Get VirtualBox

Go to www.virtualbox.org and select Downloads.

Download the current release* of VirtualBox for the OS on which you will install VirtualBox. In these notes, that's Windows 7.

Note:

- the OS on which you will install VirtualBox is called the *host OS*.
- the OS you will install on VirtualBox (later) is called the *guest OS*.

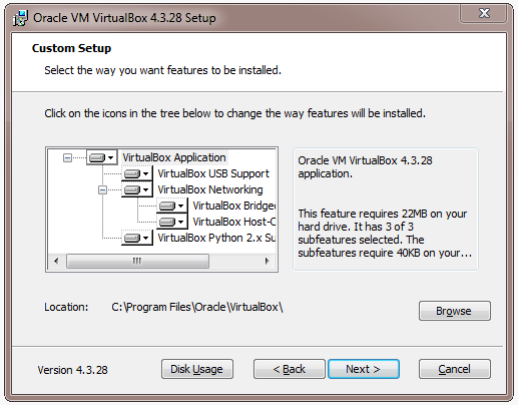
In these notes, I have a Windows 7 host and a CentOS guest.

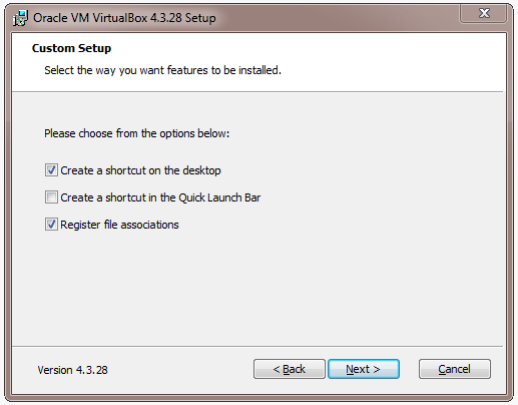
Download the VirtualBox Extension Pack.

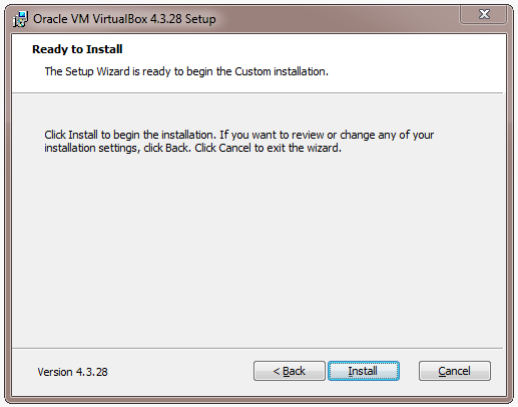
*** These notes are based on VirtualBox 4.3.28 and CentOS 7.**

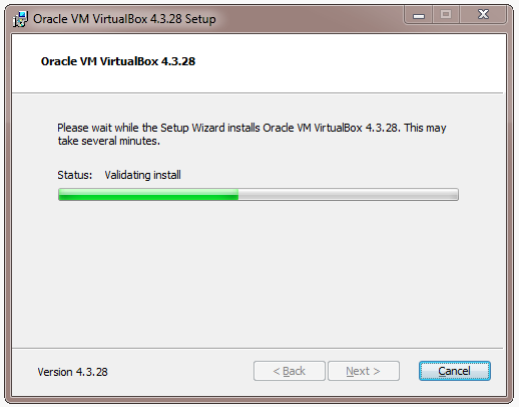
Begin the VirtualBox Installation

Run the VirtualBox installer. The first few screens are typical and probably do not require you to make any changes to the default options:



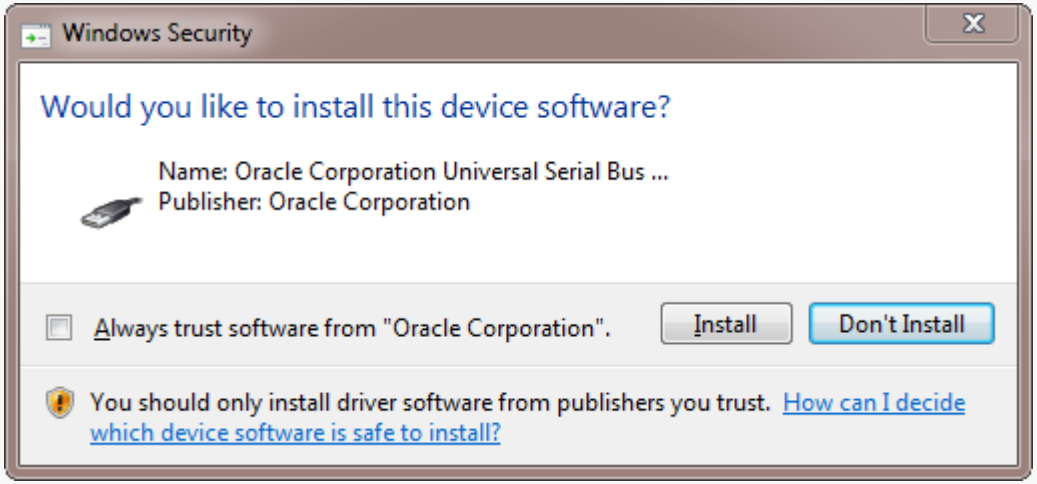






Begin the VirtualBox Installation

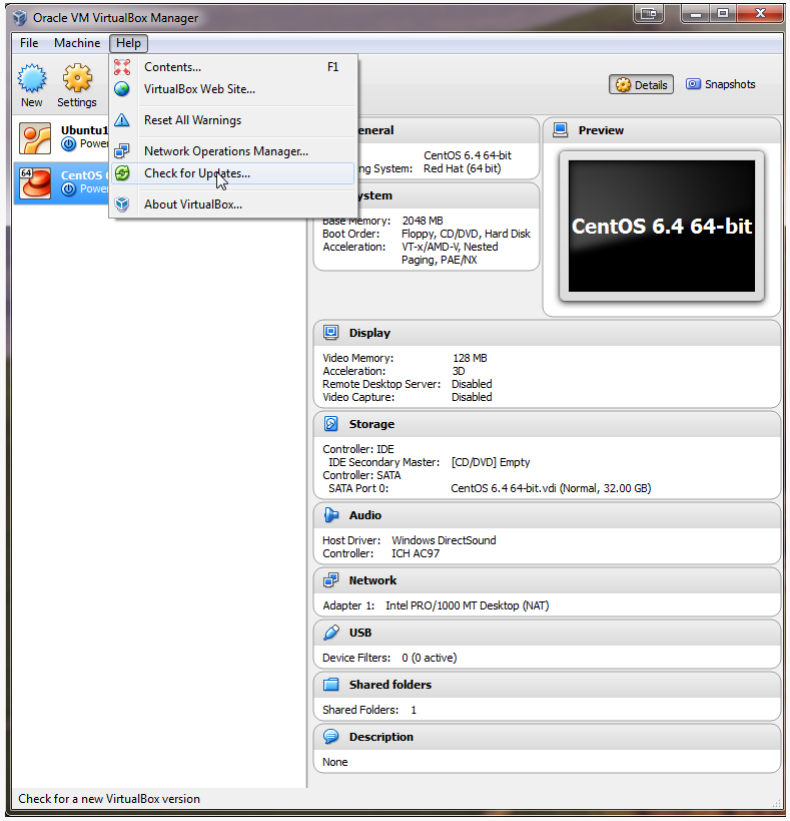
You may be prompted about installing various components relating to USB support and networking:



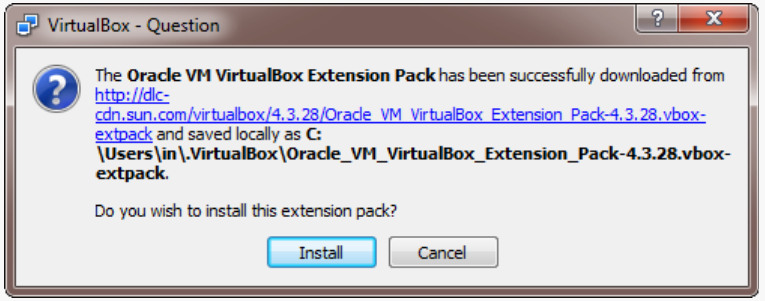
My advice is to just select "Always trust…" and let it go…

Begin the VirtualBox Installation

Once the base installation is complete, VirtualBox will start:



Choose Help/Check for Updates… this should offer to download the current version of the VirtualBox Extension Pack… do so…

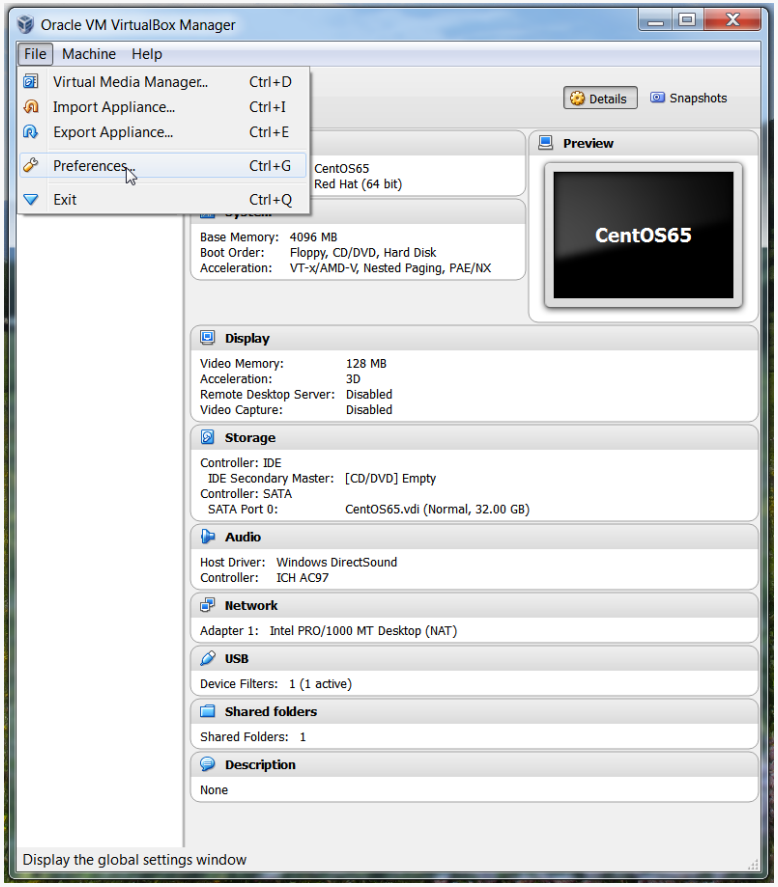


… and install it…

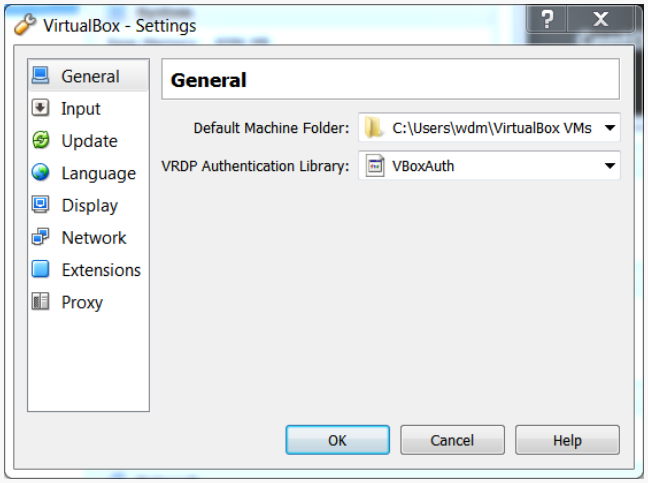
If this doesn't happen automatically, go to the VirtualBox site, download the Extension Pack, and run the installer manually... see next slide…

Install the VirtualBox Extensions

Select File/Preferences...



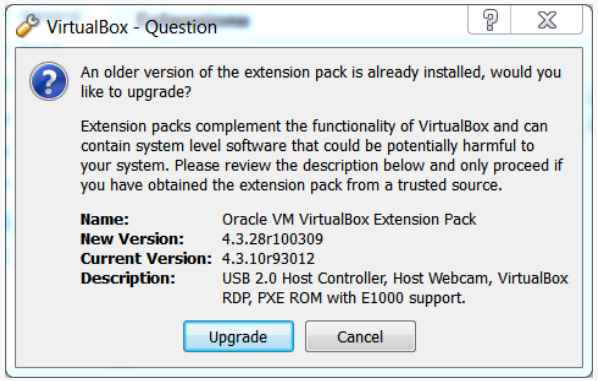
Select Extensions...

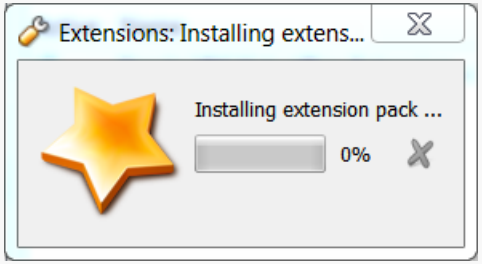


Install the VirtualBox Extensions

Select Add Package (not shown) and find the VirtualBox Extensions file you downloaded earlier.

Select Upgrade and let the installation proceed...

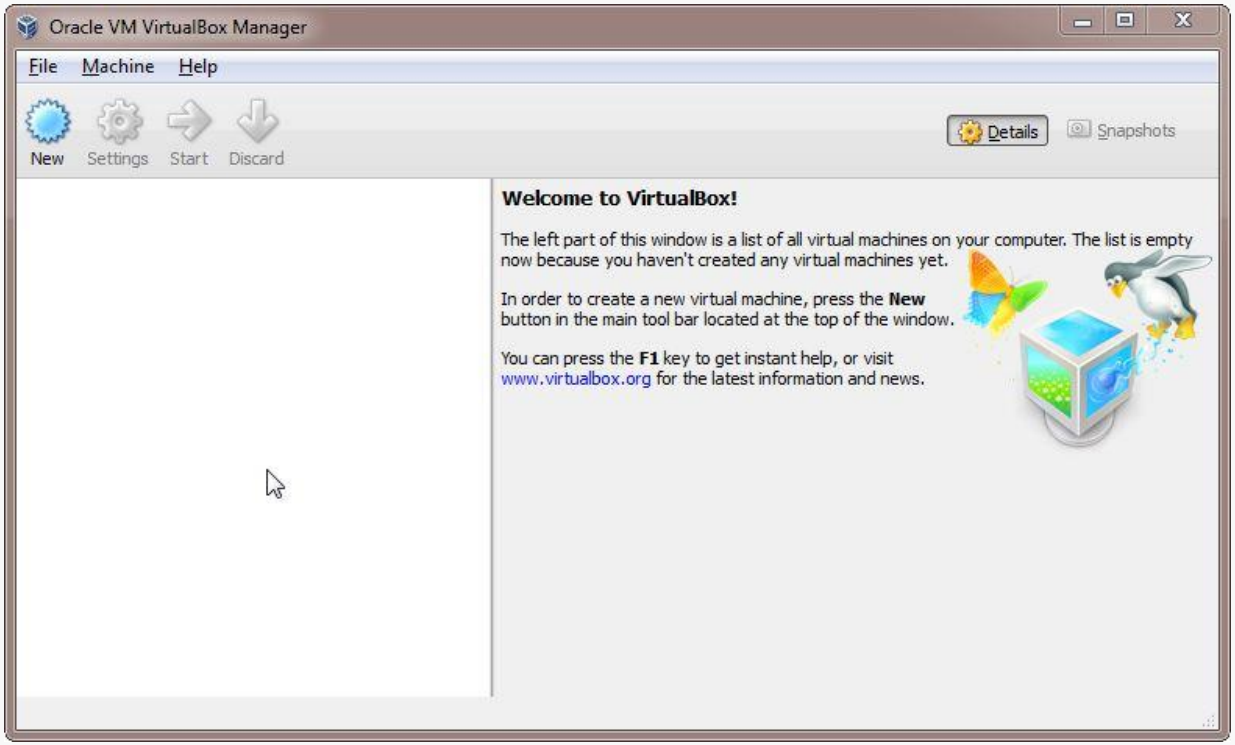




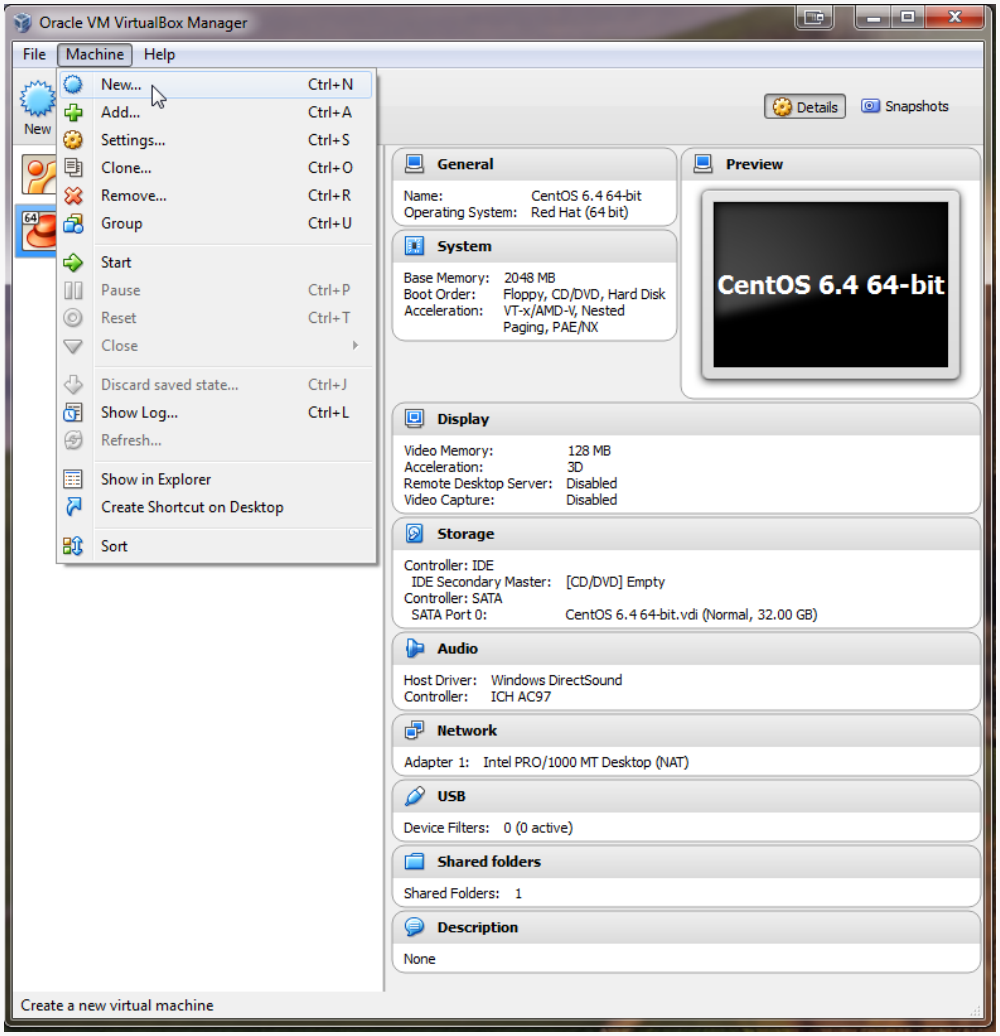
Starting VirtualBox

When the installation completes, you can run VirtualBox for the first time:

You may see something like this, or not…

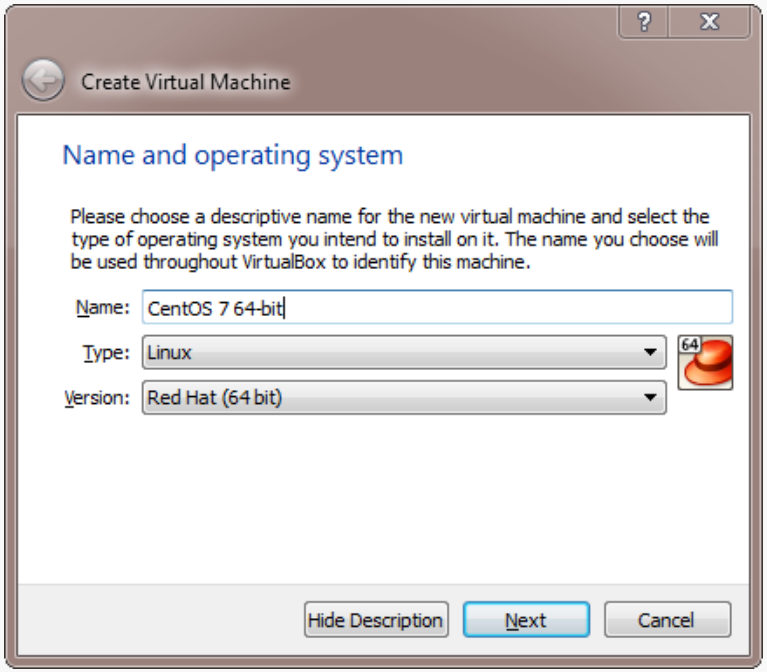


Creating a Virtual Machine



Give the new VM a descriptive name.

If you use a descriptive name for the VM, VirtualBox should auto-detect the proper OS type and version:

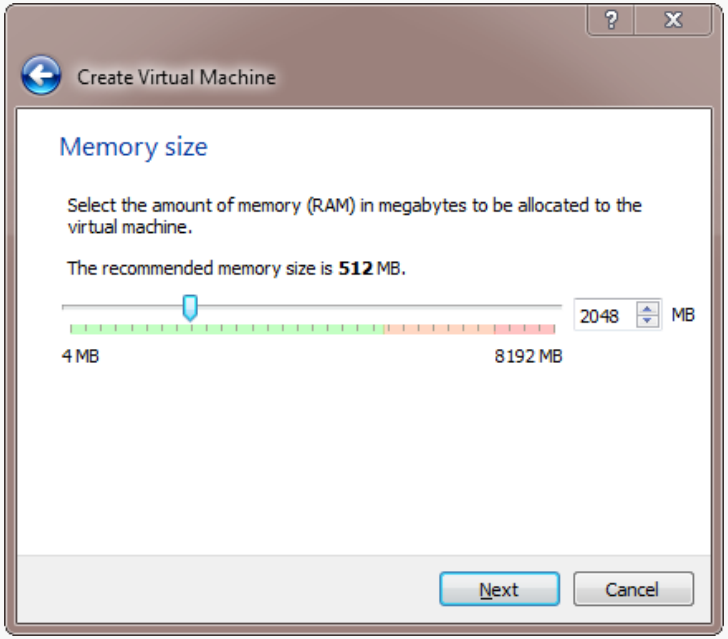


Configuring Memory for the VM

Specify the amount of memory you'll give the VM.

In this example, I'm installing on a host machine with 8GB of RAM; with less, I'd probably given the VM 1GB.

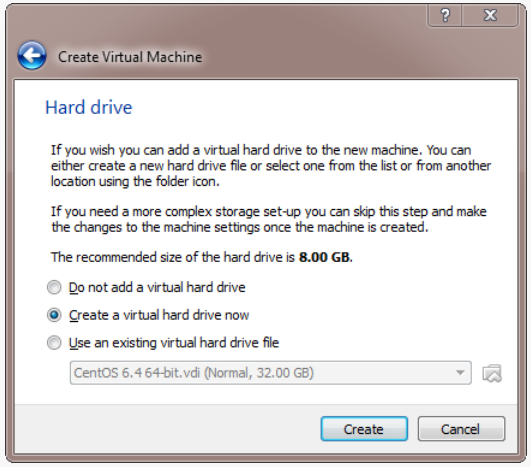
On my current working laptop, I have 10GB of RAM and gave my VM 4GB.

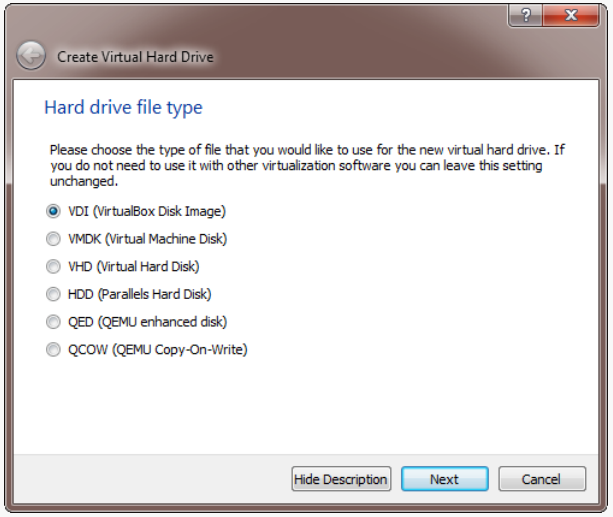


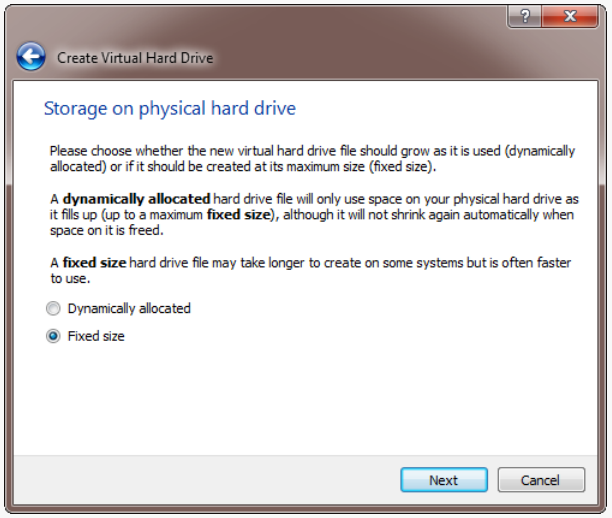
Configuring a Virtual Hard Disk

In the next dialog, select the option to create a new virtual hard drive now.

Take the default hard drive file type in the next dialog unless you're concerned about being compatible with some other virtualization tool like VMWare.



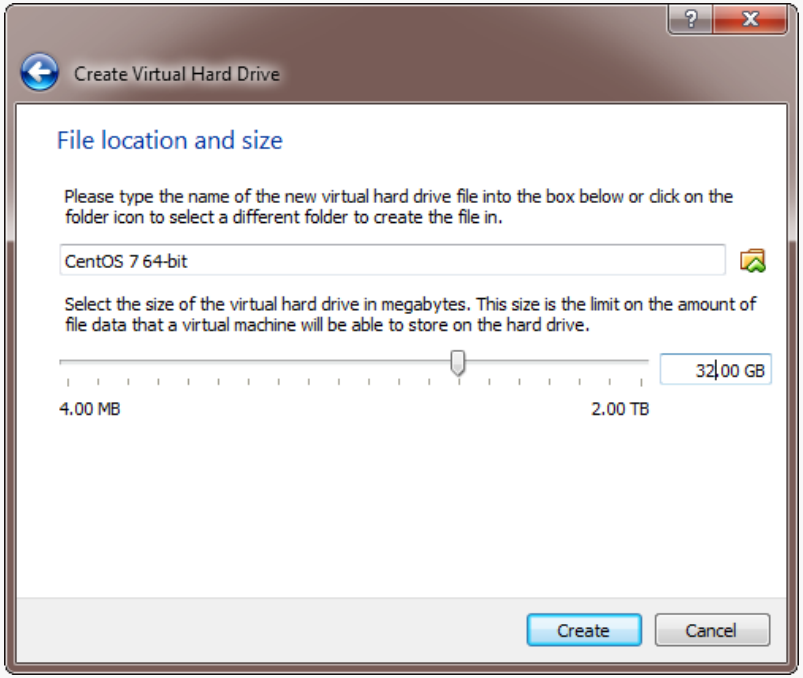


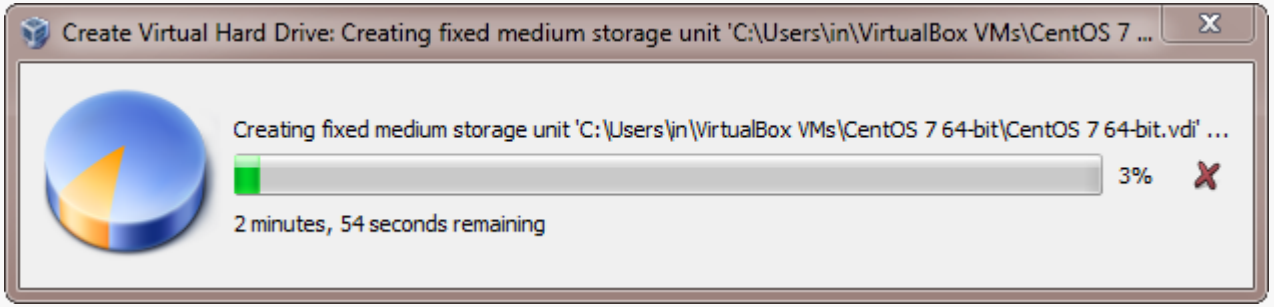


Next, I recommend choosing a fixed-size hard disk.

Configuring a Virtual Hard Disk

I generally make this 32GB, but make it smaller if you're short on space.

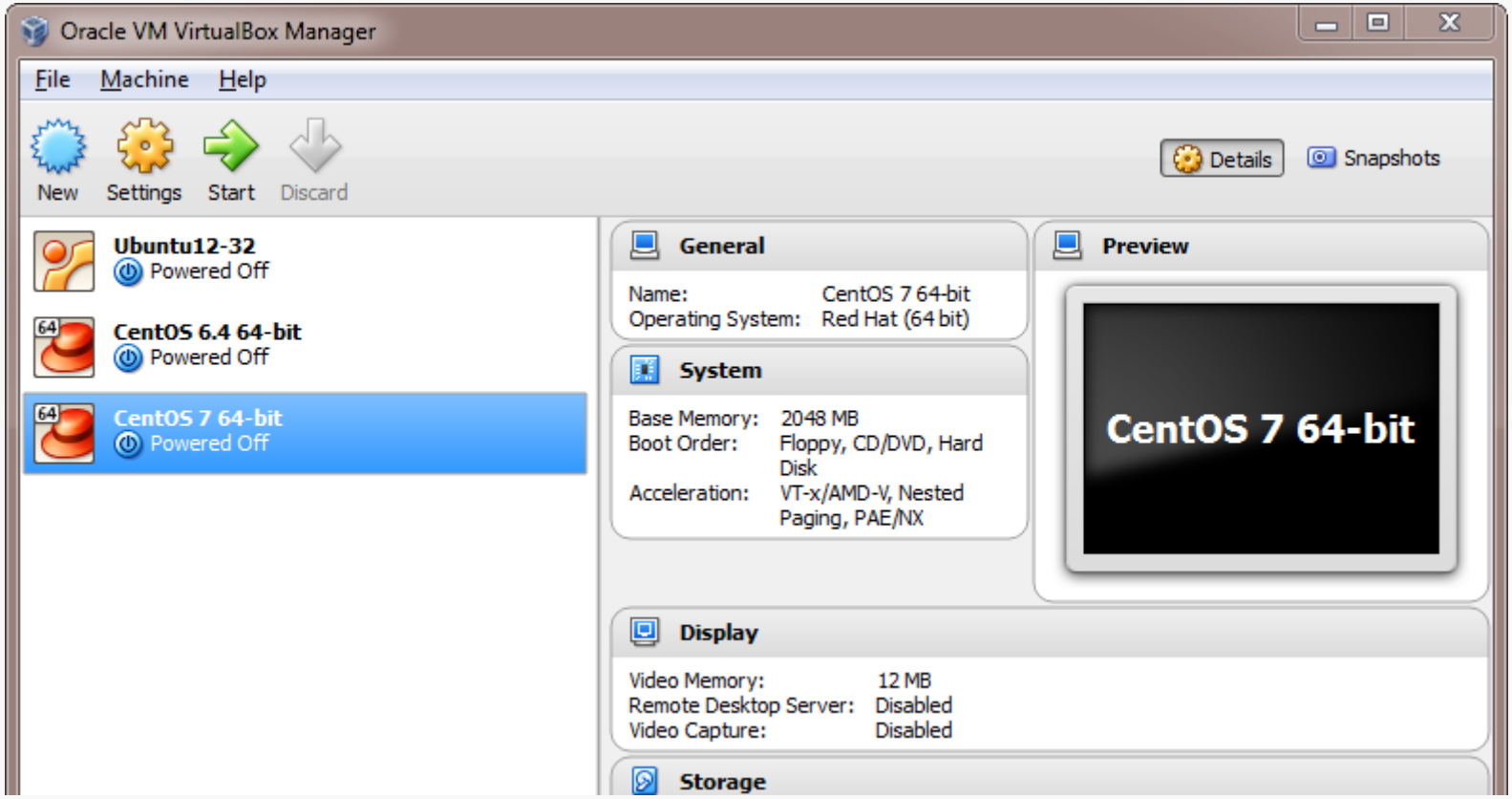




An Empty VM

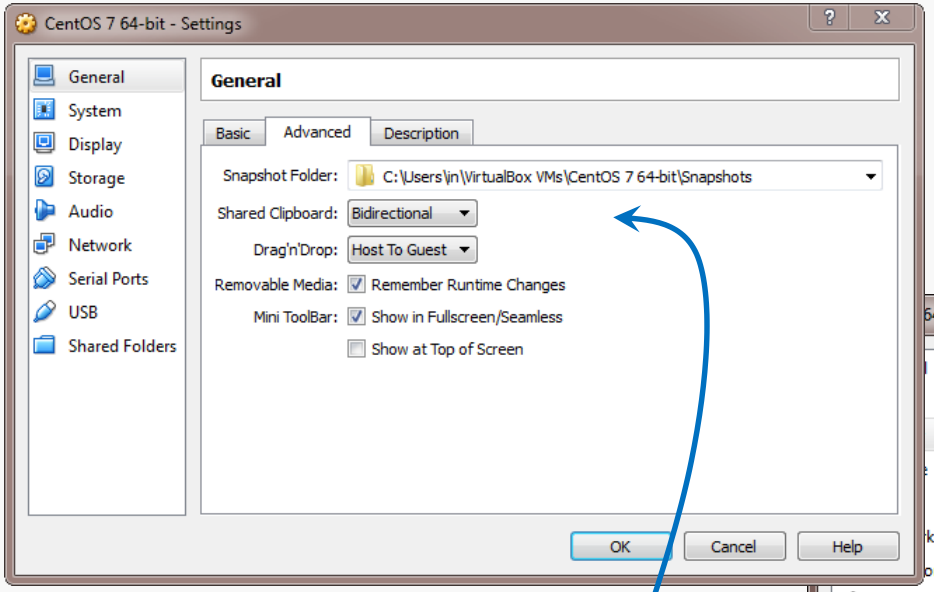
Now, you have an empty virtual machine (I already had other VMs fully set up).

That is, a formatted (virtual) hard disk and no OS.



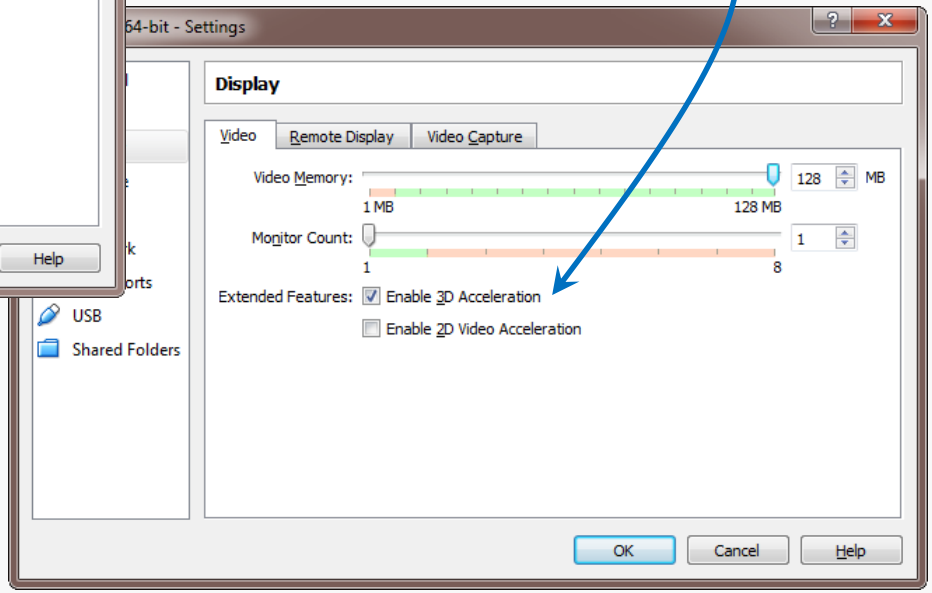
VM Settings

There are a couple of crucial VM settings; right-click on your VM and bring up the Settings dialog:



Under General/Advanced, make the shared clipboard Bidirectional, and enable Drag'n/Drop.

Under Display, enable 3D Acceleration.



Install CentOS as a Guest OS

CentOS matches the department's servers, including the rlogin cluster, so that is what you should install.

You'll have to select a 32-bit or a 64-bit version.

A 64-bit version gives you a few more options, and that's what we're running on our servers, so I recommend the 64-bit version.

If you install a 32-bit version, you won't be able to run any 64-bit code on it.

If you install a 64-bit version, you won't be able to build any 32-bit executables on it unless you install some additional packages.

Whatever you choose, download an ISO file (CD or DVD). You don't need to burn a physical disk.

Disclaimer: the following notes illustrate one session installing CentOS 7 on VirtualBox 4.3.28, running on Windows 7 Enterprise, on a particular underlying hardware system.
YMMV. Mine certainly has…

Preparation

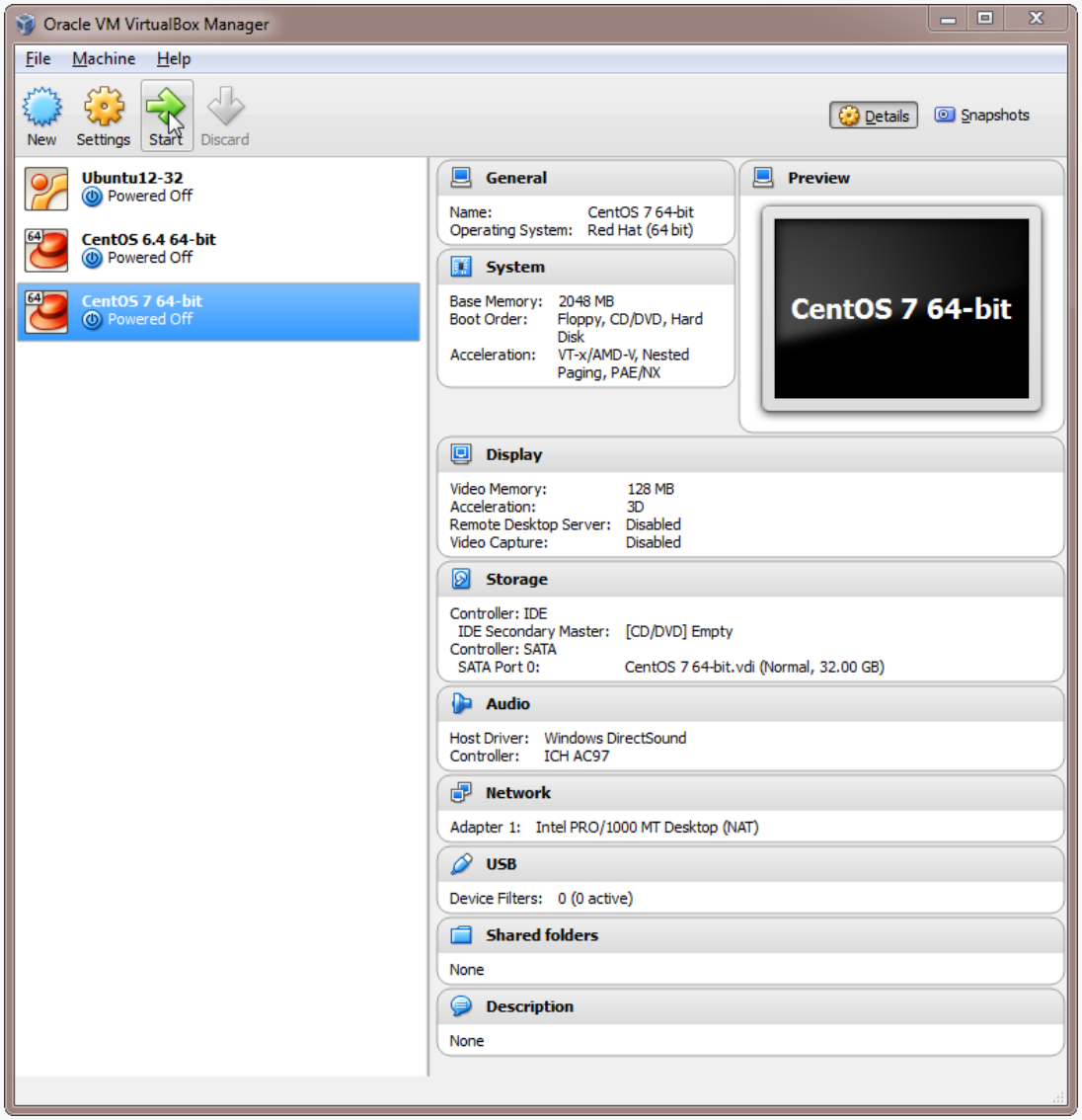
Go to centos.org, use the Get CentOS link at the top of the page, and select the link for the distribution option you want (I recommend DVD ISO):

Choose a mirror for downloading; I recommend one from VT:

http://mirror.compevo.com/centos/7/isos/x86_64/CentOS-7-x86_64-DVD-1503-01.iso
http://mirror.trouble-free.net/centos/7/isos/x86_64/CentOS-7-x86_64-DVD-1503-01.iso
http://mirror.supremebytes.com/centos/7/isos/x86_64/CentOS-7-x86_64-DVD-1503-01.iso
http://mirror.hmc.edu/centos/7/isos/x86_64/CentOS-7-x86_64-DVD-1503-01.iso
http://mirror.vtti.vt.edu/centos/7/isos/x86_64/CentOS-7-x86_64-DVD-1503-01.iso
ftp://ftp.uci.edu/mirrors/centos/7/isos/x86_64/CentOS-7-x86_64-DVD-1503-01.iso

Beginning the Installation

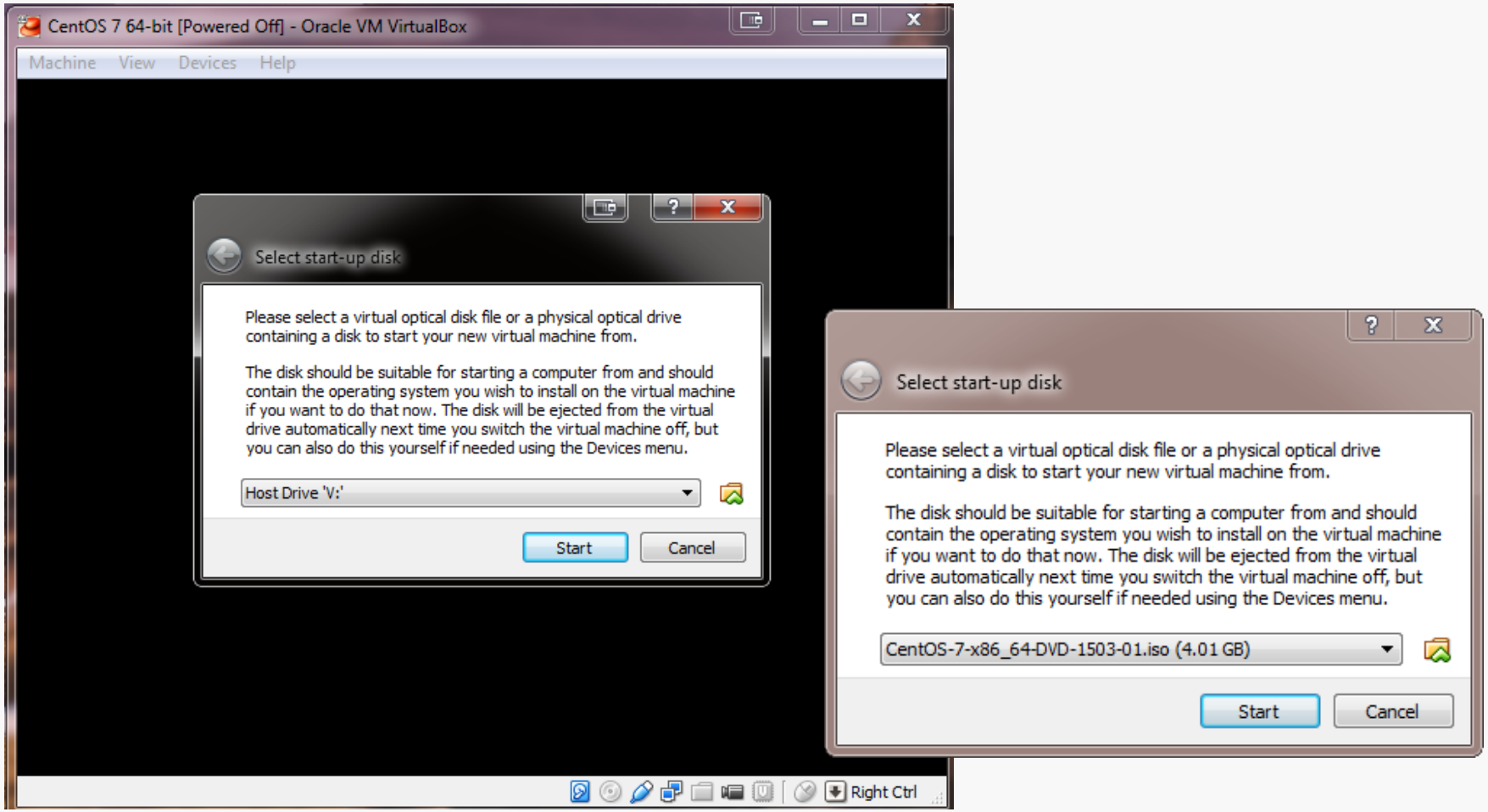
Select the VM and click Start:



Selecting Installation Media

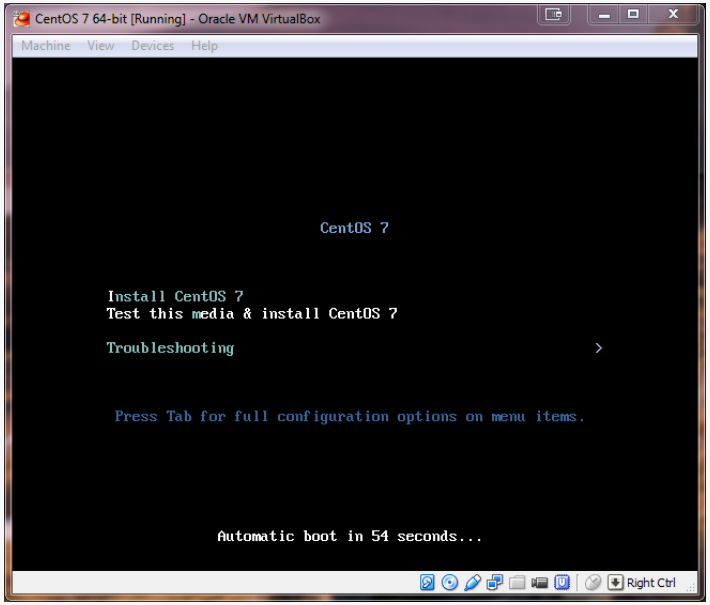
VirtualBox will recognize the empty system and prompt you to select an installation disk.

Click the folder icon and select your CentOS ISO file; then click Start...

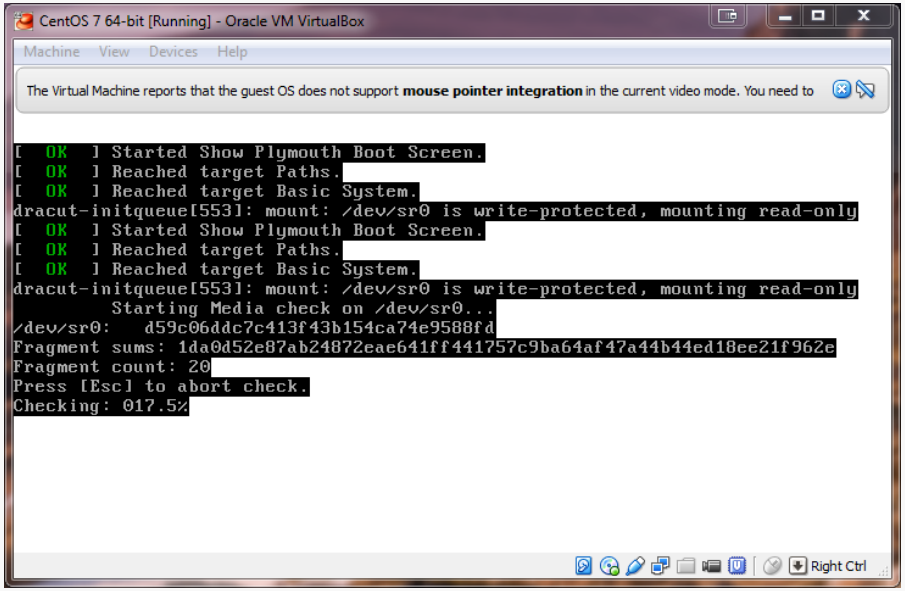


Running the Installation Code

The following sequence of screen shots are mostly self-explanatory…



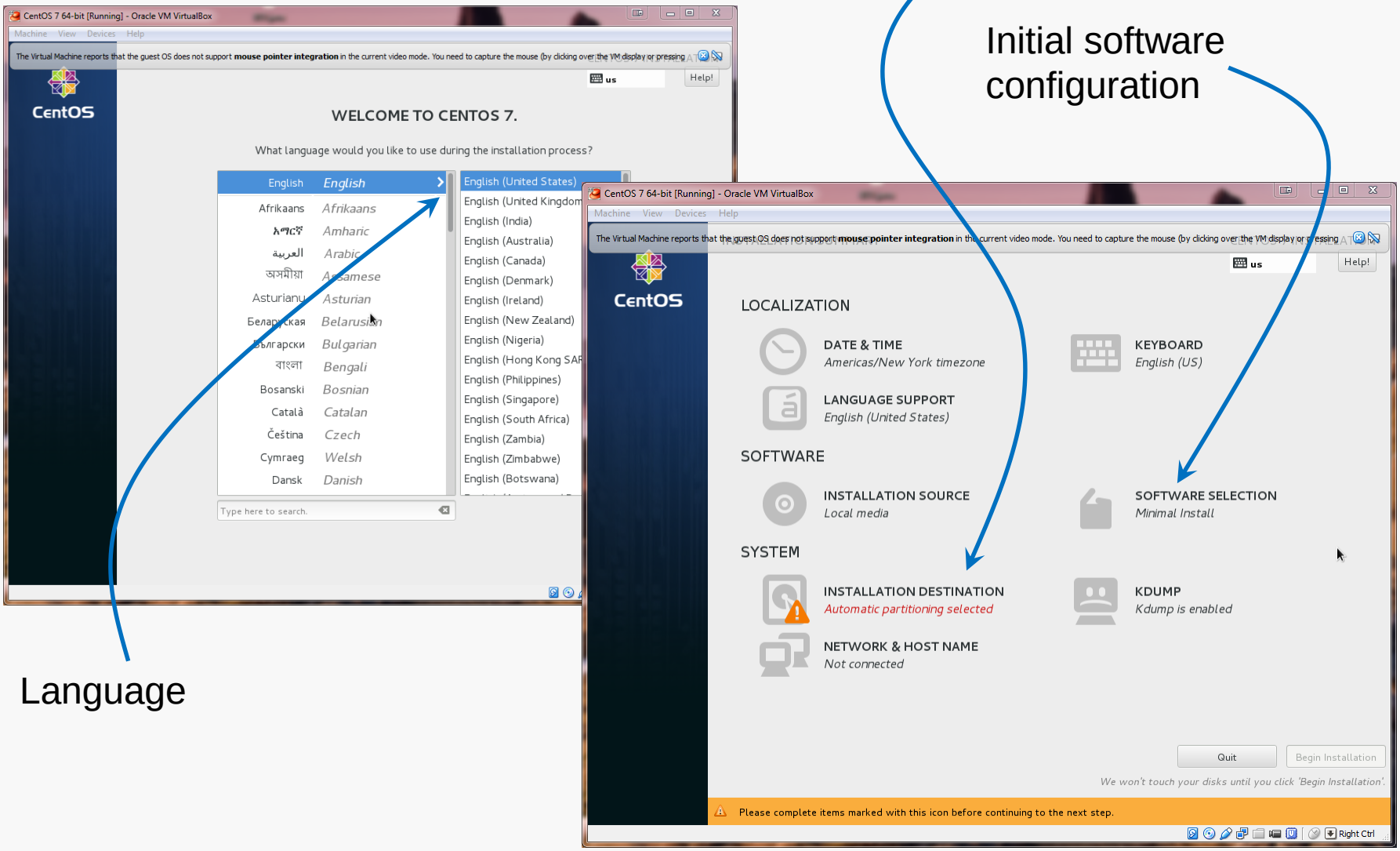
Select Install CentOS 7...



… and it grinds away awhile…

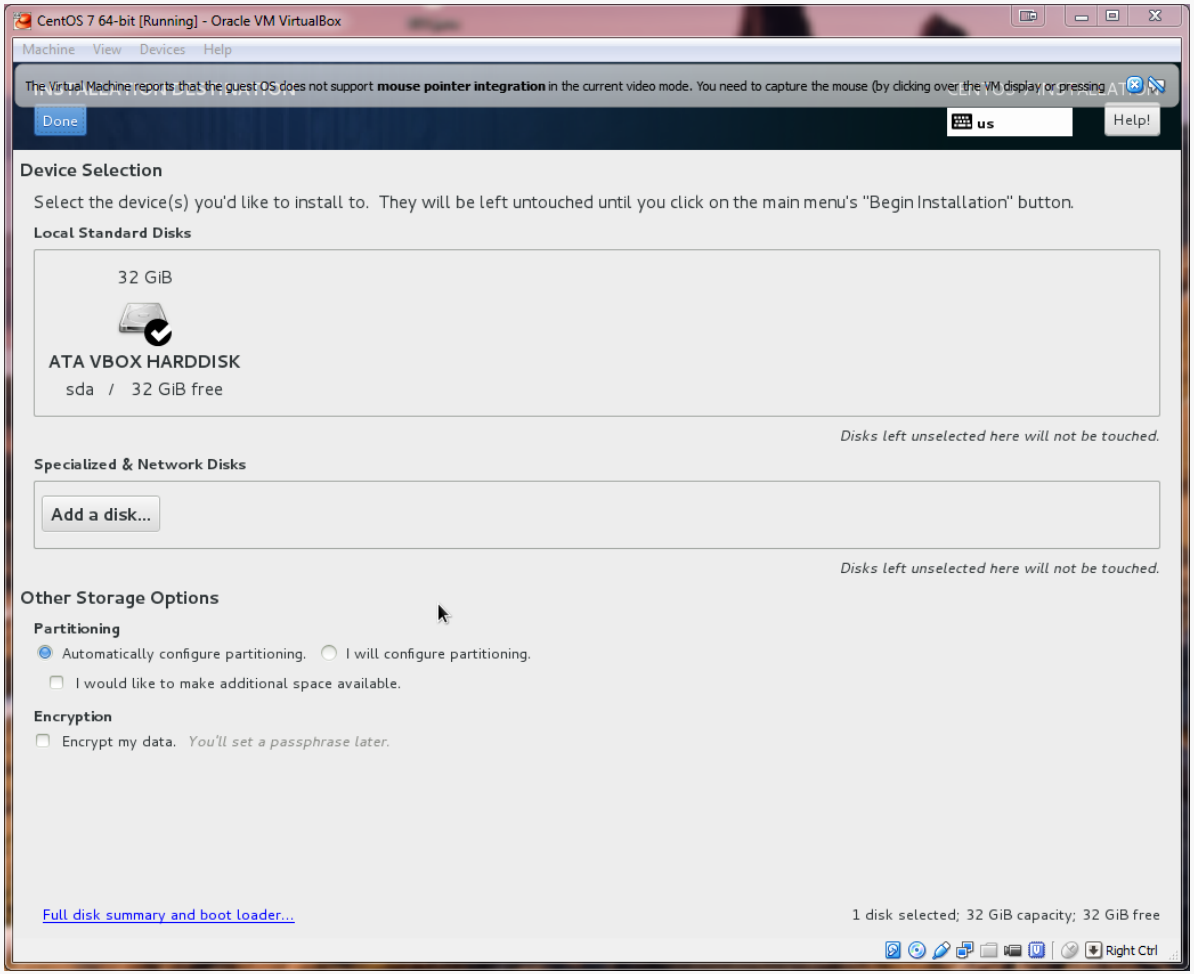
Running the Installation Code

Some basic settings need to be established:



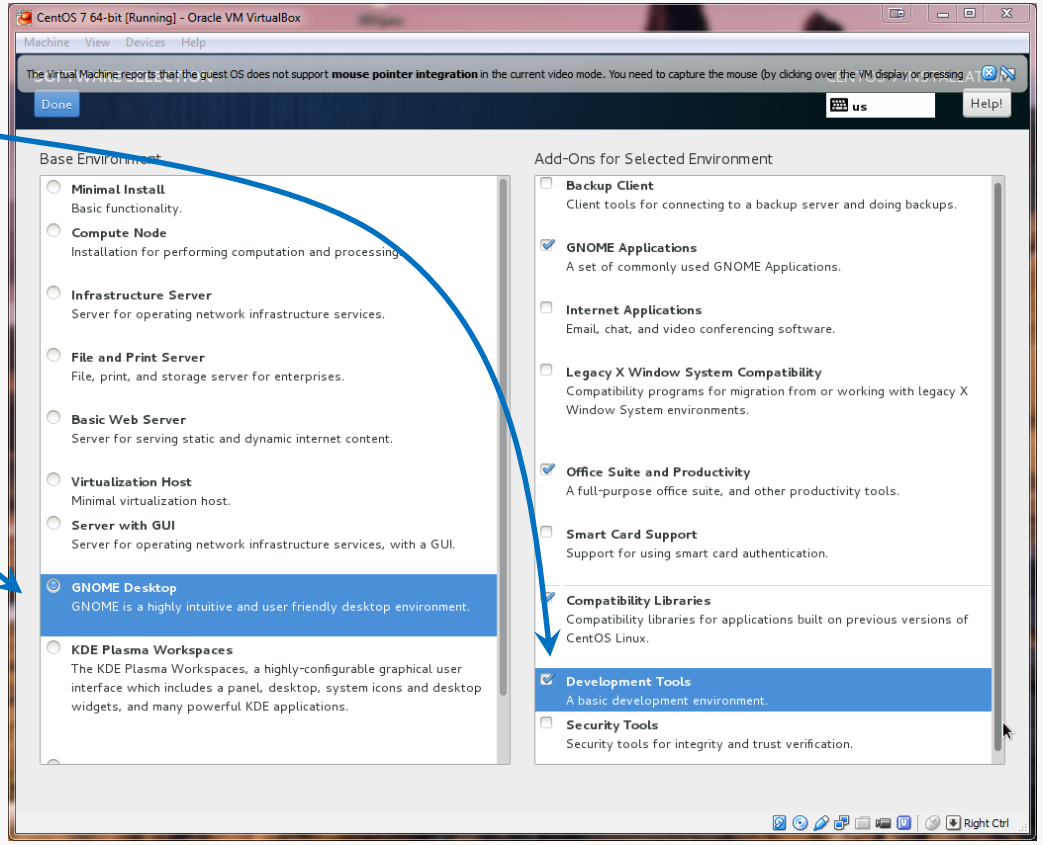
Installation Destination

This will be the virtual harddrive you just created... take the defaults.



Software Selection

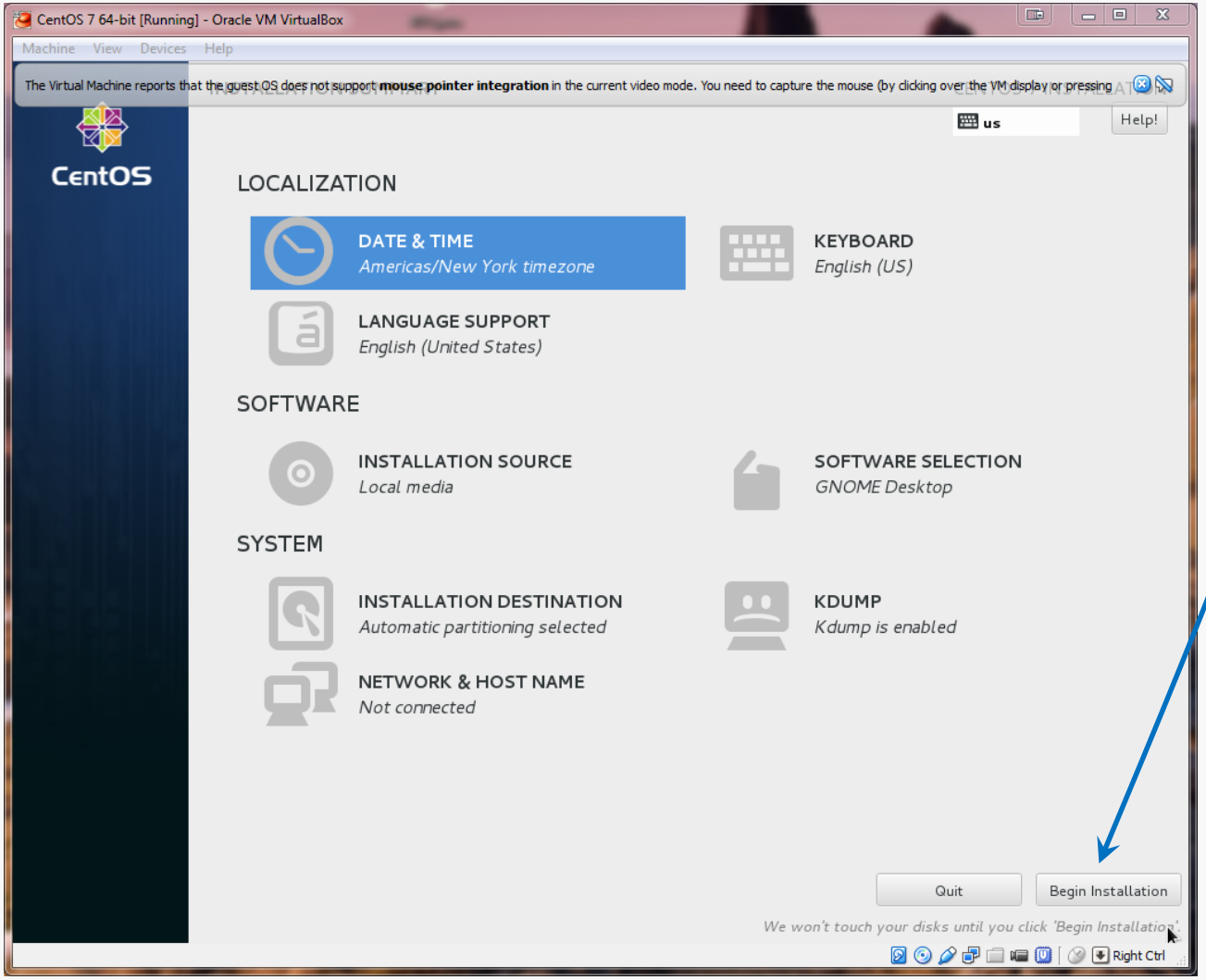
Here, I prefer the GNOME desktop and I want to be sure that I install the development tools (compiler, etc).



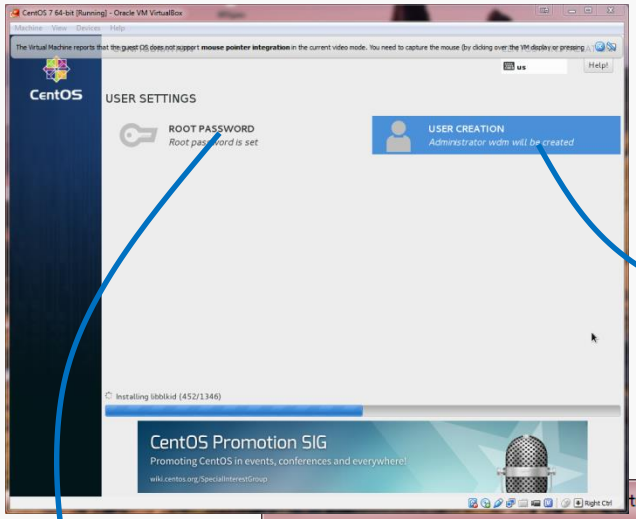
Make other choices as you like... more packages can be installed later.

Continue Installation

Fire up the installation routine...

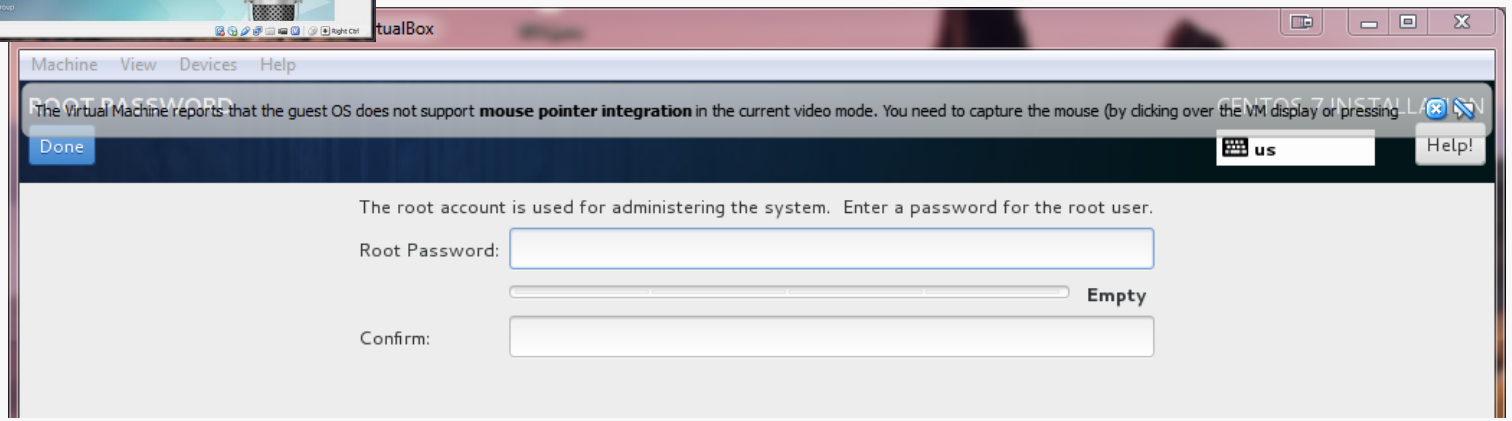


root and User Account Setup



While the installation is running, set the password for the root (superuser) account.

I also set up a user account for my personal use.



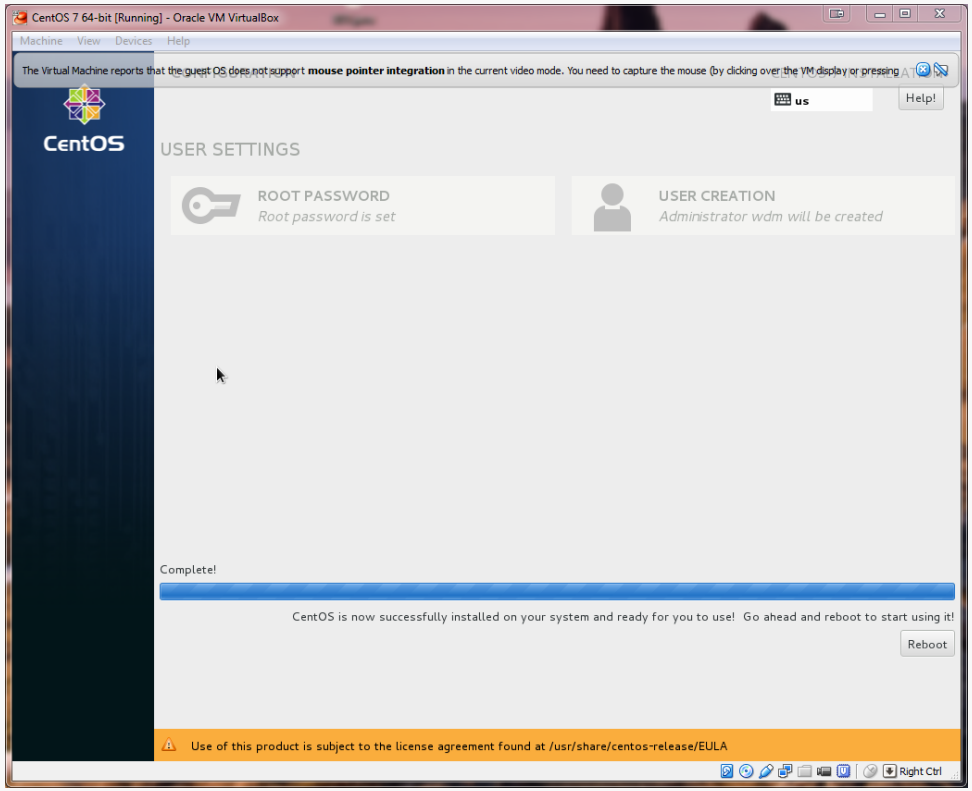
root is the administrative account.

You will use that for most software installs and some other activities.

Do not forget this password!

Other Settings

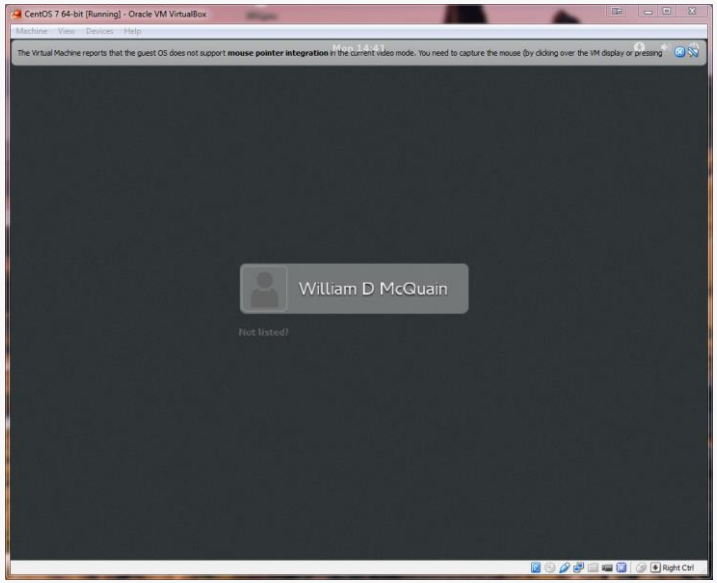
Eventually you should see the completion screen (it takes awhile, depending on how many software packages you chose, the speed of your machine, etc).

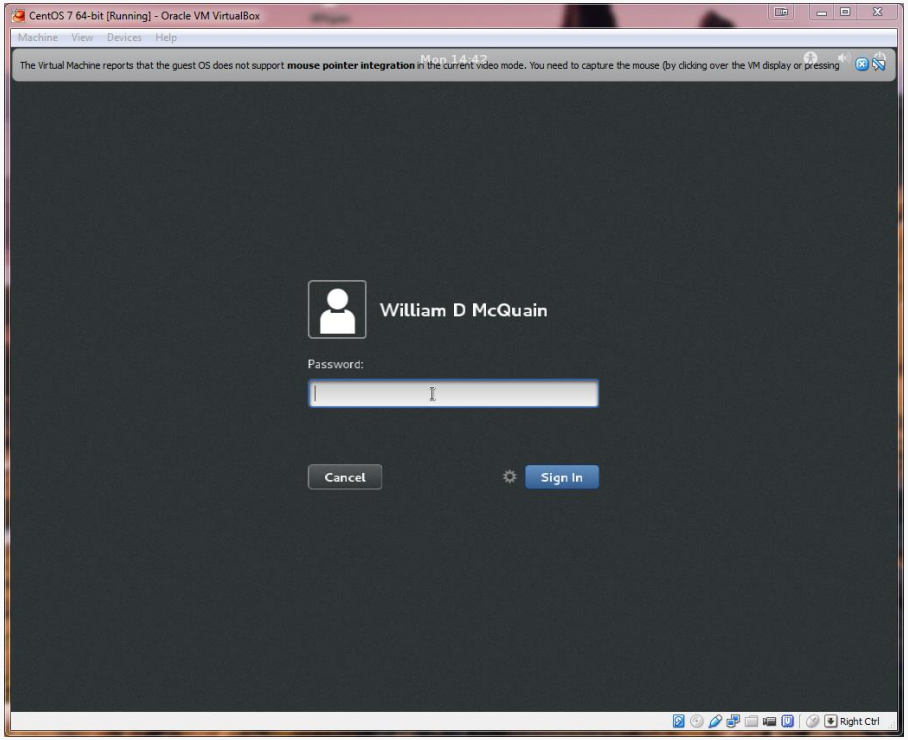


Now, you need to restart the virtual machine...

Login Screen

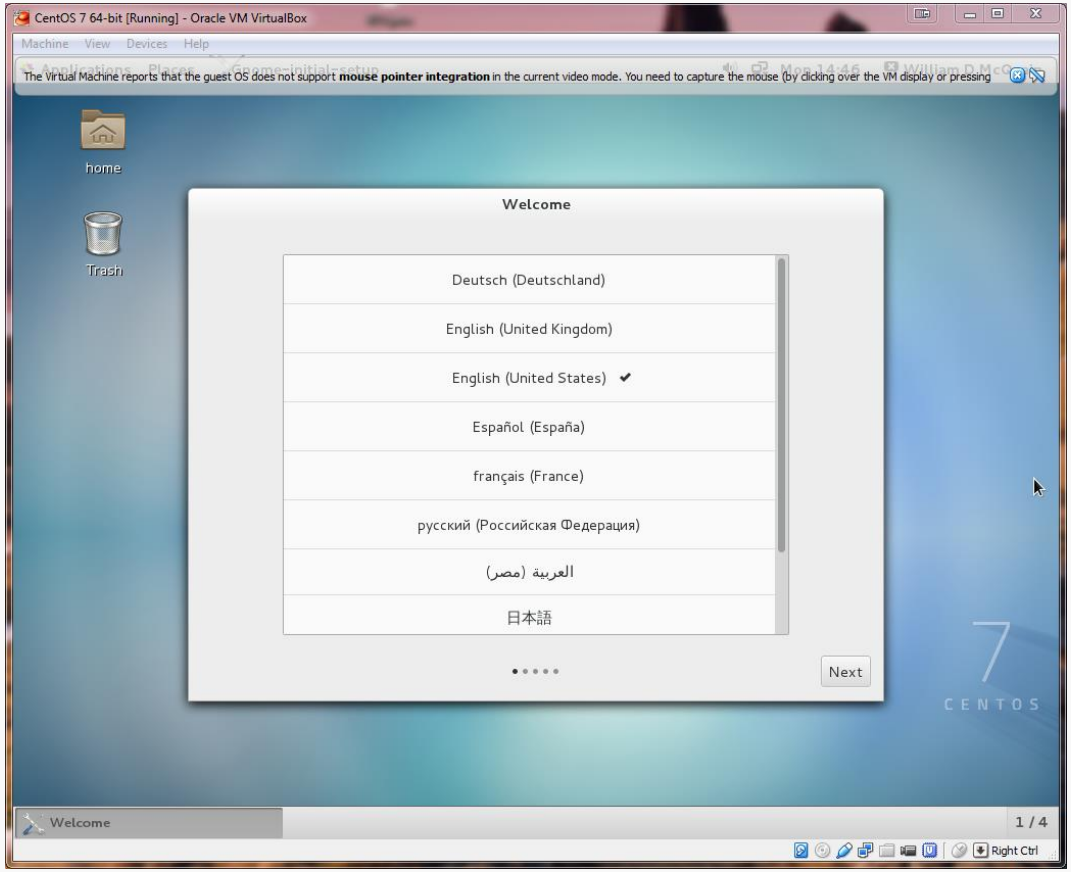
The restart will bring you to the login screen:

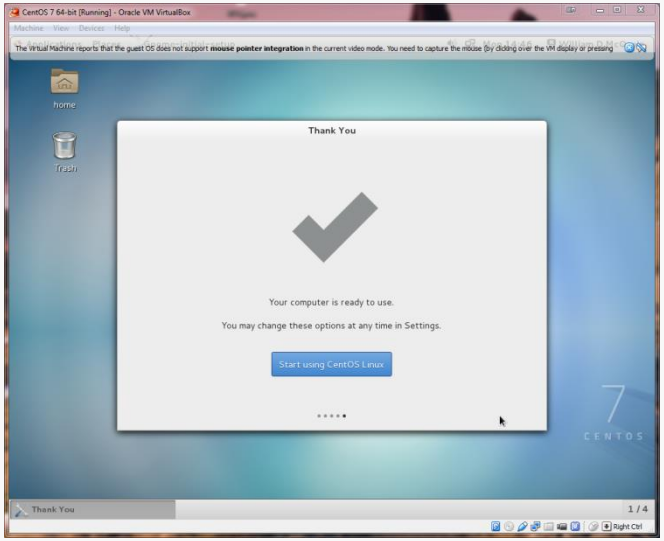




Initial Options

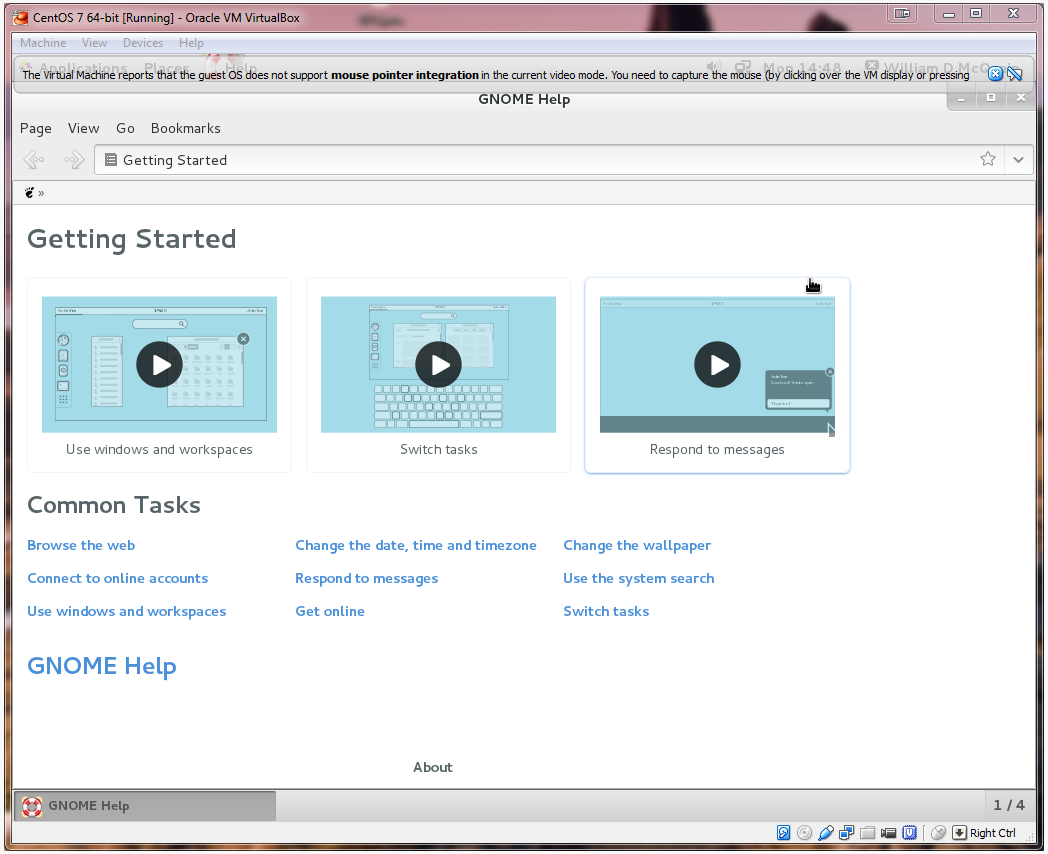
CentOS starts with some basic language and keyboard configuration:





GNOME Help

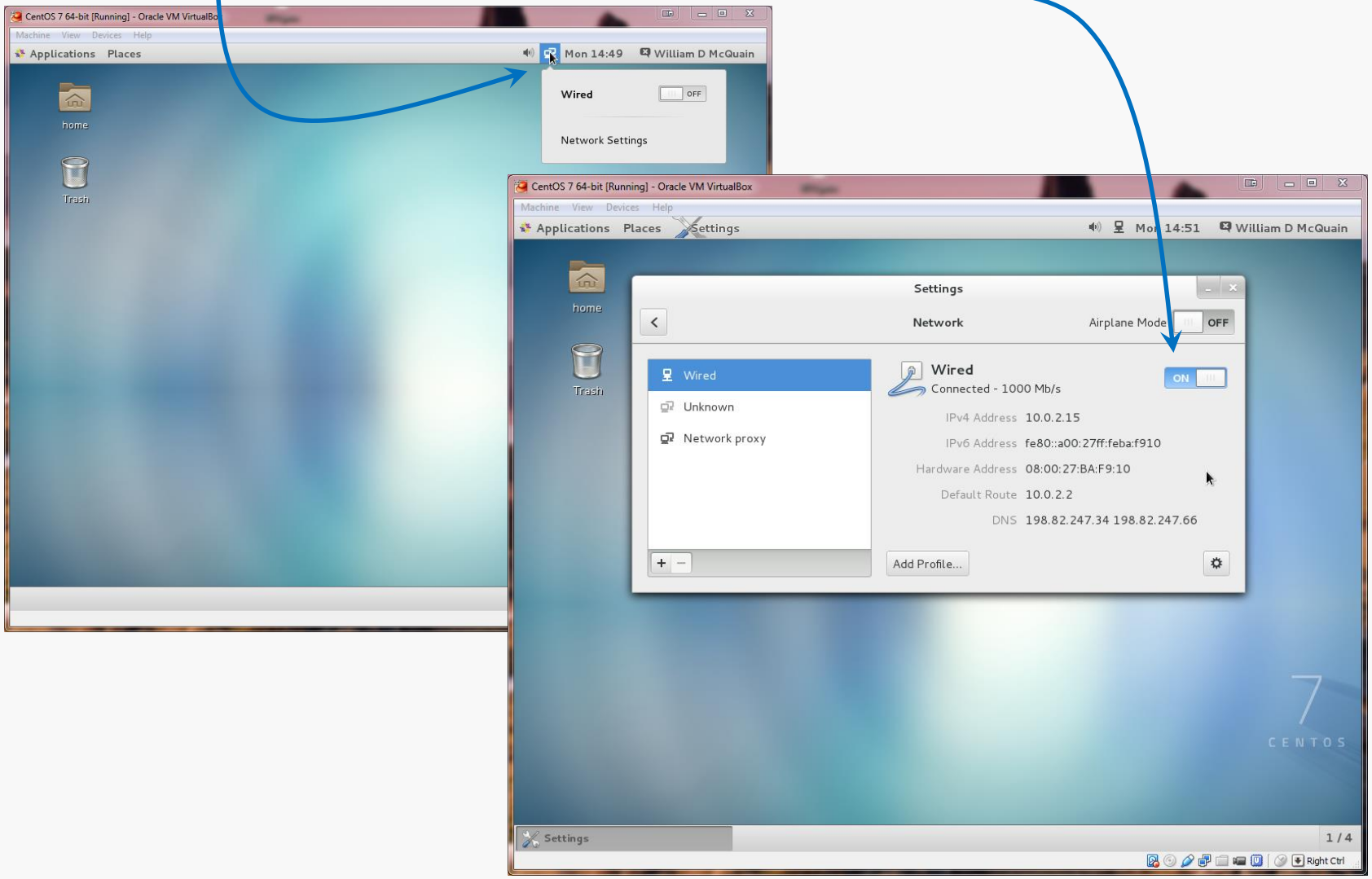
On first startup, you'll be offered help for the Linux environment:



Ignore this or explore it, as you like...

Starting the Network

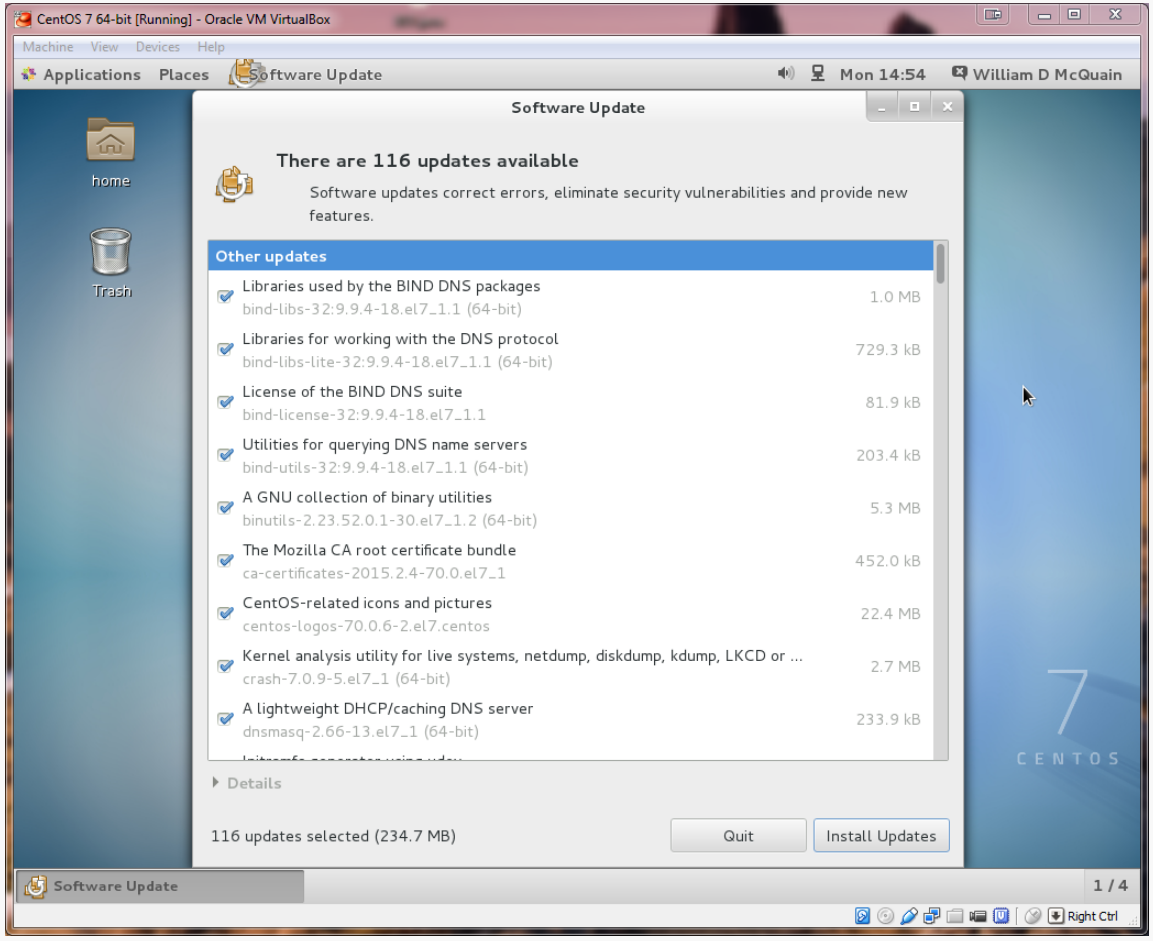
Click the Network icon and turn on the network... the default settings are usually OK.



Software Updates

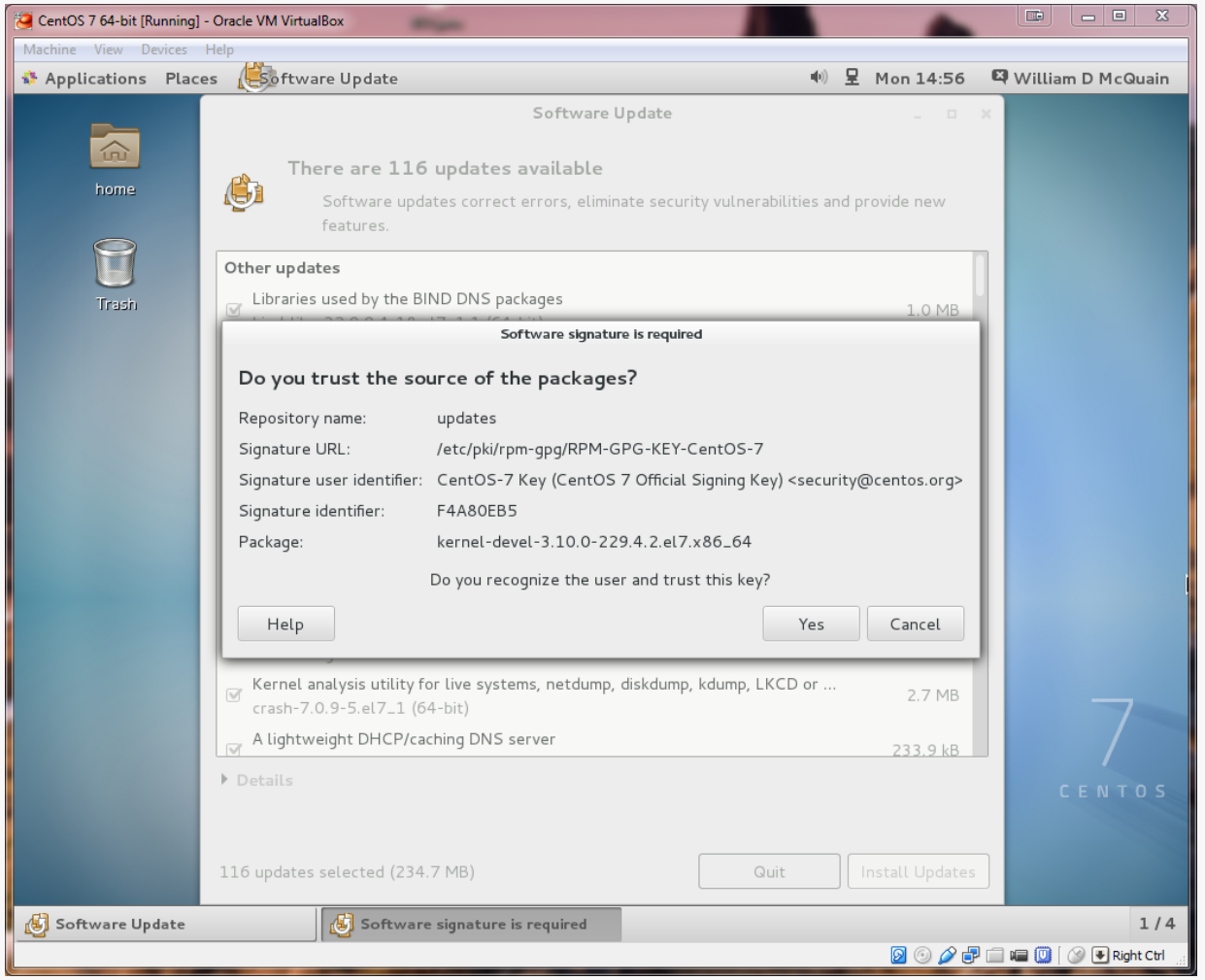
I recommend running a general software update at this point.

Go to the Application/?? menu and pick software update...



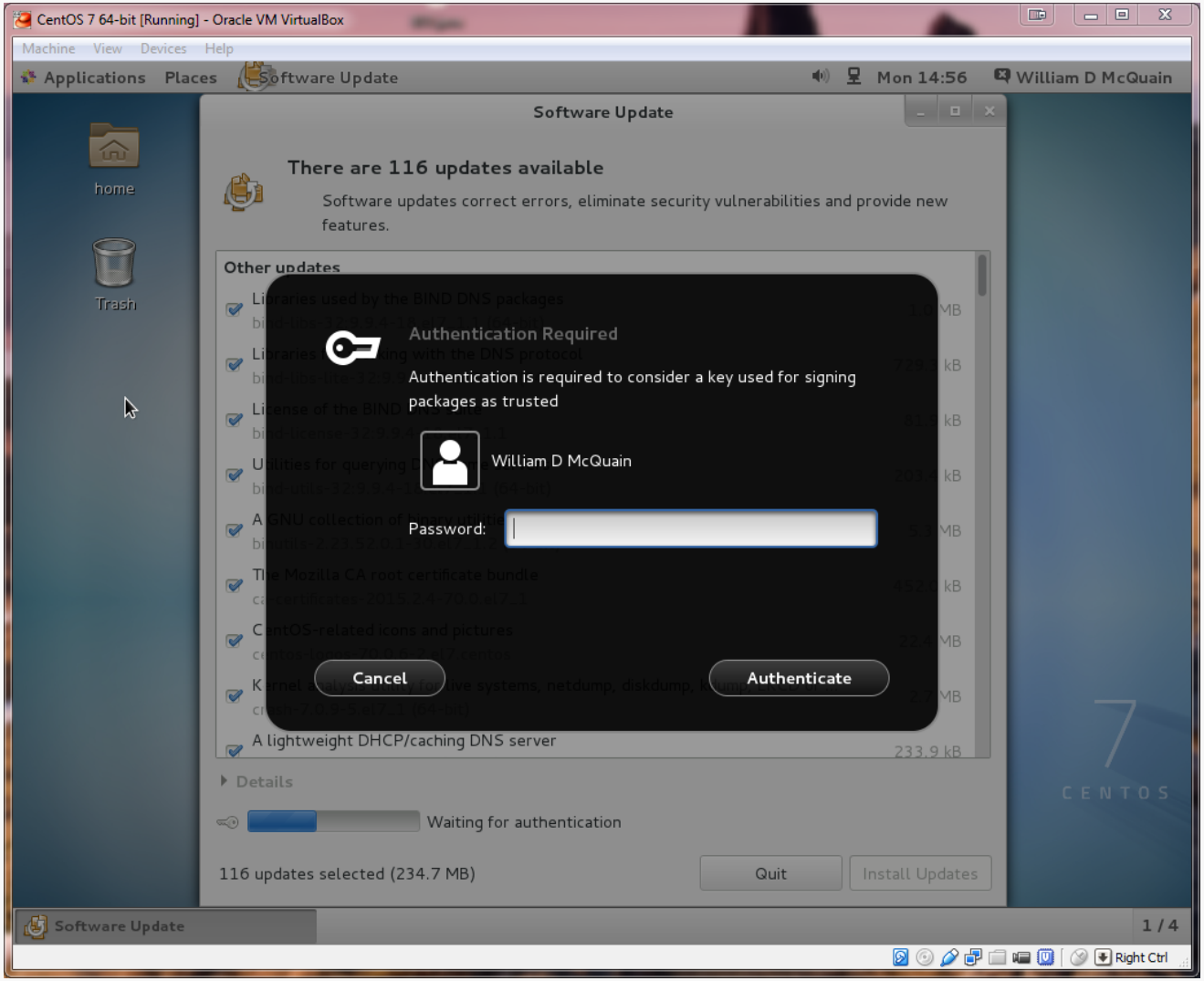
Software Updates

I'd just install ALL of them at this point... it will take awhile...



Authorizing Updates

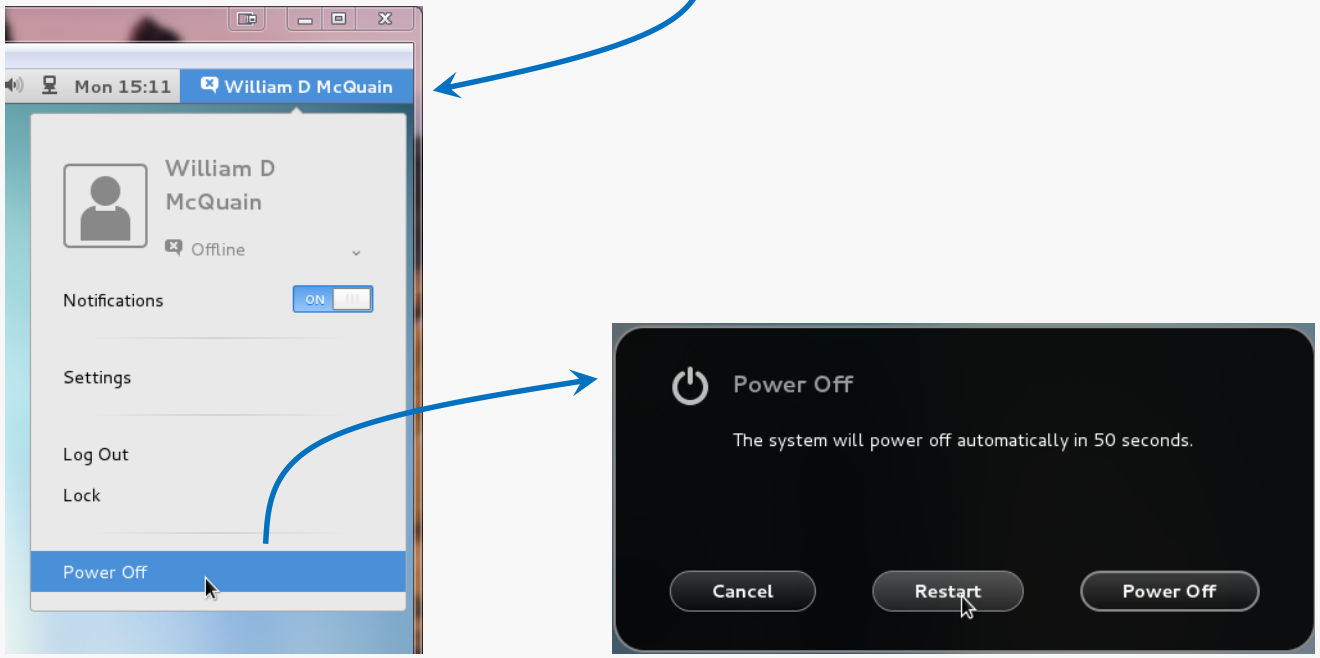
Now, you DO remember the root password you set earlier... right?



First Completion…

Things should proceed automatically until a restart is needed.

To restart or shutdown, go to the user menu and select Power Off…



VirtualBox Guest Additions

The VirtualBox Guest Additions provide additional functionality for your VM.

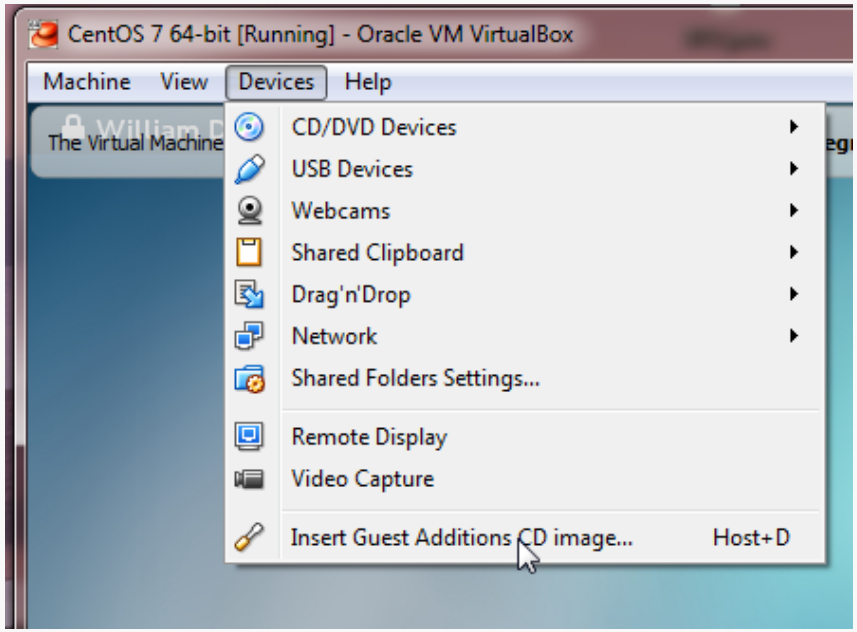
One note: until you install the VirtualBox Extension Pack (slide 5) and the Guest Additions, some things like mouse capture and scaled displays may not work.

Another note: if you run the system updater or install other software on your VM, you may have to reinstall the Guest Additions.

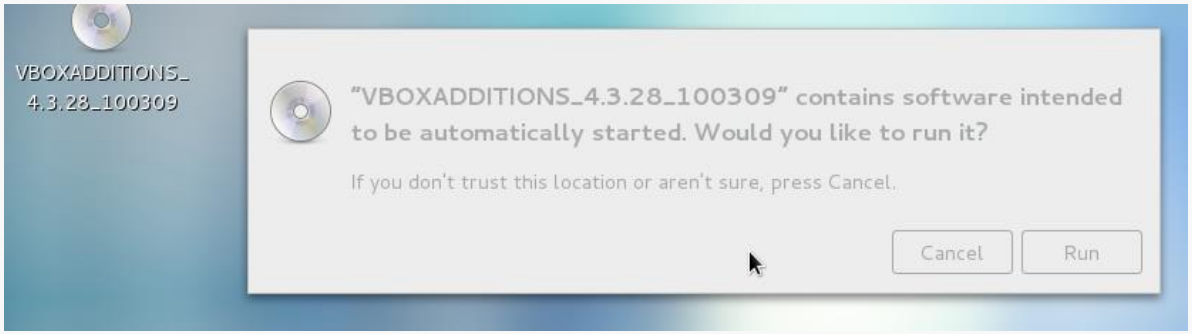
VirtualBox Guest Additions

The CD image is included in the VirtualBox installation package.

You must mount the CD image:



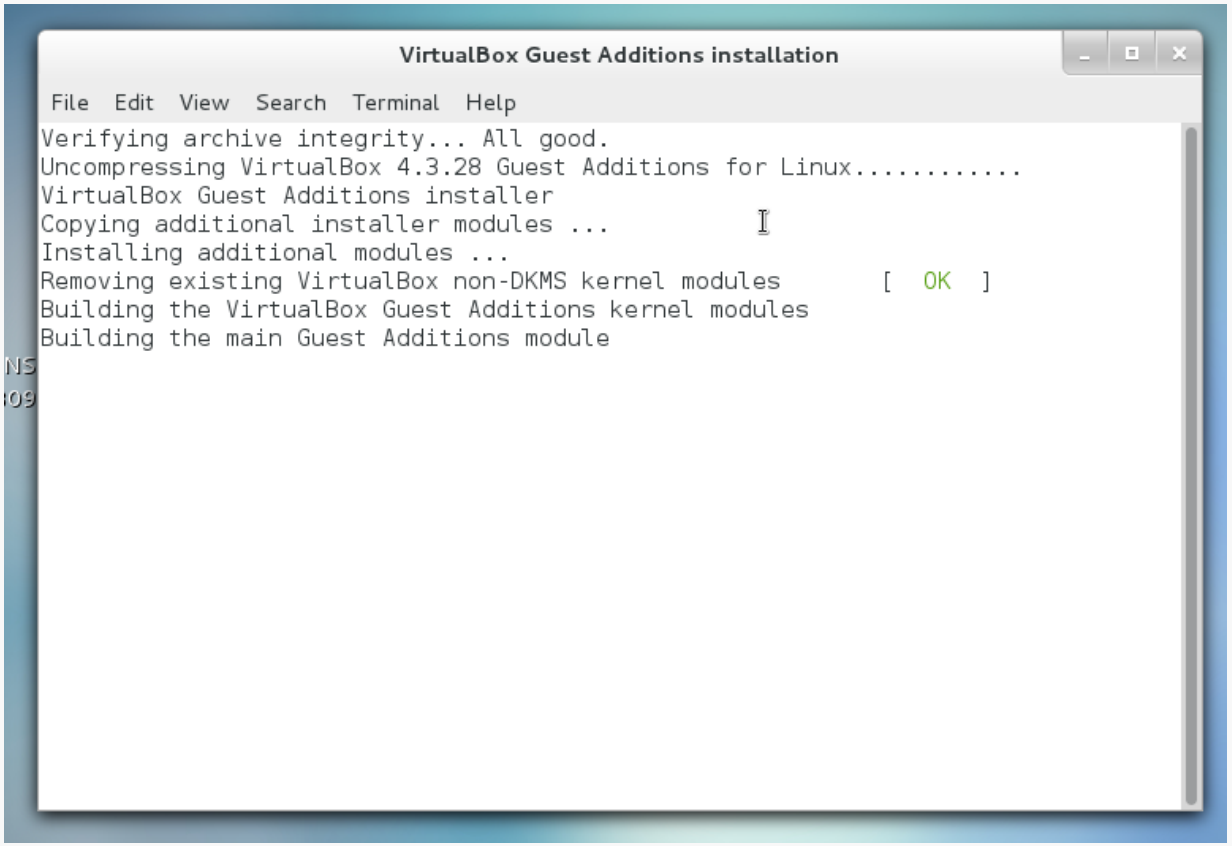
CentOS should recognize the installer once the image is mounted:



VirtualBox Guest Additions

Pay attention to the console window during the installation.

If there are error messages, the Guest Addition may not have been installed properly.



Additional Stuff: yum

As you use your CentOS system, you'll probably discover new tools you'd like that are not included by default.

In most cases, if you know the name of the software package you'd like to install, you can do so by running the `yum` tool. `yum` has many options and you should skim its man page.

For instance, we can use `yum` to determine what version of a package is installed:

```
wdm@Centos65 ~]$ yum list installed gcc
Loaded plugins: fastestmirror, refresh-packagekit, security
Determining fastest mirrors
 * base: mirror.trouble-free.net
 * extras: mirrors.einstein.yu.edu
 * updates: mirrors.advancedhosters.com
base                                                     | 3.7 kB     00:00
extras                                                   | 3.4 kB     00:00
updates                                                  | 3.4 kB     00:00
Installed Packages
gcc.x86_64    4.4.7-4.el6    @anaconda-CentOS-201311272149.x86_64/6.5
[wdm@Centos65 ~]$
```

Additional Stuff: yum

We can use `yum` to install or update a package:

```
[wdm@Centos65 ~]$ yum install tree
. . .
You need to be root to perform this command.
[wdm@Centos65 ~]$ su
Password:

[root@Centos65 wdm]# yum install tree
. . .
Setting up Install Process
Resolving Dependencies
--> Running transaction check
---> Package tree.x86_64 0:1.5.3-2.el6 will be installed
--> Finished Dependency Resolution
. . .
Transaction Summary
================================================================
Install       1 Package(s)

Total download size: 36 k
Installed size: 65 k
Is this ok [y/N]: y
. . .
```

You need to be `root` to install or update a package:

Now I am `root` ... bwa ha ha!

`yum` has determined what needs to be installed, shown me that info, and now wants confirmation...

Additional Stuff: yum

We can use `yum` to install or update a package:

```
. . .
Downloading Packages:
tree-1.5.3-2.el6.x86_64.rpm
|  36 kB     00:00
Running rpm_check_debug
Running Transaction Test
Transaction Test Succeeded
Running Transaction
  Installing : tree-1.5.3-2.el6.x86_64
1/1
  Verifying  : tree-1.5.3-2.el6.x86_64
1/1

Installed:
  tree.x86_64 0:1.5.3-2.el6

Complete!
[root@Centos65 wdm]# exit
exit
[wdm@Centos65 ~]$
```

`yum` triggers the installation..

Now I will cease to be `root` ... that much privilege can be dangerous.

Additional Stuff: yum

Sometimes `yum` cannot find a package:

```
[root@Centos65 wdm]# yum install geany
Loaded plugins: fastestmirror, refresh-packagekit, security
. . .
No package geany available.
Error: Nothing to do
[root@VMCentOS64 wdm]#
```

`yum` queries a collection of online repositories... in this case it doesn't find the package I wanted.

It's possible to direct `yum` to search additional repositories. See a good Linux reference or the man pages for more information.

Adding a Repository


```
[wdm@localhost ~]$ su
Password:
[root@localhost wdm]# yum install epel-release
...
================================================================================
 Package                          Arch                          Version
Repository                    Size
================================================================================
Installing:
 epel-release                     noarch                        7-5
extras                        14 k

Transaction Summary
================================================================================
Install  1 Package

Total download size: 14 k
Installed size: 24 k
Is this ok [y/d/N]: y
```

Here, I'm adding another common repository to those `yum` queries.

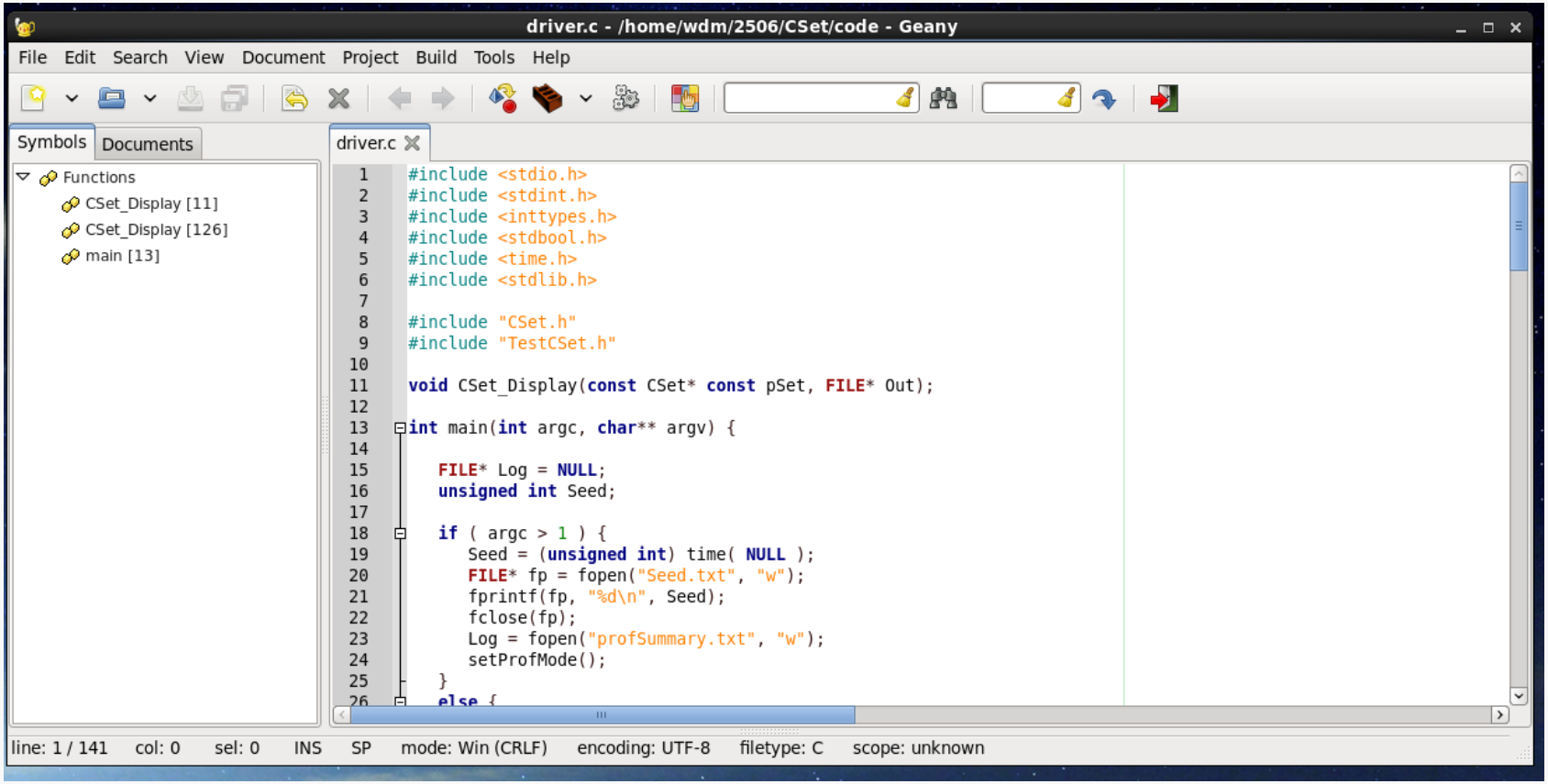
Installing Geany


```
[root@localhost wdm]# yum install geany
...
Dependencies Resolved

================================================================================
 Package           Arch       Version           Repository           Size
================================================================================
Installing:
 geany             x86_64     1.24.1-1.el7      epel                3.6 M
Installing for dependencies:
 vte               x86_64     0.28.2-10.el7     epel                361 k

Transaction Summary
================================================================================
Install  1 Package (+1 Dependent package)

Total download size: 3.9 M
Installed size: 15 M
Is this ok [y/d/N]: y
...
```

Here, I'm installing a programmer's editor, geany.

Additional Stuff: Geany

`geany` is a programmer-oriented editor:



It's my (current) favorite text editor for programming on Linux.

It's also available for Windows.

Additional Stuff: KDE Desktop

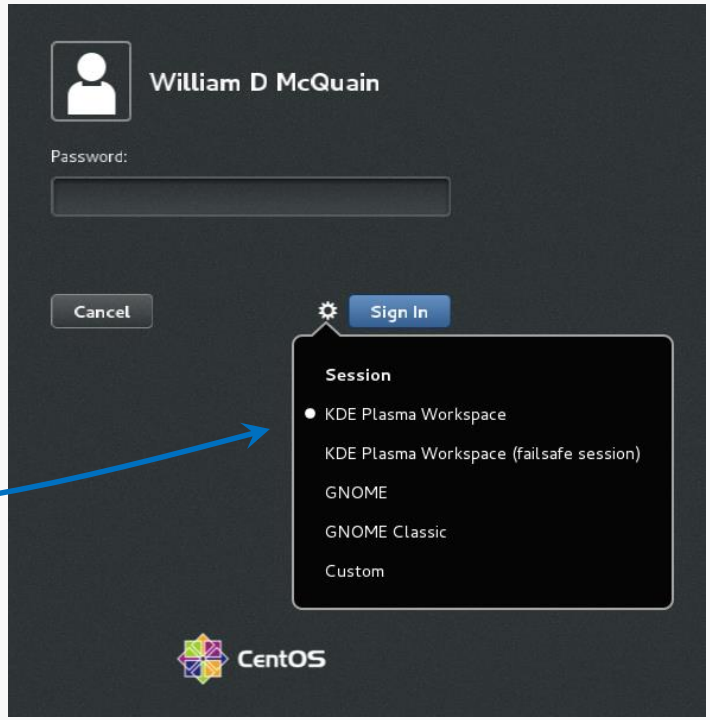
If CentOS 7 runs very slowly on your VM, you may find that performance is vastly enhanced if you switch from the GNOME desktop environment to KDE.

As root, issue the following command:

```
yum groupinstall "KDE Plasma Workspaces"
```

The installation takes awhile, but I found CentOS 7 ran much faster.

When you log in, you can click on the gear icon to get a drop list of choices for your desktop.

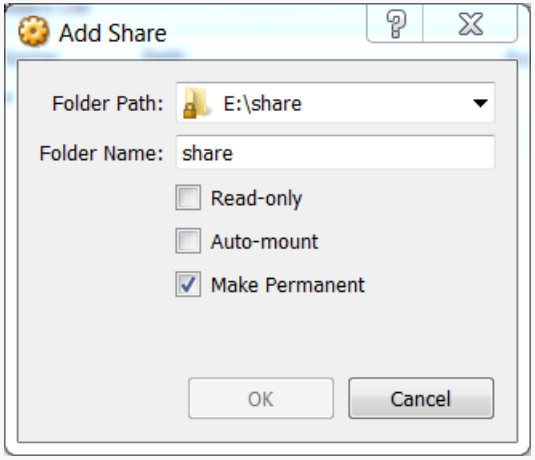


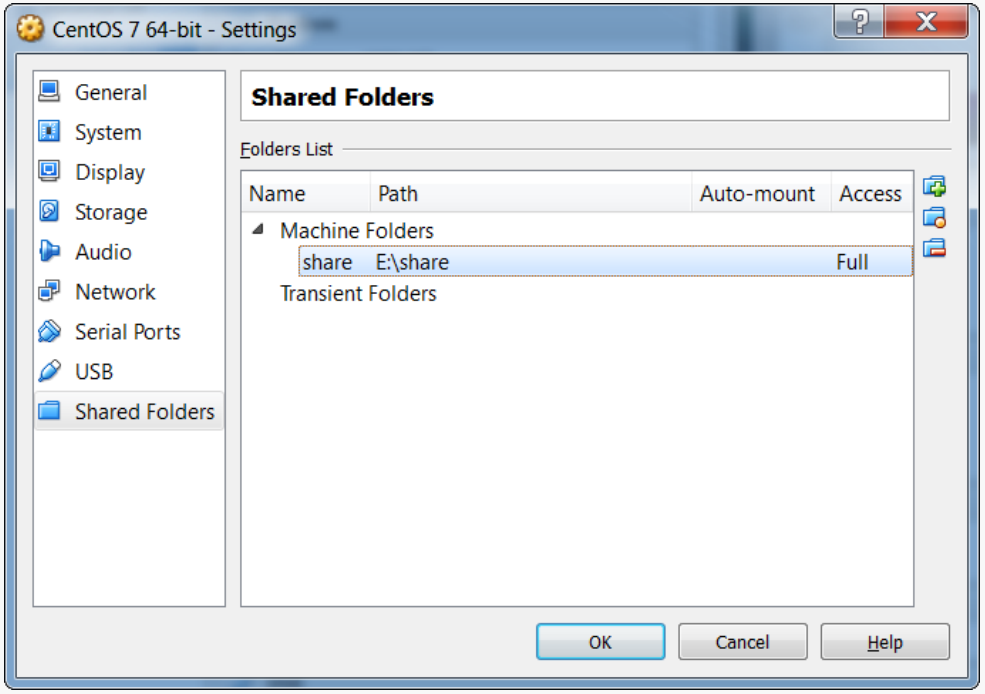
Shared Folders

The most efficient way to transfer files between your VM and the host OS is to set up a shared folder that both OSes can see.

Pick the folder you want to share; I'll use E:\share on my Win7 host.

In the VirtualBox Manager, click on Shared Folders and select the Add Folder button, then enter the path to the shared folder and make it permanent:





Shared Folders

Then, in CentOS become root and execute the commands:

```
mkdir /media/windows-share
mount.vboxsf share /media/windows-share
```

The first command creates a directory on your CentOS installation.

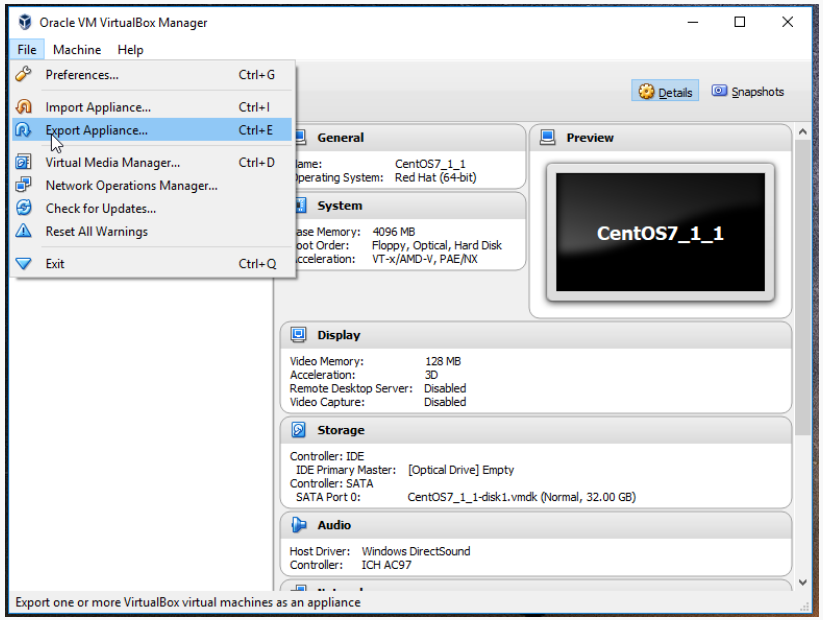
The second command links that directory to the one you selected earlier.

Backing Up Your VM

It's possible to make a full backup of your virtual machine:

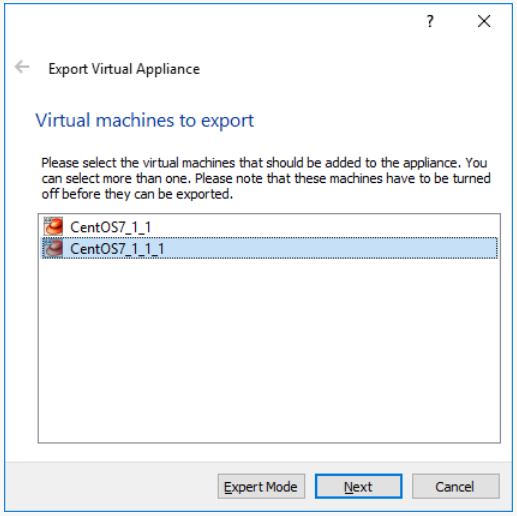
Make sure your VM is not currently running.

Choose Export appliance from the VBoxManager File menu:

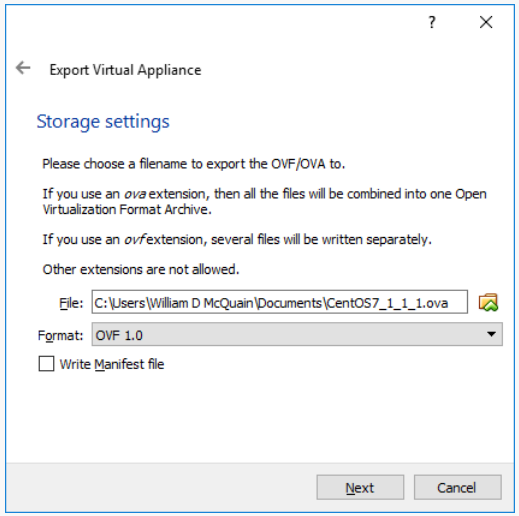


Backing Up Your VM

If you have more than one VM, choose the one you want to back up:



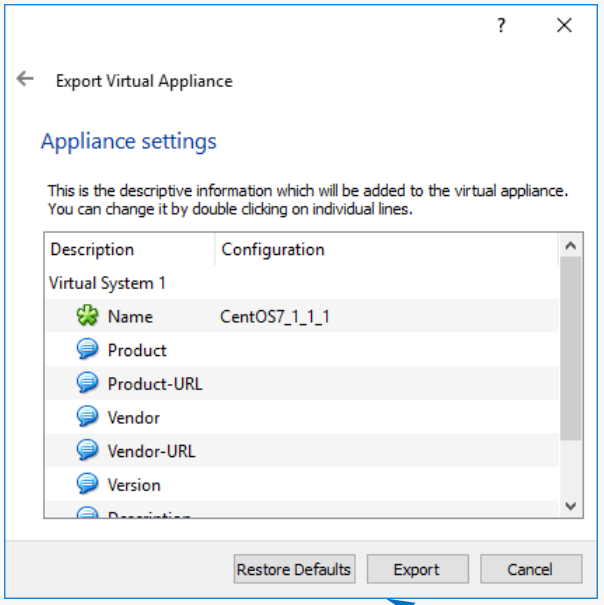
Choose a location and name for the backup file:



Backing Up Your VM

The default settings should be fine…

Click on Export.



Once the export operation is complete, you can move the backup file anywhere you like.

If you VM fails, you can use Import Appliance to recreate the VM you've backed up.