Terna Engineering College
Computer Engineering Department
Program: Sem VIII

Course: Cloud Computing Lab (CSL803)

Faculty: Reshma Koli

Experiment No. 2B

A.1 Aim: Implement Virtualization using VirtualBox.

PART B
(PART B: TO BE COMPLETED BY STUDENTS)

Roll No. 50	**Name:** AMEY MAHENDRA THAKUR
Class: BE COMPS B 50	**Batch:** B3
Date of Experiment: 24-01-2022	**Date of Submission:** 24-01-2022
Grade:	

B.1 Question of Curiosity:
Q1: Write down steps to install Virtual Box (with appropriate screen shot).
ANS:

Step 1:

- Open the VirtualBox website. Go to https://www.virtualbox.org/wiki/Downloads in your computer's Internet browser. This is the website from which you'll download the VirtualBox setup file.

Step 2:

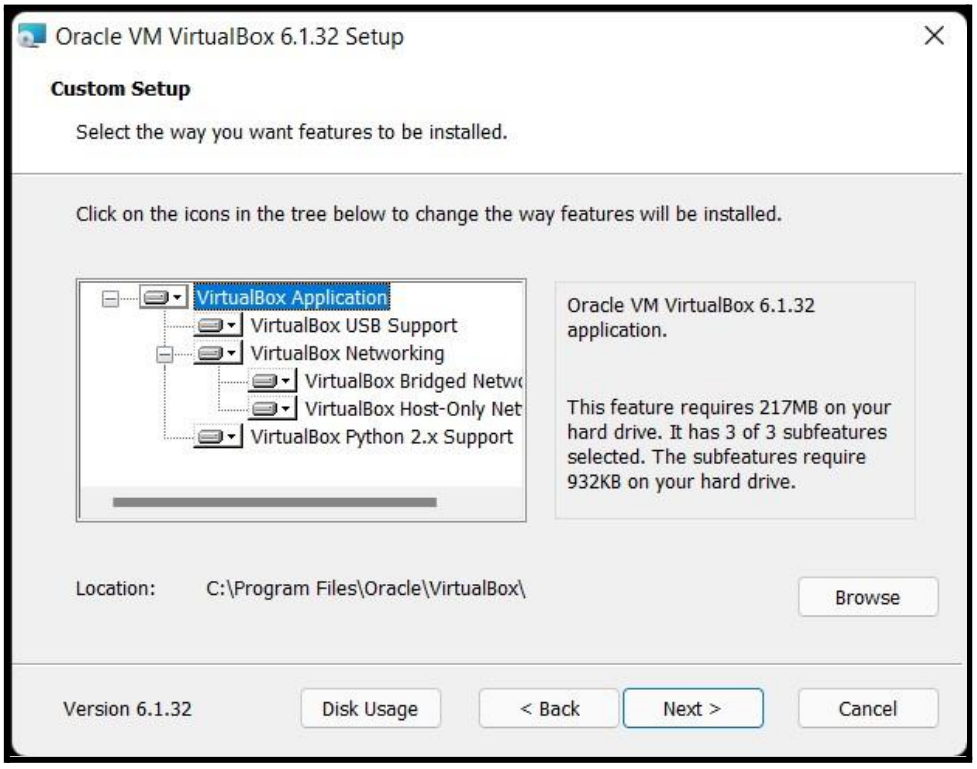
- Click Download VirtualBox. Doing so will open the downloads page.

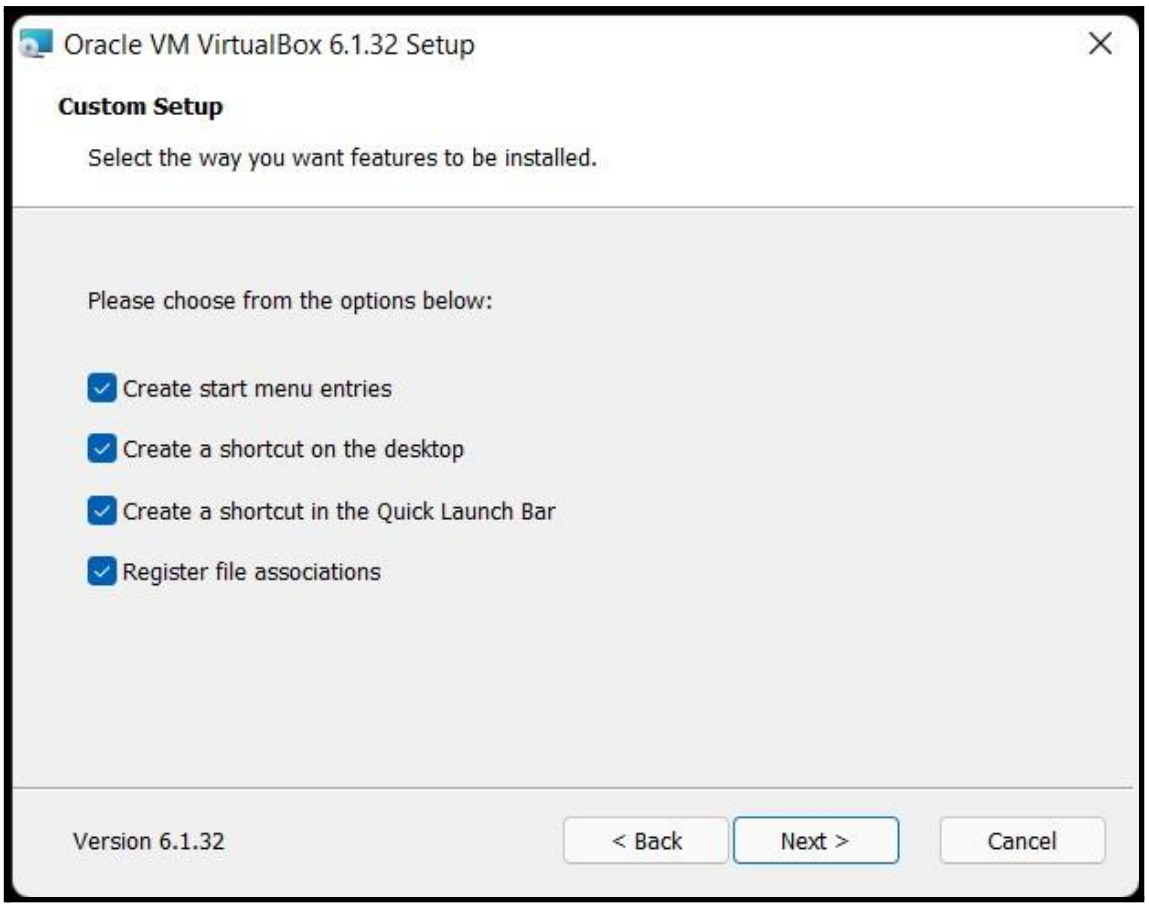
Step 3:

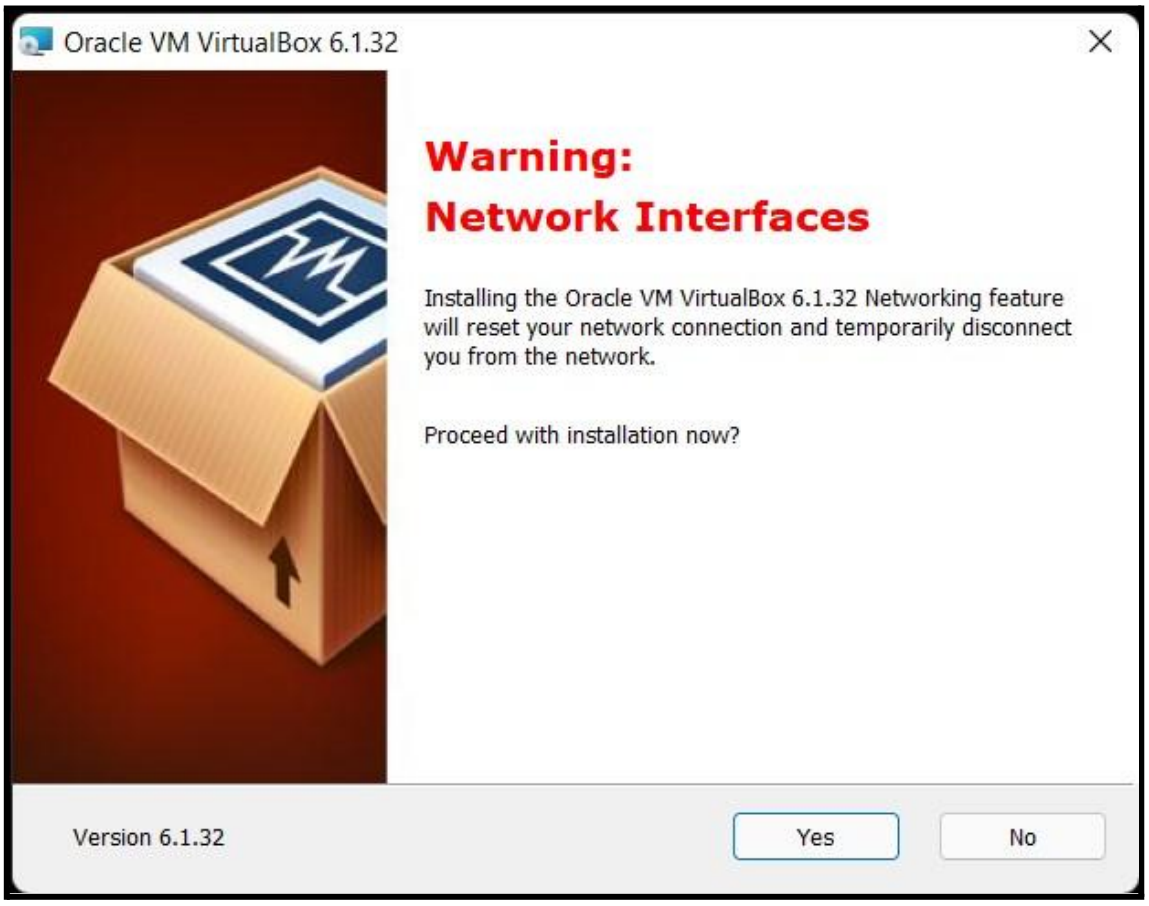
- Open the VirtualBox EXE file. Go to the location to which the EXE file downloaded and double-click the file. Doing so will open the VirtualBox installation window.

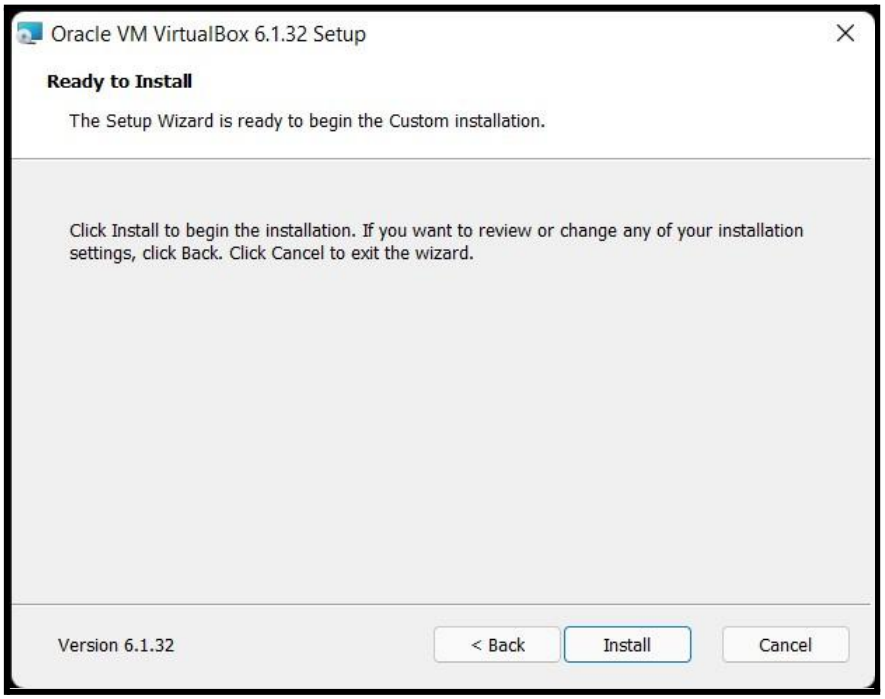
Step 4:

- Navigate through the installation prompts. Do the following:
  - ➔ Click Next on the first three pages.
  - ➔ Click Yes when prompted.
  - ➔ Click Install.
  - ➔ Click Yes when prompted.




Oracle VM VirtualBox 6.1.32 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 6.1.32
< Back
Next >
Cancel


Oracle VM VirtualBox 6.1.32
Warning:
Network Interfaces
Installing the Oracle VM VirtualBox 6.1.32 Networking feature will reset your network connection and temporarily disconnect you from the network.
Proceed with installation now?
Version 6.1.32
Yes
No



Step 5:

- Click Finish when prompted. It's in the lower-right side of the window. Doing so will close the installation window and open VirtualBox. Now that you've installed and opened VirtualBox, you can create a virtual machine in order to run any operating system on your PC.
- Make sure that you don't uncheck the "Start" box before doing this.

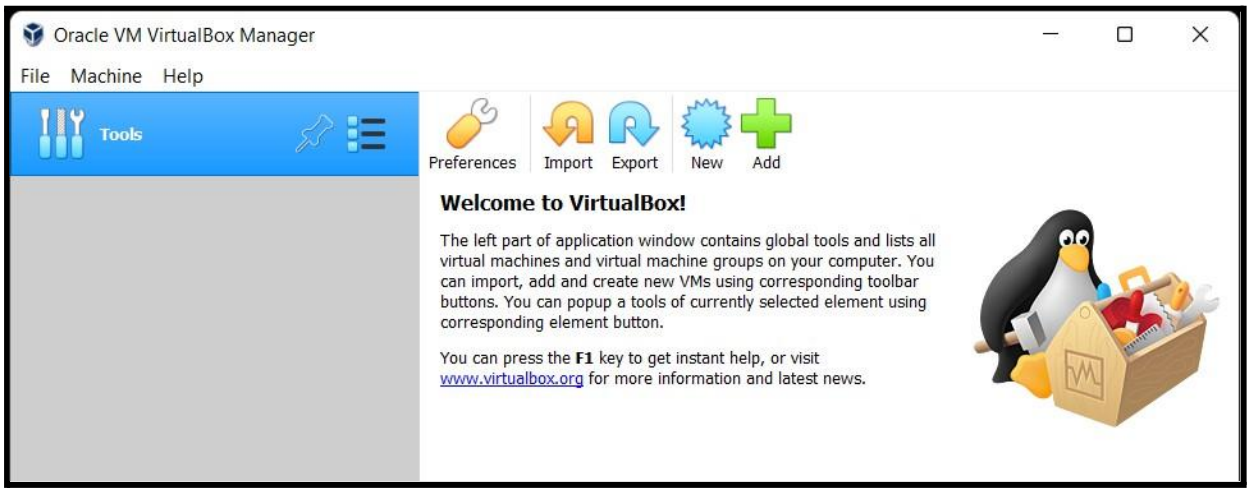
Q2: Write down steps to create virtual machines (with appropriate screen shot).
ANS:

Step 1:

- Gather your installation disc(s) or files. When creating a virtual machine, you will need to install the operating system just like you would on a regular computer. This means that you will need the installation disc(s) for the operating system you want to install on the virtual machine.
- You can also install an operating system by using its ISO file.

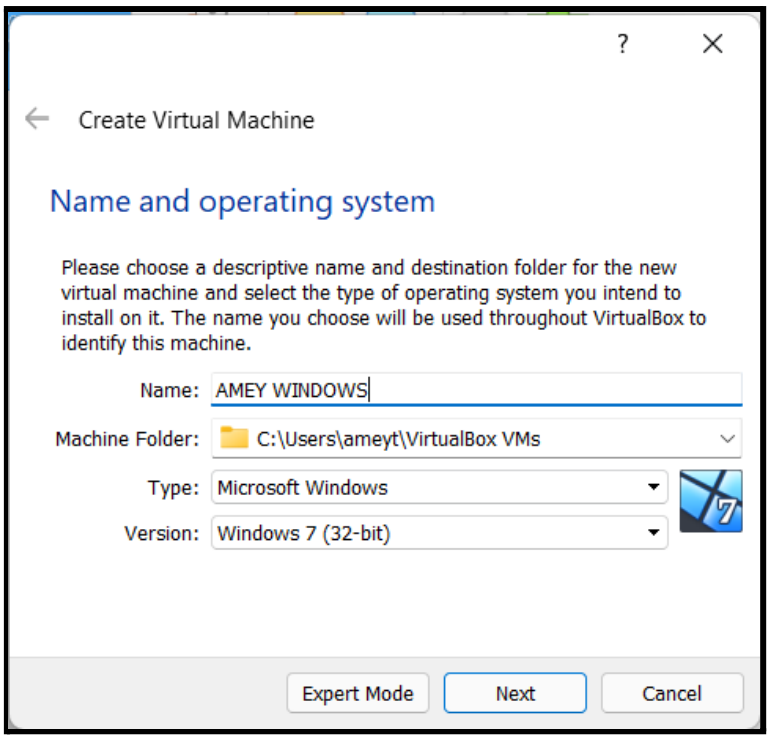
Step 2:

- Click New. This will open the wizard that will guide you through the process to create your first virtual machine.



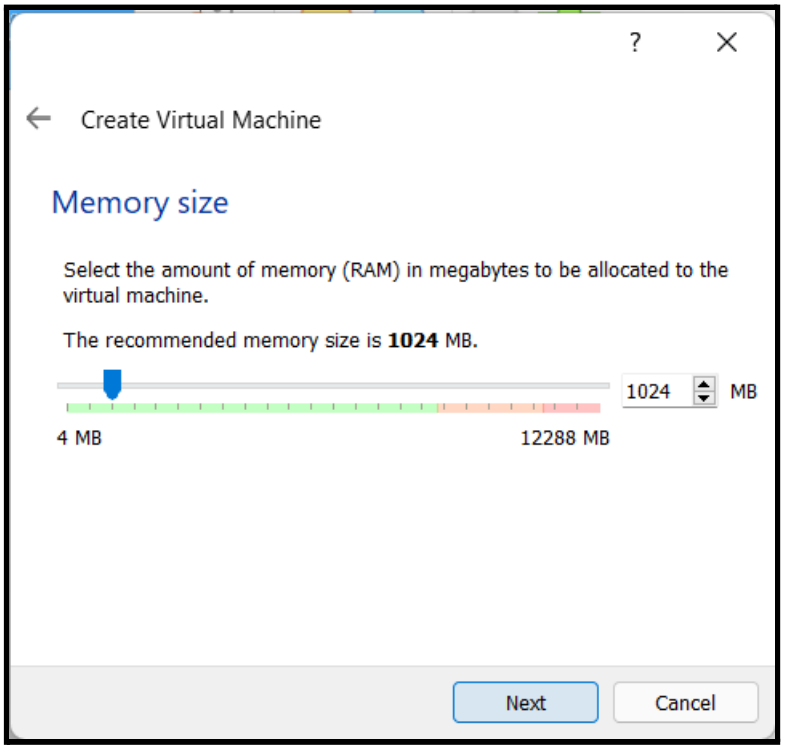
Step 3:

- Identify the operating system.
- On the first screen of the wizard, you will be asked to give the new virtual machine a name as well as choose what operating system you will be installing.
- Choose the type of operating system from the "Type" menu, and then choose which version you are installing from the "Version" menu.



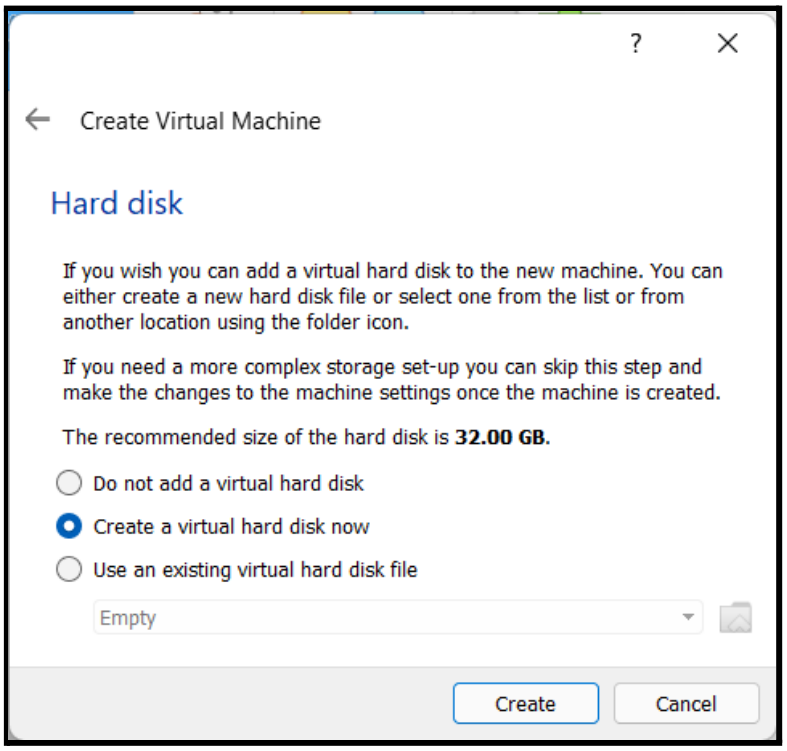
Step 4:

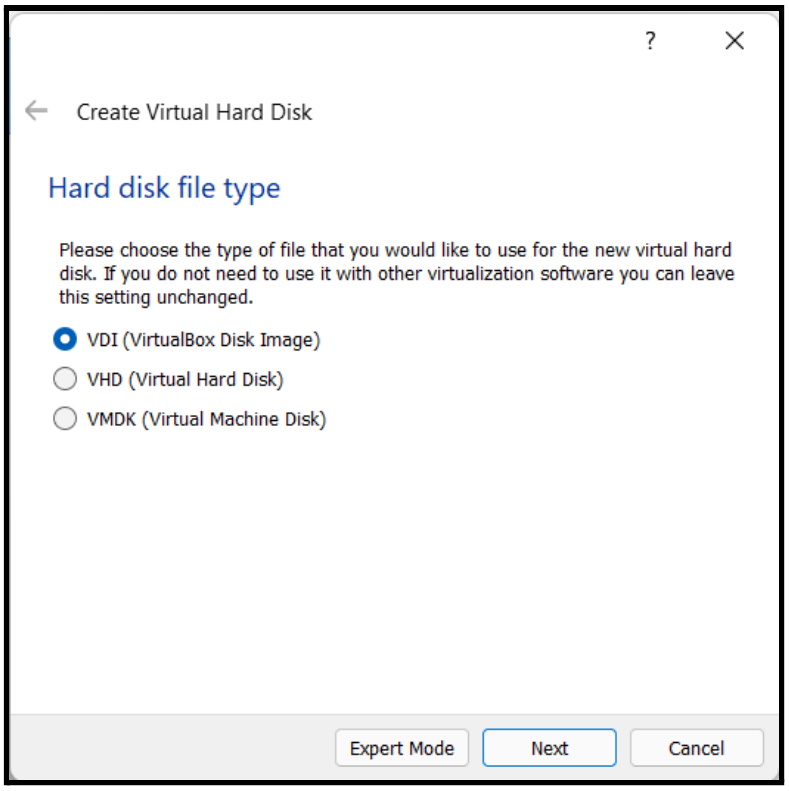
- Set the amount of RAM. You will need to designate how much of your computer's RAM will be allocated to your virtual machine. VirtualBox will automatically choose the recommended minimum amount for the operating system you selected, but you can increase or decrease this if you'd like.
- Click Next.

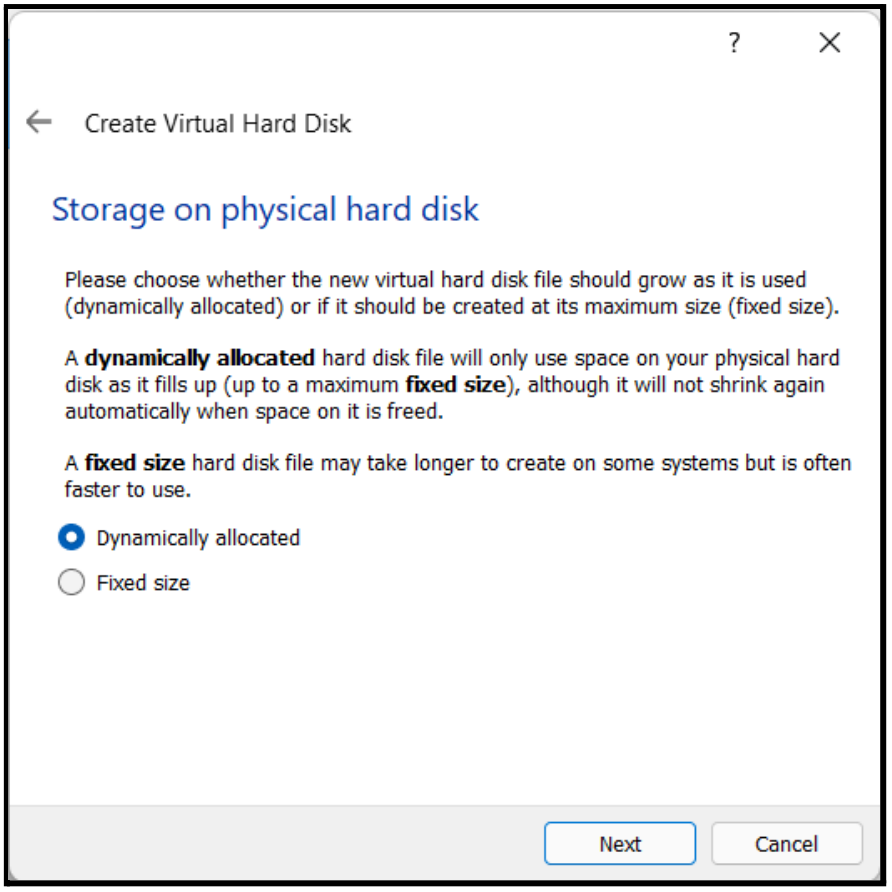


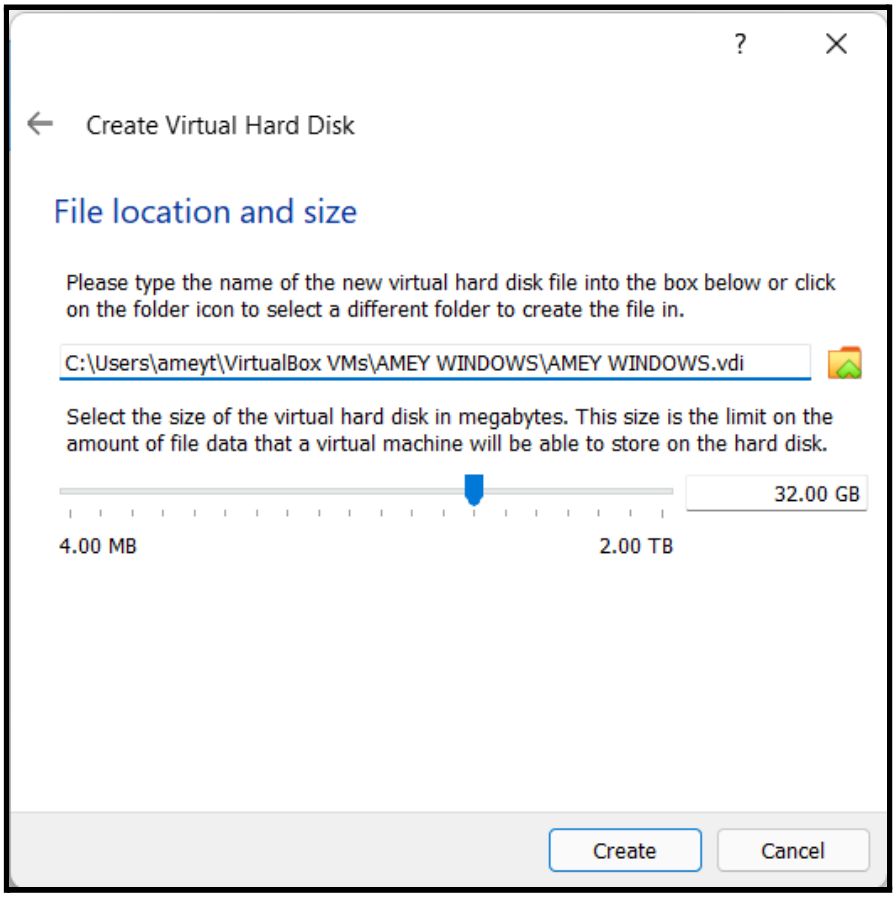
Step 5:

- Create a virtual hard drive. Select a virtual hard drive option and click Create, then click through the prompts and click Create again. Your virtual machine will need a virtual hard drive in order to install the operating system and any programs.



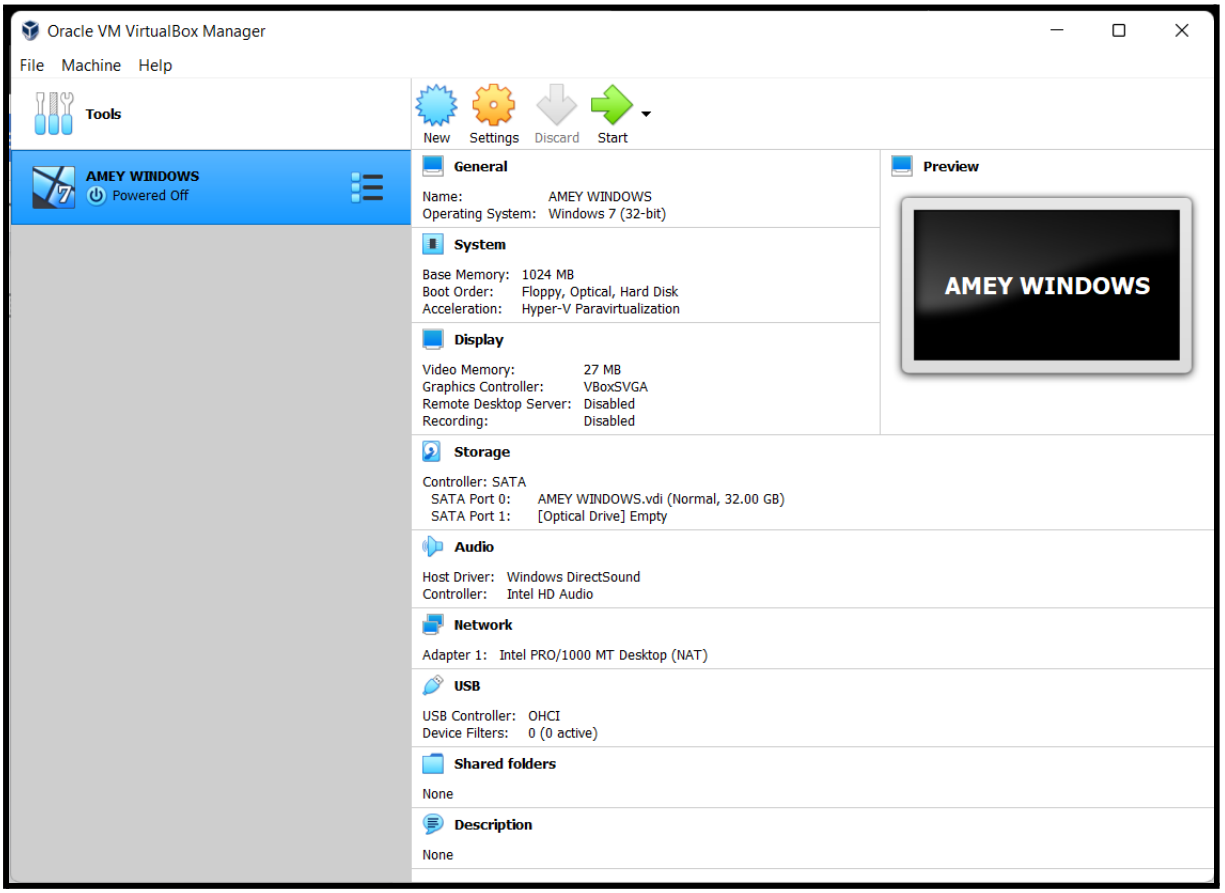



Create Virtual Hard Disk
Storage on physical hard disk
Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).
A dynamically allocated hard disk file will only use space on your physical hard disk 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


Create Virtual Hard Disk
File location and size
Please type the name of the new virtual hard disk file into the box below or click on the folder icon to select a different folder to create the file in.
C:\Users\ameyt\VirtualBox VMs\AMEY WINDOWS\AMEY WINDOWS.vdi
Select the size of the virtual hard disk in megabytes. This size is the limit on the amount of file data that a virtual machine will be able to store on the hard disk.
32.00 GB
4.00 MB
2.00 TB
Create
Cancel

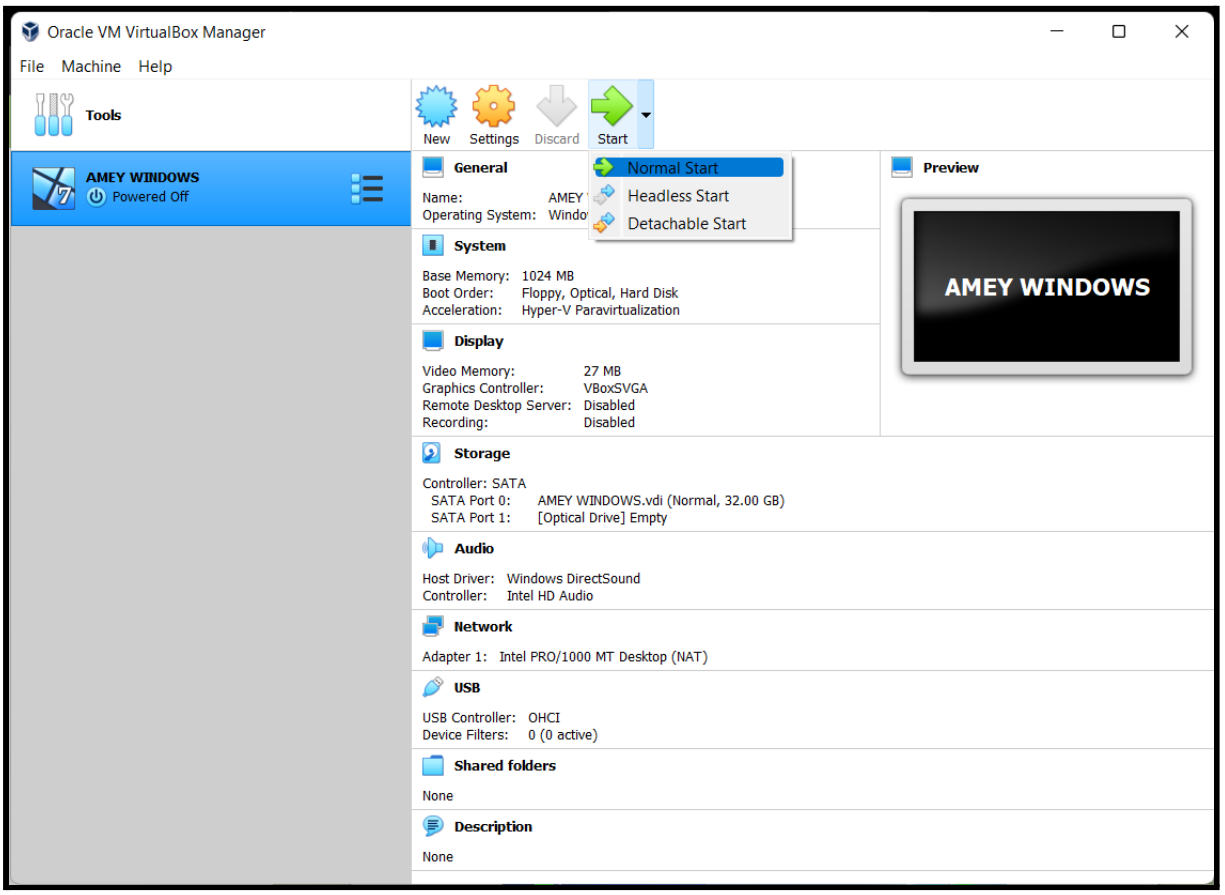
Step 6:

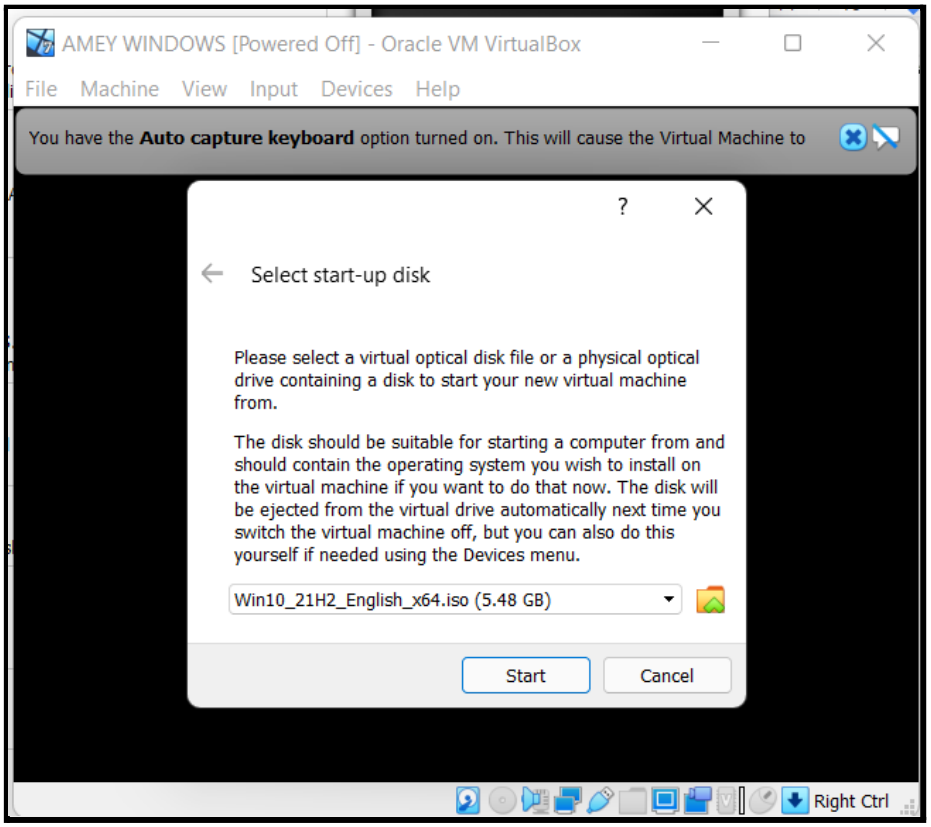
- Start the operating system installation. Once the virtual machine has been configured, the wizard will close and you will be taken back to the VirtualBox main window. Double-click your new machine in the left menu, then do one of the following:
  - ➔ If you are installing from a disc, insert it into your computer, click the "Host drive" drop-down box and click the correct drive letter from the drop-down menu.
  - ➔ If you are installing from an image file, click the folder-shaped icon to browse through your computer for the installation image file.

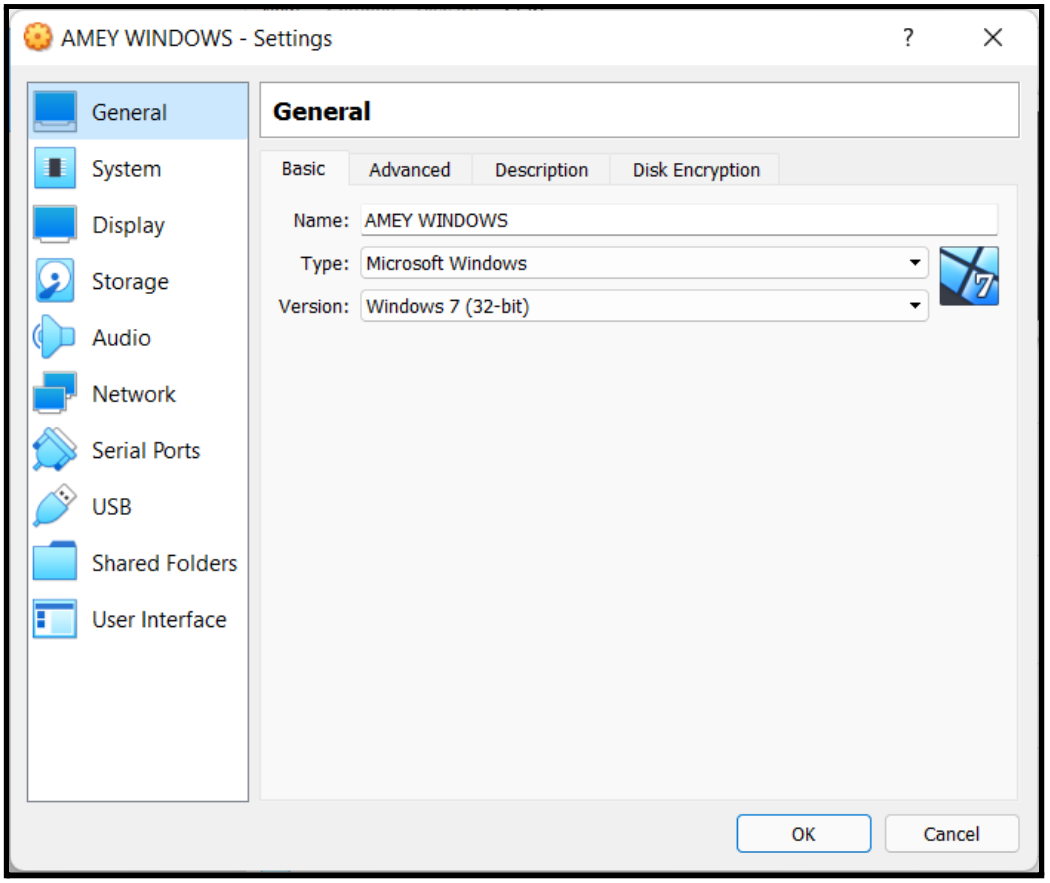


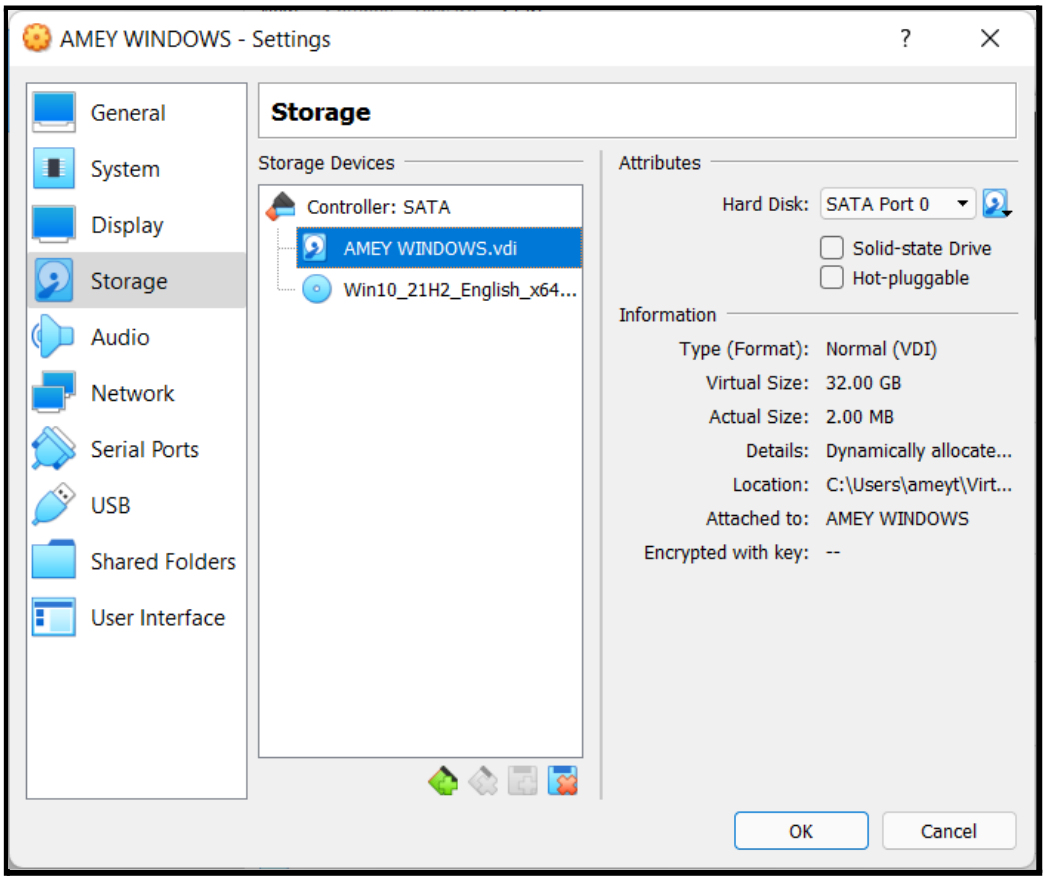
Step 7:

- Click on Start






AMEY WINDOWS - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
General
Basic
Advanced
Description
Disk Encryption
Name: AMEY WINDOWS
Type: Microsoft Windows
Version: Windows 7 (32-bit)
OK
Cancel


AMEY WINDOWS - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Storage
Storage Devices
Controller: SATA
AMEY WINDOWS.vdi
Win10_21H2_English_x64...
Attributes
Hard Disk: SATA Port 0
Solid-state Drive
Hot-pluggable
Information
Type (Format): Normal (VDI)
Virtual Size: 32.00 GB
Actual Size: 2.00 MB
Details: Dynamically allocate...
Location: C:\Users\ameyt\Virt...
Attached to: AMEY WINDOWS
Encrypted with key: --
OK
Cancel

Q3: Discuss HOST METAL HYPERVISOR? List various Host Metal Hypervisors?
ANS:

- Hosted hypervisor: hypervisors run on a host operating system that provides virtualization services, such as I/O device support and memory management.
- Hosted hypervisors:
    1. VMware Workstation/Fusion/Player
    2. VMware Server
    3. Microsoft Virtual PC
    4. Oracle VM VirtualBox
    5. Red Hat Enterprise Virtualization

1. VMware Workstation/Fusion/Player

- VMware Player is a free virtualization hypervisor. It is intended to run only one virtual machine (VM) and does not allow creating VMs. VMware Workstation is a more robust hypervisor with some advanced features, such as record-and-replay and VM snapshot support.

2. VMware Server

- VMware Server is a free, hosted virtualization hypervisor that's very similar to the VMware Workstation.
- VMware has halted development on Server since 2009

3. Microsoft Virtual PC

- This is the latest Microsoft's version of this hypervisor technology, Windows Virtual PC and runs only on Windows 7 and supports only Windows operating systems running on it.

4. Oracle VM VirtualBox

- VirtualBox hypervisor technology provides reasonable performance and features if you want to virtualize on a budget. Despite being a free, hosted product with a very small footprint, VirtualBox shares many features with VMware vSphere and Microsoft Hyper-V.

5. Red Hat Enterprise Virtualization

- Red Hat's Kernel-based Virtual Machine (KVM) has the qualities of both a hosted and a bare-metal virtualization hypervisor. It can turn the Linux kernel itself into a hypervisor so the VMs have direct access to the physical hardware.

Q4: Discuss BARE METAL HYPERVISOR? List various BareMetal Hypervisors?
ANS:

- Bare Metal hypervisor: hypervisors run directly on the system hardware – A "bare metal" embedded hypervisor.
- Bare Metal hypervisors:
    1. VMware ESX and ESXi
    2. Microsoft Hyper-V
    3. Citrix XenServer
    4. Oracle VM

1. VMware ESX and ESXi

- These hypervisors offer advanced features and scalability but require licensing, so the costs are higher. There are some lower-cost bundles that VMware offers and they can make hypervisor technology more affordable for small infrastructures. VMware is the leader in Type-1 hypervisors. Their vSphere/ESXi product is available in a free edition and 5 commercial editions.

2. Microsoft Hyper-V

- The Microsoft hypervisor, Hyper-V doesn't offer many of the advanced features that VMware's products provide. However, with XenServer and vSphere, Hyper-V is one of the top 3 Type-1 hypervisors. It was first released with Windows Server, but now Hyper-V has been greatly enhanced with Windows Server 2012 Hyper-V. Hyper-V is available in both a free edition (with no GUI and no virtualization rights) and 4 commercial editions – Foundations (OEM only), Essentials, Standard, and Datacenter. Hyper-V

3. Citrix XenServer

- It began as an open-source project. The core hypervisor technology is free, but like VMware's free ESXi, it has almost no advanced features. Xen is a type-1 bare-metal hypervisor. Just as Red Hat Enterprise Virtualization uses KVM, Citrix uses Xen in the commercial XenServer.

4. Oracle VM

- The Oracle hypervisor is based on the open-source Xen. However, if you need hypervisor support and product updates, it will cost you. Oracle VM lacks many of the advanced features found in other bare-metal virtualization hypervisors.

B.2 Conclusion:

We can now comprehend virtualization and construct virtual machines utilising virtualbox and the provided ISO image file after successfully completing this experiment.