Network Security Tutorials

Tutorial 01: Set Up a Pen Testing Environment

The purpose of the tutorials is to give students practical hands-on experience in network security auditing techniques. The focus will be on practical application of the concepts introduced in the lecture notes by learning how to use various tools related to network security auditing and penetration testing. Each tutorial will introduce a series of tools. An overview of the tools will be given with a brief step-by-step guide on how to use them.

The purpose of the current tutorial (#1) is to present the pentetsing environment setup.

Installing Kali Linux

Kali Linux is a Debian-derived Linux distribution designed for penetration testing and digital forensics.
It is maintained and funded by Offensive Security Ltd. It was developed by Mati Aharoni and Devon Kearns of Offensive Security through the rewrite of BackTrack. The third core developer Raphaël Hertzog joined them as a Debian expert.

The majority of the attack tools are open source and free; likewise, they are not always well supported, and sometimes they are difficult to install. Fortunately, there are pre-packaged LiveCDs and VM images which contain several of the needed tools. Using such packages, instead of building a server from scratch, allows saving time, in particular, if hacking attempts crash the system. Using these packages, we can quickly reboot the system or VM, and restore the server back to its original state.
For this course, we will use the Kali platform. Kali is a Linux distribution containing various penetration test tools already deployed and can be obtained (freely). Kali is a kind of one-stop-shop providing all the tools needed to execute various types of security assessment.
You can run Kali as a VM from a regular Windows or Linux partition or as a separate boot on its own.
The goal of this tutorial is to assist you in installing Kali and start getting familiar with the Kali environment. Kali works primarily like a regular Linux distribution from which you can perform any type of computing tasks, e.g., word processing, web browsing, etc.

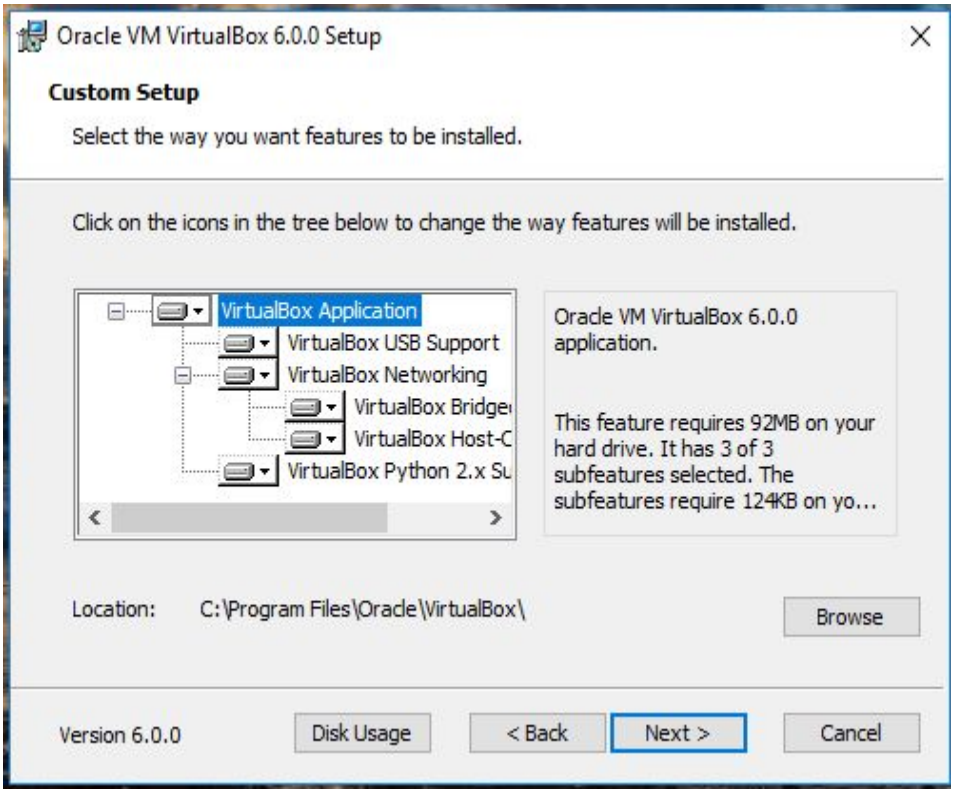
In this tutorial, we will create a virtual machine and install on it Kali Linux.

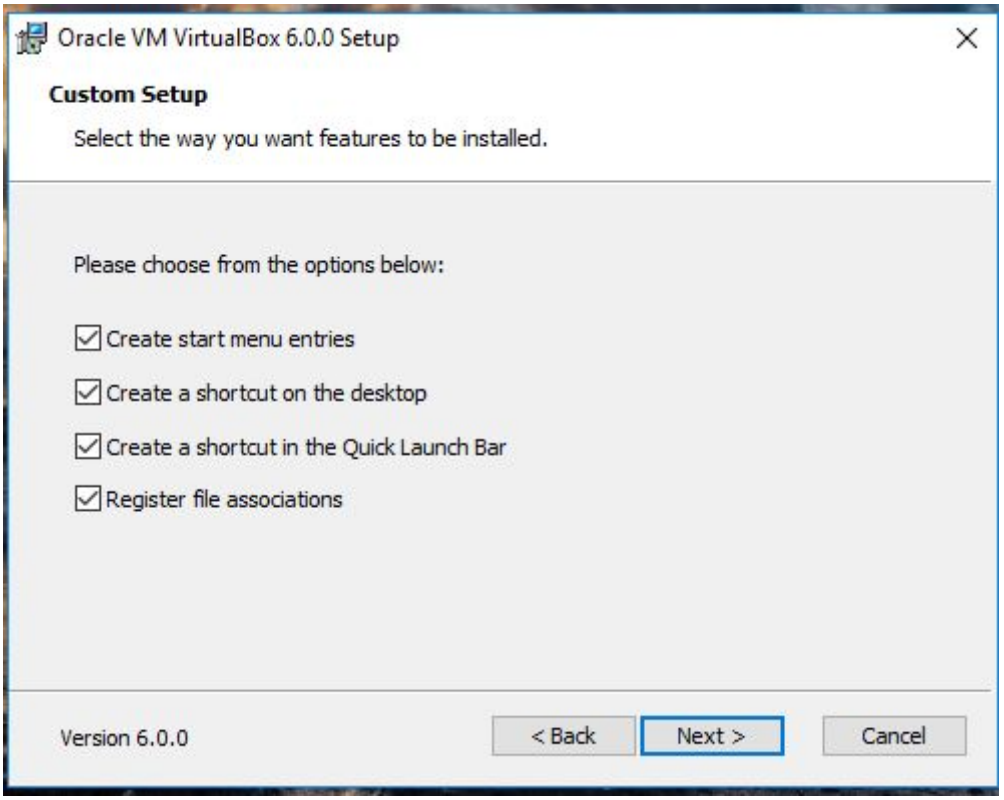
What you will need?

1. A machine running Windows, Mac, or Linux with 8GB of RAM and Harddrive with 60GB free space. Minimum 4 GB RAM and 30 GB free space
2. Virtualization software (VBox, VMware, etc)
3. High Speed network connection

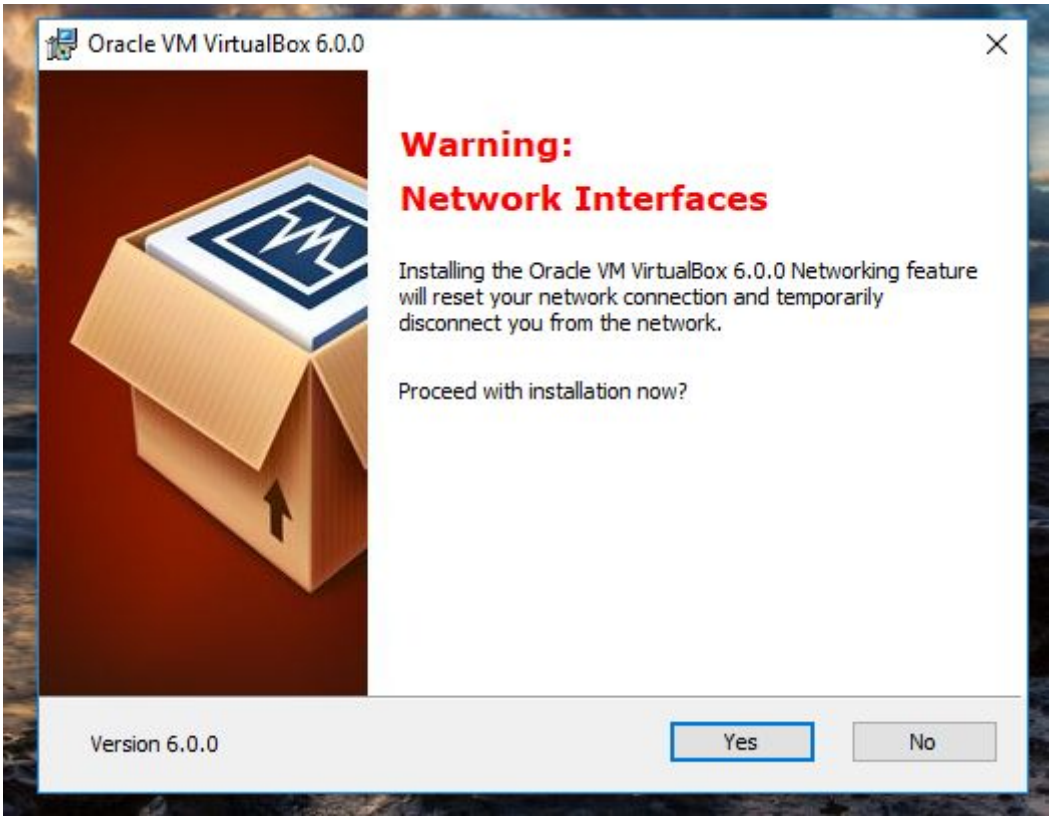
Instructions

1. Please go to https://www.virtualbox.org/ and download the most recent stable version of VirtualBox (e.g version 6.0)
2. Install VirtualBox by executing the binary/exe you downloaded in step 1 by following the same settings and configuration in the following screenshots

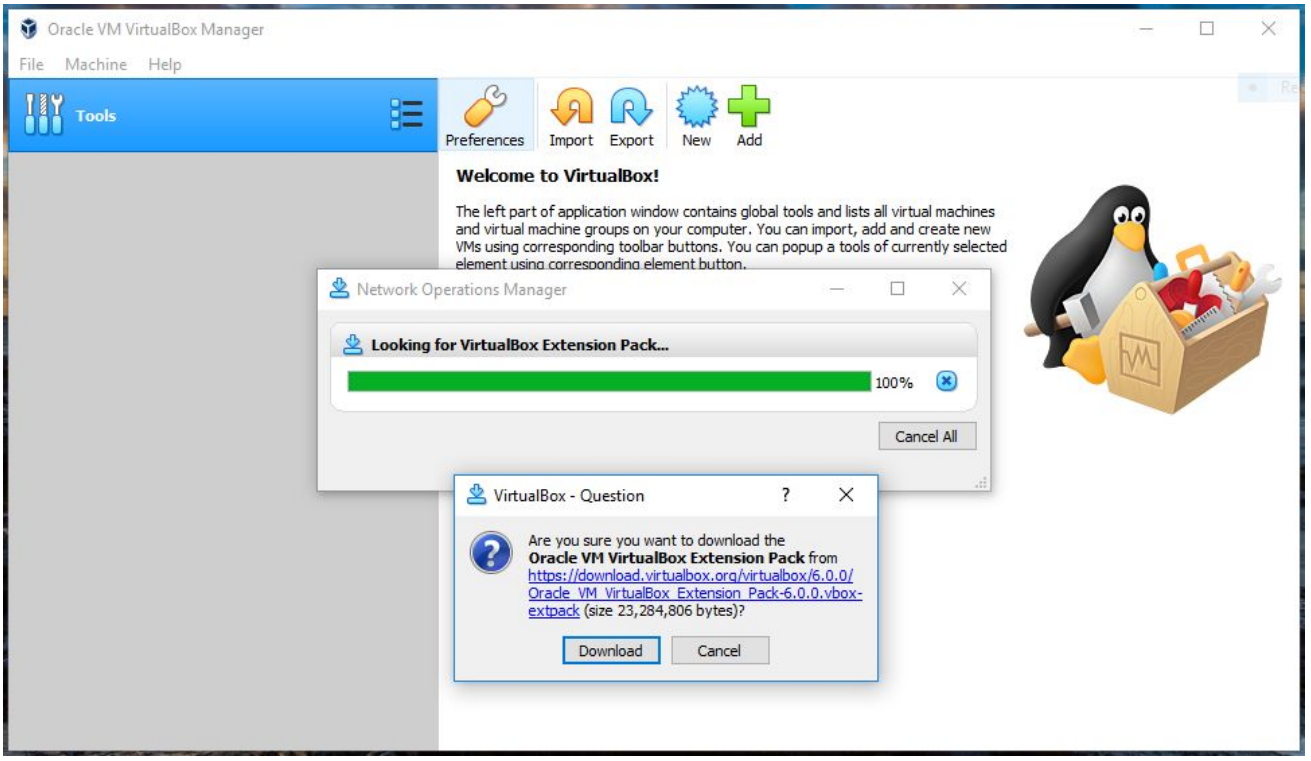

Oracle VM VirtualBox 6.0.0 Setup
Custom Setup
Select the way you want features to be installed.
Click on the icons in the tree below to change the way features will be installed.
VirtualBox Application
VirtualBox USB Support
VirtualBox Networking
VirtualBox Bridge
VirtualBox Host-C
VirtualBox Python 2.x Su
Oracle VM VirtualBox 6.0.0 application.
This feature requires 92MB on your hard drive. It has 3 of 3 subfeatures selected. The subfeatures require 124KB on yo...
Location: C:\Program Files\Oracle\VirtualBox\
Browse
Version 6.0.0
Disk Usage
< Back
Next >
Cancel

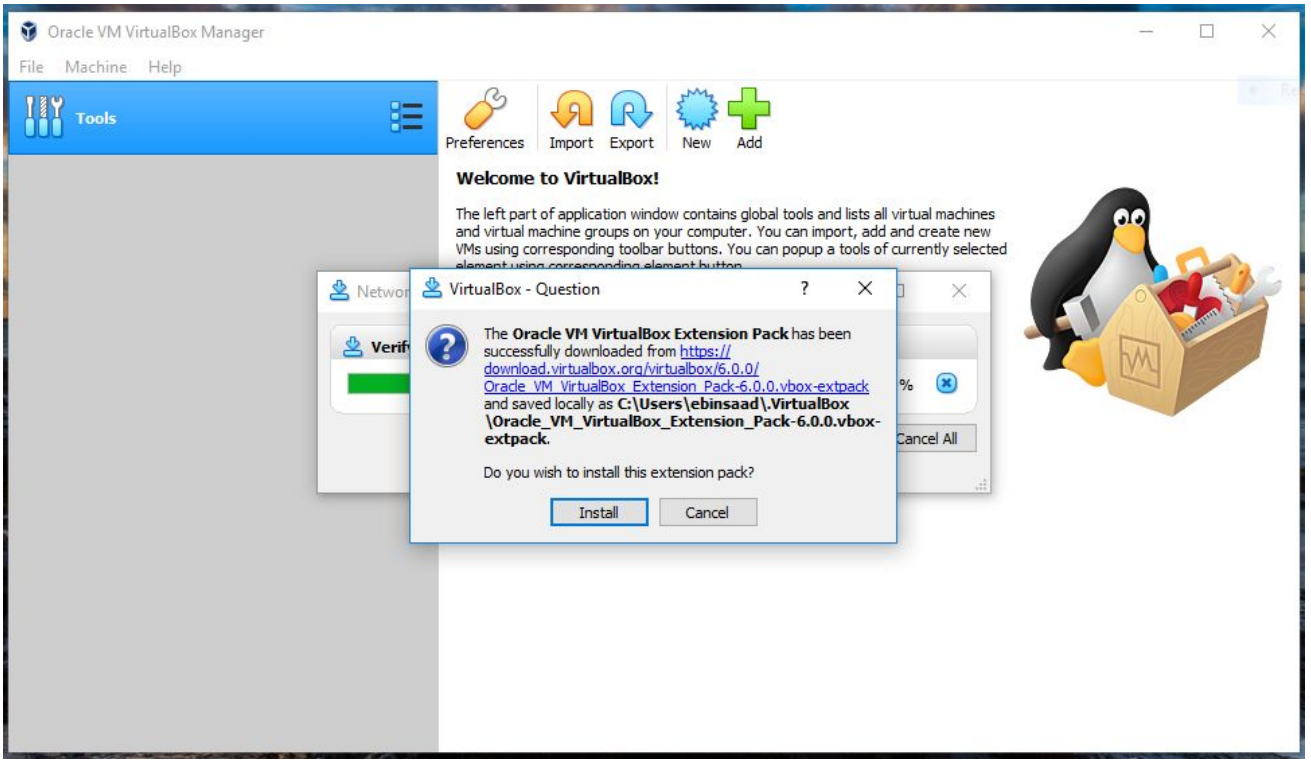

Oracle VM VirtualBox 6.0.0 Setup
Custom Setup
Select the way you want features to be installed.
Please choose from the options below:
Create start menu entries
Create a shortcut on the desktop
Create a shortcut in the Quick Launch Bar
Register file associations
Version 6.0.0
< Back
Next >
Cancel

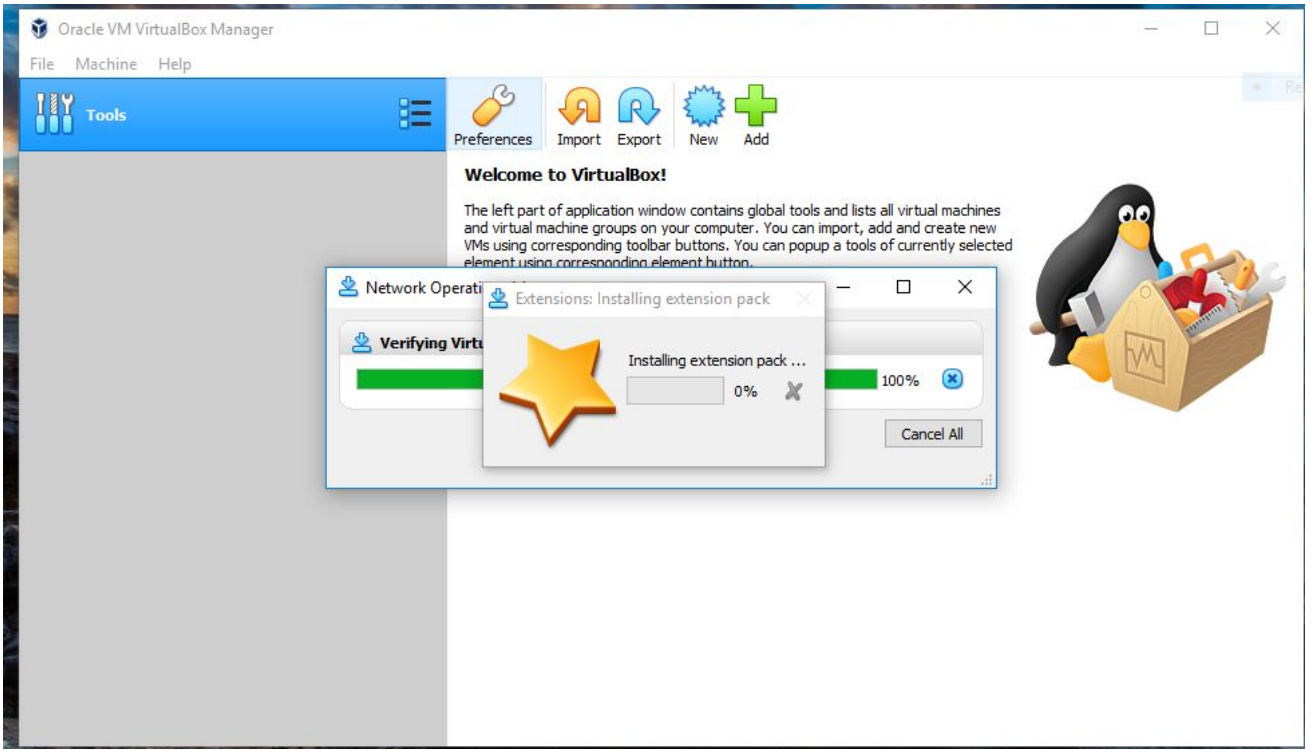
3. Select **Yes** for installing additional network interfaces, and complete the installation



4. Also it is recommend to install the VirtualBox extension package, as shown in the next screenshots



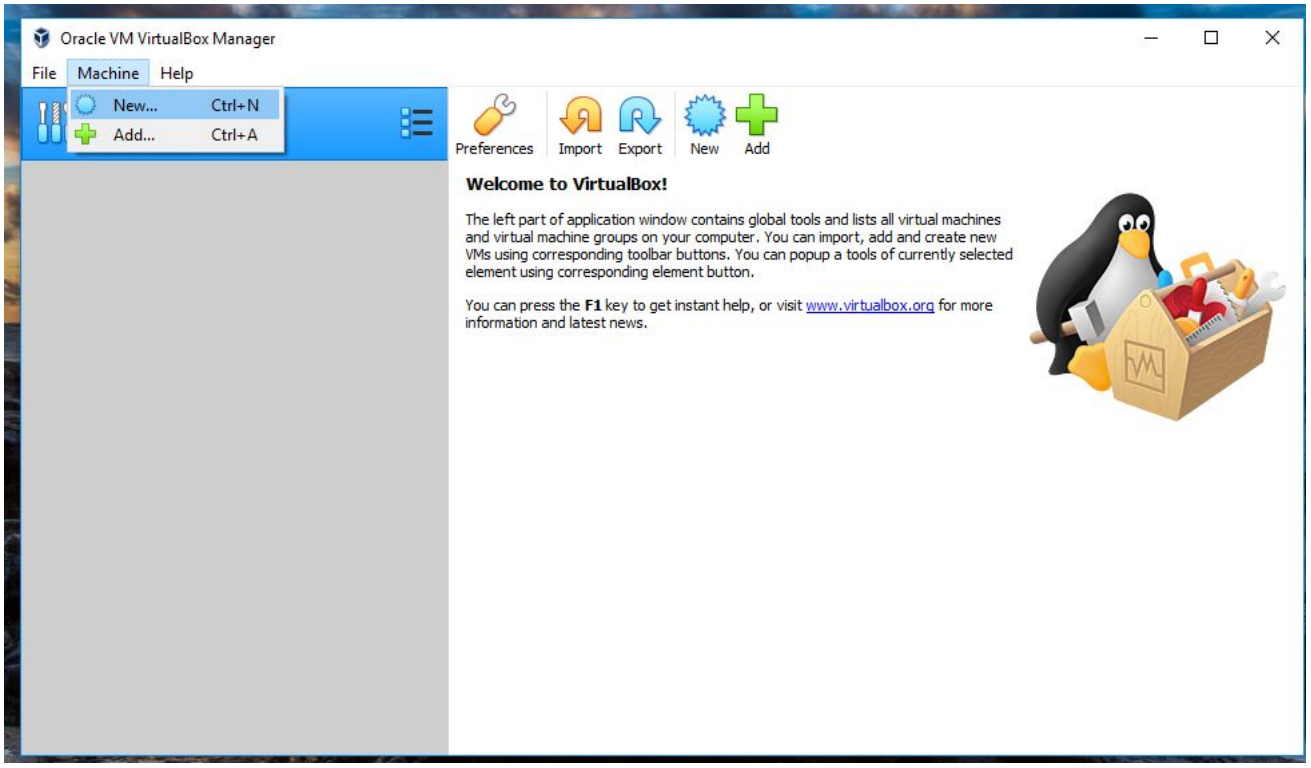


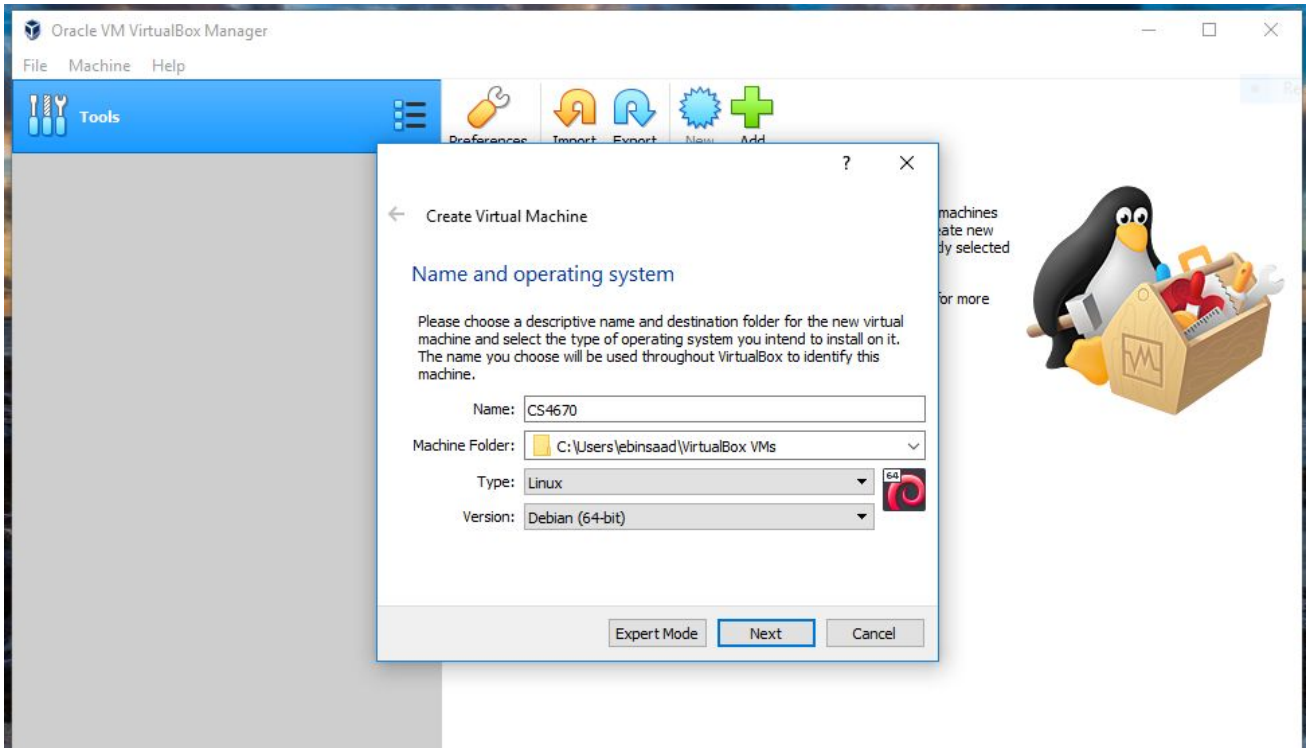


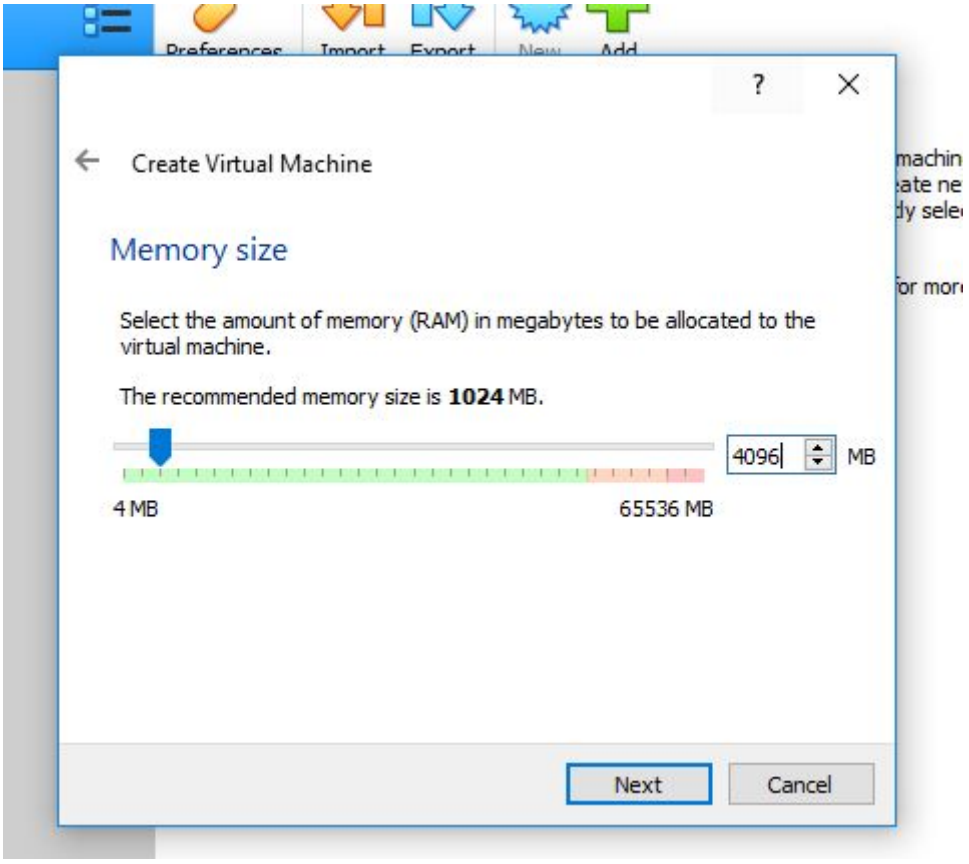
5. Now you have the virtualization software installed and ready, the next step is to download and install Kali Linux. You can download it from https://www.kali.org/downloads/ Please make sure to download the version that matches your CPU architecture. Most likely 64 bits. Download the complete version Kali Linux 2018.4. The iso file size is 3.0GB http://cdimage.kali.org/kali-2018.4/kali-linux-2018.4-amd64.iso

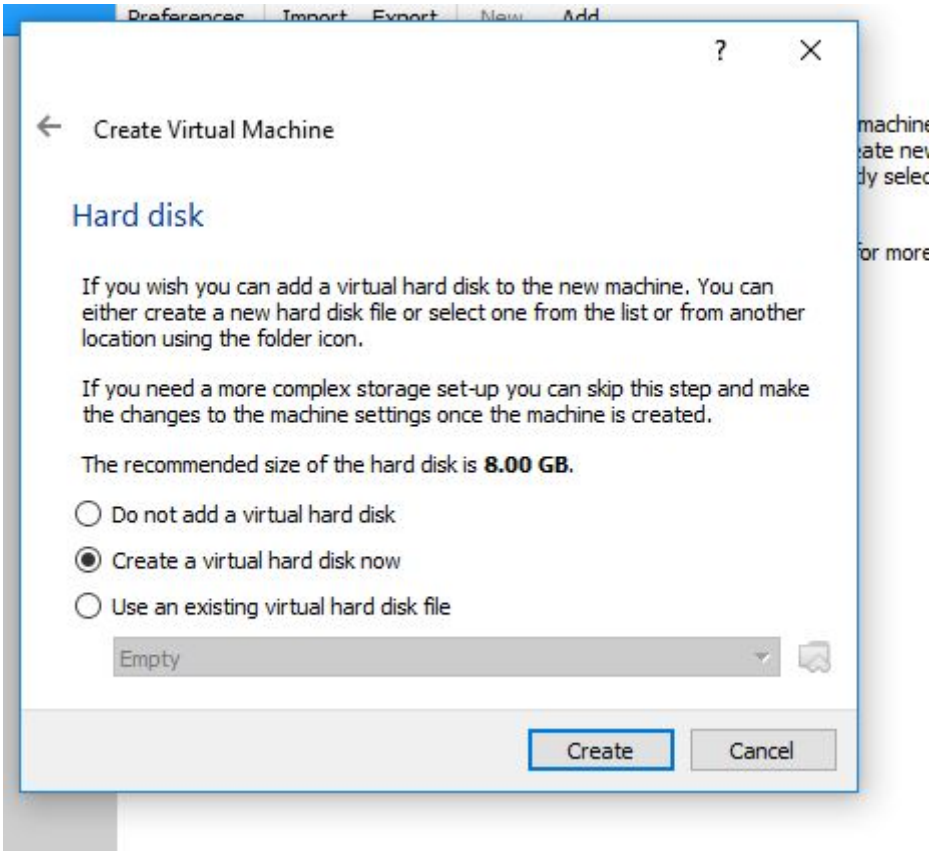
Kali Linux 64 Bit	HTTP | Torrent	3.0G	2018.4	7c65d6a319448efe4ee1be5b5a93d48ef30687d4e3f507896b46b9c2226a0ed0

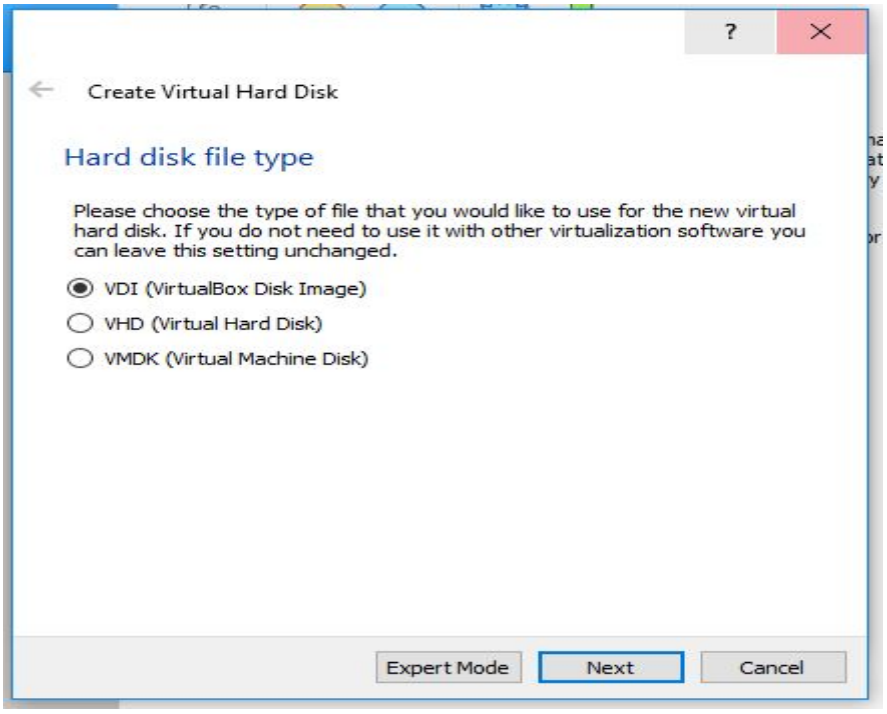
6. Start VirtualBox and create a new virtual machine by following the next screenshots

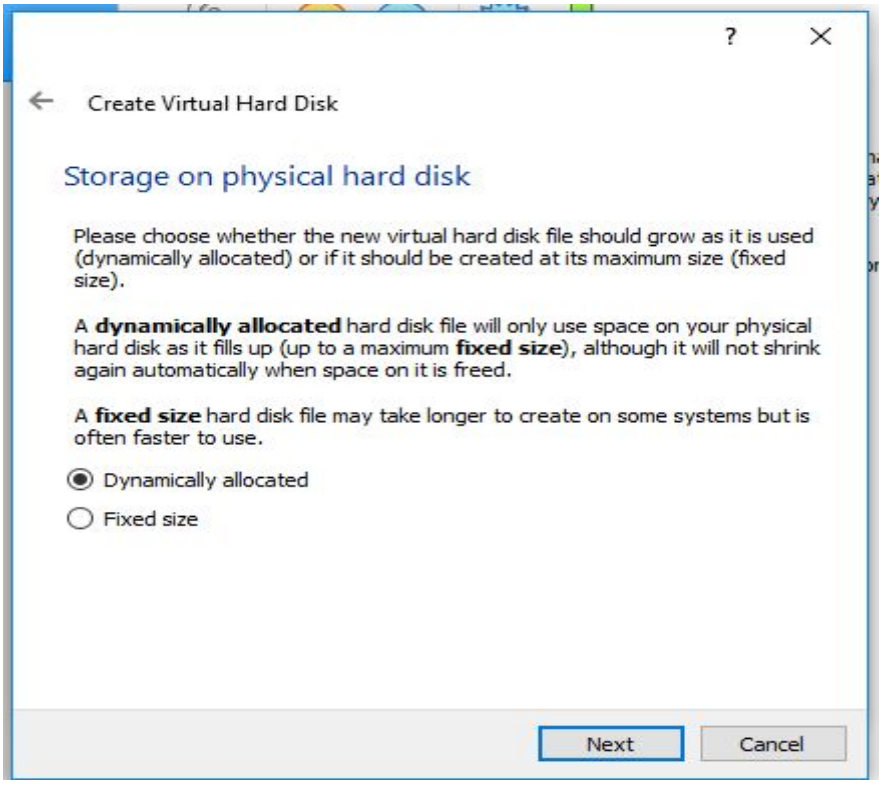

Oracle VM VirtualBox Manager
File
Machine
Help
New... Ctrl+N
Add... Ctrl+A
Preferences
Import
Export
New
Add
Welcome to VirtualBox!
The left part of application window contains global tools and lists all virtual machines and virtual machine groups on your computer. You can import, add and create new VMs using corresponding toolbar buttons. You can popup a tools of currently selected element using corresponding element button.
You can press the F1 key to get instant help, or visit www.virtualbox.org for more information and latest news.

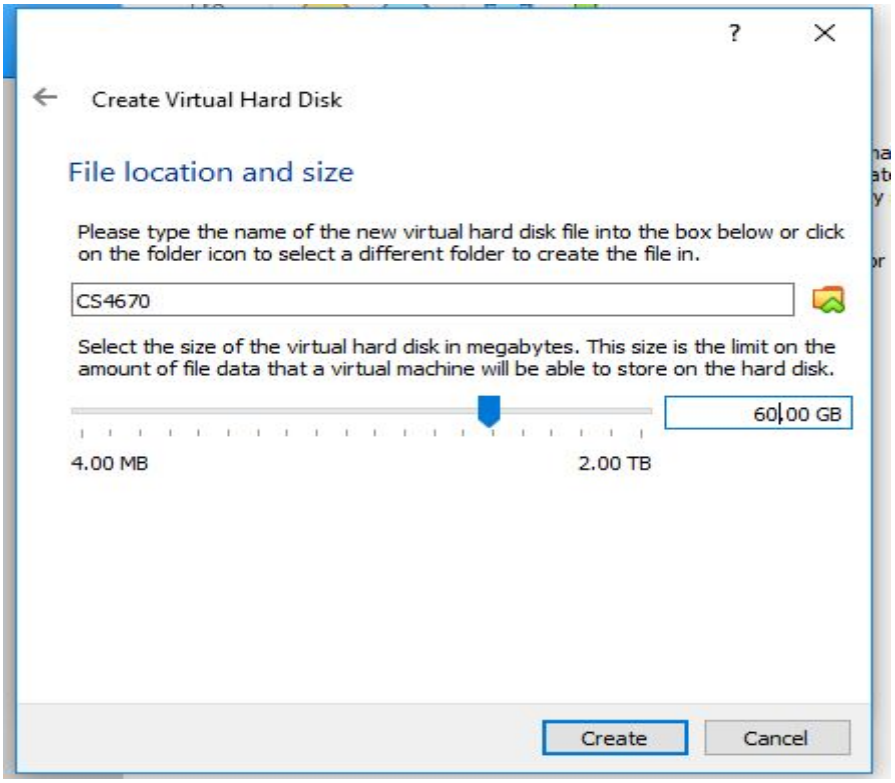

Oracle VM VirtualBox Manager
File
Machine
Help
Tools
Create Virtual Machine
Name and operating system
Please choose a descriptive name and destination folder for the new virtual machine and select the type of operating system you intend to install on it. The name you choose will be used throughout VirtualBox to identify this machine.
Name: CS4670
Machine Folder: C:\Users\ebinsaad\VirtualBox VMs
Type: Linux
Version: Debian (64-bit)
Expert Mode
Next
Cancel


Preferences
Import
Export
New
Add
Create Virtual Machine
Memory size
Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.
The recommended memory size is 1024 MB.
4096
MB
4 MB
65536 MB
Next
Cancel

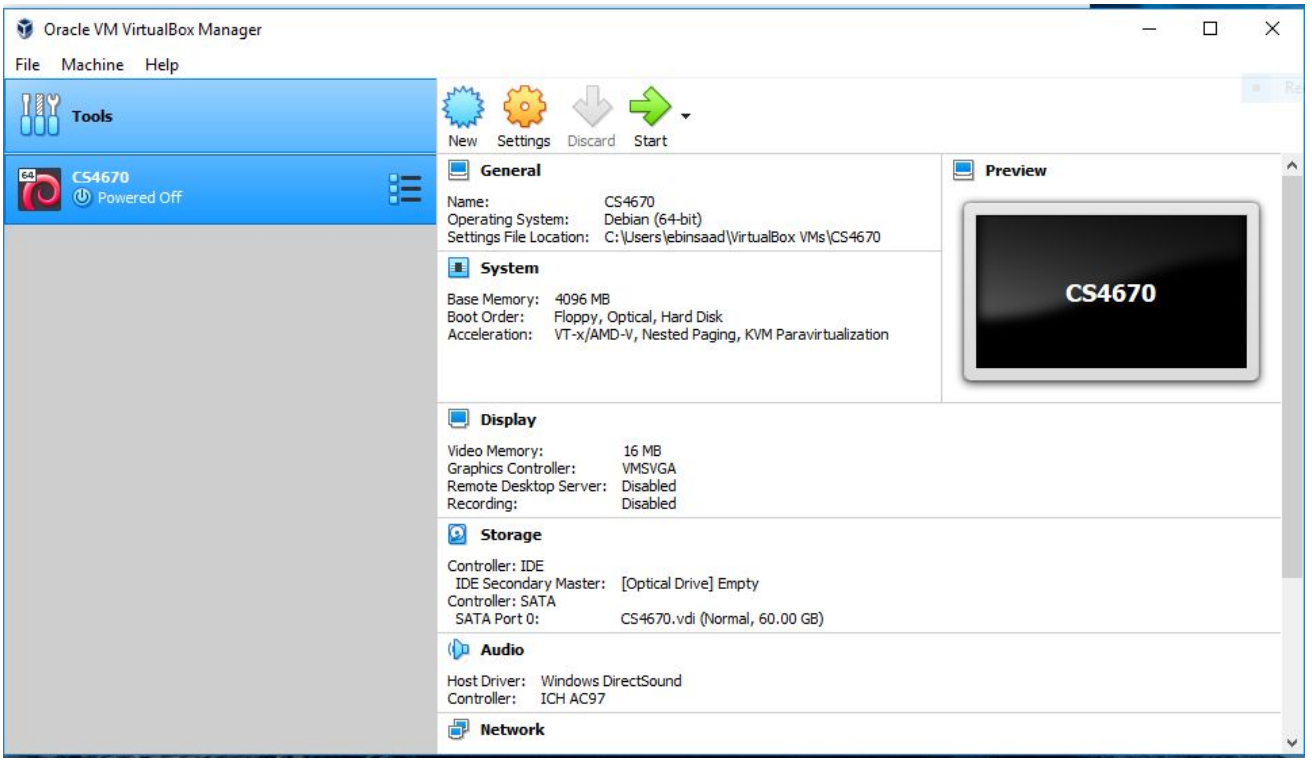

Preferences
Import
Export
New
Add
Create Virtual Machine
Hard disk
If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select one from the list or from another location using the folder icon.
If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.
The recommended size of the hard disk is 8.00 GB.
Do not add a virtual hard disk
Create a virtual hard disk now
Use an existing virtual hard disk file
Empty
Create
Cancel


Create Virtual Hard Disk
Hard disk file type
Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.
VDI (VirtualBox Disk Image)
VHD (Virtual Hard Disk)
VMDK (Virtual Machine Disk)
Expert Mode
Next
Cancel


Create Virtual Hard Disk
Storage on physical hard disk
Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).
A dynamically allocated hard disk file will only use space on your physical hard disk as it fills up (up to a maximum fixed size), although it will not shrink again automatically when space on it is freed.
A fixed size hard disk file may take longer to create on some systems but is often faster to use.
Dynamically allocated
Fixed size
Next
Cancel

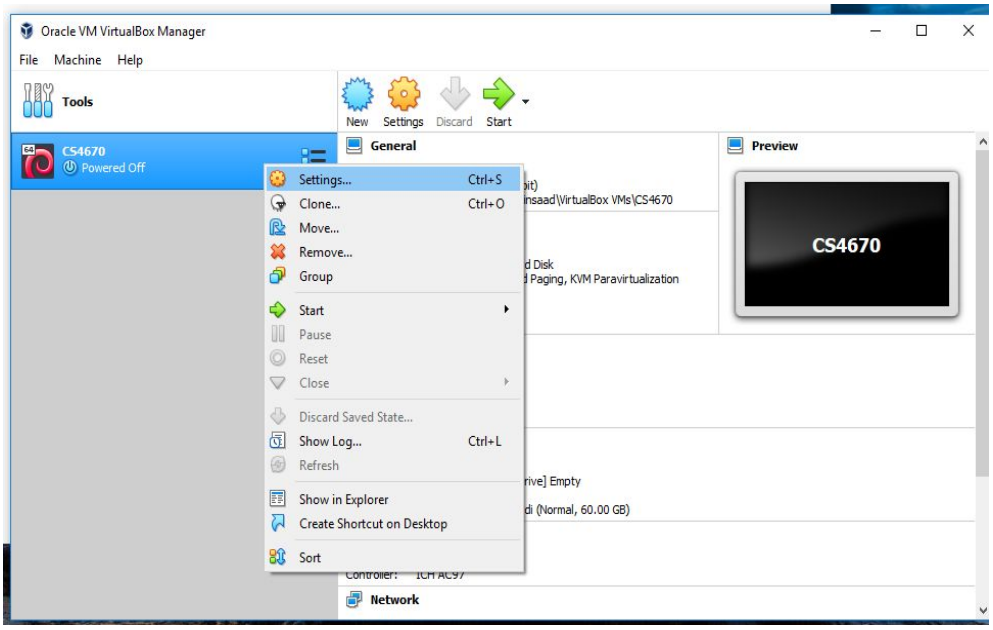


7. By completing the above steps. You have created a virtual machine with 4GB RAM and 60GB hard drive. The machine supports a guest OS of type Debian Linux

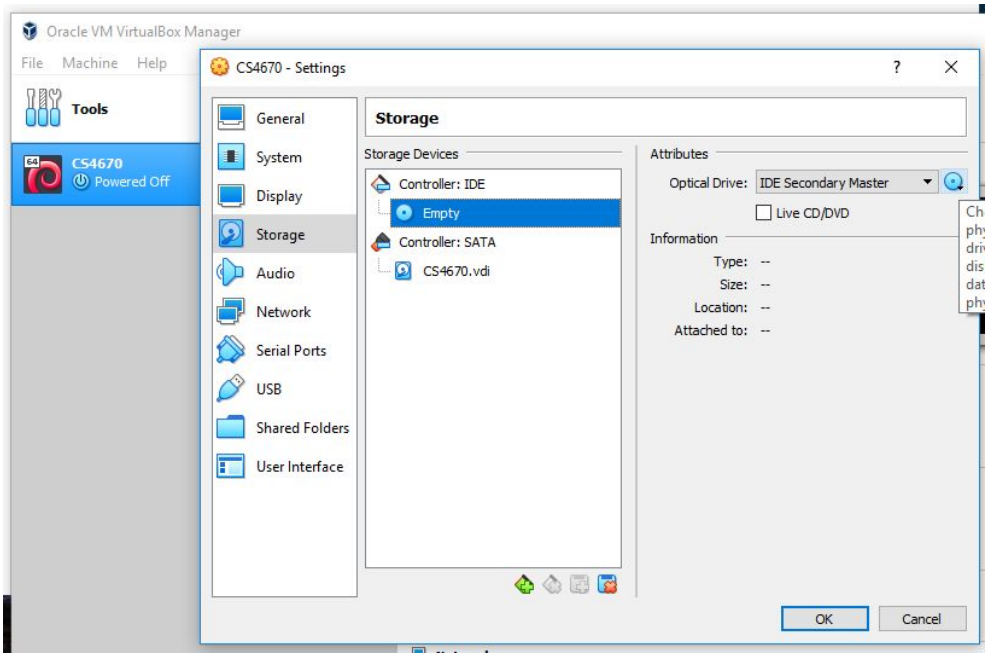


8. The next step is to install the Kali Linux on the virtual machine you have create in the previous steps. To do that please follows the instruction in the next screenshots

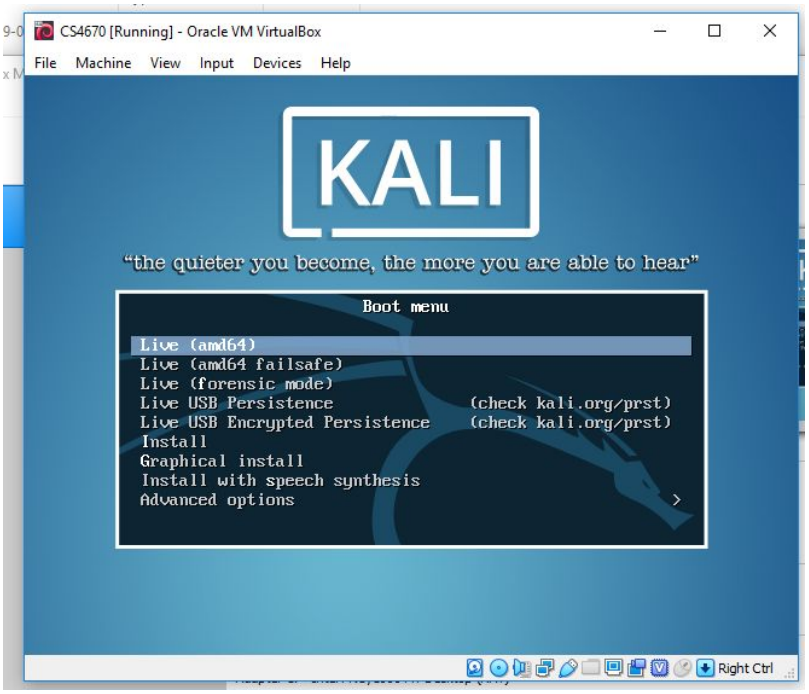
9. Select the new virtual machine and right-click to show the popup menu. From this menu select the settings option



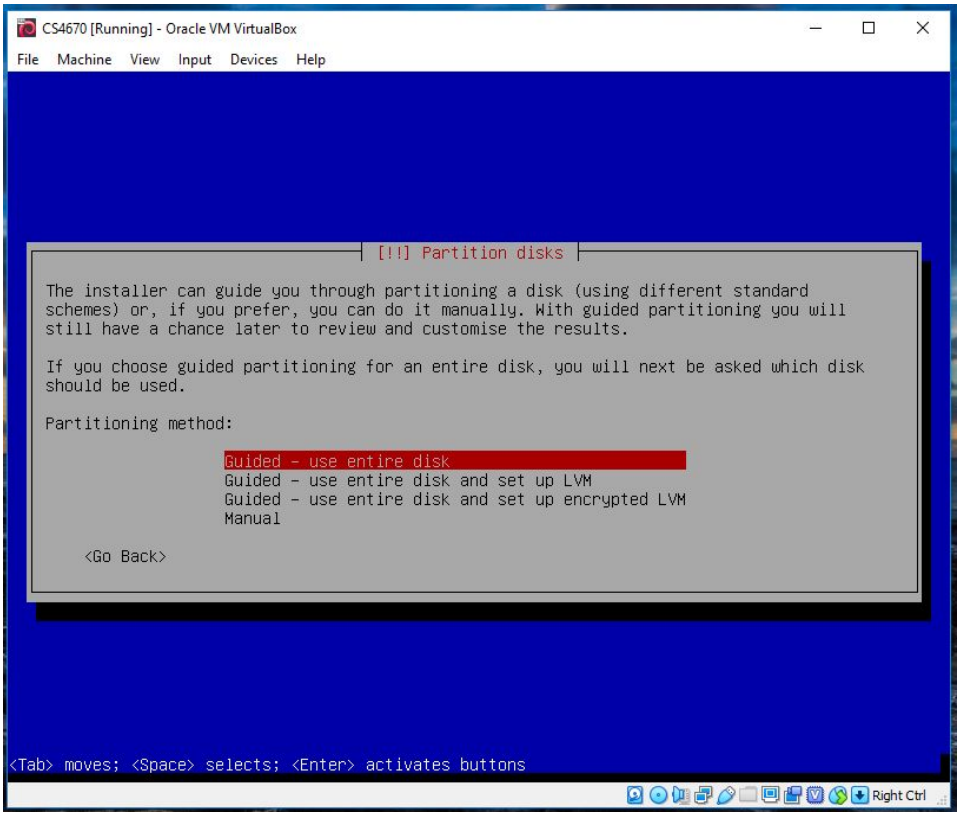
10. From the settings window, select storage and then select the Control IDE. Click on the CD/DV icon beside the dropdown menu “Optical Drive”. The select the Kali Linux iso file you downloaded in the previous steps and press the OK button

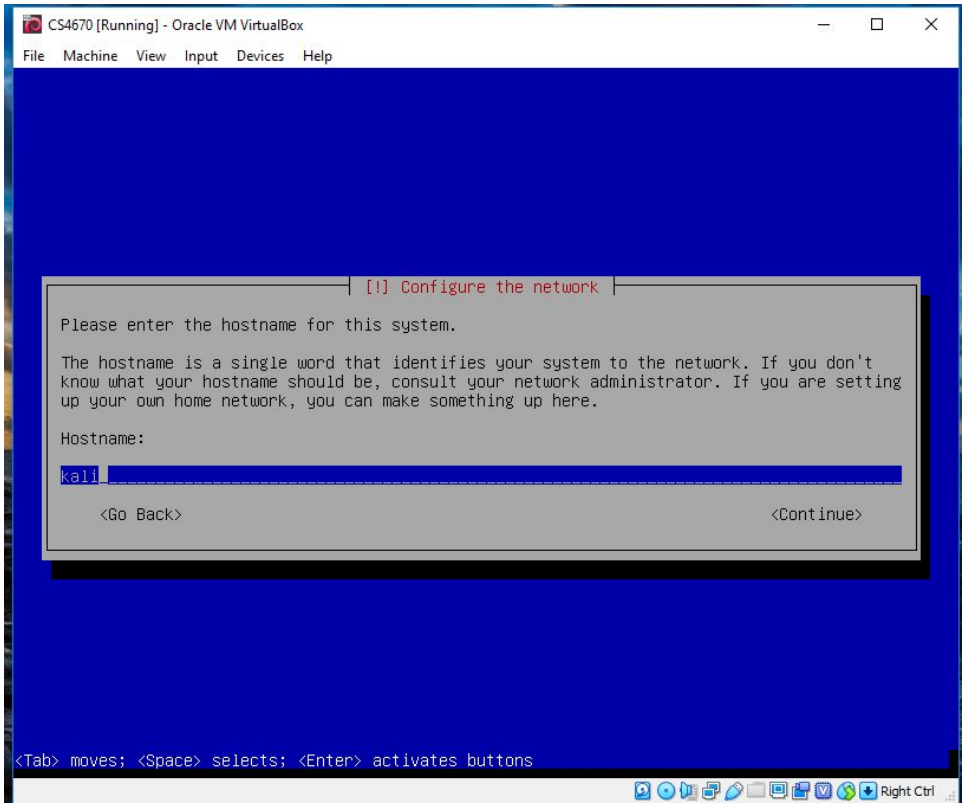


11. Now start the virtual machine by double click on the machine or click on the “Start” button. The machine will start and you should see Kali Linux Boot menu, as shown below. Select the **Install** option and hit “Enter”

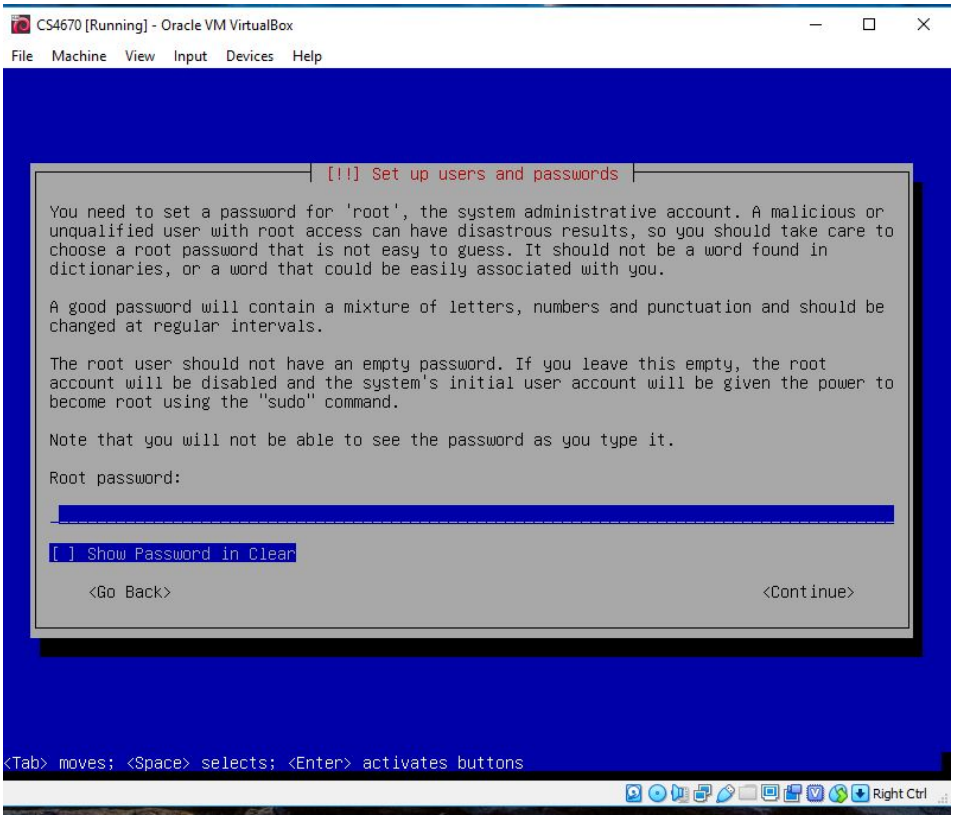


12. Follow the installation instructions and complete the installation. Make sure to select an easy to remember root password and write down if required. Note in an actual pentesting production environment you need to select a strong password and never write it down. But for the purpose of the tutorials, it is OK to select an easy to remember password even if it is not strong.





13. In the next screen you will Select the root password for the root account. Make sure to memorize this password.



14. When the installation is complete restart the virtual machine and log in using the root password you have selected during the installation. If everything worked as expected you should see the Kali Linux desktop after you logged in as shown in the following screenshot

END OF TUTORIAL 01