



Creating a Linux Virtual Machine

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Macnica Americas

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Introduction

This document is intended to help set up a Linux environment 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 Virtual Machine in VirtualBox
3. Install CentOS on the Virtual Machine

Once you have completed 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

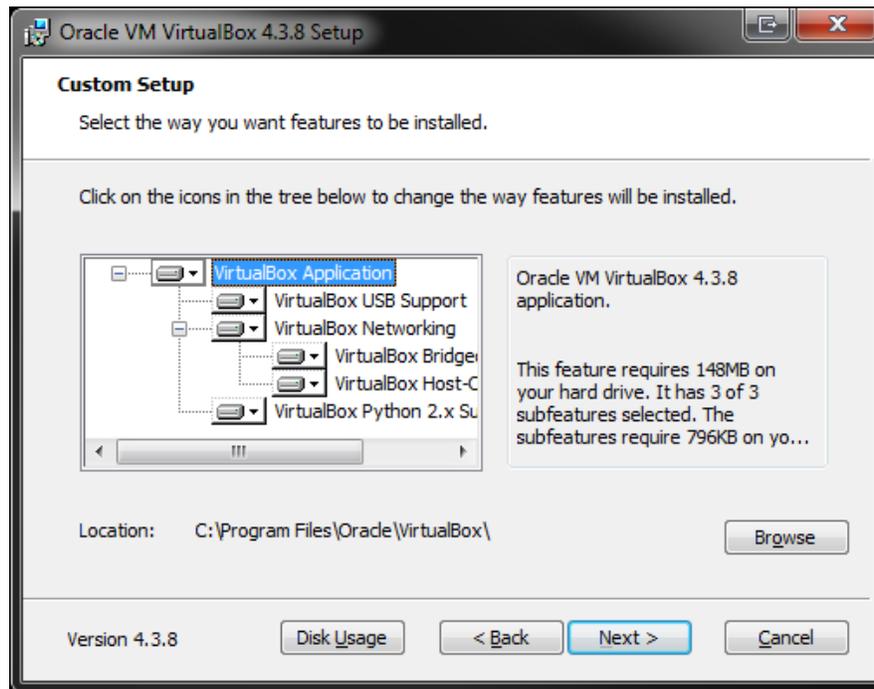
Begin by downloading the Oracle VM VirtualBox from <https://www.virtualbox.org/wiki/Downloads>. Be sure to download “for Windows host” if you are installing it on a Windows machine.

“Run as administrator” the down loaded VirtualBox-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.

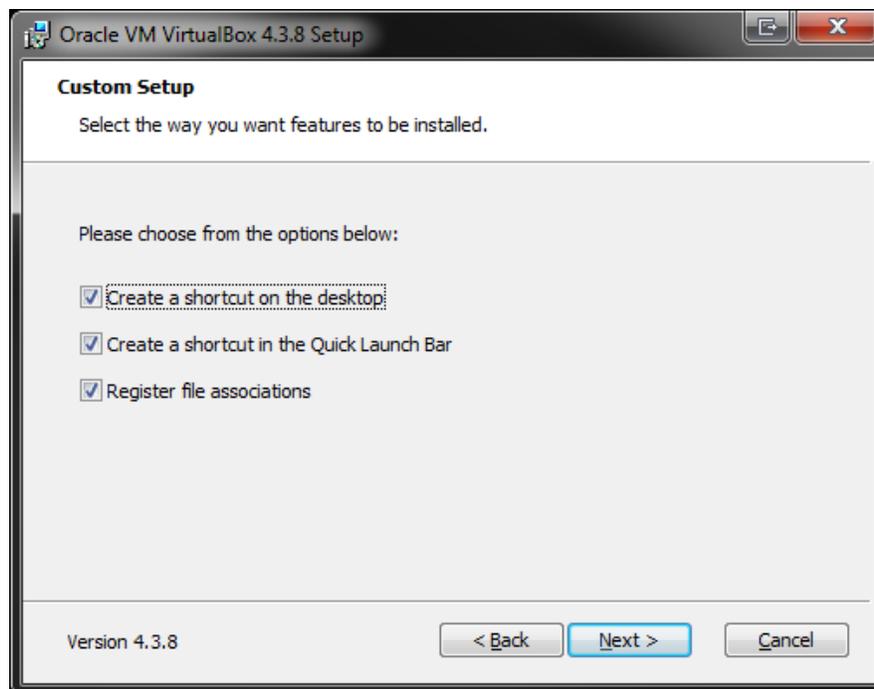
The first welcome screen pops up. Click “Next->”



Pick the install directory. And the click “Next ->”.



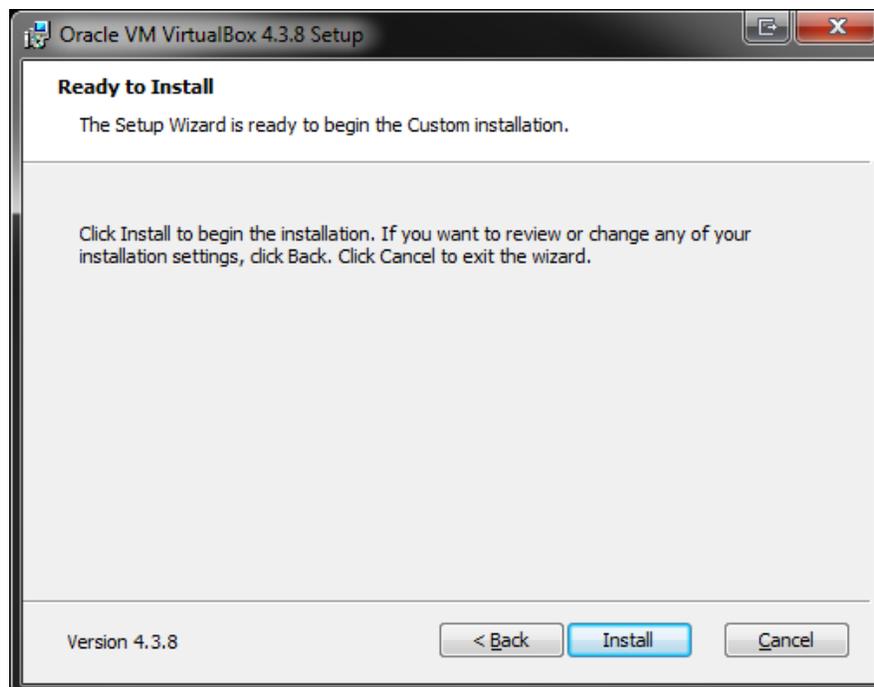
Pick your preference about shortcuts and click “Next->”



Click "Yes"



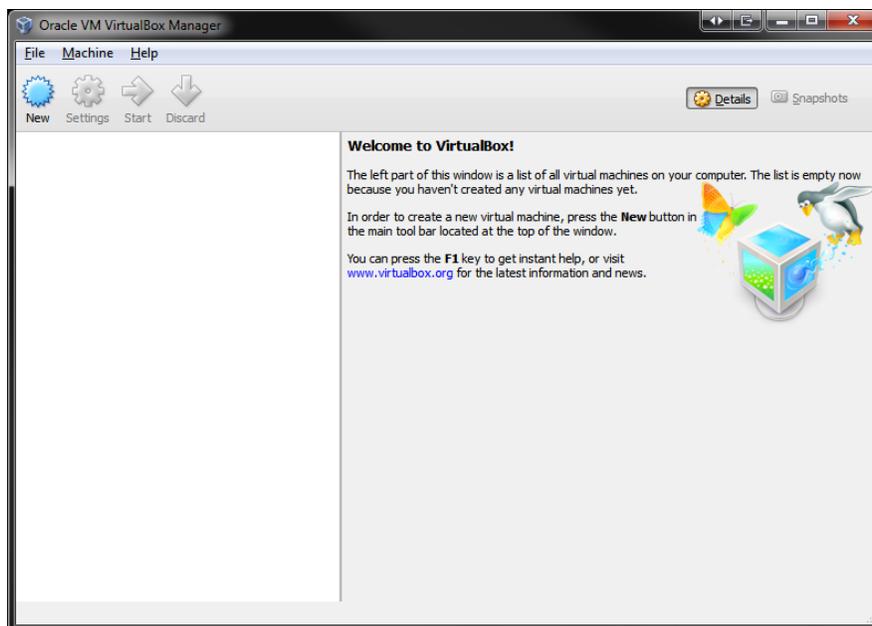
Click "Install"



Click "Finish".

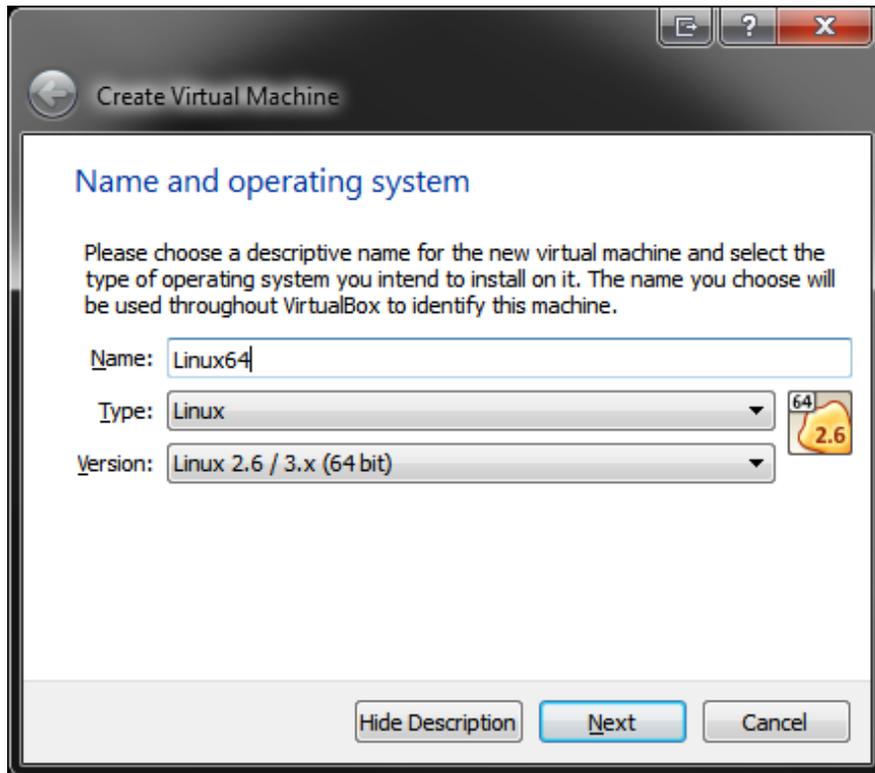


Virtual box is installed and ready to add a new Virtual Machine.

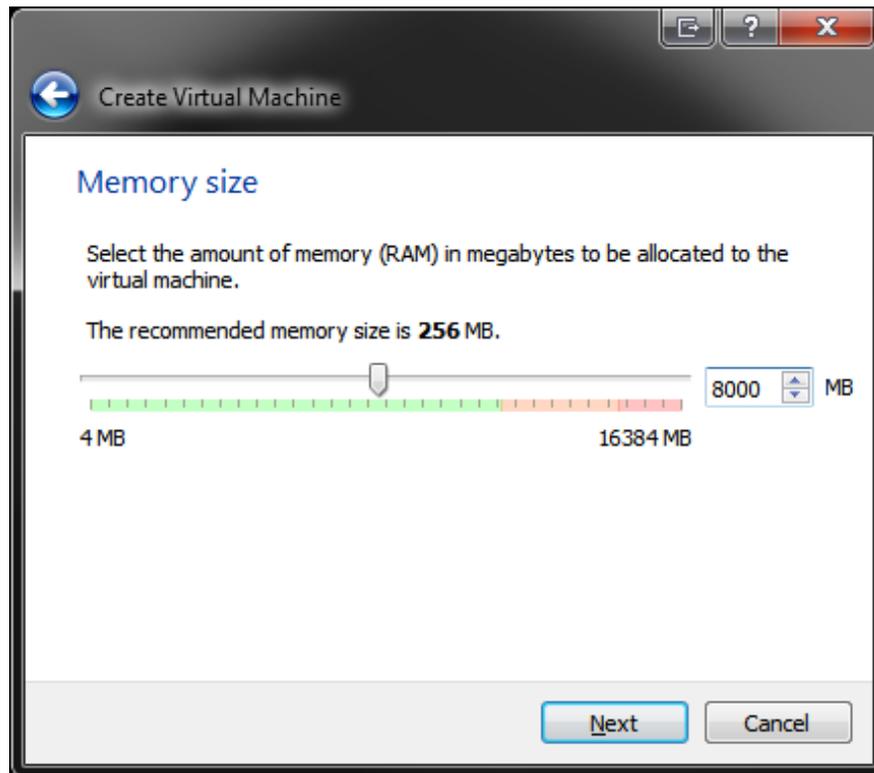


Creating a Virtual Machine (VM) in VirtualBox

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”.



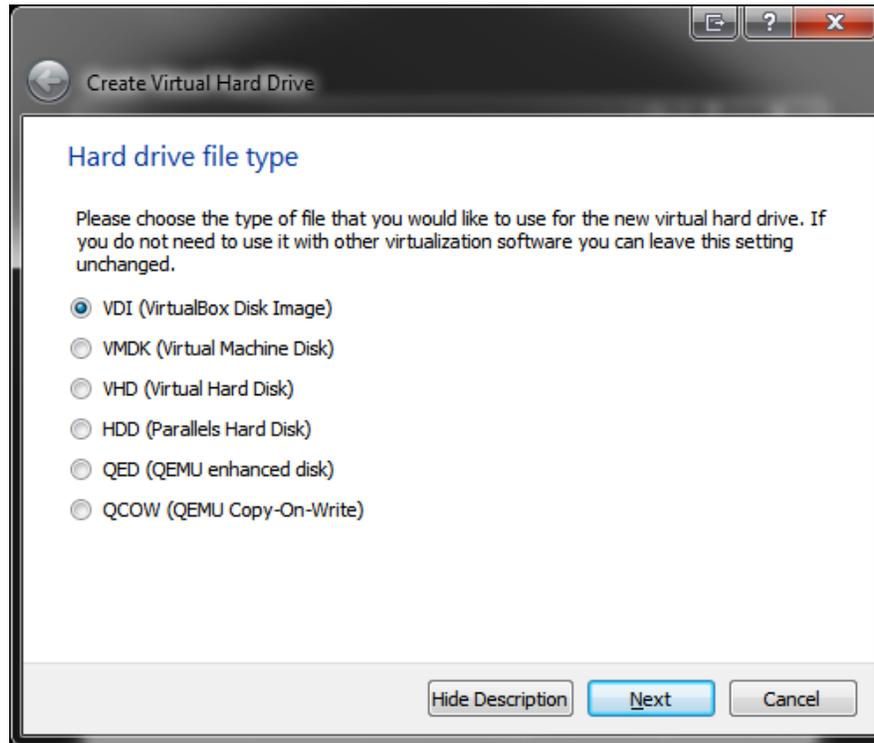
Pick the amount of memory that can be allocated for the virtual machine.



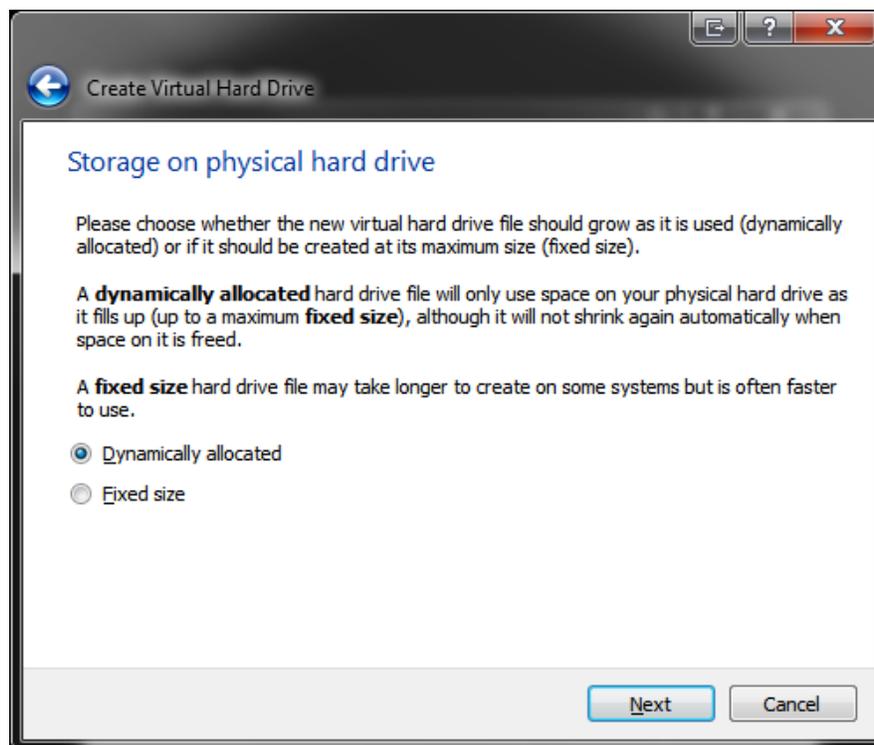
Create a "Virtual hard drive". Click "Create". This will use a portion of your actual Windows hard drive.



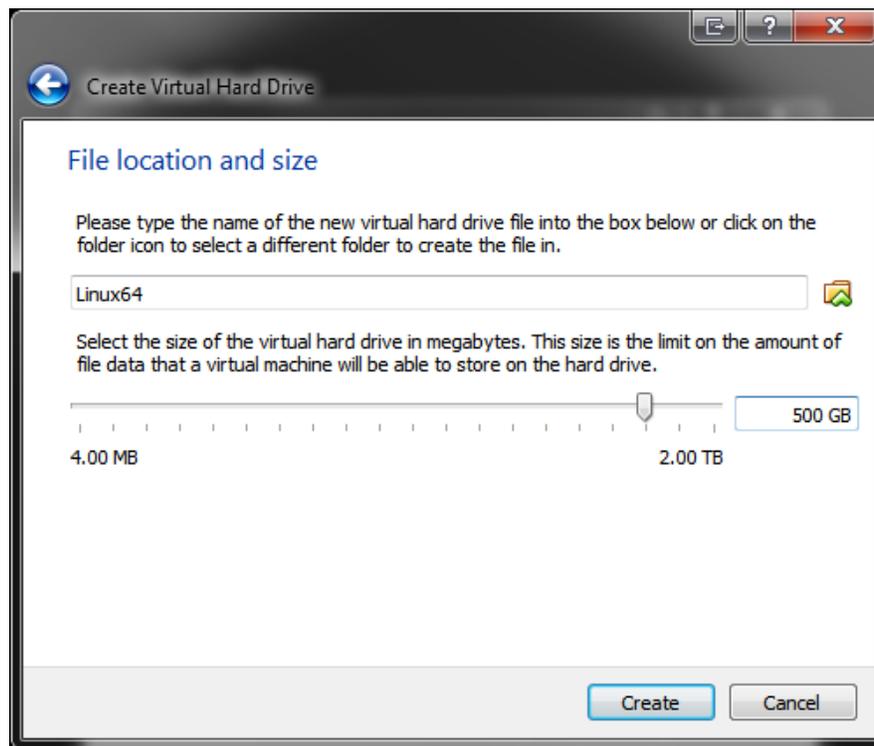
Select “VDI”. Click “Next”.



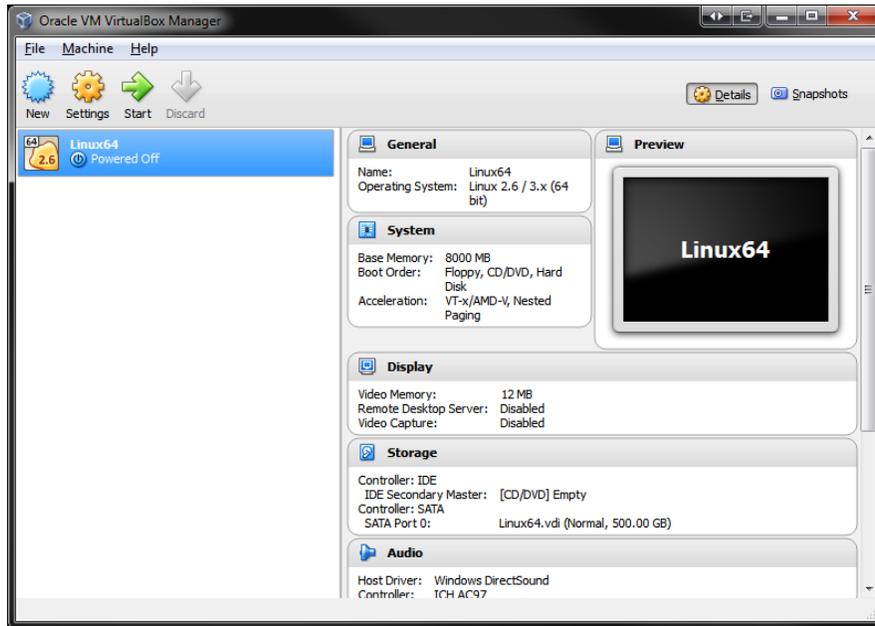
Select “Dynamically allocated”. Click “Next”. (Setting a fixed size is acceptable as well.)



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”.



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 <http://www.centos.org>

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 describes how to do this in Windows.

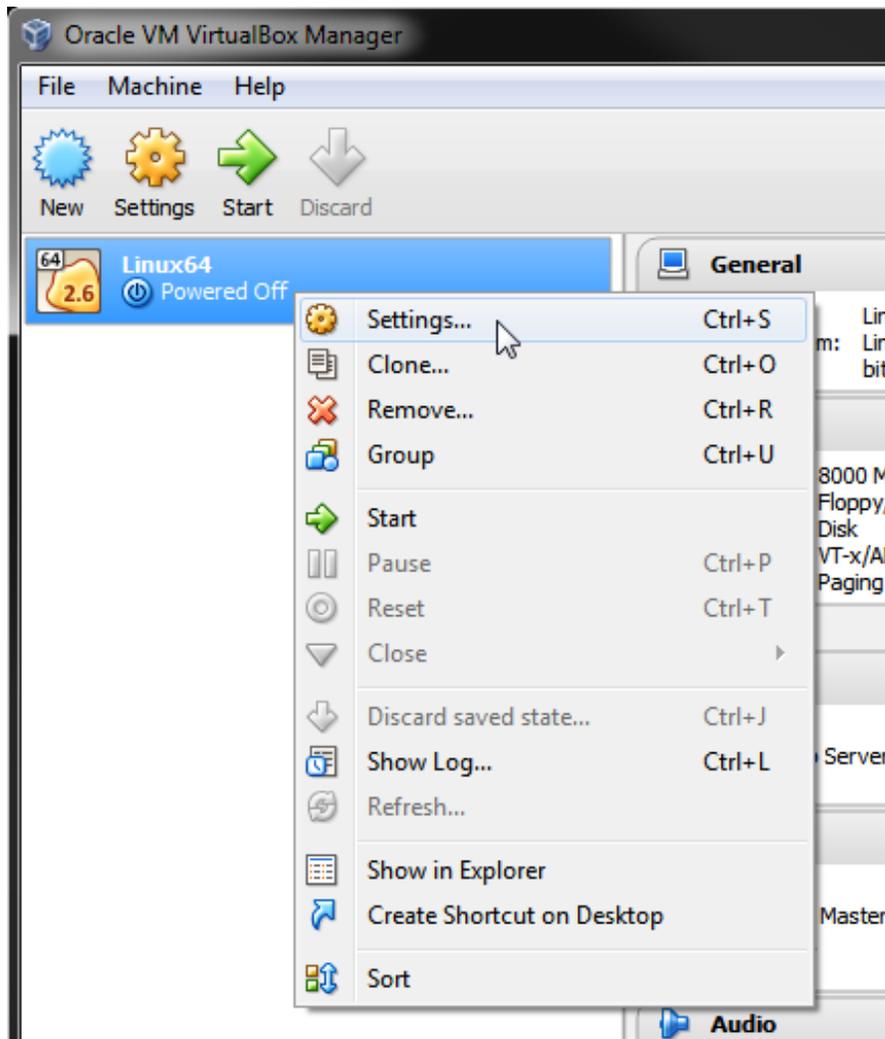
<http://windows.microsoft.com/en-us/windows7/burn-a-cd-or-dvd-from-an-iso-file>

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

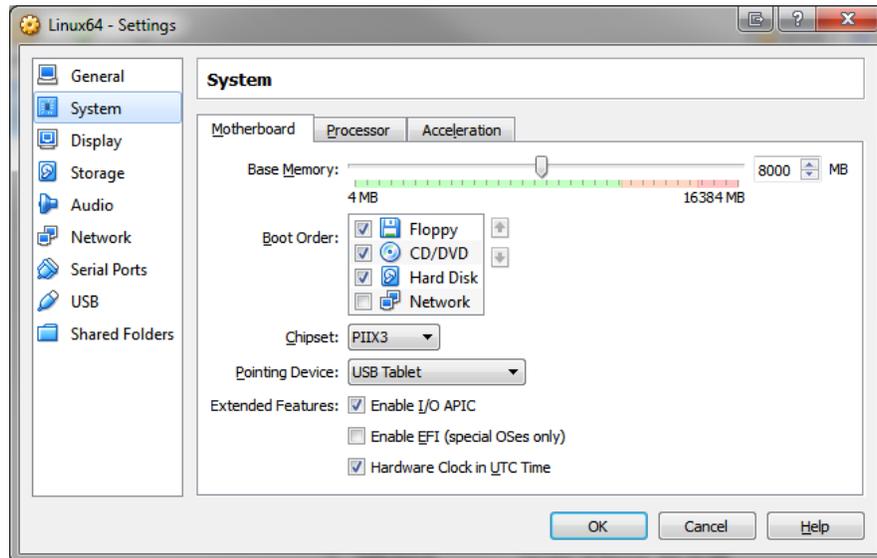
Begin CentOS Install section.

Create a Virtual DVD

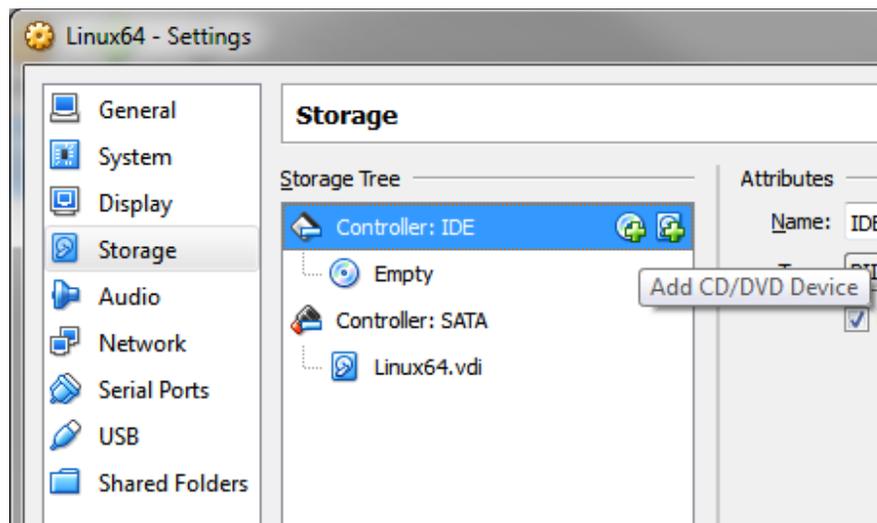
Create a virtual DVD by selecting and right clicking on the virtual machine you created in the previous section. Then click on “Settings”.



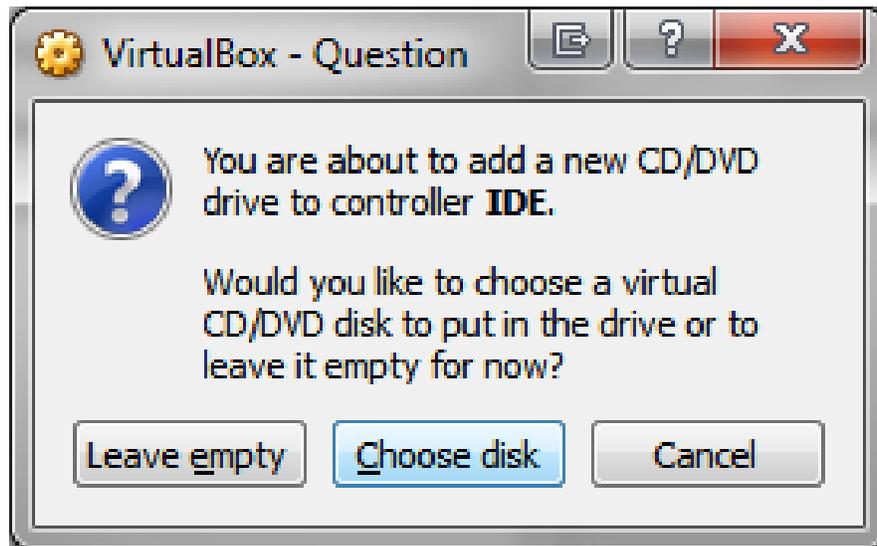
The system settings window will pop up. Click on “System”. Check the “Boot Order” to make sure the CD/DVD is before the Hardisk or Network.



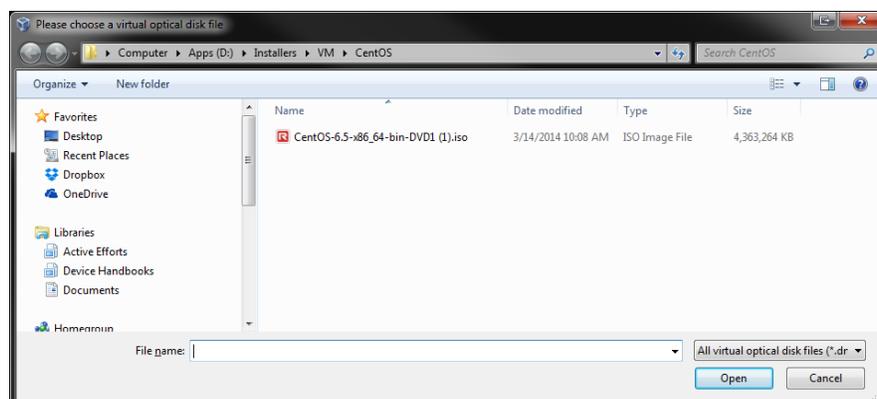
Click on “Storage”. Click on the “Controller: IDE”. Click on the “Add CD/DVD”  button.



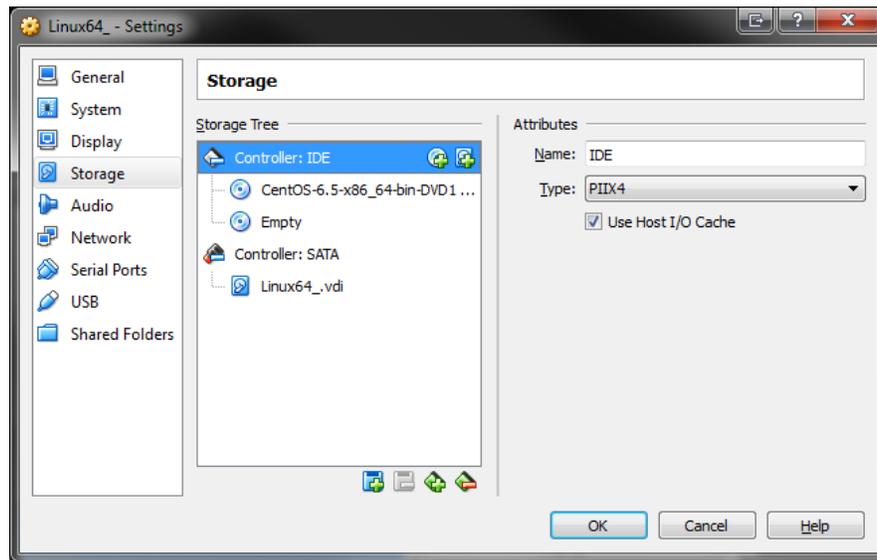
Click on the “Choose disk” button.



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



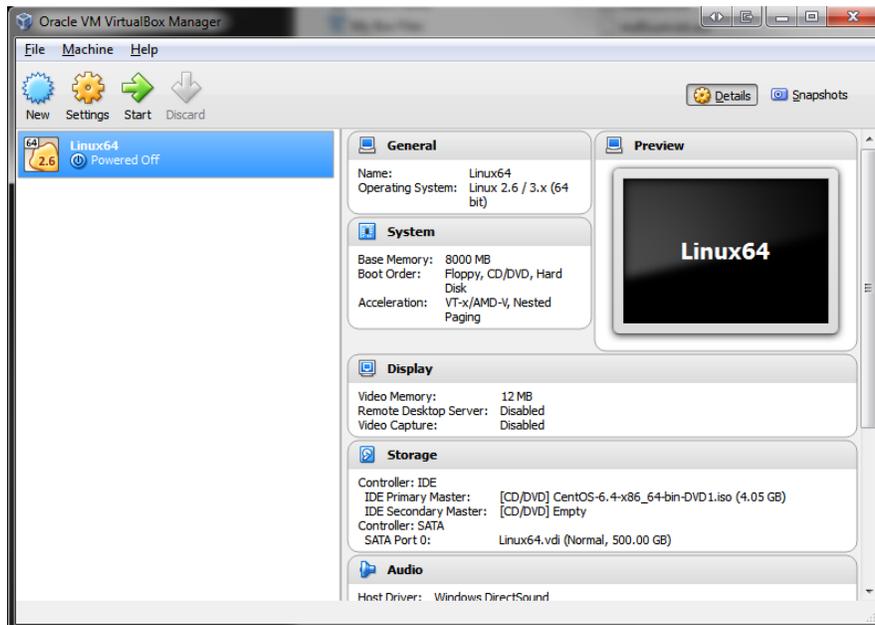
Click "OK".



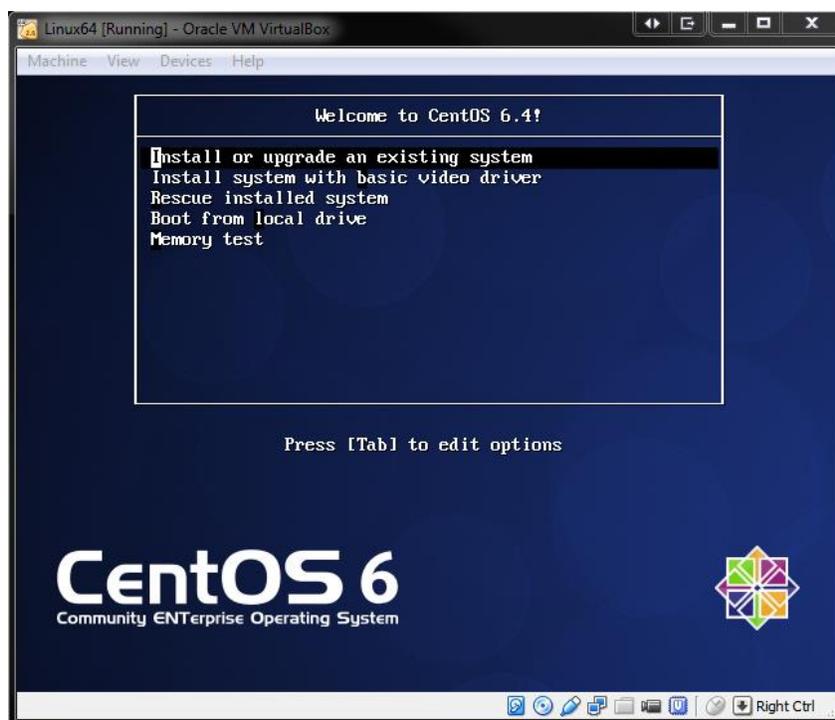
The virtual DVD has been created and you are ready to install CentOS.

Begin CentOS Install

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



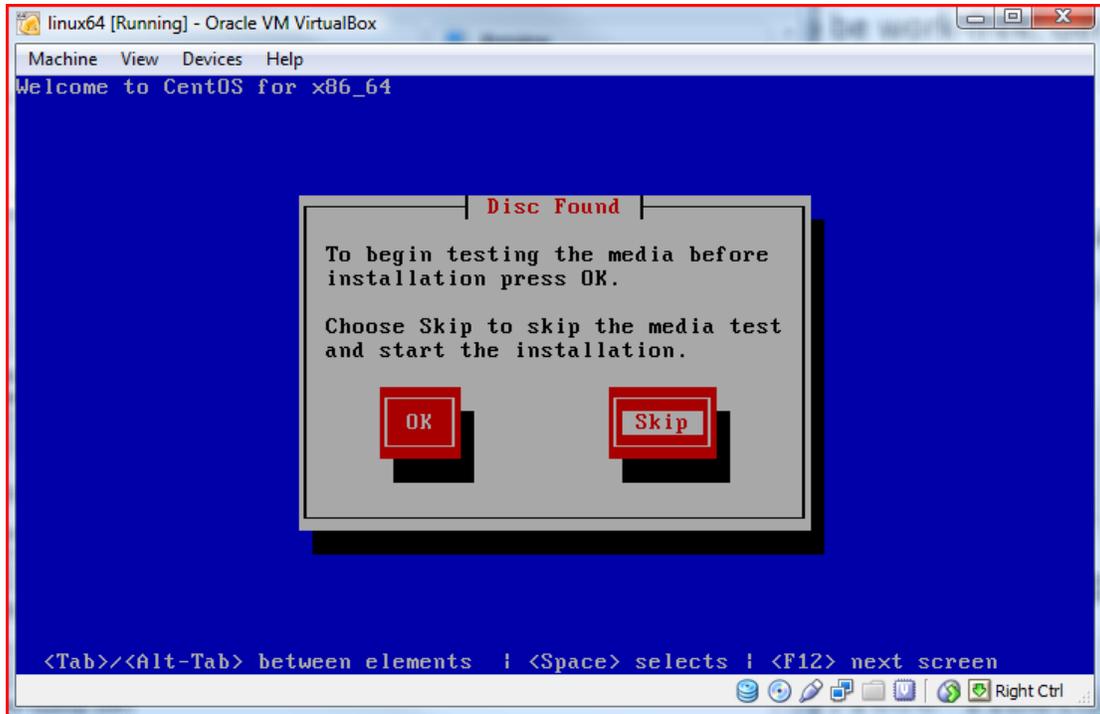
Use the first selection “Install or upgrade an existing system” Press the enter key.



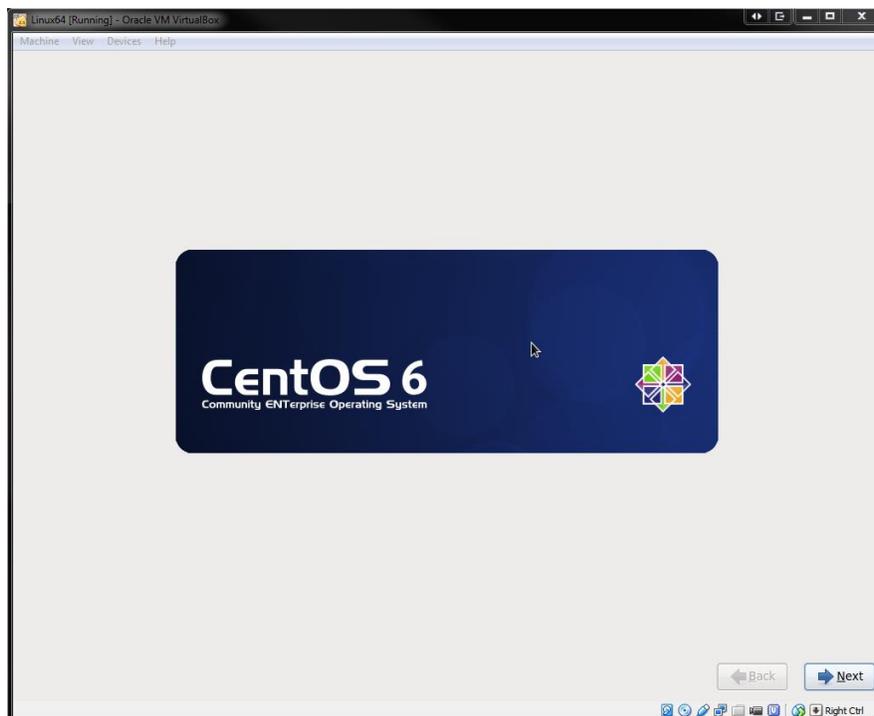
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You may lose control of the mouse for a few moments while the virtual machine starts up.

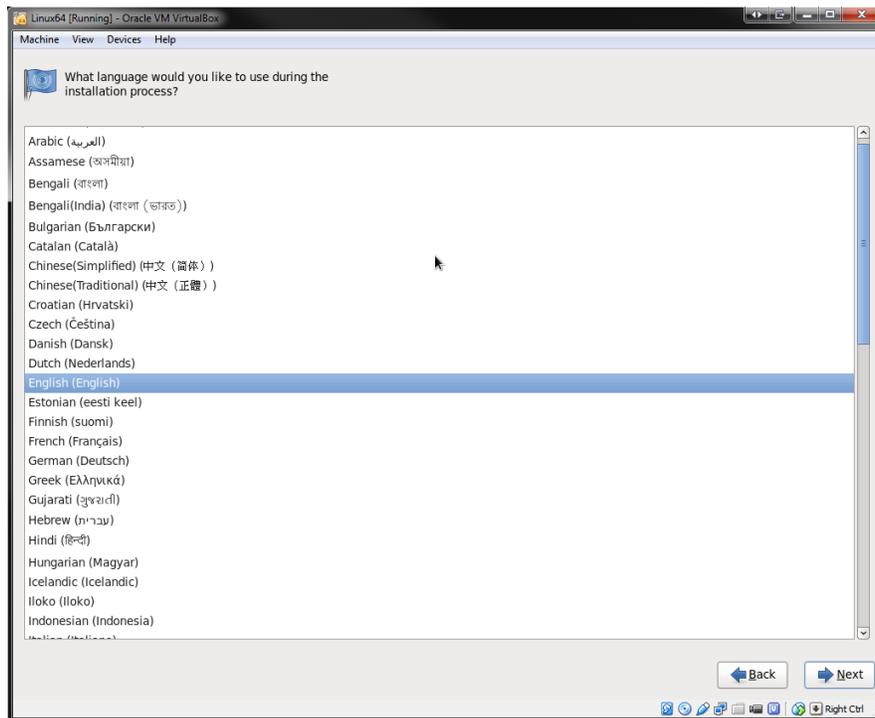
Hit tab to select “Skip” and hit the enter key. You could say OK. It will check your DVD but it will take a while.



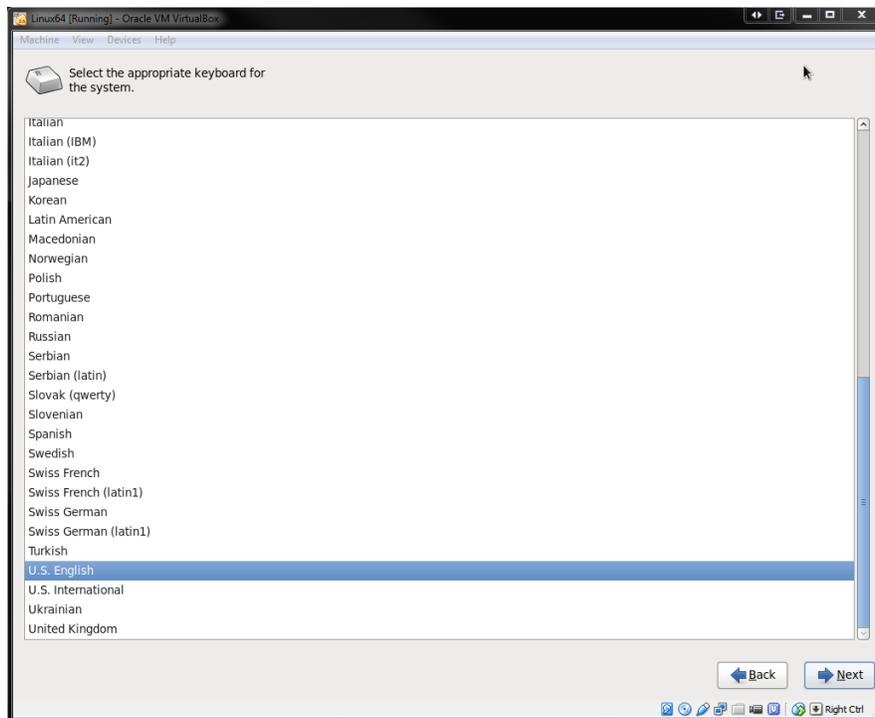
Signs of life - Click “Next”



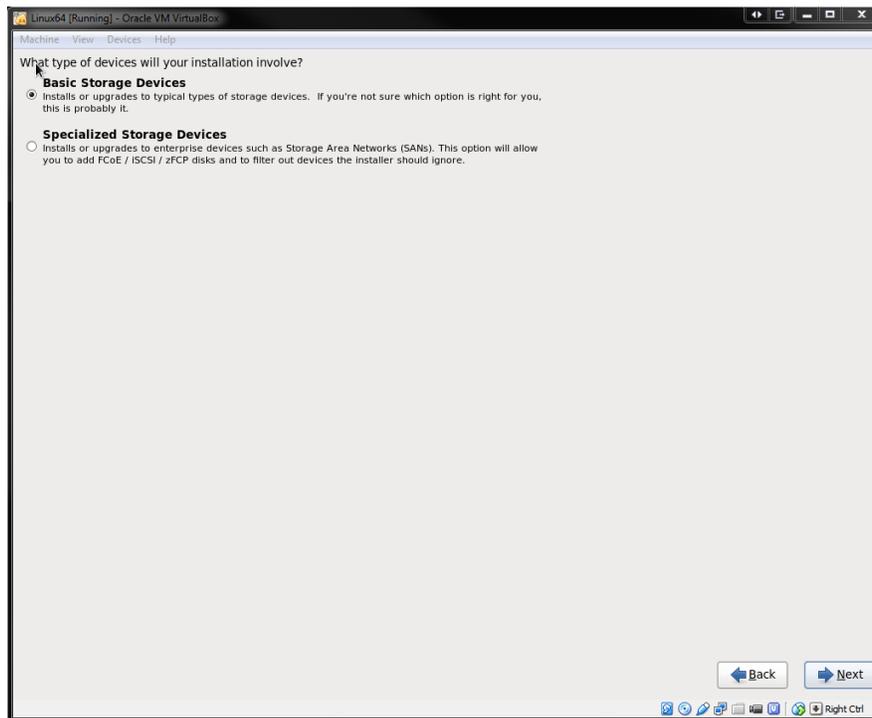
Pick English and hit “Next”



Pick US English and hit “Next”



Pick “Basic Storage Devices” and hit “Next”

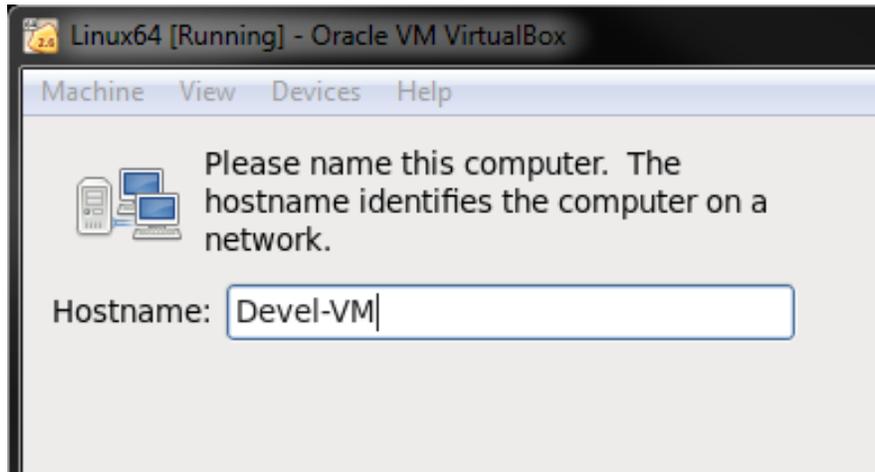


Click on “Yes, discard any data”. This is kind of scary. It’s talking about the virtual disk. Since this is a new install, there is nothing to be lost. If it’s not a new VM, you have to decide about keeping data.

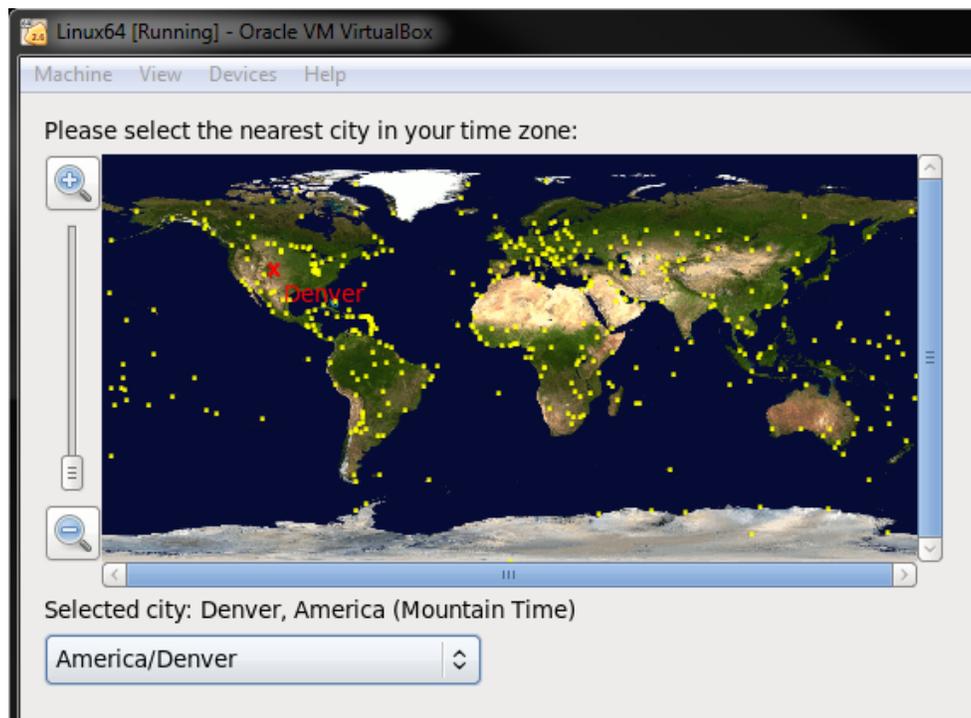


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Pick a hostname for this VM. Press “Next”.



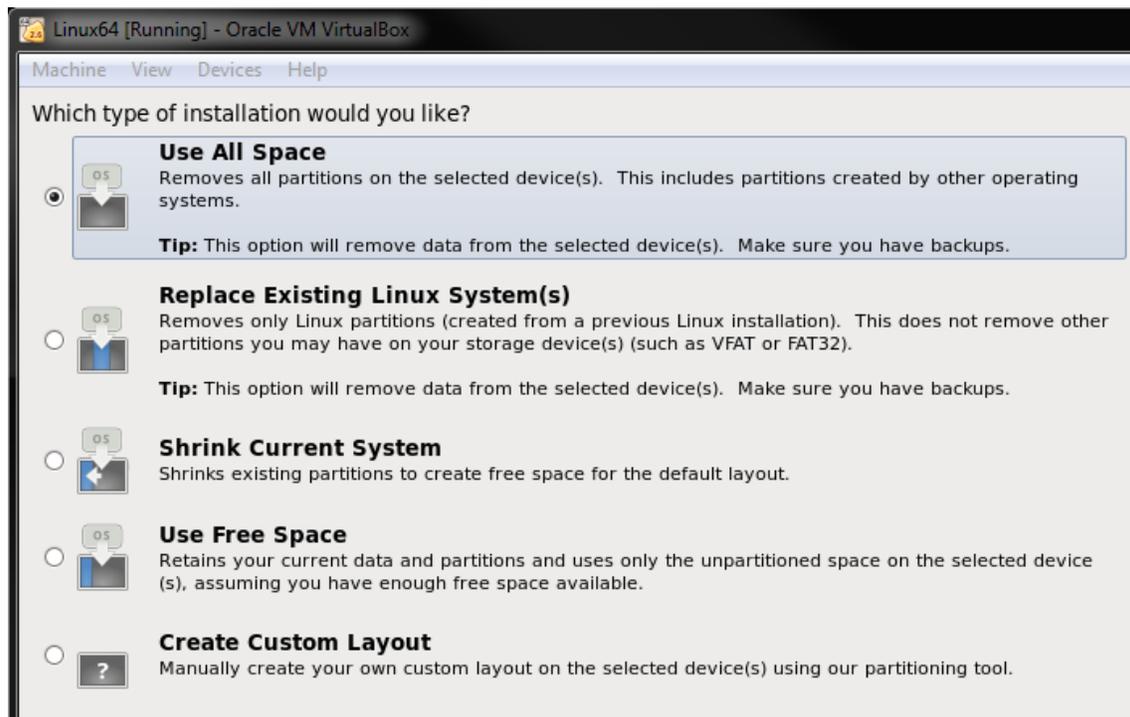
Pick your time zone and press “Next”.



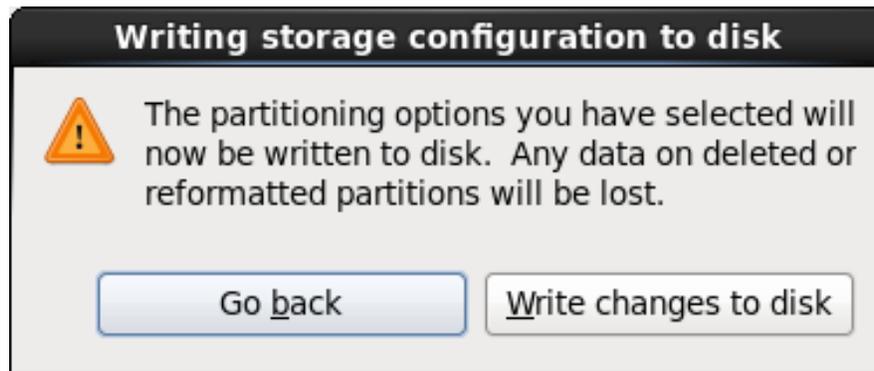
Pick your root password and press “Next”.



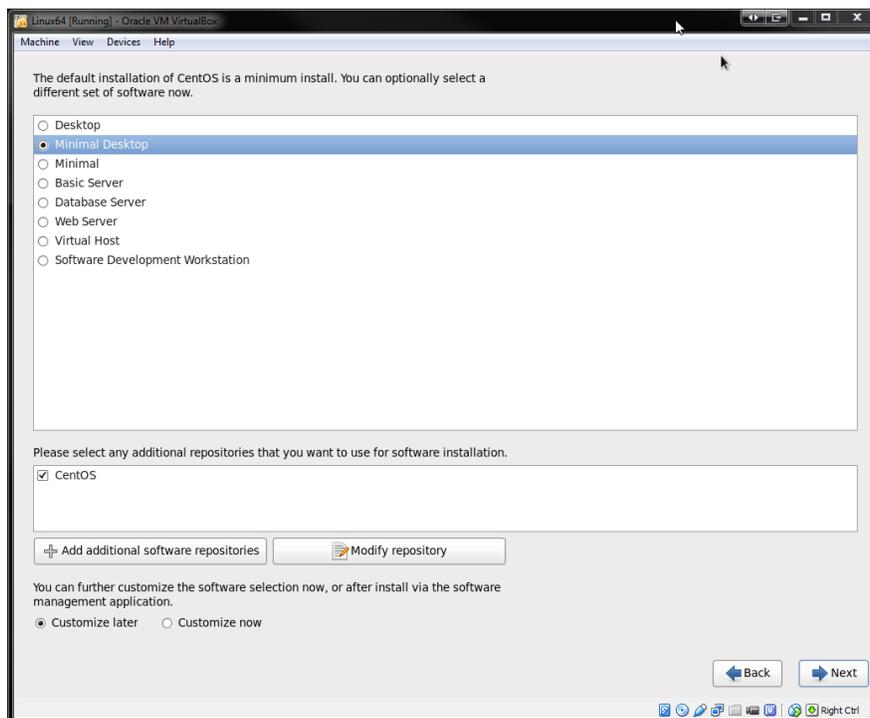
Pick “Use All Space” and press “Next”.



Pick “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.



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, java-platform, large-systems, network-file-system-client, performance, perl-runtime, server-platform

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

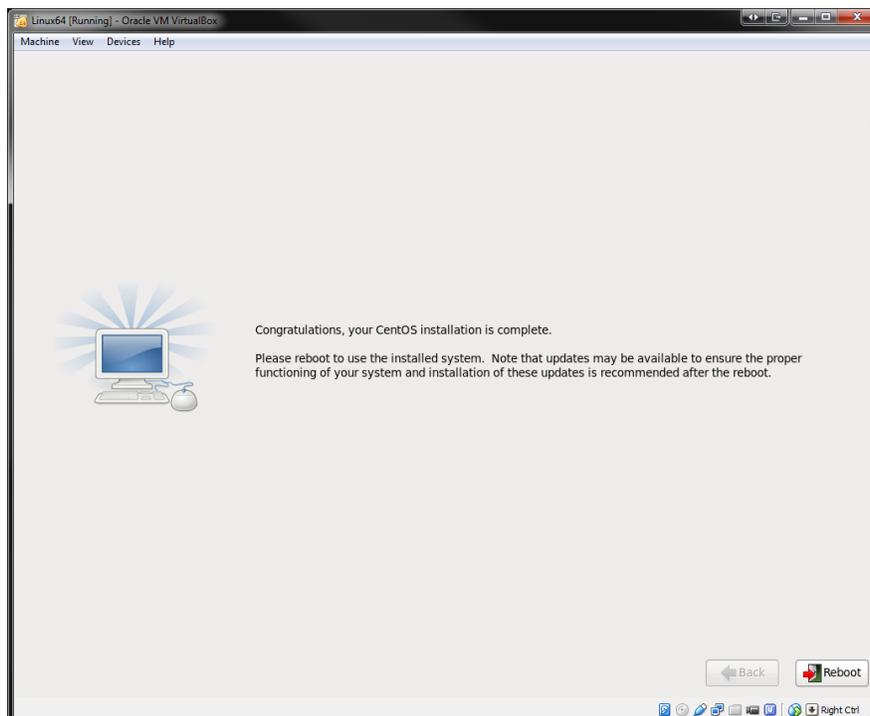
Web Server: base, console-internet, core, debugging, directory-client, java-platform, mysql-client, network-file-system-client, performance, perl-runtime, php, postgresql-client, server-platform, turbogears, web-server, web-servlet

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

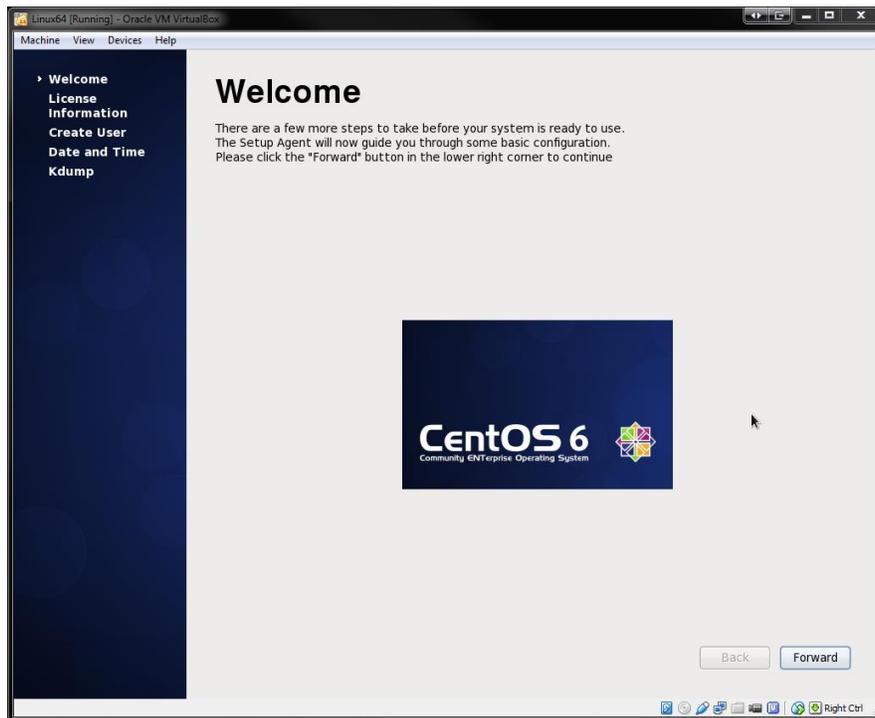
Software Development Workstation: additional-devel, base, basic-desktop, core, debugging, desktop-debugging, desktop-platform, desktop-platform-devel, development, directory-client, eclipse, emacs, fonts, general-desktop, graphical-admin-tools, graphics, input-methods, internet-browser, java-platform,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

OK information messages...

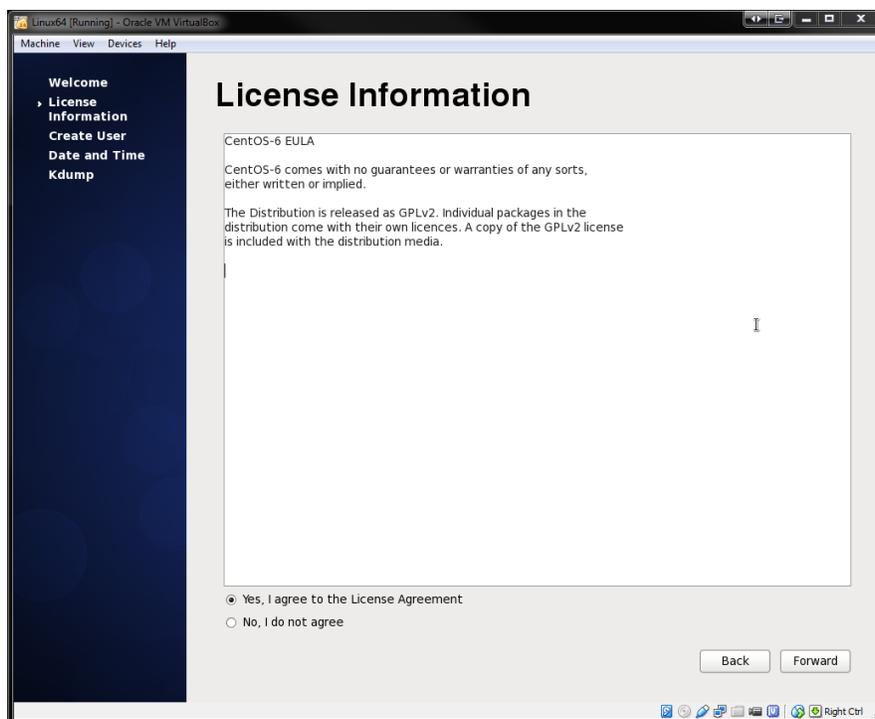
Click on “Reboot”



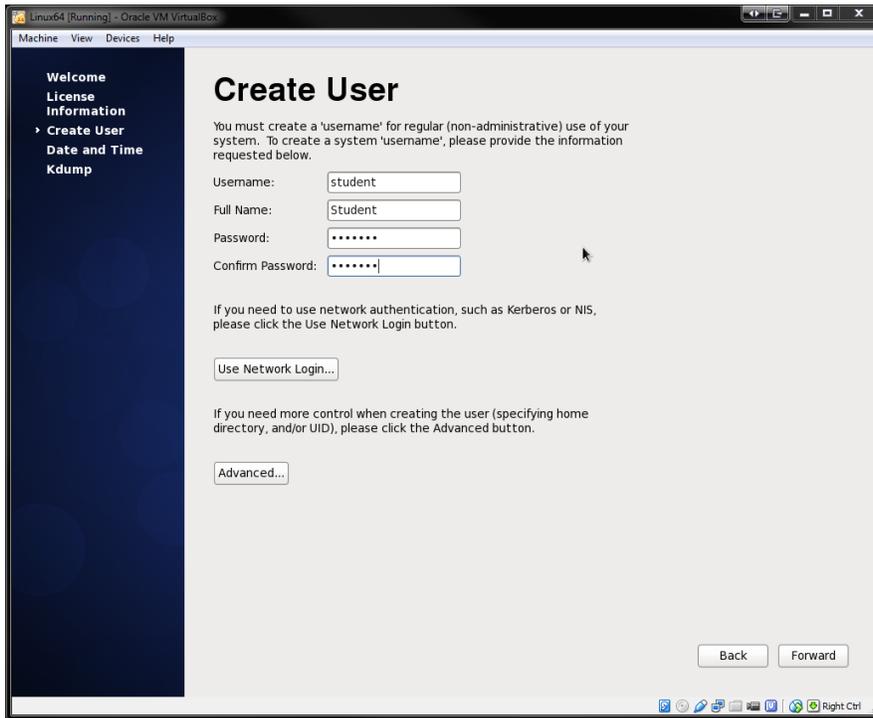
Almost there - Click on "Forward"



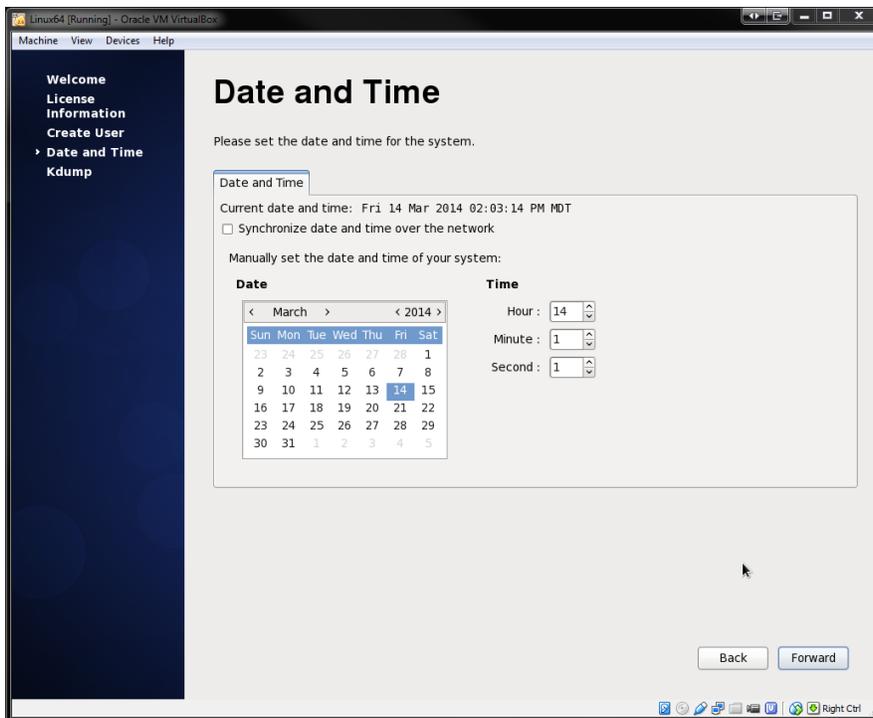
Click on "Forward"



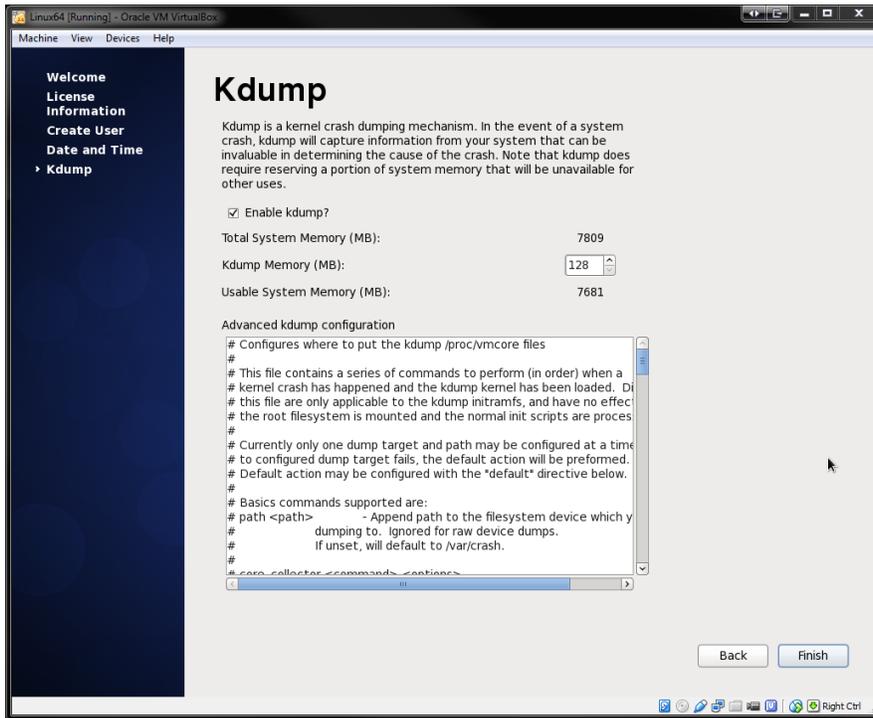
Fill in a username and password. This will be the account you will primarily use. Click on “Forward”.



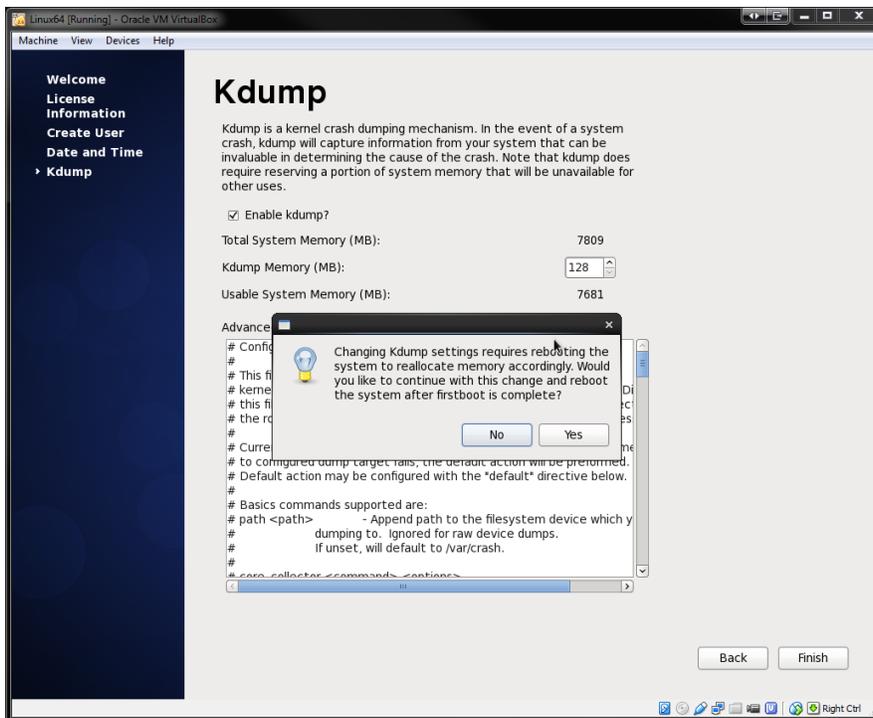
Check and correct date and time if needed. Click on “Forward”.



Click on “Finish”.

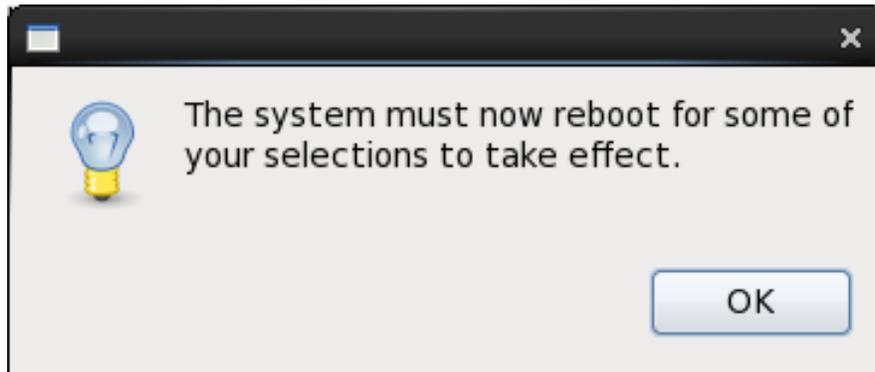


Click on “Yes”.

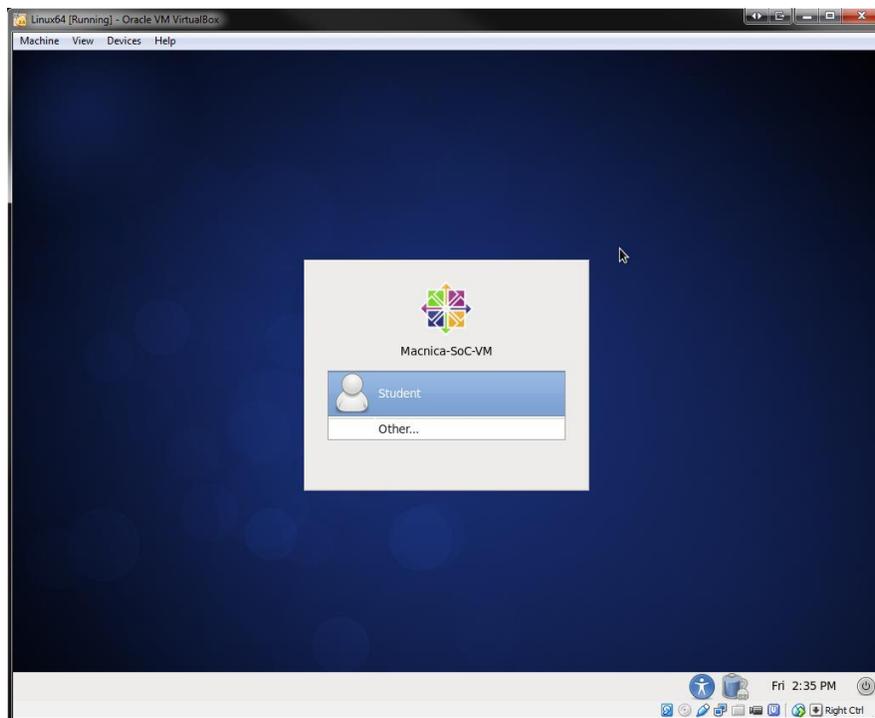


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Click on "OK".



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



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: www.virtualbox.org/manual. Many of these additions need to be 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 <ftp://ftp.vim.org/pub/vim/doc/book/vimbook-OPL.pdf>. Or <http://vim-adventures.com/> 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. www.virtualbox.org/manual .

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.