
5. [End-User License Agreement](#)

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