# Lab - Creating a Virtual install of Kali using VirtualBox

## Caveat

Be sure to read through the lab in its entirety before stating this or any lab in the course! Skipping a step in any part of the lab will cause the lab to fail. Trying to blow through this lab will result in epic failure! Slow and steady wind the race.

**Requirements:**

1. Kali Linux Preinstalled Image: (**~2.83 GB**)
2. VirtualBox: (**~107 MB**)
3. CPU that supports Virtualization.
4. 8GB of RAM preferred. (4 GB of RAM will Suffice but is not optimal)
5. At least 60 GB of free hard drive space. (An external hard drive or thumb drive can also be used as storage)

**Using Other Hypervisors**

For all the gunslingers in the course, if you are using some other hypervisor to create your virtual lab environment, you are good to go. No need to check with the instructor.

This lab will walk through the creation and installation of a Kali Linux virtual machine inside VirtualBox using one of two methods. You only need to use one. One of the other not both! Kali will function as our attack machine for all subsequent labs. After previewing this lab, students will have two different options for installing Kali:

1. Install using a prebuilt Kali VB Image (preferred)
2. Create a full install

**How much time to allocate for this lab**

The whole process may take a few hours to complete depending on the specifics of your own situation, i.e., computer, internet connection speed, and so on.

All the software used in the lab is free and open source, just like Kali.

As the lab begins, students will be taken through the download process for all three downloads. All software has been verified to be malware and crapware free.

**Virtualization is disabled in the BIOS**

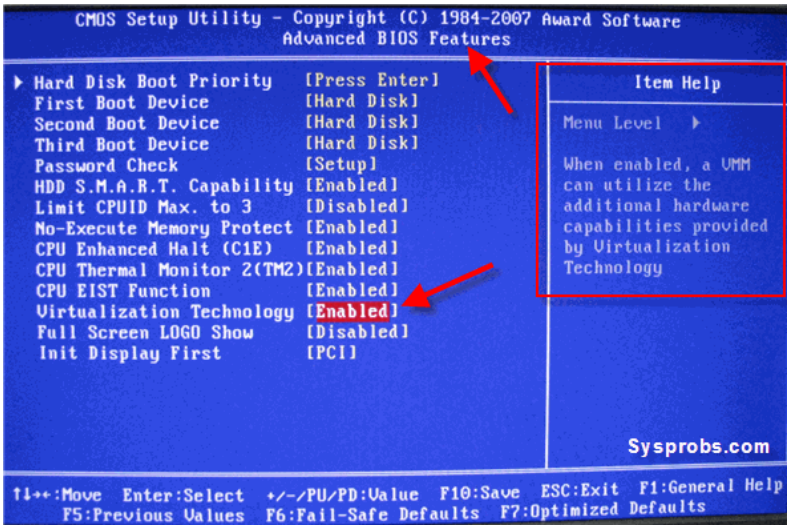
If VirtualBox errors out trying to create the VM it could be your virtualization is disable in the BIOS. This is especially true for new Motherboards and HP desktops and laptops. The come out of the box with VT-X disabled.

To create a 64-bit virtual machine you need to meet the following:

- Your **Host OS is 64-bits**
- Intel Virtualization Technology and VT-d are **both enabled** in the BIOS
- The **Hyper-V platform is disabled** in your Windows Feature list.

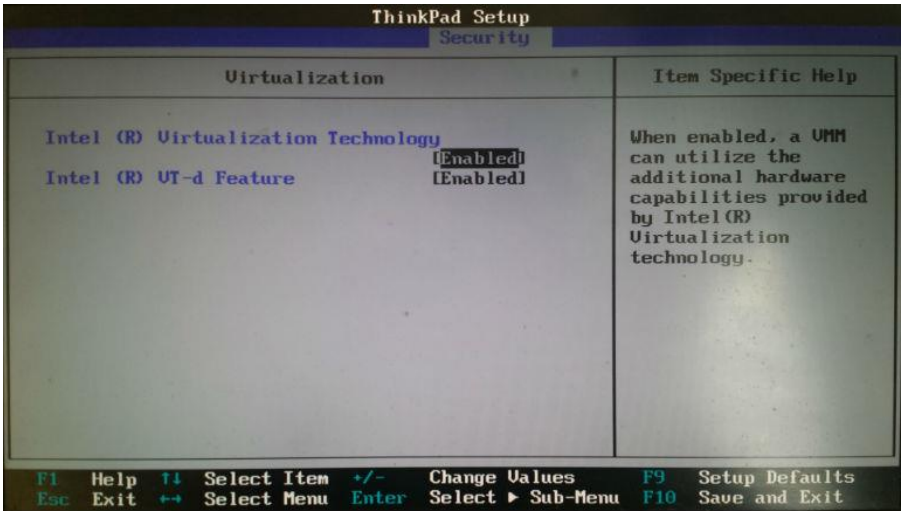
**Where to Find Intel Virtualization Technology (VT-X) in BIOS?**

It can be found under ***'Advanced Chipset settings'*** in AWARD BIOS. Normally these vt-x/amd-v extension settings will be available in advanced settings in most of the motherboards.




After you have changed the settings to disable or enable, it's recommended to shut down the computer for minimum 10 seconds and restart it (Cold Restart) to take effect. Latest motherboards automatically detect these types of changes and do the cold restart. Whenever I change VT setting in my motherboard, it delays the restart automatically.

**A different BIOS**




Step by Step: Entering the BIOS

**1. Get ready to act quickly:** You need to start the computer and press a key on the keyboard before the BIOS hands over control to Windows. You have only a few seconds to perform this step.

**2. Boot (or restart) the PC:** Pay close attention to the first screen that appears. Look for a message that indicates which key you need to press in order to access the BIOS. That key is likely to be:

--A Function key (such as *F1*, *F2*, or *F3*)

--The *Esc* key

--The *Delete* key

Access the UEFI settings from within Windows 10

## Begin the lab!

## Install Kali Linux in VirtualBox (using ova file)

### 1. Download and install VirtualBox

The first step is to download and install the **VirtualBox** software package onto the host machine chosen for your lab setup. Make sure you download the right version for your operating system and hardware architecture (32 bit vs. 64 bit). Instructions for installation on various operating systems are readily available if you run into any snags. Also, make sure to keep a handy copy of

the VirtualBox user manual, which comes packaged with the software and can also be found online.

Once, downloaded, **VirtualBox** installs like any other software program. Find your download and begin the installing. **VirtualBox** is malware and crapware free. Once you install VirtualBox and run it for the first time, you'll be presented with the application's welcome prompt, which provides an orientation for the interface. Navigate through the menus to get a feel for the software.

Download here!

### 2. Download and install Free Download Manager

Download managers allow you schedule, start, stop, and resume a download without loss of any downloaded progress. When we are downloading gigabytes of data, being almost done and having the download interrupted and having to start over is very frustrating. Download managers can also reduce your download time.

For this lab, I used a download manager called **Free Download Manager**.

Install the Free Download Manager on your host machine. Find your download and begin the installing. The **Free Download Manager** is malware and crapware free.

Download here!

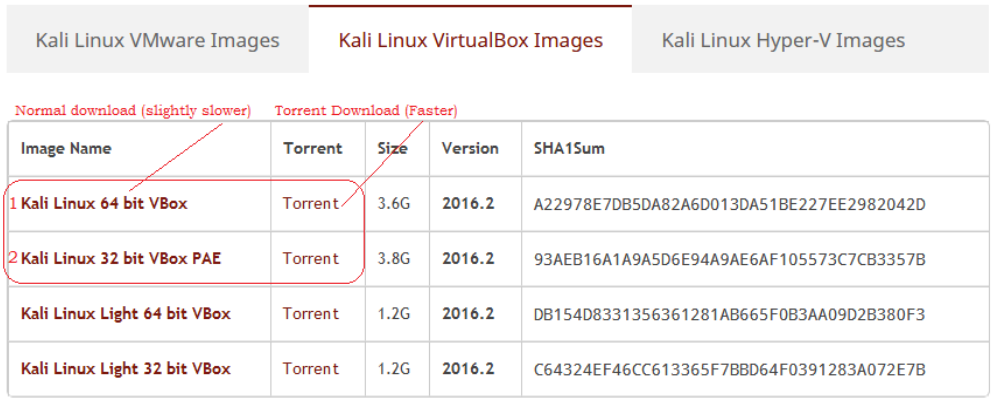
### 3. Download the Kali VirtualBox image

Using a pre-installed file saves us a lot of time as we won't have to step through the installation process.

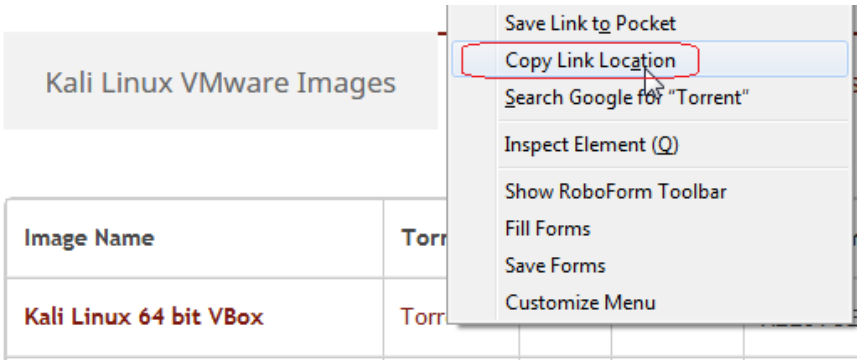
For install method, we need to use the Free Download Manager to ensure our download is uninterrupted and timely.

Since the Kali images are updated over time, the file for the download will differ than what is in the lab, but it remains the same file, just with updates. Visit the Offensive Security download page for the latest image.

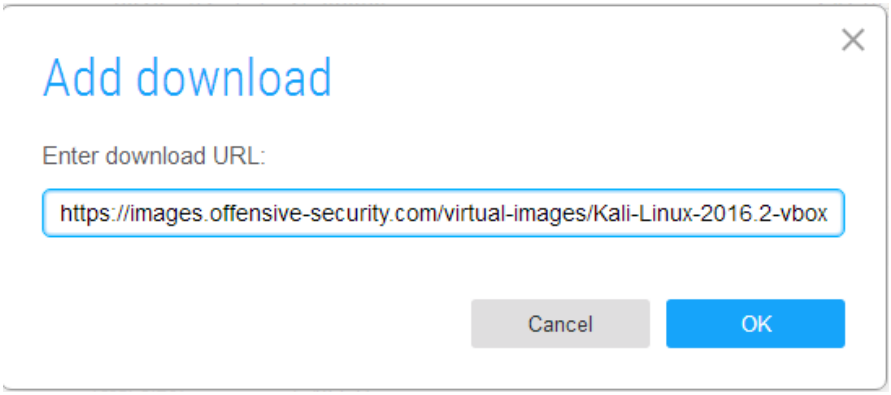
Once you're on the right download page, your choice if which download to choose from is either number 1 or number 2. If your system 64bit, use the first download. If your system is 32 bit, use the second download. Select your download method.



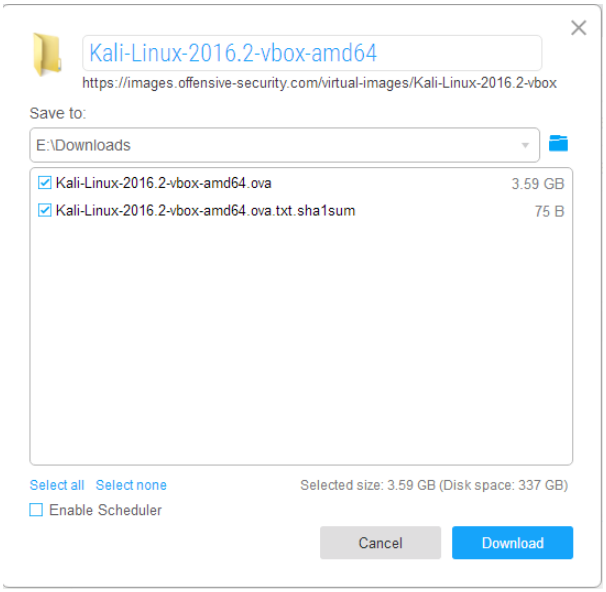

If your Free Download Manager is associated with your browser, it should automatically open and prompt you to start the download. If not, just right click on the download method and select, Copy link location.




Open you Free Download Manager and click on the + sign in the upper left corner. The **Add Download** box appears. The link is already inserted. Click OK, the download starts.

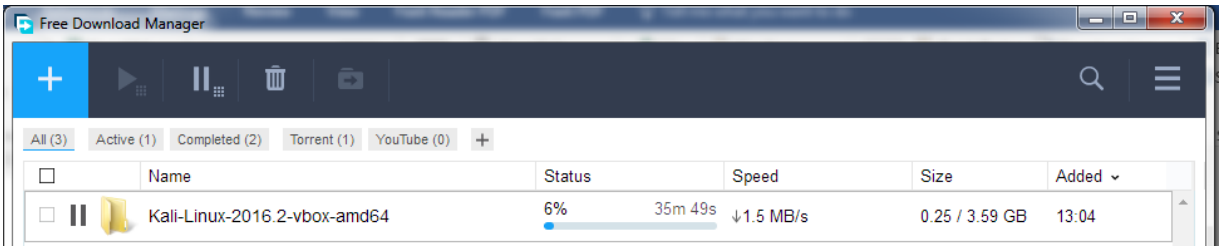



I choose to use a torrent so I get a dialog box letting me know what it is I am downloading. Click download.

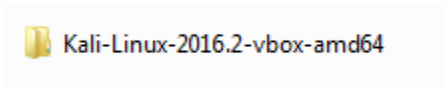



As the torrent starts connecting to other peers, the time begins to drop drastically. As the speed increases the time to download decreases. After just a few minutes the download will settle in at roughly 27 minutes. Your ISP may block torrent files so you will need to use the straight download with the Free Download Manager.

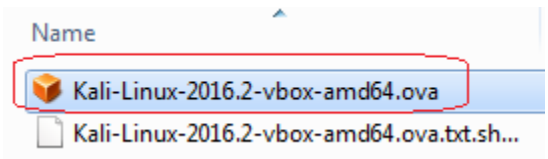
The same method used to get the normal download link applies for either VirtualBox image or the full install ISO image.



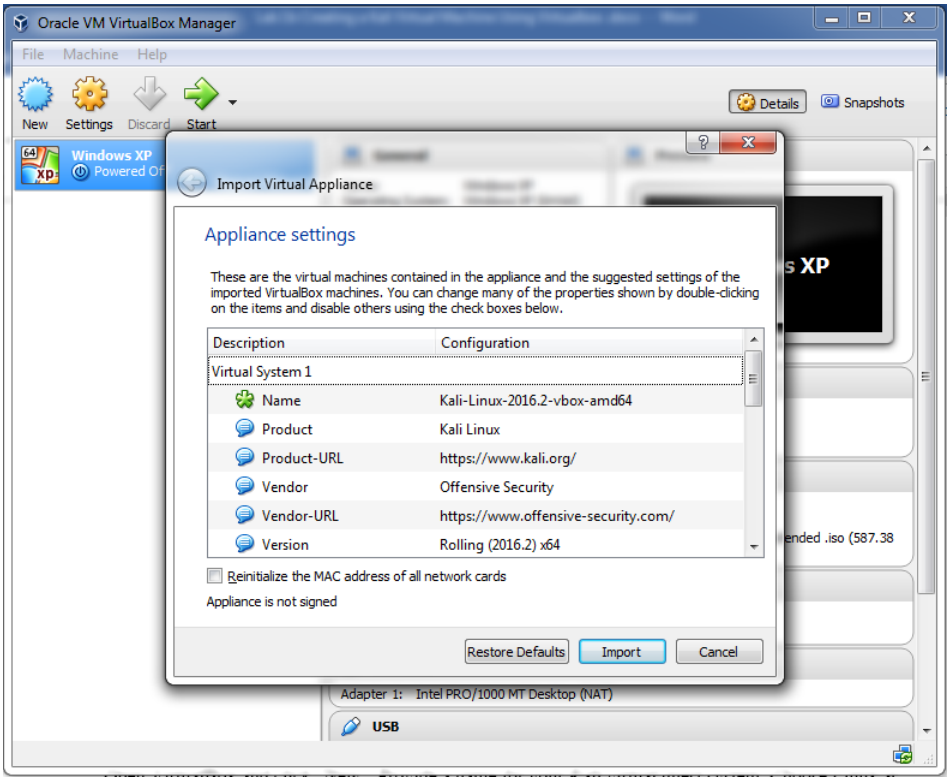

Once the download has been completed, browse over to the download location where the image was saved.



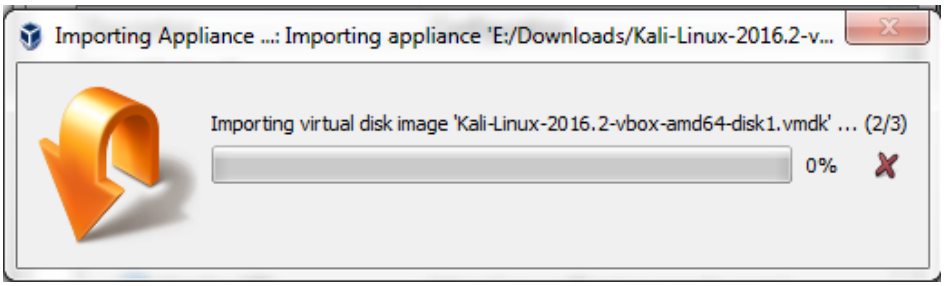

Open the folder and inside, double-click the OVA file.



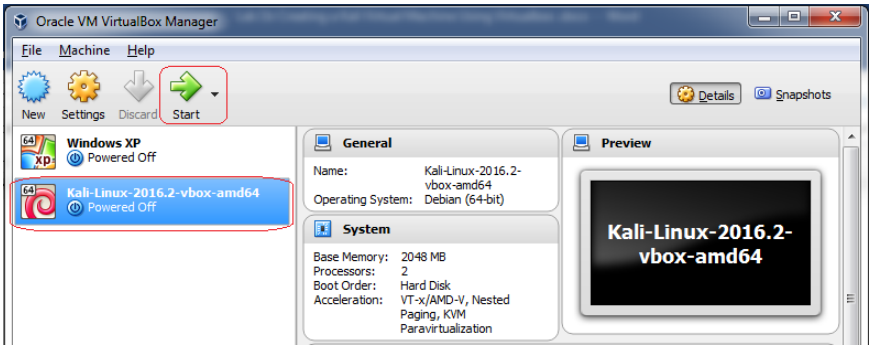

VirtualBox opens and is ready to import Kali. Click on Import.



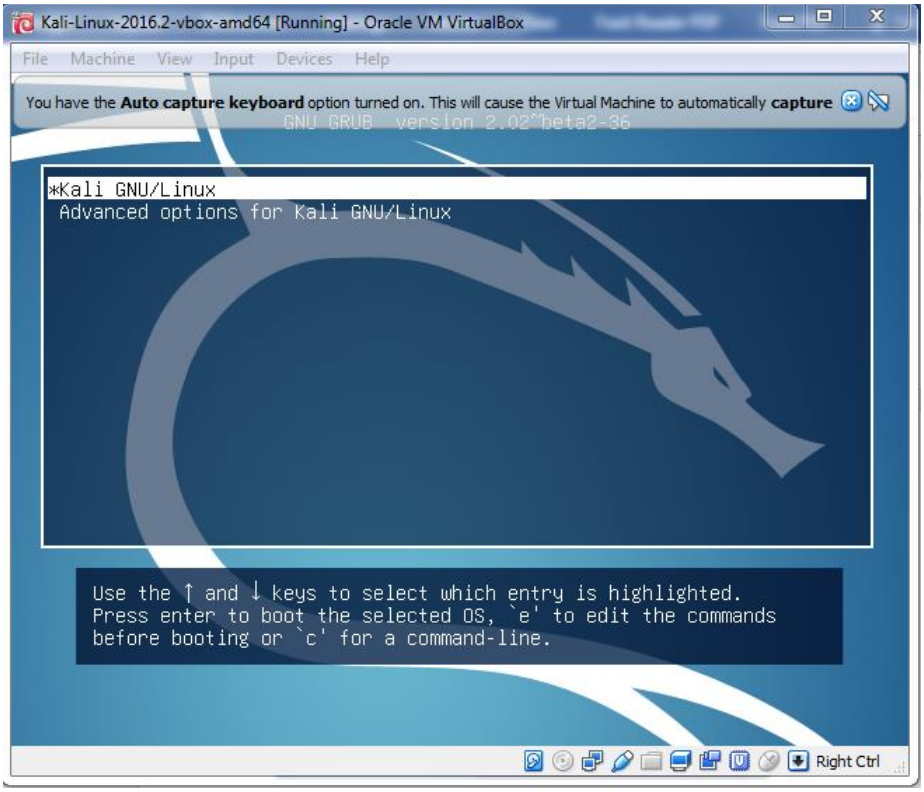

The image is imported.



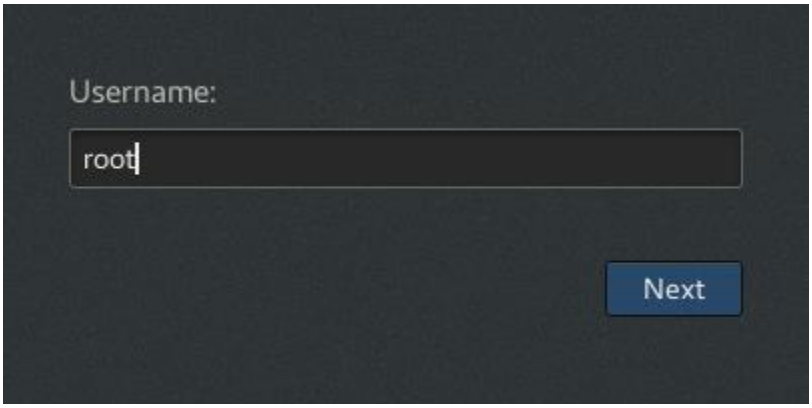

Once the image has been imported, from the left Windows pane, highlight Kali, and click on the green Start arrow.



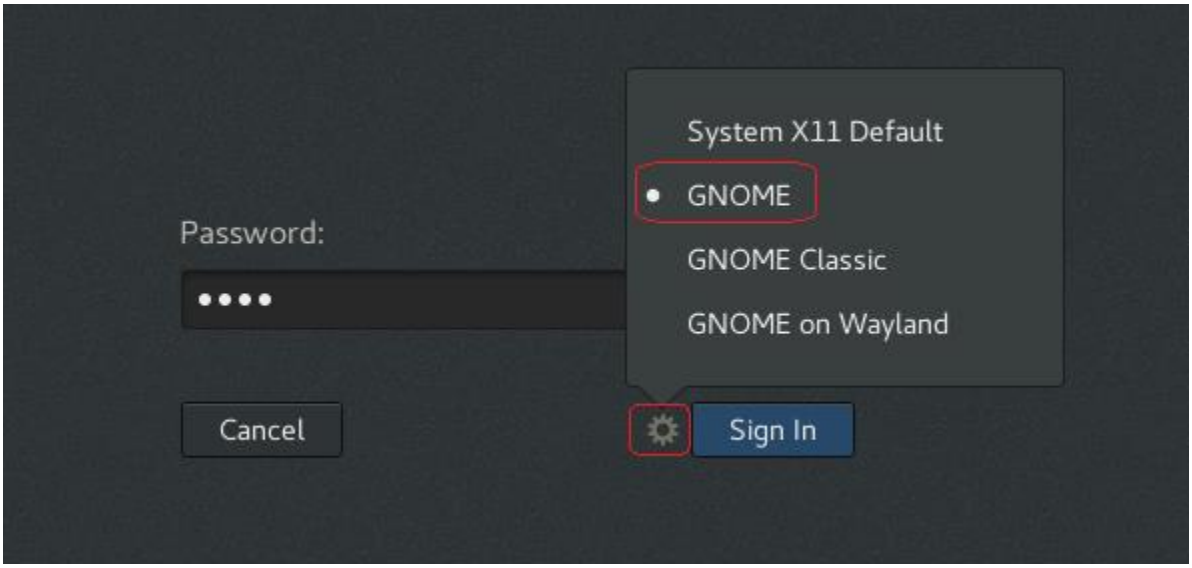

When Kali starts to boot, select the default install option and hit enter.




At the login for the username, type, **root** and hit enter




For the password, use **toor**, root spelled backwards. Before you sign in, click on the small gear next to the **Sign in button**. Change your desktop to GNOME. If you have issues with be logged off after opening a terminal session, change to another desktop.



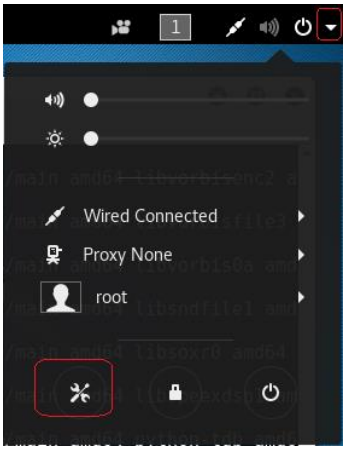

Congratulations, you now have a virtual instance of Kali Linux installed on your computer!

We still have to update the software on the system, and then we're going to install the VirtualBox Guest Additions in order to enable full-screen mode, tab completion in the terminal and so on. This process might take you another hour or so, depending on your internet connection.

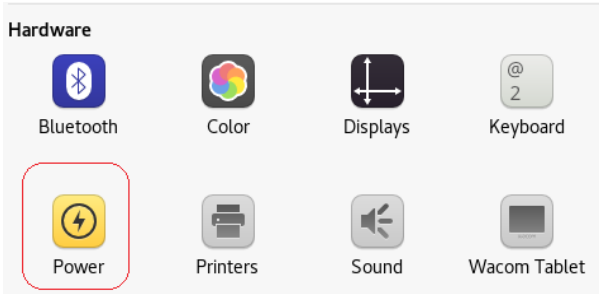
## Stop Kali from logging you out!

After being idle for just 5 minutes, Kali will you log off. To get back to login box, hit the enter key. Type in your password of `toor`

To prevent this from happening, we can adjust the power setting to **never**. At the top right corner, click on the down arrow then the icon for the settings properties.



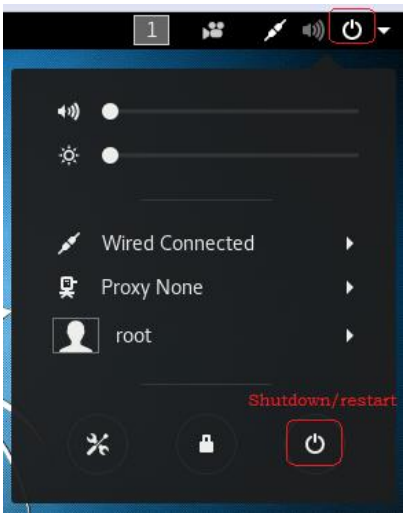

Click on the Power program.



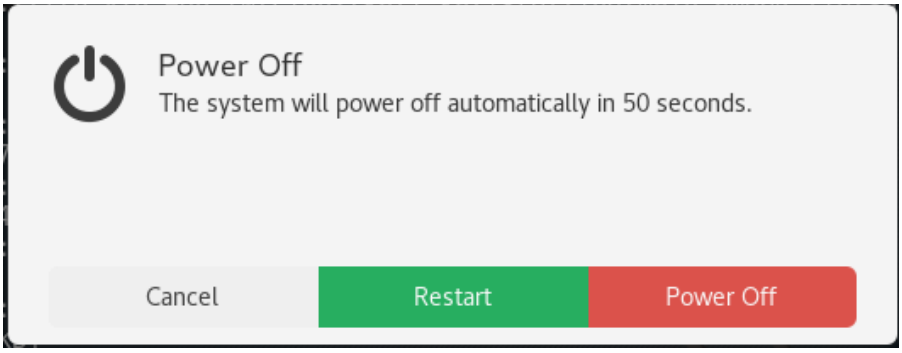

Under Power Savings, pull down the window to the right and select 'never' for the bottom of the window.


Close the Power window.

To shut down or restart Kali, do it just as if you were gracefully shutting down or restarting your host machine. Do not just power off VirtualBox as this will corrupt your Kali install!




The following screen pops up, select your option.




**Caveat!**

**If this is your first time installing and updating a Linux machine, you are in for a genuine real-world experience. Linux, regardless of what distro or version you use is all about updating and customizing your install with packages and files on a regular basis. This is a time-consuming process, and depending on the quality of your Internet, your hardware, disk space and the packages you wish to install, the updating can take some time to complete.**

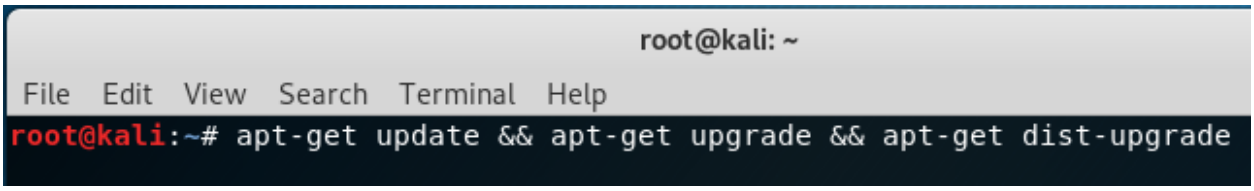
**Rules to follow when updating Kali:**

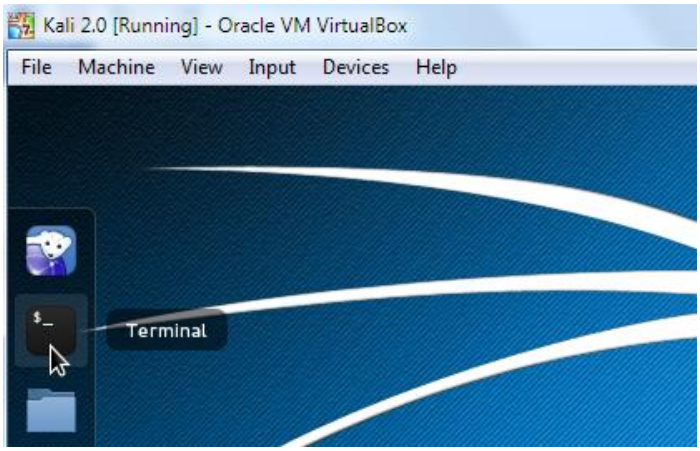
- **You must be patient!**
- **You must not interrupt the update process!**
- **You need to update, or things will not work as described in the lab.**

## Updating Your Kali Install

To update Kali, open a terminal session and type:

```
apt-get update && apt-get upgrade && apt-get dist-upgrade
```




This will make sure Kali checks the most recent repository for any software updates.

**Troubleshooting Kali not updating**

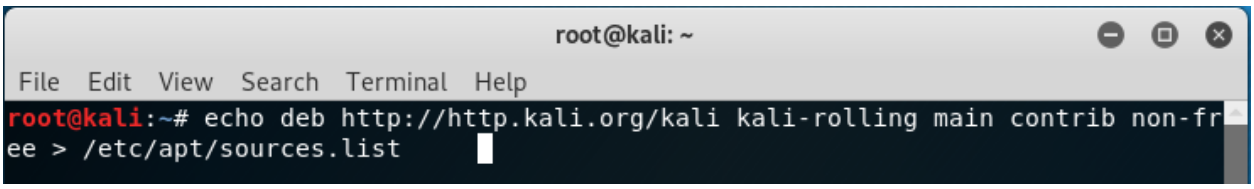
Kali can get squirrely from time to time when it comes to updating. Best thing to do is copy and paste the error or message into Google to search for a result.
Kali only wants you to use repositories that are signed and secured but that is not always going to be the case. See the following example:

```
E: The repository 'file:/media/cdrom0 kali-rolling Release' is not signed.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
```

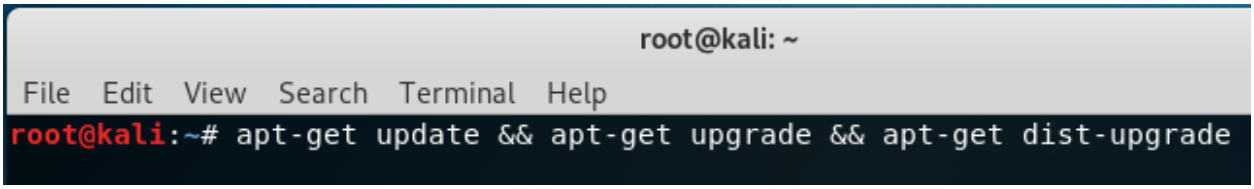
The repository for the file is not signed and secured. This could be for any number of files and not just the one shown in the image.

When this happens, open a terminal and type or copy and paste the following commands one at a time:

```
echo deb http://http.kali.org/kali kali-rolling main contrib
non-free > /etc/apt/sources.list
```

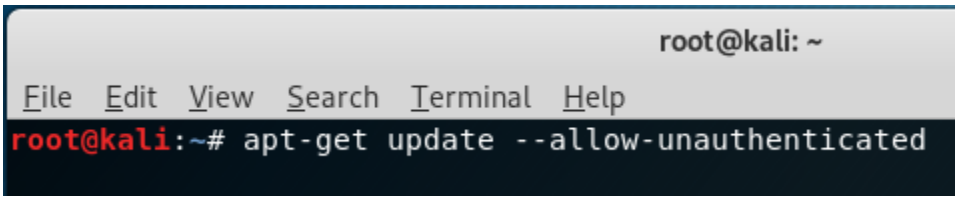



```
apt-get update && apt-get upgrade && apt-get dist-upgrade
```




To allow the update of unauthenticated packages:

```
apt-get update --allow-unauthenticated
```

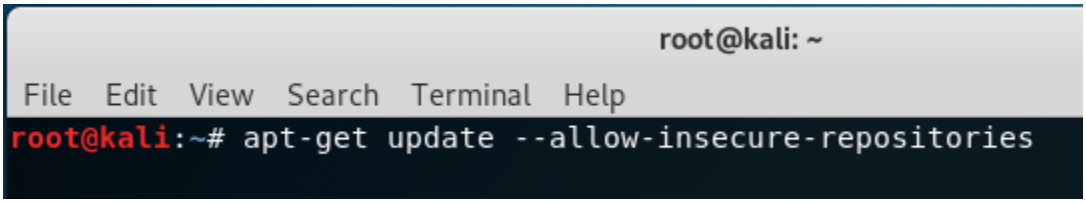



About this command:

> Ignore if packages can't be authenticated and don't prompt about it. This can be useful while working with local repositories, but is a huge security risk if data authenticity isn't ensured in another way by the user itself. The usage of the Trusted option for sources.list(5) entries should usually be preferred over this global override. Configuration Item: APT::Get::AllowUnauthenticated.

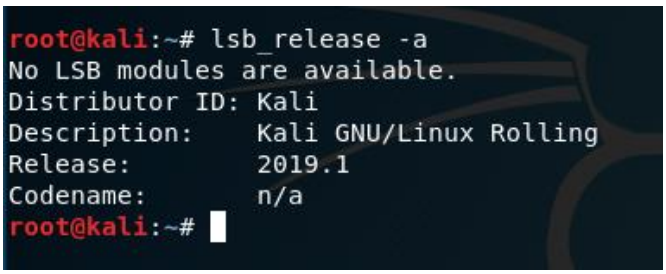
Here's another command you can try:

```
apt-get update --allow-insecure-repositories
```



Check your version of Kali:

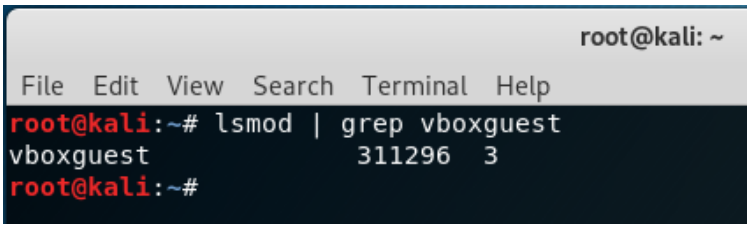
```
lsb_release -a
```




## Installing the VirtualBox Guest Additions

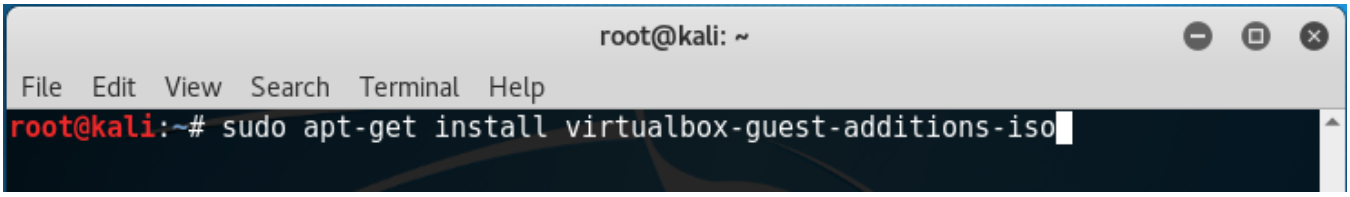
**Stop! The new builds of Kali come with the guest editions installed. To check to see if your Kali already has the VirtualBox guest editions installed, use the following command:**

```
lsmod | grep vboxguest
```



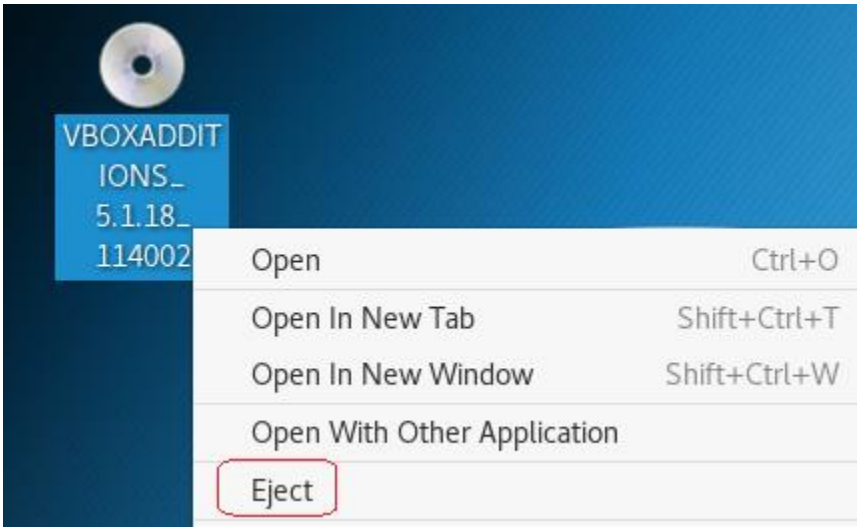

If the guest editions are installed, you should have full screen integration as well as the ability to share folders with the host system. If not, proceed on.

At the terminal, type:




Upon successful installation of the Guest Additions, restart the machine for the updates to take effect. Reboot and log in as root again. Once the system reboots, the simplest way to confirm that the Guest Additions have been successfully installed is to see if you can maximize the window for the guest system. You should now also have code completion in the terminal, among other things. You can now eject the Guest Additions virtual CD from the Virtual cd drive.

Right-click the disk icon on the Desktop and click eject.

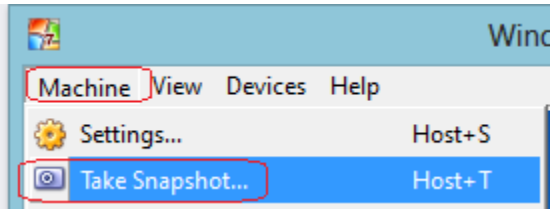



We now have a fully updated and fresh install of Kali. We have installed the VirtualBox Guest Additions, and so we should take a snapshot of the machine as a backup. This will save much time if we need to reinstall Kali.

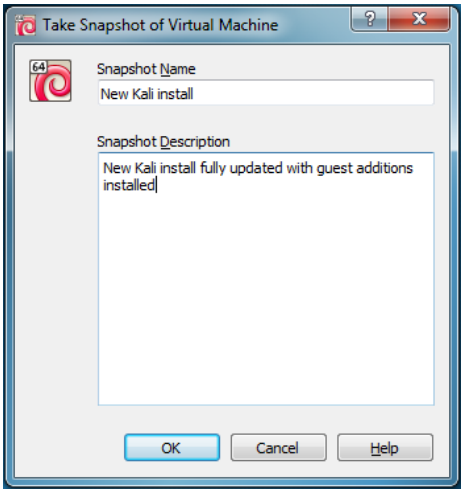
## Taking a Snapshot of Kali

The basic idea of a snapshot is you have set up your virtual machine exactly the way you want it. Once we take a snapshot, we can make any changes we want. If Kali becomes corrupted or we would like a fresh install, all you need to do is roll back the snapshot, and our virtual machine will be exactly how it was before when we took the snapshot.

With Kali up and running, from the taskbar, click on Machine and from the menu select Take a snapshot.




Give the Snapshot a user-friendly name.

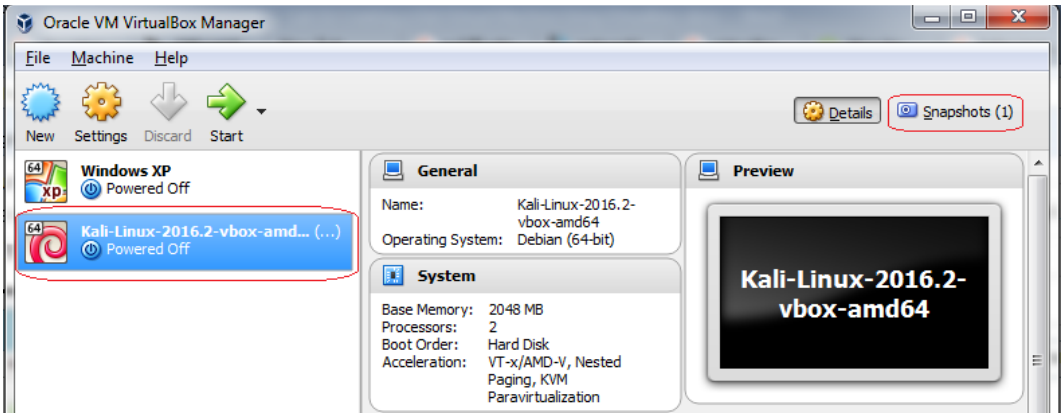



VirtualBox saves the machine state.

## Restore your machine state using Snapshot

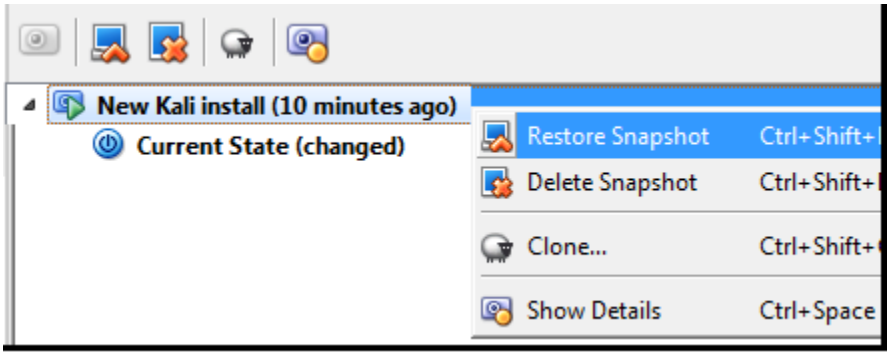
To restore using your newly created snapshot, shut Kali down (gracefully!)

From the VirtualBox management console, open the saved snapshot by going to the upper right corner and clicking on Snapshots (1).

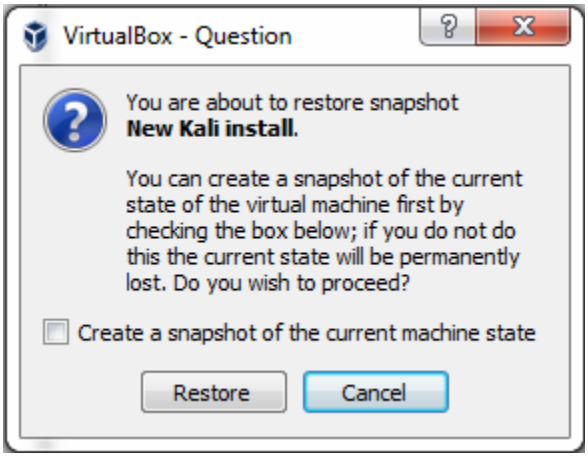



If the current state has changed and you feel comfortable making another snapshot, feel free to do so by right-clicking on Current state (changed) and selecting take snapshot.

To restore using a Snapshot




On the next window, uncheck the box to create a snapshot of the current state.




When you click on restore, the "Current State" will become the same as the snapshot you selected to restore to.

When you power on the virtual machine, you will see the virtual machine quickly reverting itself to its previous state.

## Switching to Bridged Networking

After the VM has shut down and you've taken your snapshot, open up the settings of your new virtual system and go to the Network menu. Unless you've already changed these settings, you should have network Adapter 1 enabled, and attached to NAT. Change the attachment to a bridged adapter. This will allow our guest to act as an independent host on our local network, rather than have its address translated by the host computer the virtualization software is running on.

### Networking for MAC users

For the most part windows users can use NAT to network but for MAC users, not so quick. First off, MAC will want a bridged connection so both the Windows XP and the MAC machine will probably have to use a bridged adapter.

Once you select Bridged adapter, click on Advanced and from the available adapters, select the PCnet-Fast III (Am79C973).

The PCNet FAST III is the default because nearly all operating systems support it out of the box, as well as the GNU GRUB boot manager. As an exception, the Intel PRO/1000 family adapters are chosen for some guest operating system types that no longer ship with drivers for the PCNet card, such as Windows Vista.

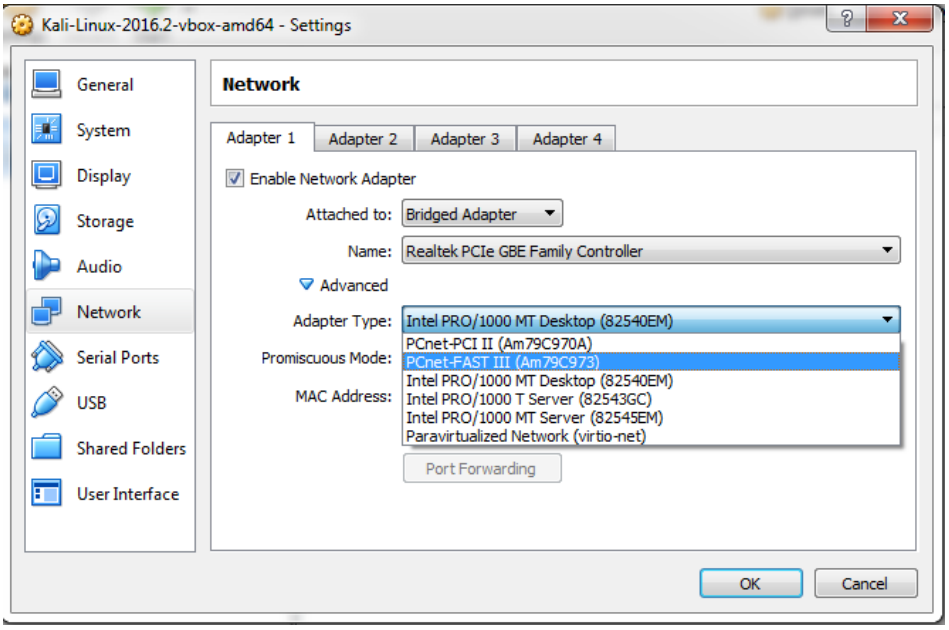
The Intel PRO/1000 MT Desktop type works with Windows Vista and later versions. The T Server variant of the Intel PRO/1000 card is recognized by Windows XP guests without additional driver installation. The MT Server variant facilitates OVF imports from other platforms.

Make sure both VM adapters are configured the same under the Attached to. Either bridged or NAT. From your XP machine, bring up a command prompt and check for an adapter and an IP address bound to it (IPCONIG).

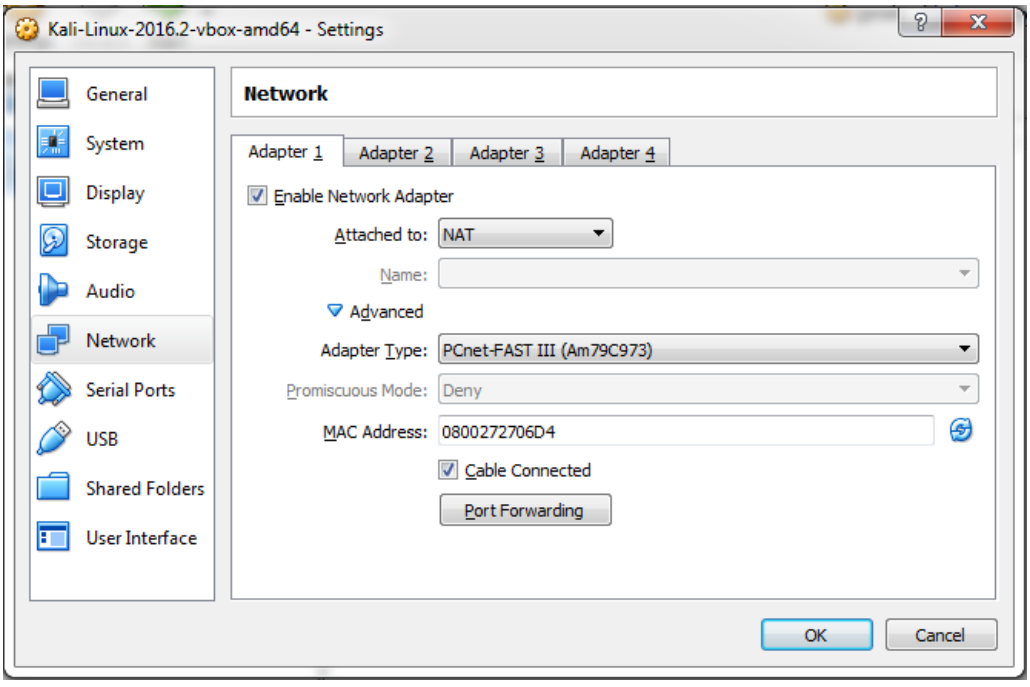
Do the same for your Kali VM using the terminal (ip addr or ifconfig). If both machines have an IP address bound to an adapter and the first three octets of the IP address are the same on both machines, you have a network. If you want XP and Kali to see you home or business network, switch both to bridged adapter. If the breaks the connection, switch them back.

You might have to play around with the virtual adapters to find one that works for either Kali or XP.

This is the network settings for the Kali.




If bridge networking does not work with Windows XP, switch both to NAT.




If switching to bridged adapter does not work, switch both back to NAT.

**End of the lab!**