

# **Creating a Linux Virtual Machine**

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### Introduction

This document is intended to help set up a Linux enviroment on a Windows 7 host machine using Oracle's VirtualBox VM Manager and the CentOS Linux distribution.

Virtual Box is a cross-platform virtualization application that allows you to run Linux on a Windows machine. VirtualBox is a very proven and capable tool. This document describes how to create Virtual Machine (VM). Each VM is stored on the host machine's hard disk (Windows disk). However, you can install and run as many virtual machines as you like -- the only practical limits are disk space and memory.

Once the VM is created, it is ready to have Linux installed. CentOS is next installed on the virtual machine. Altera Quartus-II and SoCEDS tools are tested on CentOS Linux distributions. CentOS will run on the VM as if it was running on a dedicated machine.

There are three steps to this process:

- 1. Install Oracle VM VirtualBox Manager
- 2. Create a Virual Machine in VirtualBox
- 3. Install CentOS on the Virtual Machine

Once you have comleted the creation of your virtual Linux machine, follow the steps outlined in the vWorkshops\_Getting\_Started\_v2p0.pdf document to install the Altera tools as necessary.

vWorkshops Getting Started v2p0.pdf

### Hardware and Software Requirements

In order to run VirtualBox on your machine, you need:

- Reasonably powerful **x86 hardware.** Any recent Intel or AMD processor should do.
- **Memory.** Depending on what guest operating systems you want to run, you will need at least 512 MB of RAM (but probably more, and the more the better). Basically, you will need whatever your host operating system needs to run comfortably, plus the amount that the guest operating system needs.
- **Hard disk space.** While VirtualBox itself is very lean (a typical installation will only need about 30 MB of hard disk space), the virtual machines will require fairly huge files on disk to represent their own hard disk storage. So, to install Linux, you will need a file that will easily grow to several GB in size.
- A supported **host operating system.** We recommend Windows XP or later. A Windows 7 host machine is used in this reference.

A dedicated e-mail account has been setup to receive support requests for the vWorkshop series. Please identify the subject (in this case Creating a Linux Virtual Machine) in addition to details on the question. workshophelp@macnica.com

### Instructions

### **Installing Oracle Virtual Box**

Begin by downloading the Oracle VM VirtualBox from <u>https://www.virtualbox.org/wiki/Downloads</u>. Be sure to download "for Windows host" if you are installing it on a Windows machine.

"Run as aministrator" the down loaded VirualBox-version-Win.exe . This example is based on version 4.3.2.90405. Other version may work and vary in screen shots and required steps.

The first welcome screen pops up. Click "Next->"



Pick the install directory. And the click "Next ->".

🛃 Oracle VM VirtualBox 4.3.8 Setup	
Custom Setup Select the way you want features to be installed.	
Click on the icons in the tree below to change the way features will be install	led.
Image: WirtualBox Application       Oracle VM VirtualBox 4.         Image: WirtualBox USB Support       Oracle VM VirtualBox 4.         Image: WirtualBox Networking       VirtualBox Networking	3.8
VirtualBox Bridger VirtualBox Host-C VirtualBox Python 2.x Su VirtualBox Python 2.x Su VirtualBox Bridger VirtualBox Host-C Subfeatures requires 14 your hard drive. It has Subfeatures requires 79 Subfeatures require 79 Subfeatures requires 79 Subfeatures requi	48MB on 3 of 3 ľhe 6KB on yo
Location: C:\Program Files\Orade\VirtualBox\	Browse
Version 4.3.8 Disk <u>U</u> sage < <u>B</u> ack <u>Next</u> >	Cancel

Pick your preference about shortcuts and click "Next->"

🔁 Oracle VM VirtualBox 4.3.8 Setup	C X
Custom Setup Select the way you want features to be installed.	
Please choose from the options below:	
Create a shortcut on the desktop	
🔽 Create a shortcut in the Quick Launch Bar	
Register file associations	
Version 4.3.8	<u>C</u> ancel

#### Click "Yes"



#### Click "Install"



Click "Finish".



Virtual box is installed and ready to add a new Virtual Machine.



## **Creating a Virtual Machine (VM) in VirtualBox**

In the Oracle Virtual Box Manager click the "New" icon to create a Virtual Machine. Give any name you would like. The "Type" must be "Linux". The "Version" in this example is "Linux 2.6 (64 bit)". You may be using 32 bit. Then click "Next".

Create	Virtual Machine
Name	and operating system
Please d type of be used	hoose a descriptive name for the new virtual machine and select the operating system you intend to install on it. The name you choose will throughout VirtualBox to identify this machine.
<u>N</u> ame:	Linux64
<u>T</u> ype:	Linux
Version:	Linux 2.6 / 3.x (64 bit)
	Hide Description Next Cancel

Pick the amount of memory that can be allocated for the virtual machine.



Create a "Virtual hard drive". Click "Create". This will use a portion of your actual Windows hard drive.



Select "VDI". Click "Next".

	E?	x
Create Virtual Hard Drive		
Hard drive file type		
Please choose the type of file that you would like to use for the new virt you do not need to use it with other virtualization software you can leav unchanged.	ual hard drive e this setting	e. If
<ul> <li>VDI (VirtualBox Disk Image)</li> </ul>		
VMDK (Virtual Machine Disk)		
VHD (Virtual Hard Disk)		
HDD (Parallels Hard Disk)		
QED (QEMU enhanced disk)		
QCOW (QEMU Copy-On-Write)		
Hide Description	Car	ncel

Select "Dynamically allocated". Click "Next". (Setting a fixed size is acceptable as well.)



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Pick the file name of virtual hard drive and select the Windows drive/folder where the virtual machine hard drive will reside using the folder icon on the right. Slide the arrow with mouse to select the maximum size of the virtual hard disk. This will be the MAXIMUM size of the virtual disk. The virtual disk will start small and grow in size as the virtual machine needs more disk space. Take note that once the machine is created, you cannot change the size of the virtual hard disk. It is recommended that you set an overly large virtual disk size limit. 500GB is chosen here. Click "Create".

	E ? ×
Create Virtual Hard Drive	
File location and size	
Please type the name of the new virtual hard drive file into the box below folder icon to select a different folder to create the file in.	w or click on the
Linux64	
Select the size of the virtual hard drive in megabytes. This size is the limi file data that a virtual machine will be able to store on the hard drive.	t on the amount of
	500 GB
4.00 MB 2.0	ютв
Create	Cancel

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The new virtual machine is created and ready for an OS to be installed.



### **Installing CentOS on a Virtual Machine in VirtualBox**

Download DVD 1 to 2 iso for CentOS 6.4 from <a href="http://www.centos.org">http://www.centos.org</a>

You will now use the iso file to create a DVD. This can be a real DVD or virtual DVD in Virtual box. The virtual DVD meathod is very easy. If you want to use the virtual DVD meathod, skip the next section "Create Real DVD" and jump to the "Create a Virtual DVD" section.

#### **Create Real DVD**

**To create a real DVD** using the downloaded CentOS 6.4 iso file. Here is a link that descibes how to do this in Windows.

http://windows.microsoft.com/en-us/windows7/burn-a-cd-or-dvd-from-an-iso-file

Next, put CentOS DVD in drive. Wait for DVD to be recognized by windows. Skip to the

Begin CentOS Install section.

#### **Create a Virtual DVD**

**Create a virtual DVD** by selecting and right clicking on the virtual machine you created in the previous section. Then click on "Settings".

🗿 Oracle VM VirtualBox	Manager	
File Machine Help		
New Settings Start	Discard	
Linux64		📃 General
	🥝 Settings	Ctrl+S Lin
	Clone	Ctrl+O bit
	😂 Remove	Ctrl+R
	🛃 Group	Ctrl+U 8000 M
	i Start	Floppy, Disk
	Pause	Ctrl+P VT-x/Al
	Reset	Ctrl+T
	Close	+ <u>-</u>
	Discard saved state	Ctrl+J
	🔄 Show Log	Ctrl+L Server
	💮 Refresh	
	Show in Explorer	
	Create Shortcut on Desk	top Master
	Sort	
		🕨 Audio

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The system settings window will pop up. Click on "System". Check the "Boot Order" to make sure the CD/DVD is before the Hardisk or Network.

😳 Li	nux64 - Settings	
	General	System
	System	
	Display	Motherboard Processor Acceleration
	Storage	Base Memory: 8000 🖈 MB
	Audio	4 MB 16384 MB
0	Network	Boot Order:
	Serial Ports	V O CO/DVD Hard Disk
	USB	🔲 🛃 Network
	Shared Folders	Qhipset: PIIX3 🔻
		Pointing Device: USB Tablet
		Extended Features: 📝 Enable I/O APIC
		Enable EFI (special OSes only)
		✓ Hardware Clock in <u>U</u> TC Time
		OK Cancel <u>H</u> elp

Click on "Storage". Click on the "Controller: IDE". Click on the "Add CD/DVD" Gebutton.

😳 Linux64 - Setti	ngs		
<ul> <li>General</li> <li>System</li> <li>Display</li> <li>Storage</li> <li>Audio</li> <li>Network</li> <li>Serial Ports</li> <li>USB</li> <li>Shared Fold</li> </ul>	Storage Storage Tree Storage Tree Controller: IDE Controller: SATA Controller: SATA Controller: SATA Controller: SATA Controller: SATA	Add Cl	Attributes <u>N</u> ame: IDE D/DVD Device

Click on the "Choose disk" button.

😳 Virtu	alBox - Question 🕒 🤗 💌
?	You are about to add a new CD/DVD drive to controller <b>IDE</b> .
	Would you like to choose a virtual CD/DVD disk to put in the drive or to leave it empty for now?
Leave	empty Choose disk Cancel

Browse to the CentOS DVD1 iso file that was downloaded and click on "Open".

💱 Please choose a virtual optical disk file							
💮 💮 – 🕌 🕨 Computer 🔸 Apps (D:	) ▶ In	stallers + VM + CentOS		<b>▼</b> 49	Search CentOS		٩
Organize 🔻 New folder					≣ -		0
☆ Favorites	^	Name	Date modified	Туре	Size		
Marktop		CentOS-6.5-x86_64-bin-DVD1 (1).iso	3/14/2014 10:08 AM	ISO Image File	4,363,264 KB		
Recent Places	Ξ						
ConeDrive							
Libraries							
Device Handbooks							
Documents							
A Homograup	-						
File name:				•	All virtual optical disk f	iles (*.dr	-
				(	Open	Cancel	

Click "OK".

😳 Linux64 Settings			G ? ×
<ul> <li>General</li> <li>System</li> <li>Display</li> <li>Storage</li> <li>Audio</li> <li>Network</li> <li>Serial Ports</li> <li>USB</li> <li>Shared Folders</li> </ul>	Storage Storage Tree Controller: IDE CentOS-6.5-x86_64-bin-DVD1 CentOS-65-x86_64-bin-D	Attributes Name: IDE Type: PIIX4 Vuse Host I/O C	v ≥ache
		OK Ca	ncel <u>H</u> elp

The virtual DVD has been created and you are ready to install CentOS.

#### **Begin CentOS Install**

In the VM VirtualBox Manager, press the "Start" green arrow icon.

💱 Oracle VM VirtualBox Manager	State State	
<u>F</u> ile <u>M</u> achine <u>H</u> elp		
New Settings Start Discard		Q Details 💿 Snapshots
Linux64	📃 General	Preview
(2.6 W Powered Off	Name: Linux64 Operating System: Linux 2.6 / 3.x (64 bit)	
	🔝 System	
	Base Memory: 8000 MB Boot Order: Floppy, CD/DVD, Hard Disk Acceleration: VT-x/AMD-V, Nested Paging	Linux64
	Display	
	Video Memory: 12 MB Remote Desktop Server: Disabled Video Capture: Disabled	
	Storage	j
	Controller: IDE IDE Primary Master: [CD/DVD] CentOS- IDE Secondary Master: [CD/DVD] Empty Controller: SATA SATA Port 0: Linux64.vdi (Norm	-6.4-x86_64-bin-DVD1.iso (4.05 GB) al, 500.00 GB)
	🕞 Audio	
	Host Driver: Windows DirectSound	-
		H.

Use the first selection "Install or upgrade an existing system" Press the enter key.



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You may lose control of the mouse for a few moments while the virtual machine starts up.

Hit tab to select "Skip" and hit the enter key. You could say OK. It will check your DVD but it will take a while.



Signs of life - Click "Next"



Pick English and hit "Next"

👸 Linux64 (Running) - Oracle VM VirtualBox	• c = 0 <mark>=</mark> ×
Machine View Devices Help	
What language would you like to use during the Installation process?	
Arabic (العربية)	
Assamese (অসমীয়া)	
Bengali (वाश्ला)	
Bengali(India) (বাংলা (ভারত))	
Bulgarian (Български)	
Catalan (Català)	=
Chinese(Simplified) (中文(简体))	
Chinese(Traditional) (中文(正體))	
Croatian (Hrvatski)	
Czech (Čeština)	
Danish (Dansk)	
Dutch (Nederlands)	
English (English)	
Estonian (eesti keel)	
Finnish (suomi)	
French (Frenkels)	
Greek (EXAnuscá)	
Guiarati (Josefd)	
Hebrew (Juccu)	
Hindi (हिन्दी)	
Hungarian (Magyar)	
Icelandic (Icelandic)	
Iloko (Iloko)	
Indonesian (Indonesia)	
Janlin /Janlinn)	
	<b>♦</b> Back
	💿 🤌 🖶 🚞 🚛 🛄 🛛 🐼 🖲 Right Ctrl

Pick US English and hit "Next"

😘 Linux64 [Running] - Oracle VM VirtualBox	
Machine View Devices Help	
Select the appropriate keyboard for the system.	k
Italian	
Italian (IBM)	
Italian (it2)	
Japanese	
Korean	
Latin American	
Macedonian	
Norwegian	
Polish	
Portuguese	
Romanian	
Russian	
Serbian	
Serbian (latin)	
Slovak (qwerty)	
Slovenian	
Spanish	
Swedish	
Swiss French	
Swiss French (latin1)	
Swiss German	
Swiss German (latin1)	
Turkish	
U.S. English	
U.S. International	
Ukrainian	
United Kingdom	
	<b>♦</b> <u>B</u> ack
Ø (	💿 🌽 🖃 📾 🔟 🛛 🐼 💌 Right Ctrl 💡

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Pick "Basic Storage Devices" and hit "Next"

Linux64 [Running] - Oracle VM VirtualBox	
Machine View Devices Help	
What type of devices will your installation involve?	
Basic Storage Devices Installs or upgrades to typical types of storage devices. If you're not sure which option is right for you, this is probably it.	
Specialized Storage Devices O Installs or upgrades to enterprise devices such as Storage Area Networks (SANs). This option will allow you to add ToCe/ ISCE/ IRCP disks and to filter out devices the installer should ignore.	
	<b>♦</b> Back
Ø 6	) 🖉 🗗 📖 🔟 🚺 🐼 🖲 Right Ctrl 💡

Click on "Yes, discard any data". This is kind of scary. It's talking about the virtual disk. Since this is a new install, there is nothing to be lost. If it's not a new VM, you have to decide about keeping data.

Storage Device Warning			
	The storage device below may contain data.		
	ATA VBOX HARDDISK 512000.0 MB pci-0000:00:0d.0-scsi-0:0:0:0		
	We could not detect partitions or filesystems on this device.		
	This could be because the device is <b>blank</b> , <b>unpartitioned</b> , or <b>virtual</b> . If not, there may be data on the device that can not be recovered if you use it in this installation. We can remove the device from this installation to protect the data.		
	Are you sure this device does not contain valuable data?		
	☑ Apply my choice to all devices with undetected partitions or filesystems		
	Yes, discard any data No, keep any data		

Pick a hostname for this VM. Press "Next".



Pick your time zone and press "Next".



Pick your root password and press "Next".

🔯 Linux64 [Running] - Oracle VM VirtualBox			
Machine View Devices Help			
The root account is used for administering the system. Enter a password for the root user.			
Root <u>P</u> assword:			
<u>C</u> onfirm:			

Pick "Use All Space" and press "Next".

🔝 Linux64 [Running] - Oracle VM VirtualBox			
Mac	hine Vi	ew Devices Help	
Whi	ich type	of installation would you like?	
۲	OS	Use All Space Removes all partitions on the selected device(s). This includes partitions created by other operating systems.	
		Tip: This option will remove data from the selected device(s). Make sure you have backups.	
0		Replace Existing Linux System(s) Removes only Linux partitions (created from a previous Linux installation). This does not remove other partitions you may have on your storage device(s) (such as VFAT or FAT32).	
Tip: This option will remove data from the selected device(s). Make sure you have backups.			
0	05 •	Shrink Current System Shrinks existing partitions to create free space for the default layout.	
0	05 	Use Free Space Retains your current data and partitions and uses only the unpartitioned space on the selected device (s), assuming you have enough free space available.	
0	?	Create Custom Layout Manually create your own custom layout on the selected device(s) using our partitioning tool.	

Pick "Write changes to disk".

Writing storage configuration to disk			
The partitioning options you have selected wil now be written to disk. Any data on deleted o reformatted partitions will be lost.			
(	Go <u>b</u> ack	Write changes to disk	

Select "Minimal Desktop" and click on "Next". This uses the least amount of space. You could select "Desktop" if you prefer.

🙀 Linux64 [Running] - Oracle VM VirtualBox	
Machine View Devices Help	l.
The default installation of CentOS is a minimum install. You can optionally select a different set of software now.	<b>N</b>
O Desktop	
Minimal Desktop	
O Minimal	
O Basic Server	
<ul> <li>Database Server</li> </ul>	
O Web Server	
<ul> <li>Virtual Host</li> </ul>	
<ul> <li>Software Development Workstation</li> </ul>	
Please select any additional repositories that you want to use for software installation.	
✓ CentOS	
🕂 Add additional software repositories 📄 Modify repository	
You can further customize the software selection now, or after install via the software management application.	
Customize later     Customize now	
	Back Next
	😼 💿 🌽 🖶 📖 💷 🚺 🛛 🐼 🖲 Right Ctrl

The descriptions are listed here:

**Desktop**: base, basic-desktop, core, debugging, desktop-debugging, desktop-platform, directory-client, fonts, general-desktop, graphical-admin-tools, input-methods, internet-applications, internet-browser, java-platform, legacy-x, network-file-system-client, office-suite, print-client, remote-desktop-clients, server-platform, x11

Minimal Desktop: base, basic-desktop, core, debugging, desktop-debugging, desktop-platform, directory-client, fonts, input-methods, internet-browser, java-platform, legacy-x, network-file-system-client, print-client, remote-desktop-clients, server-platform, x11

#### Minimal: core

**Basic Server**: base, console-internet, core, debugging, directory-client, hardware-monitoring, javaplatform, large-systems, network-file-system-client, performance, perl-runtime, server-platform

**Database Server**: base, console-internet, core, debugging, directory-client, hardware-monitoring, javaplatform, large-systems, network-file-system-client, performance, perl-runtime, server-platform, mysqlclient, mysql, postgresql-client, postgresql, system-admin-tools

**Web Server**: base, console-internet, core, debugging, directory-client, java-platform, mysql-client, network-file-system-client, performance, perl-runtime, php, postgresql-client, server-platform, turbogears, web-server, web-servlet

Virtual Host: base, console-internet, core, debugging, directory-client, hardware-monitoring, javaplatform, large-systems, network-file-system-client, performance, perl-runtime, server-platform, virtualization, virtualization-client, virtualization-platform

**Software Development Workstation**: additional-devel, base, basic-desktop, core, debugging, desktopdebugging, desktop-platform, desktop-platform-devel, development, directory-client, eclipse, emacs, fonts, general-desktop, graphical-admin-tools, graphics, input-methods, internet-browser, javaplatform, legacy-x, network-file-system-client, performance, perl-runtime, print-client, remote-desktopclients, server-platform, server-platform-devel, technical-writing, tex, virtualization, virtualization-client, virtualization-platform, x11

OK information messages...

Click on "Reboot"



#### Almost there - Click on "Forward"



#### Click on "Forward"

ix64 [Running] - Oracle VM Virtu ne View Devices Help	lai8ox	
Welcome License	License Information	
Information Create User	CentOS-6 EULA	
Kdump	CentOS-6 comes with no guarantees or warranties of any sorts, either written or implied.	
	The Distribution is released as GPLv2. Individual packages in the distribution come with their own licences. A copy of the GPLv2 license is included with the distribution media.	
		I
	• Yes, I agree to the License Agreement	
	O No, I do not agree	
		Back Forward
		😼 💿 🌽 🖶 📖 🖷 🛄 🛛 🐼 🖲 Right

Fill in a username and password. This will be the account you will primarily use. Click on "Forward".

[ Linux64 [Running] - Oracle VM Virtua	ulBox	
Machine View Devices Help		
Welcome License Information	Create User	
<ul> <li>Create User</li> <li>Date and Time</li> <li>Kdump</li> </ul>	You must create a 'username' for regular (non-administrative) use of your system. To create a system 'username', please provide the information requested below.	
	Usemame: student	
	Full Name: Student	
	Password:	
	Confirm Password:	
	If you need to use network authentication, such as Kerberos or NIS, please click the Use Network Login button. Use Network Login If you need more control when creating the user (specifying home directory, and/or UID), please click the Advanced button. Advanced	Back Forward
		💿 🖉 🖶 🗀 🖛 🕅 🛛 🐼 🖲 Right Ctrl 🐋
		j 💿 🌽 遭 📖 🛄 🚺 🚫 🕙 Right Ctrl 🔡

Check and correct date and time if needed. Click on "Forward".

Linux64 [Running] - Oracle VM Virtua	Box	
Welcome License Information Create User > Date and Time Kdump	Date and Time Please set the date and time for the system. Date and Time Current date and time: Fri 14 Mar 2014 02:03:14 PM MDT	
	Synchronize date and time over the network	
	Manually set the date and time of your system: Date Time	
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
		Back Forward

Click on "Finish".



Click on "Yes".

强 Linux64 [Running] - Oracle VM Vi Machine View Devices Help	tualBox		
Welcome License Information Create User Date and Time > Kdump	Kdump Kdump is a kernel crash dumping mechanism crash, kdump will capture information from yo invaluable in determining the cause of the cr require reserving a portion of system memor other uses.	. In the event of a system our system that can be ash. Note that kdump does y that will be unavailable for	
	✓ Enable kdump?		
	Total System Memory (MB):	7809	
	Kaump Memory (MB):	7691	
	Advance Confi This fi Kemei this fi the ref Curre Curre to configured damp carget rais, the deraid Curre to configured damp target rais, the deraid Default action may be configured with th Basics commands supported are: a path - path > - Append path to th dumping to. Ignored for raw If unset, will default to /var/c to configured to reationce	x s requires rebolting the mory accordingly. Would this change and reboot to is complete? No Yes arc accuor win be preromred. e "default" directive below. e filesystem device which y device dumps. rrash.	
			Back Finish
		<b>S</b> (0)	🤌 🛃 📖 💷 🚺 🚫 🚱 Right Ctrl

Click on "OK".



And finally you have a CentOS VM. Login and off you go...



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#### **Network & Updates**

You will need to get connected to the network in order to update the CentOS installation and add additional packages. You can refer to the manual to get assistance setting up the network: <u>www.virtualbox.org/manual</u>. Many of these additions need to been done as root. It is not advised to be logged in as root to do this, but to "sudo" (execute a command as "root" even though you are logged in as "user".) You will need to edit /etc/sudoers file as root to add your "user" to the authorized "sudo" user list.

```
$ su root
Password: [enter password you set up when initially installing CentOS]
$ visudo
```

Duplicate the 'root ALL=(ALL) ALL' line with your username in place of root.

It is assumed you have some basic knowledge of using the "vi" or "vim" editor in Linux. If you need assistance please refer to <u>ftp://ftp.vim.org/pub/vim/doc/book/vimbook-OPL.pdf</u>. Or <u>http://vim-adventures.com/</u> is a fun diversion to learn the VIM way!

If you have problems with your network, contact us at workshophelp@macnica.com.

#### Linux required packages

These are the required packages that need to be installed on a fresh DVD-based installation of CentOS 6.4. If a different installation method was used (e.g. from a CD) then more packages might be necessary.

- 32-bit libraries: compat-libstdc++-33.i686, expat.i686, fontconfig.i686, freetype.i686, glibc.i686, gtk2.i686, libcanberra-gtk2.i686, gtk2-engines-2.18.4-5.el6.centos.i686, libpng.i686, libICE.i686, libSM.i686, libuuid.i686, ncurses-devel.i686, ncurses-libs.i686, PackageKit-gtk-module.i686, tcldevel, i686, tcl.i686, and zlib.i686, libgcc.i686, libstdc++.i686, glibc-devel.i686
- XWindow libraries: libX11.i686, libXau.i686, libXdmcp.i686, libXext.i686, libXft-devel.i686, libXft.i686, libXrender.i686, libXt.i686, and libXtst.i686
- GIMP toolkit: GTK+2

\$ sudo yum update

- \$ sudo yum groupinstall "Development Tools"
- \$ sudo yum install texi2html texinfo glibc-devel chrpath ncurses-devel
- \$ sudo yum install compat-libstdc++-33.i686 expat.i686 \
  fontconfig.i686 freetype.i686 glibc.i686 gtk2.i686 \
  libcanberra-gtk2.i686 gtk2-engines-2.18.4-5.el6.centos.i686 \
  libpng.i686 libICE.i686 libSM.i686 libuuid.i686 ncurses-devel.i686 \
  ncurses-libs.i686 PackageKit-gtk-module.i686 tcldevel.i686 tcl.i686\
  zlib.i686 libgcc.i686 libstdc++.i686 glibc-devel.i686
- \$ sudo yum install libX11.i686 libXau.i686 libXdmcp.i686 libXext.i686\
   libXft-devel.i686 libXft.i686 libXrender.i686 libXt.i686 \
   libXtst.i686

#### **Setup Virtual Box Guest Additions**

Virtual Box Guest Additions make life easier transferring information between Windows and VM. Guest Additions allow you to set up shared directories. Refer to the Virtual box manual for setting up guest additions. <u>www.virtualbox.org/manual</u>.

## Notes

# **Document Revision History**

Revision	Date	Comments
0.1		Initial Draft
0.2		Internal Review
1.0		Customer Release
2.0	March 18, 2014	Updated flow. Removed ACDS install.