# Oracle<sup>®</sup> VM VirtualBox Installation Instructions for Windows

# and

# Linux Virtual Machine Creation Targeting Avnet Development Boards

**IMPORTANT:** Xilinx requires their tools to be downloaded from an individual user account. They disallow copying Virtual Machines that contain pre-installed tools! Therefore we cannot distribute a complete virtual machine.

To help as much as possible we have pre-installed several items including the Ubuntu OS and several other useful utilities and things that needed set up.

IF YOU ARE GOING TO USE THE PRE-MADE VM CREATED FOR THE PETALINUX SPEEDWAY FOR MINIZED (highly suggested)

THEN YOU ONLY HAVE TO PERFORM THE SECTIONS WHOSE TITLES ARE HIGHLIGHTED IN YELLOW IF A SECTION IS YELLOW YOU NEED TO DO ALL OF THE STEPS IN THAT SECTION UNLESS YOU ARE INSTRUCTED NOT TO

The pre-made 2GB PetaLinux Speedway VM download is here:

https://docs.avnet.com/amer/smart\_channel/Ubuntu\_16.04\_MiniZed\_PetaLinux\_Spee dway\_Virtual\_Box.zip

> Version 1.6 Aug 2017



## Installing Oracle VM VirtualBox on Windows

This document shows how to install VirtualBox and the Extension Pack to enable the use of a Linux virtual machine for the cross build platform. Note: most dialogs are shown using Windows 7 however Windows 10 has also been verified to work. The dialogs for Windows 10 will look slightly different.

#### **General Instruction:**

Install Oracle VM VirtualBox using the official VirtualBox installer. For legal distribution reasons, the VirtualBox installation executable cannot be included with any public Avnet materials. To obtain a free legal copy of the Oracle VM VirtualBox and the Extension Pack, please download from the VirtualBox website:

#### https://www.virtualbox.org/wiki/Downloads

The version downloaded may differ from the version shown in this documentation (5.1.22). Be sure to read the VirtualBox EULA to ensure you do not violate the *Personal Use and Evaluation License* (PUEL). You may also wish to consult the *VirtualBox Licensing Frequently Asked Questions* for a quick overview of the intent of the license agreements:

https://www.virtualbox.org/wiki/Licensing\_FAQ

#### **Step-by-Step Instructions:**

1. To obtain a free legal copy of Oracle VM VirtualBox, download the installer from this website:

#### https://www.virtualbox.org/wiki/Downloads

**IMPORTANT NOTE:** Newer or older versions of VirtualBox *may* work, there are no known incompatibilities but version 5.1.22 has been tested to work with the rest of the tool versions that are utilized for this project. Use this link to install the version documented here:

http://download.virtualbox.org/virtualbox/5.1.22/VirtualBox-5.1.22-115126-Win.exe

You also need to download the Extension Pack which is a separate download. Make sure the Extension Pack you download is the same version as your VirtualBox installer. The version to go with 5.1.22 can be found here:

http://download.virtualbox.org/virtualbox/5.1.22/Oracle\_VM\_VirtualBox\_Extension\_Pack-5.1.22-115126.vbox-extpack

2. Launch the VirtualBox installer from Windows Explorer by double-clicking the self-extracting executable. Allow the installer to make changes to your computer, if so prompted.

Name	Date modified	Туре	Size
💱 VirtualBox-5.1.22-115126-Win.exe	7/13/2017 8:02 AM	Application	120,772 KB

VirtualBox Installer for Windows



3. Once the VirtualBox installation wizard appears, click the **Next** button.



4. You may accept all the installation defaults, although you may wish to change the installation location on your development platform using the **Browse** button. If the options are acceptable, click the **Next** button.

😸 Oracle VM VirtualBox 5.1.22 Setup	x
Custom Setup Select the way you want features to be installed.	
Click on the icons in the tree below to change the v	vay features will be installed.
VirtualBox Application VirtualBox USB Support VirtualBox Networking VirtualBox Bridger VirtualBox Host-C VirtualBox Python 2.x Su VirtualBox Python 2.x Su	Orade VM VirtualBox 5.1.22 application. This feature requires 522KB on your hard drive. It has 3 of 3 subfeatures selected. The subfeatures require 0KB on your Browse
Version 5. 1. 22 Disk Usage < B	lack Next > Cancel



5. You may again accept the default options and click the **Next** button.

B Oracle VM VirtualBox 5.1.22 Setup	x
Custom Setup Select the way you want features to be installed.	
Please choose from the options below:	
☑ Create start menu entries	
Create a shortcut on the desktop	
Create a shortcut in the Quick Launch Bar	
Register file associations	
Version 5.1.22 < Back Next > Canc	el

6. Click the **Yes** button to continue with the installation wizard.





7. Click the **Install** button to load VirtualBox to your development system.

1	Oracle VM VirtualBox 5.1.22 Setup	J
	Ready to Install	
	The Setup Wizard is ready to begin the Custom installation.	
	Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.	
	Version 5. 1. 22 < Back Install Cancel	-

8. During the installation you may receive prompts to authorize installation of various components. If prompted, allow the installer to make changes to your system, including installation of the USB interface and Network adapters.

😸 C	Pracle VM VirtualBox 5.1.22 Setup	
	Oracle VM VirtualBox 5.1.22	
	Please wait while the Setup Wizard installs Oracle VM VirtualBox 5.1.22. take several minutes. Status:	This may
	/ersion 5.1.22 	Cancel



9. Click the **Finish** button to complete the installation. Leave the checkbox enabled so VirtualBox will start after the installer finishes.



10. Once VirtualBox starts (you can also start it from the Desktop shortcut, or the Windows Start button), the Extension Pack must be added. From the main menu, select **File > Preferences**.

<b>3</b> (	Dracle VM VirtualBox Manager		
File	Machine Help		
S	Preferences	Ctrl+G	Detaile @ Snanchots
R	Import Appliance	Ctrl+I	vier Decails and Shapshors
	Export Appliance	Ctrl+E	e to VirtualBox!
	Virtual Media Manager Network Operations Manager Check for Updates Reset All Warnings	Ctrl+D	rt of this window is a list of all virtual machines on your computer. The list is because you haven't created any virtual machines yet. create a new virtual machine, press the <b>New</b> e main tool bar located at the top of the
	Exit	Ctrl+Q	ess the <b>F1</b> key to get instant help, or visit libox.org for the latest information and news.



11. Select **Extensions**. Right-click in the *Extension Packages* whitespace box, and select **Add Package**.

🏈 VirtualBox - Pre	ferences	X
E General	Extensions	
🧼 Input	Extension Packages	
G Update	Active Name Version	
Language		113
📃 Display		
Network		
Extensions		
Ргоху		
	OK Cancel Help	

12. Browse to the location where you downloaded the VirtualBox Extension Pack compatible with your VirtualBox version. Select the Extension Pack and click the **Open** button.

Name	Date modified	Туре	Size
Oracle_VM_VirtualBox_Extension_Pack-5.1.22-115126.vbox-extpack	7/13/2017 8:20 AM	VirtualBox Extensi	19,102 KB

13. Click the Install button to add the VirtualBox Extension Pack.





14. Read the VirtualBox Extension Pack PUEL License to ensure you will not be in violation of the Oracle definition of Personal Use. See the VirtualBox Licensing Frequently Asked Questions for additional details. If you can accept the license conditions, scroll to the bottom of the agreement text box and click the I Agree button<sup>1</sup>. If prompted, allow the installer to make changes to your development system.



15. Click the **OK** button to complete the installation.



<sup>&</sup>lt;sup>1</sup> If you must disagree, the installation will be terminated. You should either purchase a commercial license or uninstall VirtualBox from your host computer.



16. Click the **OK** button to return to VirtualBox.

4	۶ Virt	ualBox - Pref	erences		2	x						
		General	Exten	sions								
		Input	Extension Packages									
	G	Update	Active	Name	Version							
			2	Oracle VM VirtualBox Extension Pack	5.1.18r114002							
	<b>V</b>	Language										
		Display										
	₽	Network										
		Extensions		Lists all insta	lled							
		Proxy		packages.								
				ОК	Cance							

This completes the installation of VirtualBox on your host development system. VirtualBox is now ready to accept a new Virtual Machine.



# **Create a New Virtual Machine**

1. Launch Oracle VM VirtualBox Manager and click the **New** icon at the upper left.



2. Select a descriptive name for the new VM. Set the *Type* to **Linux** and the *Version* to **Ubuntu 64bit**. Click Next.

		8
) Create V	rtual Machine	
Name and	operating system	
Name:	Ubuntu PetaLinux 2017.1	
Type:	Linux	▼ 64
0.06056		2

3. Select the amount of memory to be allocated to the Virtual Machine. Allocating more memory<sup>2</sup> will improve the VM performance, but you must leave sufficient memory available for your host system for all other concurrent processes. For a host system with 16 GB of RAM, a **minimum** value of **2048** MB. **4096** MB or more is **recommended**. You may wish to experiment with this value to optimize your performance as larger density target fpga devices have higher memory requirements. The memory can also be changed at any time even after installing the VM hosted OS.

Memory size				
	-0	 	 	2048 🌻 N
4 MB			8192 MB	

<sup>&</sup>lt;sup>2</sup> You may need more memory if you intend to run Vivado with large Xilinx devices.



 If you are going to use the pre-made Virtual Machine with Ubuntu already installed you will want to choose to use an existing virtual hard disk file option. Locate and the Virtual Box VM from the zip file that you downloaded earlier from:

https://docs.avnet.com/amer/smart\_channel/Ubuntu\_16.04\_MiniZed\_PetaLinux\_Speedway\_Virtual\_Box.zip

(These dialogs were captured from Windows 10) Click on the little folder with the green arrow to browse for the pre-made .vdi file you extracted earlier from the .zip.







The .zip contains a .vdi extension file which is a Virtual Box formatted hard disk. It shows up in Windows™ Explorer™ with a red box:

💗 Ubuntu 16.04 MiniZed PetaLinux Speedway

Open the .vdi file and this will add the hard disk to your VM. The new VM should now be ready for starting up and continuing with the rest of the configuration. In the Virtual Box program select the new VM in the left-hand panel.

Click the Virtual Box Start button to execute the VM. Alternatively you can just double click the new VM's name and icon. This should start to boot the new VM:

🐧 Ora	icle VM Vi	rtualBox	Manag	er			
File	Machine	Help					
New	Settings	Discard	Start	•			
<b>1</b>	Ubuntu () Powe	PetaLin ered Off	ux 2017	7.1		Nam	General

**Note:** When the imported VM is started for the first time you may get an error. This error should be harmless it looks like:

🛞 🖱 💷 Ubuntu
Sorry, Ubuntu 16.04 has experienced an internal error.
If you notice further problems, try restarting the computer.
<ul> <li>▼ ExecutablePath /usr/sbin/avahi-daemon</li> <li>▼ Package</li> </ul>
avahi-daemon 0.6.32~rc+dfsg-1ubuntu2
▼ ProblemType Crash
<ul> <li>Title avahi-daemon crashed with SIGABRT in avahi_malloc()</li> </ul>
<ul> <li>ApportVersion</li> <li>2.20.1-Oubuntu2.10</li> </ul>
<ul> <li>✓ Architecture amd64</li> </ul>
CoreDump ▼ Date
🗹 Send an error report to help fix this problem
Hide Details         Continue

If it occurs click Continue, then shutdown the VM and re-boot it. The error should go away.

**Important:** If for some reason the pre-made VM does not work at all with your PC/Laptop you will have to try to install everything from scratch. Follow all the instructions in this guide except this step.

Now skip the section that creates a new hard disk and Ubuntu installation, proceed to the next Yellow Highlighted section to setup the VirtualBox shared folder.



5. **Important:** If you are using the pre-made VM .vdi file DO NOT create a new hard disk, skip this and launch the new VM and go to the next section to setup the VirtualBox shared folder and other settings.

Click the **Create**<sup>3</sup> button to accept the default file type for a VirtualBox Disk Image and allocate a virtual hard drive now.

		? ×
G Create V	Virtual Machine	
	La las martines	
-Name an	d operating system	
Name:	Ubuntu PetaLinux 2017.1	
Type:	Linux	- 64
Version:	Ubuntu (64-bit)	<b>-</b>
Memory	size —	
	20	048 🄶 MB
4 MB	8192 MB	
-Hard disk	<	
🔘 Do n	ot add a virtual hard disk	
Crea	ate a virtual hard disk now	
🔘 Use a	an existing virtual hard disk file	
Ubu	intu PetaLinux 2016.4.vdi (Normal, 57.69 GB)	
	Guided Mode Create	Cancel

<sup>&</sup>lt;sup>3</sup> If you are importing an existing Virtual Machine, click the "**Use an existing**..." button.



6. Select **Fixed Size** for better performance when using the VM or select **Dynamically allocated** if you are low on host disk space. The Dynamically allocated option will only expand the virtual hard disk file's size as needed. The Fixed size will take up a fixed amount of hard drive space even if the virtual OS doesn't use it.

Create Virtual Hard Disk	ि <del>×</del>
File location Ubuntu PetaLinux 2017. 1.vdi	
File size	2.00 TB
Hard disk file type <ul> <li>VDI (VirtualBox Disk Image)</li> <li>VHD (Virtual Hard Disk)</li> <li>VMDK (Virtual Machine Disk)</li> <li>HDD (Parallels Hard Disk)</li> <li>QCOW (QEMU Copy-On-Write)</li> <li>QED (QEMU enhanced disk)</li> </ul>	Storage on physical hard disk <ul> <li>Dynamically allocated</li> <li>Fixed size</li> <li>Split into files of less than 2GB</li> </ul>
	Guided Mode Create Cancel



Select the name and location for the Virtual Machine within your host file system. The recommended size is **100.00** GB to accommodate the Xilinx tools. If this space is unavailable,
 **70.0** GB is sufficient if you plan to install the SDK and only a few of the Vivado tools and work on small projects. Click the **Create** button. **200.00** GB works even better if you have the space.

Create Virtual Hard Disk	ି <mark>କ</mark> ୍ଷ
File location	
Ubuntu PetaLinux 2017.1.vdi	
File size	
	100.00 GB
4.00 MB	2.00 TB
Hard disk file type	Storage on physical bard disk
VDI (VirtualBox Disk Image)	
VHD (Virtual Hard Disk)	Fixed size
VMDK (Virtual Machine Disk)	Split into files of less than 2GB
HDD (Parallels Hard Disk)	
QCOW (QEMU Copy-On-Write)	
QED (QEMU enhanced disk)	
	Guided Mode Create Cancel

The Virtual Hard Disk may take a few minutes to create and initialize on your host file system.





8. Once the Virtual Disk completes, your VM is ready to accept an operating system.

🗿 Oracle VM VirtualBox Manager		- • ×
File Machine Help		
New Settings Discard Start		设 Details 💿 Snapshots
Ubuntu PetaLinux 2017.1	General	Preview
64 Ubuntu Patal inux 2016 4	Name: Ubuntu PetaLinux 2017.1 Operating System: Ubuntu (64-bit)	
Powered Off	System	
	Base Memory: 2048 MB Boot Order: Floppy, Optical, Hard Disk Acceleration: VT-x/AMD-V, Nested Paging, KVM Paravirtualization	Ubuntu PetaLinux 2017.1
	Display	
	Video Memory: 16 MB Remote Desktop Server: Disabled Video Capture: Disabled	
	Storage	
	Controller: IDE IDE Secondary Master: [Optical Drive] Empty Controller: SATA SATA Port 0: Ubuntu PetaLinux 2017. 1. vdi	(Normal, 100.00 GB)
	🕞 Audio	
	Host Driver: Windows DirectSound Controller: ICH AC97	•
		- ti



# Install the Ubuntu 16.04 Operating System

To perform the steps in this section, you will need to download a bootable OS image in .iso format to your host system. While Ubuntu 17.04 is the latest, Ubuntu 16.04.3 is the recommended version (ubuntu-16.04.3-desktop-amd64.iso). The Ubuntu images can be downloaded from:

#### http://www.ubuntu.com/download/desktop

Repeat the steps outlined in **Create a New Virtual Machine**, entering Ubuntu as the **Name** of the VM. Once the Virtual Disk completes, your VM is ready to accept an operating system.

1. Launch VirtualBox (if necessary) and select the VM you wish to start in the left-hand panel. Click the **Start** button to execute the VM.

🐧 Ora	cle VM Vi	rtualBox	Manager		
File	Machine	Help			
New New	Settings	لمنابع Discard	start		
<b>64</b>	Ubuntu O Powe	PetaLin ered Off	ux 2017.1		General

2. Select the **Browse** kicon to locate the .iso image for the OS you wish to install on your Virtual Machine. Click the **Start** button to begin.





3. When the Install Welcome screen appears, select English and click the **Install Ubuntu** button.

😣 Install (as superus	ser)		ſ
Welcome			
English Español Esperanto Euskara Français Gaeilge Galego Hrvatski İslenska Italiano Kurdî Latviski Lietuviškai Magyar Nederlands Norsk bokmål Norsk hynorsk Polski Português	Try Ubuntu You can try Ubuntu without makin this CD. Or if you're ready, you can install U operating system. This shouldn't t	Install Ubuntu Ubuntu alongside (or instead of) your current take too long.	
Magyar Nederlands Norsk bokmål Norsk nynorsk Polski Português	This CD. Or if you're ready, you can install U operating system. This shouldn't t	Ubuntu alongside (or instead of) your current take too long.	

4. The installer shows requirements for installation. The two options can be left unchecked. Click the **Continue** button.

🛞 Install (as superuser)	
Preparing to install Ubuntu	
Download updates while installing Ubuntu	
This saves time aller installation.	
🗌 Install third-party software for graphics and Wi-Fi hardware, Flash, MP3 and other media	
This software is subject to license terms included with its documentation. Some is proprietary.	
Fluendo MP3 plugin includes MPEG Layer-3 audio decoding technology licensed from Fraunhofer IIS and Technicolor SA.	
Quit Back Continue	



5. The installer displays various installation types. The default displays as **Erase disk and install Ubuntu**. Click the **Install Now** button.

Install (as superuser)
Installation type
This computer currently has no detected operating systems. What would you like to do?
• Erase disk and install Ubuntu Warning: This will delete all your programs, documents, photos, music, and any other files in all operating systems.
Encrypt the new Ubuntu installation for security You will choose a security key in the next step.
Use LVM with the new Ubuntu installation This will set up Logical Volume Management. It allows taking snapshots and easier partition resizing.
<ul> <li>Something else</li> <li>You can create or resize partitions yourself, or choose multiple partitions for Ubuntu.</li> </ul>
Quit Back Install Now

As this is a new installation, we want all changes written to the disks. Click the **Continue** button.



6. Select your time zone and click the **Continue** button.





7. Select your preferred keyboard layout option. The default displays as English (US). Click the **Continue** button.

Install (as superuser)	
Keyboard layout	
Choose your keyboard layout:	
English (Chana) English (Nigeria) English (South Africa) English (UK) English (US) Esperanto Estonian Faroese Filipino	English (US) English (US) - Cherokee English (US) - English (Colemak) English (US) - English (Dvorak alternative international no dead keys) English (US) - English (Dvorak) English (US) - English (Dvorak, international with dead keys) English (US) - English (Macintosh) English (US) - English (Macintosh) English (US) - English (VS, alternative international)
Type here to test your keyboard           Detect Keyboard Layout	
	Back Continue

8. Enter the primary user name for the Virtual Machine. In this case, create a default user name *training*. The system will auto-populate the computer name and username. Enter and confirm a password. Click the **Continue** button.

Install (as superuser)			
Who are you?			
Your name:	training		4
Your computer's name:	training-Virtual	Box 🗸	
Diskausoraama	The name it uses whe	n it talks to other computers.	
PICK d User Hame.	training	<b>\</b>	
Choose a password:	•••••	Short password	
Confirm your password:	00000	✓	
	🔿 Log in automa	atically	
	O Require my pa	ssword to log in	
	Encrypt my	home folder	
			Back Continue

9. The installation displays a Welcome graphic and proceeds with installation. When the installation is complete, a screen appears asking you to restart. Click the **Restart Now** button.

If the Restart appears to "freeze", you can force a reboot manually:

- a. From the main VirtualBox menu, select File | Close.
- b. In the *Close Virtual Machine* dialog, select **Power off the machine** and click the **OK** button.
- c. In the Oracle VM VirtualBox Manager, select your Virtual Machine and click the **Start** button.



# **VirtualBox Ubuntu Refinements**

**NOTE:** Several installation actions will require root privilege level. This is done in Ubuntu 16.04 by invoking temporary root privileges with the sudo command. When asked for a password enter the one set for the user 'training'. During the initial VM creation the password was set to: '**avnet**'

This section outlines a few of the common issues that may be encountered and instructs on how to add some features that allow better interaction with the host operating system.

## VirtualBox Guest Additions Installation (File Sharing)

 The use of shared folders allows for easy transfer of files between the host and guest systems. To use the shared file facility of VirtualBox, you must install the Guest Additions (VBoxGuestAdditions\_5.1.22.iso). If you attempt to use the shared folder facility without the Additions, you will receive the following error message.



After Guest Additions are installed, you can move the cursor between the Virtual Machine and the host OS without having to use the *Right Ctrl* key to recapture the cursor in the host.

a. After logging into the Ubuntu Virtual Machine, from the **Devices** menu, select **Insert Guest Additions CD image...** 





20

b. Click the **Run** button to execute the installation.



c. Enter the root password (the password that was created for the default user) and click the **Authenticate** button.

8 🖲 A	uthenticate
O	Authentication is needed to run `/bin/sh' as the super user
ET-S	An application is attempting to perform an action that requires privileges. Authentication is required to perform this action.
	Password:
Details	
	Cancel Authenticate

d. The Guest Additions should install and verify with no failures. Press the **Enter** key to close the installation window. Be sure to restart Linux to ensure that the Guest Additions is started properly before moving on to a later section of this guide.



e. Right click the Ubuntu Desktop CD icon and select Eject to remove the Guest Additions.





## VirtualBox Shared Folders

If the Guest Additions have been installed (which they were if you are using the pre-made VM) you must select a folder to share between the host and guest systems. This folder is used to transfer files to/from the Virtual Machine and the Host system. If not already done, Start and login to the Ubuntu VM. If you are using the MiniZed Speedway pre-made VM the user is: 'training' and the password is: 'avnet'

1. From the VirtualBox main menu, select **Devices > Shared Folder > Shared Folders Settings...** 

🧏 Ubuntu PetaLinux 2017.1 [Rur	nning	- Oracle VM VirtualBox			
File Machine View Input	Dev	rices Help			
Ubuntu Desktop	$\odot$	Optical Drives	►		
	₽	Network	►		
$(\mathbf{O})$	Ø	USB	►		
	9	Webcams	►		
		Shared Folders	►	6	Shared Folders Settings
		Shared Clipboard	►		
	₿	Drag and Drop	•		
	S	Insert Guest Additions CD image			

2. Right-click *Machine Folders* and select Add Shared Folder.

😳 Ub	untu PetaLinux 20	)17.1 - Settings			?	x
	General	Shared Folders				
	System	Folders List				
	Display	Name Path		Auto-moun	t Access	
	Storage	Transient Folders	Add Shared Folder	Ins		
	Audio					
₽	Network					
	Serial Ports					
	USB					
	Shared Folders					
	User Interface					
				ОК	Cance	el



3. In the *Folder Path* box, click the dropdown arrow on the right. Select the **Other** entry to open a Windows Explorer pane. Browse to the location in Windows where you want to set up a shared folder and click **Select Folder** in the Explorer pane. Click the checkboxes for **Auto-mount** and **Make Permanent**. Click the **OK** button.

🥝 Add Share	100	? ×	Add Share		2
Folder Path:	<not selected=""></not>	-	Folder Path:	C:\VirtualBox_Share	
Folder Name:	Other		Folder Name:	VirtualBox_Share	
	Auto-mount			Auto-mount	
	Make Permanent			Make Permanent	
	ОК	Cancel		ОК	Cancel

4. The location of the shared folder in Windows is shown in the Path column. The folder will Auto-mount and Full Access is allowed. The corresponding folder in the Linux VM is /media/sf\_<Windows Folder Name>. In the example shown, this corresponds to:

#### /media/sf\_VirtualBox\_Share

Click the **OK** button to close the panel.

6	🧿 Ubu	intu PetaLinux 20	)17.1 -	Settings			?	x
		General	Sh	ared Folders				
		System	Folde	ers List				
Į.		Display	Nan	ne Mashira Faldara	Path	Auto-mount	Access	
	$\bigcirc$	Storage	1	VirtuaShare	C:\VirtualBox_Share	Yes	Full	
		Audio		Transient Folders				
	₽	Network						
		Serial Ports						
	Ø	USB						
		Shared Folders						
	=	User Interface						
						ОК	Cance	



5. Shared folders are only available to user accounts that are also members of the group vboxsf. This means the user account created earlier must be added to this group. This can only be done in Ubuntu 16.04 from the command line. To view available groups and members, open a Terminal window but selecting the Dash and then searching for Terminal. In a Terminal window enter one or more of the following commands.

This command lists all groups (if you are using the pre-made virtual machine this has already been done for you, skip to the next Step):

\$ getent group

This command lists a specific group named vboxsf:

\$ getent group vboxsf

To add an existing user to an existing group, in a Terminal enter the following command:

\$ sudo usermod -a -G vboxsf training

6. <u>Reboot the Virtual Machine</u> from within Ubuntu, in the Terminal window enter:

\$ sudo shutdown -r now

7. The selected user name will belong to the *vboxsf* group on the next login. To access the shared folder from the Virtual machine, browse to: **/media/sf\_**<**sharename**>

In this example, the folder in Windows is named *VirtualBox\_Share*, so the <u><sharename></u> in Linux is **sf\_VirtualBox\_Share**, automatically mounted in the **/media** folder. Any files in this folder are available to the Virtual Machine and the Host OS system.





### VirtualBox Shared Clipboard

If the Guest Additions have been installed (which were if using the pre-made VM) you can enable the Shared Clipboard which will make it easier to copy and paste text strings from tutorial documents from the host system to the guest systems. This is very useful for later tutorials where it is desirable to copy command prompt instructions verbatim from the tutorial guide document directly into the command prompt of the guest system.

1. From the VirtualBox main menu, select **Devices > Shared Clipboard > Bidirectional** 



## Network Bridging

When VirtualBox is installed with its default options, the networking is set up to use Network Address Translation (NAT). This allows your Virtual Machine complete outgoing access to your LAN and/or the Internet, but it assigns an internal IP address that may not be compatible with your LAN and the IP address of your host system.

If you would like your Virtual Machine to accept an address from a local DHCP server, you can change the default network type to Bridged. This will make the Virtual Machine available to any other connected device on the same subnet on your LAN.

1. From the main VirtualBox menu in a powered off *(or running)* Virtual Machine, click on the **Settings** button. If the button is not visible, select **Machine > Settings**.

🗿 Oracle VM VirtualBox Manager							
File	Machine	Help					
E Mar				•			
New	Settings	Discard	Start		17		
	Ubuntu PetaLinux 2017.1 Powered Off						

2. Select the Network entry in the left panel. Select the tab for your NIC (typically **Adapter 1**) and expand the dropdown menu for the *Attached to* field.

🥝 Ubuntu PetaLi	ix 2017.1 - Settings
General	Network
🛒 System	Adapter 1 Adapter 2 Adapter 3 Adapter 4
Display	☑ Enable Network Adapter
😥 Storage	Attached to: Bridged Adapter
Audio 🛁	Name: NAT NAT Network
Network	Internal Network Host-only Adapter
Serial Port	Generic Driver
🏈 USB	
Shared Fo	lers
User Inter	ce
	OK Cancel
<u></u>	

 Select Bridged Adapter from the dropdown menu and click the OK button to save the changes. Wait a few seconds for your Virtual Machine to request an address from the local DHCP server. Once complete, the VM will now have an address on your local subnet, accessible to all devices on your LAN.

If you do not receive a new IP address after a minute, stop and restart the Ethernet service.



# Xilinx Vivado/SDK Installation

**IMPORTANT:** You do not have to install both Vivado and the SDK, they can be independently installed. The instructions below have been written assuming both but you do not have to install both. The procedure for one or the other is the same with respect to the specific instructions for each one. Download the installer and only select the desired packages, adapt where appropriate to the instructions. You must use **version 2017.1** of the tools.

**NOTE:** Several installation actions will require root privilege level. This is done in Ubuntu 16.04 by invoking temporary root privileges with the sudo command. When asked for a password enter the one set up for the VM if you are using it. During the initial pre-made VM creation for the MiniZed Speedway, the password was set to: 'avnet'

**NOTE:** We recommend you download the Xilinx tools for Ubuntu from your host OS and place the downloaded installer on your shared folder (the one shared between the host OS and VirtualBox OS).

To perform the steps in this section, you need to download an image to your host system. The most recent images for version 2017.1 can be downloaded from link below. **Make sure to download 2017.1** for LINUX !

You want to select "Vivado HLx 2017.1: WebPACK and Editions - Linux Self Extracting Web Installer"

#### http://www.xilinx.com/support/download.html

### Install Vivado/SDK in the VirtualBox Linux VM

- 1. If you downloaded the installation file with your host OS vs the Virtual OS you must copy the All-OS version of the .bin file into the Host's shared folder location.
- Open a terminal window and enter the following, it is very important to chmod /opt <u>but if you</u> are using the pre-made Virtual Machine setting the permission of /opt has already been done for you, you can skip the chmod:

```
$ sudo chmod ugo+w /opt
$ chmod +x /media/sf_<shared folder>/Xilinx_Vivado_SDK_2017.1_0415_1_Lin64.bin
$ /media/sf <shared folder>/Xilinx Vivado SDK 2017.1_0415_1_Lin64.bin
```

3. The installer will run and open a dialog asking if you want to install a newer version than 2017.1, you do not. Select Continue, then it will close and then click Next.

× A	Newer Version Is Available
?	Xilinx Design Tools 2017.2 is now available.
_	Click Get Latest to download this latest version and cancel this installation. Click Continue to continue with this installation of Xilinx design Tools 2017.1.
	Get Latest Continue



4. Enter your Xilinx Account credentials and click, leave Download and Install Now selected. Click Next.

😸 🖨 💷 Vivado 2017.1 Installer - Select Install Type	
Select Install Type	
Please select install type and provide your Xilinx.com user ID and password for authentication.	ALL PROGRAMMABLE.
User Authentication	
Please provide your Xilinx user account credentials to download the required files.         If you don't have an account, please create one.         User ID         Password	
Download and Install Now Select your desired device and tool installation options and the installer will download and install just what is red installation files will be saved for future use. NOTE: Future installs using these downloaded files will be restricted selected during this install. For access to all options later, choose "Download Full Image".	quired. Downloaded to the options
🕞 🔾 Download Full Image (Install Separately)	
The installer will download an image containing all devices and tool options for later installation. Use this option full image on a network drive or allow different users maximum flexibility when installing.	i if you wish to install a

- 5. Please read and accept all license agreements on the new dialog, then click Next.
- 6. You should choose WebPack if you do not have official license keys for the full versions, then click Next:





7. You will next be presented with several installation choices, for MiniZed you should choose the following, which will require 23GB of disk space. Make sure you select the SDK and the Zynq-7000 options as a minimum. At the bottom of the dialog (not shown) it will tell you how much space will be needed for all options selected. If you are using the provided pre-built VM it has room for up to 200GB total, including the Ubuntu OS and other utilities.

You will need to click on the little circle – to expand the option trees. An option is partially selected if the box is grayed, if all options are selected under the tree a check box will show up.

Vivado 2017.1 Installer - Vivado HL WebPACK Vivado HL WebPACK Vivado HL WebPACK is the no cost, device limited version of Vivado HL Design Edition. 💡 🄆 Design Tools 🖌 Vivado Design Suite Vivado System Generator for DSP ~ Vivado High Level Synthesis Software Development Kit (SDK) DocNav 🏾 Devices Production Devices 📍 🔳 SoCs ✓ Zynq-7000 (<u>limited support</u>)
 ✓ Zynq UltraScale+ MPSoC (<u>limited support</u>) • 7 Series (limited support) 0-UltraScale (limited support) UltraScale+ (limited support) Engineering Sample Devices 💡 🖌 Installation Options able Drivers are not installed on Linux. Please follow the instructions in UG973 to install Linux cable drivers Enable WebTalk for Vivado to send usage statistics to Xilinx (Always enabled for WebPACK license) Enable WebTalk for SDK to send usage statistics to Xilinx

Click Next when done selecting the proper options.

 The next dialog is for choosing the installation directory, leave the defaults for everything else in place. Not show here, this dialog will display how much disk space is both needed and remaining.

If the option is red something is wrong, either permissions for the /opt folder was not done, there is not enough disk space, or an existing install already exists which is the case for below when these instructions were being created.



Click Next to proceed.



9. The final summary dialog before the beginning of the installation should now be presented. Click Install to begin the installation.

😕 🖨 🗊 🛛 Vivado 201	7.1 Installer - Installation Summary
X	Installation Summary
HLx Editions	Edition: Vivado HL WebPACK
	Production Devices (SoCs)
	Design Tools
	<ul> <li>Vivado Design Suite (Vivado, System Generator for DSP, Vivado High Level Synthesis)</li> <li>Software Development Kit (SDK)</li> </ul>
	DocNav
	Installation Options
	<ul> <li>Enable WebTalk for SDK to send usage statistics to Xilinx</li> </ul>
	• Enable WebTalk for Vivado to send usage statistics to Xilinx (Always enabled for WebPACK license)
	Installation location
	<ul> <li>/opt/Xilinx/Vivado/2017.1</li> </ul>
	<ul> <li>/opt/Xilinx/Vivado_HLS/2017.1</li> </ul>
	<ul> <li>/opt/Xilinx/SDK/2017.1</li> </ul>
	• /opt/Xilinx/DocNav
	Download location
	<ul> <li>/opt/Xilinx/Downloads/Vivado_2017.1</li> </ul>
	Disk Space Required
	Download Size: 4.14 GB
	Disk Space Required: 22.52 GB
E XILINX ALL PROGRAMMABLE.	
Copyright © 1986-2017 Xilin×	, Inc. All rights reserved. Preferences < Back Install Cancel



10. The download and installation will take a while. At least 4GB will be downloaded and then installed. This will likely take from ½ hour up to 2 hours. It mainly depends on your download speed and how fast the Xilinx servers are to your internet connection.



The installation at this point should be complete!



## Adjust GTK Version Used for Vivado in the VirtualBox Linux VM

**IMPORTANT:** It is a known issue that the SDK will fail to launch on Ubuntu 16.04 without a workaround and this is addressed in Xilinx Answer Record AR67580:

https://www.xilinx.com/support/answers/67580.html

The issue is with the GTK version shipped with Ubuntu 16.04, which has issues with the Eclipse application that the SDK and Vivado uses. In order to work around this issue, set the environment variable **SWT\_GTK3** to 0.

1. To temporarily set this environment variable for the current terminal session, use the following command:

\$ export SWT\_GTK3=0

To permanently set this environment variable for the all future terminal sessions, insert this comment and export command near the top of the *~/.bashrc* file using your favorite editor (vi or nano or gedit which is the desktop GUI editor). *~/.bashrc* is a hidden file so it won't show up normally in a list of available files, if you enter it by name for any editor the editor will find it.

\$ gedit ~/.bashrc

Add the following text toward the top of the file:

# This is a workaround for Xilinx SDK and GTK incompatibility. export SWT GTK3=0



3. Save the edits to the ~/.bashrc file.



### Install GTK Terminal

The Ubuntu **Serial port terminal** (or GTK Terminal) application is used in some of the Avnet Reference Designs and Tutorial materials since it allows for simple connection to USB-UART of many development board platforms.

1. Before you plug in the MiniZed to the PC take note of the existing USB serial ports. After the MiniZed is plugged in you should see an additional device which you will setup with gtkterm.

\$ ls /dev/ttyUSB\*

Plug in your development board and connect the USB-UART port to the PC so that the USB-UART device is recognized under Windows first. Then locate your USB-UART device under the Devices->USB selection menu and click on it to remove the device from the host operating system and add it to the VM operating system. In this example the Xilinx JTAG+Serial [0700] device is used from the Avnet MiniZed board.

🦻 Ubuntu PetaLinux 2017.1 [Ru	nning	] - Oracle VM VirtualBox			
File Machine View Input	Dev	rices Help			
Ubuntu Desktop	<b>⊙</b> ₽	Optical Drives Network	+ +		
Q		USB	÷		USB Settings
	<b>2</b>	Webcams Shared Folders	+ +		Intel Corp. [0001] Validity Sensors. Inc. Fingerprint Reader (0078)
	□ ₿	Shared Clipboard Drag and Drop	+ +		Western Digital My Passport 2599 [1012] J31E63BPE Integrated Camera [1004]
	P	Insert Guest Additions CD image	_	<ul> <li>✓</li> </ul>	Logitech USB Receiver [2401] Xilinx JTAG+Serial [0700]

3. Once the device is detected and enumerated under Ubuntu, the USB-UART port should be listed under one of the **/dev/ttyUSB***x* device entries. Locate the device entry for the USB-UART and make a note of this device for use in a later step. From a terminal:

\$ ls /dev/ttyUSB\*



4. To make it easier to launch the terminal app (gtkterm) without needing to provide the root password each time, open a command window and add the current user to the group for the /dev/ttyUSBx devices used for USB-UART.

\$ sudo usermod -a -G dialout training

5. Install the gtkterm package (OK to skip this step if you are using the pre-built Virtual Machine):

\$ sudo apt-get install gtkterm



6. <u>Reboot the Virtual Machine</u> from within Ubuntu, in the Terminal window enter:

\$ sudo shutdown -r now

6. Re-login and then create a Desktop icon by copying and pasting **Serial port terminal** (gtkterm) application from the **/usr/share/applications** folder directly to the ~/Desktop folder:



- 7. Right-click on the new **Serial port terminal** (gtkterm) application Desktop icon and select the **Properties** option.
- 8. Within the Properties window, set the app attributes to match the USB-UART device attached to the system, in this example the USB-UART is attached to the **/dev/ttyUSB1** device entry:

Name: Serial port ttyUSB1 Command: gtkterm -p /dev/ttyUSB1 -s 115200

😣 🖨 🗊 S	erial port ttyl	ISB1 Properties
Basic Per	missions	
	Name:	Serial port ttyUSB1
	Description:	
	Command:	gtkterm -p /dev/ttyUSB1 -s 115200
	Comment:	Communicate with the serial port
	Type: Size:	desktop configuration file (applic 242 bytes
	Location:	/home/training/Desktop
	Accessed: Modified:	Mon, Apr 17 2017 13:03:17 Mon, Apr 17 2017 13:03:17

9. Close the Properties window.



### Install Missing Cable Drivers

The drivers, which were not included with the install, can be installed manually.

- 1. Open a Terminal window.
- 2. At the command prompt, enter:

```
$ cd
/opt/Xilinx/Vivado/2017.1/data/xicom/cable_drivers/lin64/install
_script/install_drivers
$ sudo ./install_drivers
```

```
😝 😑 💷 training@training-VirtualBox: /opt/Xilinx/Vivado/2017.1/data/xicom/cable_drivers/lin64/
training@training-VirtualBox:/opt/Xilinx/Vivado/2017.1/data/xicom/cable_drivers/
lin64/install_script/install_drivers$ sudo ./install_drivers
INFO: Installing cable drivers.
INFO: Script name = ./install_drivers
INFO: HostName = training-VirtualBox
INF0: Current working dir = /opt/Xilinx/Vivado/2017.1/data/xicom/cable_drivers/l
in64/install_script/install_drivers
INFO: Kernel version = 4.8.0-36-generic.
INFO: Arch = x86 64.
Successfully installed Digilent Cable Drivers
--File /etc/udev/rules.d/52-xilinx-ftdi-usb.rules does not exist.
--File version of /etc/udev/rules.d/52-xilinx-ftdi-usb.rules = 0000.
--Updating rules file.
--File /etc/udev/rules.d/52-xilinx-pcusb.rules does not exist.
--File version of /etc/udev/rules.d/52-xilinx-pcusb.rules = 0000.
--Updating rules file.
INFO: Digilent Return code = 0
INFO: Xilinx Return code = 0
INFO: Xilinx FTDI Return code = 0
INFO: Return code = 0
INFO: Driver installation successful.
CRITICAL WARNING: Cable(s) on the system must be unplugged then plugged back in
order for the driver scripts to update the cables.
training@training-VirtualBox:/opt/Xilinx/Vivado/2017.1/data/xicom/cable_drivers/
lin64/install_script/install_drivers$
```



### Install Missing Desktop Icons

In some cases Vivado and/or SDK desktop icons may be missing. These can be manually added through the use of some launcher shell scripts and by adding some desktop icon entries.

1. Using your favorite text editor create a new shell script named vivado\_launch.sh

```
$ gedit ~/vivado launch.sh
```

Paste the following text into that script file, save the contents and exit. This creates a script that is capable of invoking the settings script needed for Vivado to launch correctly.

```
#!/bin/bash
. /opt/Xilinx/Vivado/2017.1/settings64.sh
vivado &
```

2. Using your favorite text editor create a new shell script named **sdk\_launch.sh.** From a terminal enter:

\$ gedit ~/sdk launch.sh

Paste the following text into that script file, save the contents and exit. This creates a script that is capable of invoking the settings script needed for Xilinx SDK to launch correctly.

```
#!/bin/bash
# This is a workaround for Xilinx SDK and GTK incompatibility.
export SWT_GTK3=0
. /opt/Xilinx/SDK/2017.1/settings64.sh
xsdk &
```

3. Change permissions of the launcher scripts so they can be executed.

\$ chmod +x ~/sdk launch.sh ~/vivado launch.sh

4. Using your favorite text editor create a new file named SDK.desktop

\$ gedit ~/Desktop/SDK.desktop



Paste the following text into that script file, save the contents and exit. This creates a desktop launcher icon that is capable of invoking the Xilinx SDK launcher script created in earlier steps.

```
#!/usr/bin/env xdg-open
```

```
[Desktop Entry]
Version=1.0
Type=Application
Terminal=false
Exec=/home/training/sdk_launch.sh
Name=Xilinx SDK 2017.1
Comment=Xilinx Software Development Kit 2017.1
Icon=/opt/Xilinx/SDK/2017.1/data/sdk/images/sdk_logo.ico
StartupNotify=true
```

5. Using your favorite text editor edit the existing file Vivado 2017.1.desktop

\$ gedit ~/Desktop/Vivado\ 2017.1.desktop

Replace the text in the existing file with the following text, save the contents and exit. This updates the desktop launcher icon to make it capable of invoking the Vivado launcher script created in the earlier steps that work around the GTK issues:

```
[Desktop Entry]
Encoding=UTF-8
Type=Application
Exec=/home/training/vivado_launch.sh
Name=Vivado 2017.1
Comment=Vivado 2017.1
Icon=/opt/Xilinx/Vivado/2017.1/doc/images/vivado_logo.png
StartupNotify=true
Exec=/opt/Xilinx/Vivado/2017.1/bin/vivado
```



6. Change permissions of both Desktop launchers so that they show up properly (Vivado is already done but leaving the redundant chmod step in, in-case they don't include it next release):

```
$ chmod u+x ~/Desktop/Vivado\ 2017.1.desktop
$ chmod u+x ~/Desktop/SDK.desktop
```

Once the execution permission is changed, the icons will populate on the Desktop with the correct graphics.



# Running the SDK for the First Time

The first time you run the SDK with sdk\_launch.sh you will see a dialog that sets up the location of the SDK workspace. Accept the default and choose not to be reminded again, click OK:

×)	Ecli	DSe	Lau	INC	he	Г

#### Select a directory as workspace

Xilinx SDK uses the workspace directory to store its preferences and development artifacts.

Workspace: /home/training/workspace	▼ Browse
Use this as the default and do not ask again	
	Cancel OK

You will then be greed with a Welcome screen, feel free to peruse the tutorials if you like. Otherwise click Workbench to begin using the SDK.

![](_page_38_Picture_13.jpeg)

#### Workbench

![](_page_38_Picture_15.jpeg)

# **PetaLinux Installation** (skip to highlighted section if using pre-made)

### Installation Workarounds

Installing PetaLinux tools on a supported Linux system should be straightforward, but there are some adjustments necessary. For more information on the installations of PetaLinux tools, please refer to Xilinx User Guide UG1144.

**IMPORTANT:** If you intend to use the PetaLinux tool-chain under Ubuntu, you will find that it requires the bash shell as the default to execute correctly. By default, Ubuntu uses the dash shell, which is an extension of the bash shell with a few additional features and optimized for faster execution. Unfortunately, the dash shell is not compatible with the current PetaLinux tool-chain.

**NOTE:** Several installation actions will require root privilege level. This is done in Ubuntu 16.04 by invoking temporary root privileges with the sudo command. When asked for a password enter the one set for the user 'training'. If you are using it, during the initial pre-made VM creation for the MiniZed Speedway, the password was set to: 'avnet'

A description for the dash shell and its potential issues can be found here:

#### https://wiki.ubuntu.com/DashAsBinSh

1. Most distributions use /bin/sh as a symbolic link to point to the actual default shell. Under your Ubuntu environment, to determine the current shell, enter which will point to either bash or dash:

#### \$ ls -l /bin/sh

2. To change the default shell for all terminal windows, enter:

#### \$ sudo dpkg-reconfigure dash

![](_page_39_Picture_13.jpeg)

3. Select the option to remove dash as the default shell when prompted.

![](_page_40_Picture_3.jpeg)

- 4. When the change is complete, close all open Terminal windows and open a new Terminal.
- 5. Verify the default shell is bash using the commands shown previously (ls -l /bin/sh).

#### **TFTP Server Install and Setup**

1. Install the following packages:

\$ sudo apt-get install xinetd tftpd tftp

2. Create /etc/xinetd.d/tftp and put this entry:

```
service tftp
{
protocol
                = udp
                = 69
port
socket_type
                = dgram
wait
                = yes
user
                = nobody
                = /usr/sbin/in.tftpd
server
server args
                = /tftpboot
disable
                = no
}
```

![](_page_40_Picture_11.jpeg)

3. Create a tftpboot folder, this should match what is in the server\_args, and assign read/write permissions with the following command:

```
$ sudo mkdir /tftpboot
$ sudo chmod ugo+rw /tftpboot/
```

4. Restart the xinetd service. For new systems:

```
$ sudo service xinetd restart
```

Now your tftp server is up and running!

### Install openssl Libraries for PetaLinux

As of 2015.2, the PetaLinux tools require the **openssl** libraries on the host system which can be installed under Ubuntu using the following command:

```
$ sudo apt-get --yes install libssl-dev
```

### Install Additional System Tools and Library Dependencies for PetaLinux

According to Xilinx User Guide UG1144, PetaLinux 2017.1 tools require some additional system tools and libraries to be installed on the host system. For exact system dependencies, refer to UG1144 document.

If you are using Ubuntu, this can be accomplished in a terminal window with the following command:

```
$ sudo apt-get --yes install tofrodos iproute gawk gcc git-core make
net-tools libncurses5-dev tftpd zlib1g-dev flex bison lib32z1
lib32ncurses5 lib32ncursesw5 lib32gomp1 xvfb chrpath socat autoconf
libtool texinfo gcc-multilib libsdl1.2-dev libglib2.0-dev
zlib1g:i386
```

### Adjusting Permissions of PetaLinux Install Folder

As of 2017.1, PetaLinux tools require the installation as a non-root user so the permissions of these folders under the /opt folder must be adjusted accordingly.

This can be accomplished in a terminal window with the following commands. training for the chown command is the default user name setup for the Virtual Machine:

```
$ sudo mkdir /opt
$ sudo chmod ugo+w /opt
$ audo mkdir (opt/patal)
```

```
$ sudo mkdir /opt/petalinux-v2017.1-final
```

```
$ sudo chmod ugo+w /opt/petalinux-v2017.1-final
```

```
$ chown -R training:training /opt/petalinux-v2017.1-final
```

![](_page_41_Picture_21.jpeg)

### Install PetaLinux into /opt/petalinux-v2017.1-final Folder

From the host system's web browser go to the Xilinx website and locate the The PetaLinux 2017.1 Installer (TAR/GZIP - 7.54 GB) and download it. This file is large and can take a long time to download.

```
https://www.xilinx.com/support/download/index.html/content/xilinx/en/downloadNav/embedded-
design-tools/2017-1.html
```

1. Copy the PetaLinux installer from your host system to the shared folder.

![](_page_42_Figure_6.jpeg)

2. Open a terminal window and launch the installer while specifying the target install folder.

```
$ chmod +x /media/sf_<shared folder>/petalinux-v2017.1-final-
installer.run
$ /media/sf_<sharded folder>/petalinux-v2017.1-final-
installer.run /opt/petalinux-v2017.1-final
```

- 3. The PetaLinux 2017.1 Installer will take several minutes to verify the integrity of the packed installer and then extract itself.
- 4. Read the PetaLinux license agreements and accept the license conditions, press enter to view the license, use keyboard **page up/down** keys to scroll through the agreement, press the **q** key to quit viewing the agreement when finished, and press the **y** key if you accept the license conditions. If prompted, allow the installer to make changes to your development system.

![](_page_42_Picture_11.jpeg)

![](_page_42_Picture_12.jpeg)

5. You must execute (source) the **/opt/petalinux-v2017.1-final/settings.sh** script prior to attempting to use the PetaLinux tools for development.

\$ source /opt/petalinux-v2017.1-final/settings.sh

6. To permanently set this environment variable for future terminal sessions, insert this comment and export command near the top of the ~/.bashrc file using your favorite editor (vi or nano or gedit which is the desktop GUI editor). ~/.bashrc is a hidden file so it won't show up normally in a list of available files, if you enter it by name for any editor the editor will find it.

\$ gedit ~/.bashrc

Add the following text toward the top of the ~/.bashrc file:

```
# This is a workaround for the PetaLinux tools.
source /opt/petalinux-v2017.1-final/settings.sh
```

😣 🖻 🗉 training@training-VirtualBox: ~
<pre># ~/.bashrc: executed by bash(1) for non-login shells. # see /usr/share/doc/bash/examples/startup-files (in the package bash-doc) # for examples</pre>
# This is a workaround for Xilinx SDK and GTK incompatibility. export SWT_GTK3=0
# This is a workaround for the PetaLinux tools. source /opt/petalinux-v2017.1-final/settings.sh
<pre># If not running interactively, don't do anything case \$- in     *i*) ;;     *) return;; esac</pre>
# don't put duplicate lines or lines starting with space in the history. # See bash(1) for more options HISTCONTROL=ignoreboth
# append to the history file, don't overwrite it shopt -s histappend

- 7. Save the edits to the **~/.bashrc** file.
- 8. Be sure to logout from Ubuntu and then re-login. Alternatively you could reboot (with sudo shutdown -r now) but rebooting is not necessary as you re-login. This will execute the ~./bashrc file and setup the paths for PetaLinux.
- 9. Congratulations you've finished installing PetaLinux into a VirtualBox VM setup!

![](_page_43_Picture_12.jpeg)

# **Revision History**

Version	Date	Details
1.0	Feb 19, 2015	VirtualBox 4.3, CentOS 6.5, CentOS 7
1.1	Feb 24, 2015	Device tree reverse compilation, Ethernet Adapter Names
1.2	November 2015	Removed CentOS 6.5 support, validated all instructions, and restructured/standardized document.
1.3	August 2016	CentOS 7 support, Ubuntu 16.04, CentOS PetaLinux 2016.2, and Xilinx Vivado/SDK 2016.2
1.4	April 2017	Updated for PetaLinux 2016.4 and Xilinx Vivado/SDK 2016.4 tools, removed instructions and support for CentOS, removed unnecessary sections
1.5	July 2017	Updated for PetaLinux 2017.1 and Xilinx Vivado/SDK 2017.1 tools
1.6	Aug 2017	Further clean-up for 2017.1 instructions.

![](_page_44_Picture_4.jpeg)