

Experiment No:1

Title: Installation and Configuration of virtualization

Aim: To understand the concepts of virtualization and implementation of it.

Theory:

Virtualization:

Virtualization is the "creation of a virtual (rather than actual) version of something, such as a server, a desktop, a storage device, an operating system or network resources".

In other words, Virtualization is a technique, which allows to share a single physical instance of a resource or an application among multiple customers and organizations. It does by assigning a logical name to a physical storage and providing a pointer to that physical resource when demanded.

Creation of a virtual machine over existing operating system and hardware is known as Hardware Virtualization. A Virtual machine provides an environment that is logically separated from the underlying hardware.

The machine on which the virtual machine is going to create is known as Host Machine and that virtual machine is referred as a Guest Machine

Types of Virtualizations:

- Hardware Virtualization.
- Operating system Virtualization.
- Server Virtualization.
- Storage Virtualization.

1) Hardware Virtualization:

When the virtual machine software or virtual machine manager (VMM) is directly installed on the hardware system is known as hardware virtualization.

The main job of hypervisor is to control and monitoring the processor, memory and other hardware resources.

After virtualization of hardware system, we can install different operating system on it and run different applications on those OS.

Usage:

Hardware virtualization is mainly done for the server platforms, because controlling virtual machines is much easier than controlling a physical server.

2) Operating System Virtualization:

When the virtual machine software or virtual machine manager (VMM) is installed on the Host operating system instead of directly on the hardware system is known as operating system virtualization.

Usage:

Operating System Virtualization is mainly used for testing the applications on different platforms of OS.

3) Server Virtualization:

When the virtual machine software or virtual machine manager (VMM) is directly installed on the Server system is known as server virtualization.

Usage:

Server virtualization is done because a single physical server can be divided into multiple servers on the demand basis and for balancing the load.

4) Storage Virtualization:

Storage virtualization is the process of grouping the physical storage from multiple network storage devices so that it looks like a single storage device.

Storage virtualization is also implemented by using software applications.

Usage:

Storage virtualization is mainly done for back-up and recovery purposes.

Virtualization Tool:

VirtualBox

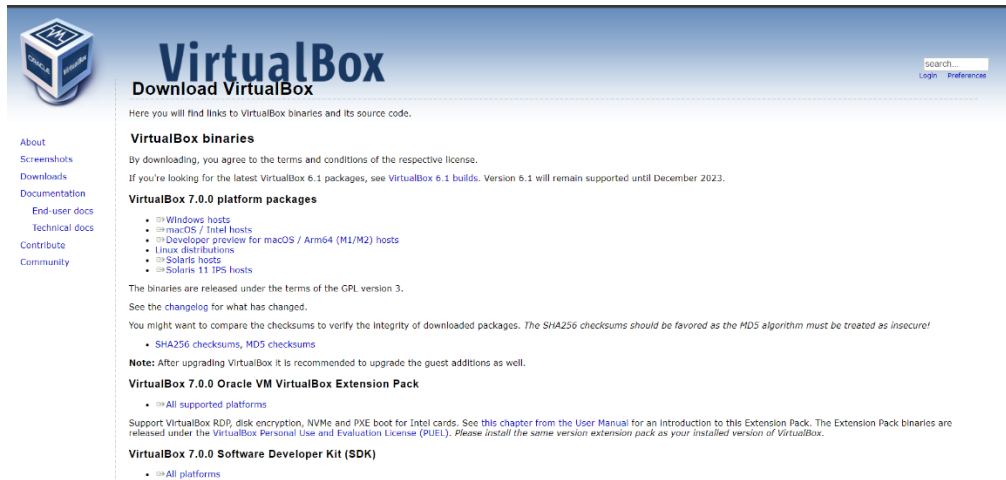
VirtualBox is open-source software for virtualizing the x86 computing architecture. It acts as a hypervisor, creating a VM (virtual machine) where the user can run another OS (operating system).

The operating system where VirtualBox runs is called the "host" OS. The operating system running in the VM is called the "guest" OS. VirtualBox supports Windows, Linux, or macOS as its host OS.

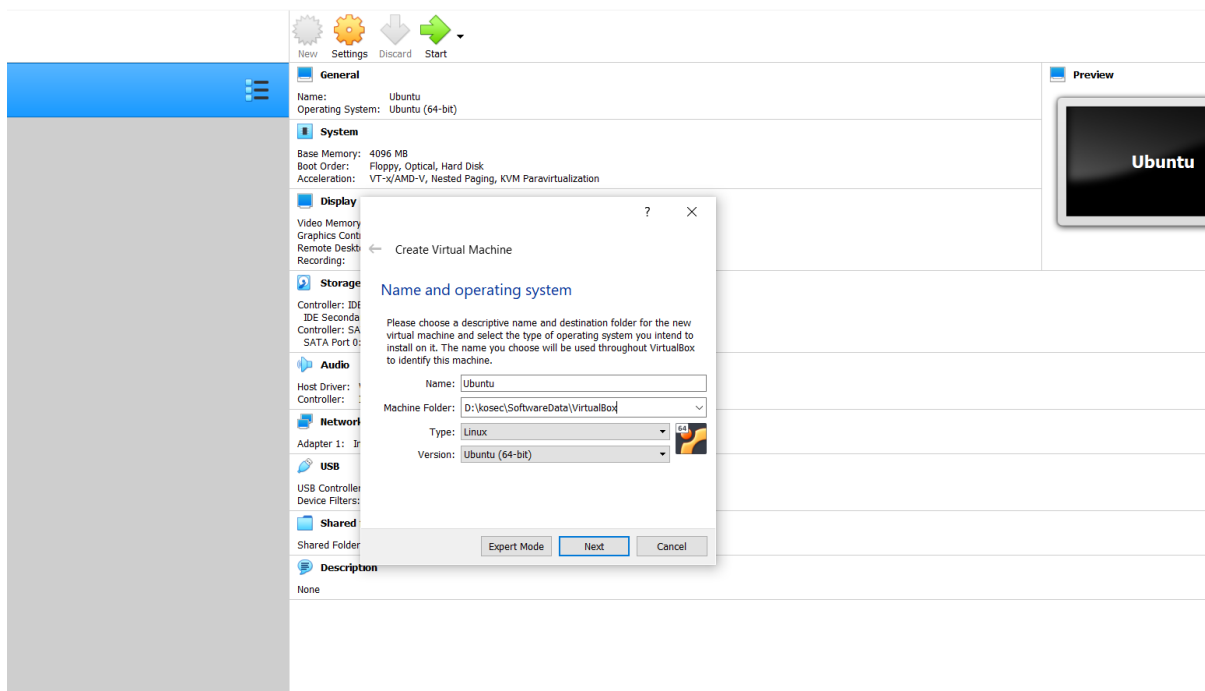
When configuring a virtual machine, the user can specify how many CPU cores, and how much RAM and disk space should be devoted to the VM. When the VM is running, it can be "paused." System execution is frozen at that moment in time, and the user can resume using it later.

Practical:

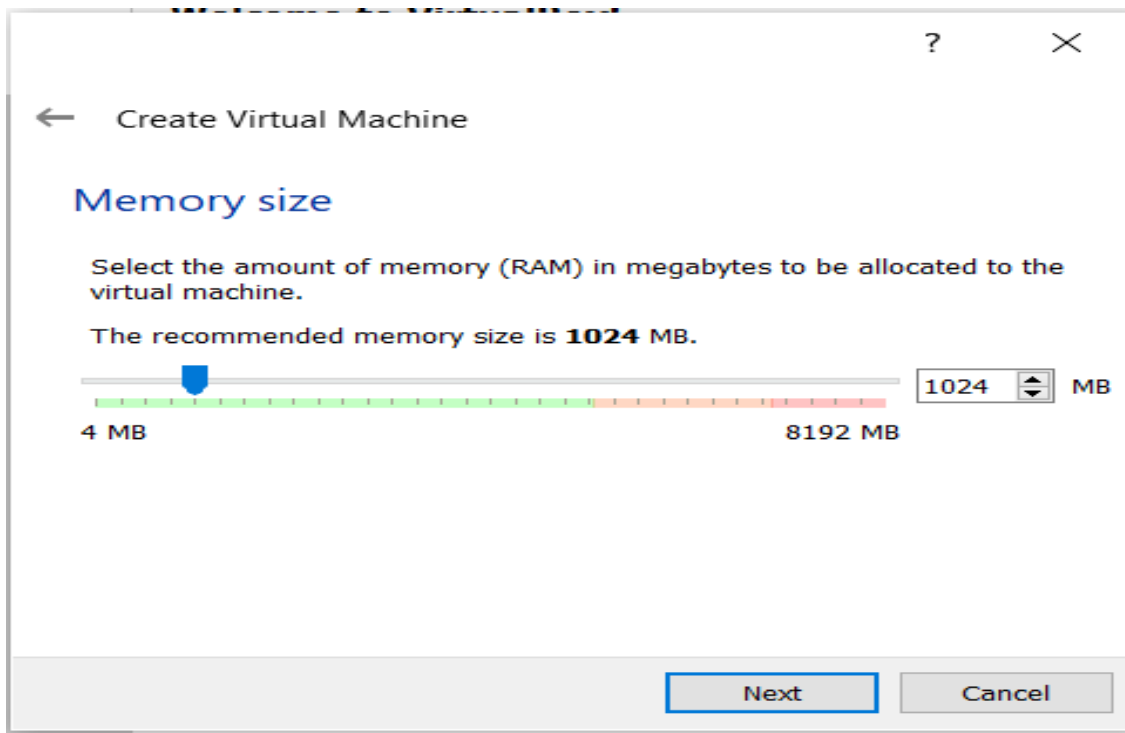
Downloading Oracle VirtualBox:



Installation:



Configuration of Virtual Machine:



The screenshot shows the 'Create Virtual Machine' dialog box with the 'Memory size' step selected. The title bar includes a question mark and a close button. A back arrow and the text 'Create Virtual Machine' are at the top left. The main heading is 'Memory size'. Below it, instructions state: 'Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.' and 'The recommended memory size is 1024 MB.' A horizontal slider is shown with a blue handle at 1024 MB. The slider has a green segment from 4 MB to approximately 6000 MB and an orange segment from 6000 MB to 8192 MB. A text box on the right shows '1024' and 'MB'. At the bottom right are 'Next' and 'Cancel' buttons.

← Create Virtual Machine

Memory size

Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.

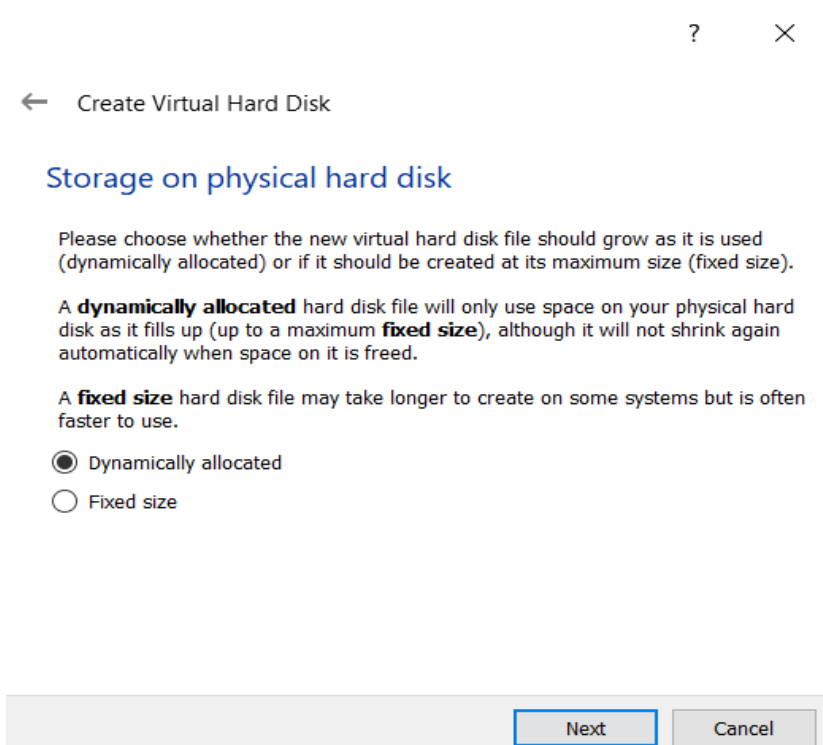
The recommended memory size is **1024 MB**.

4 MB 8192 MB

1024 MB

Next Cancel

Configure



The screenshot shows the 'Create Virtual Hard Disk' dialog box with the 'Storage on physical hard disk' step selected. The title bar includes a question mark and a close button. A back arrow and the text 'Create Virtual Hard Disk' are at the top left. The main heading is 'Storage on physical hard disk'. Below it, instructions state: '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).' Two options are listed: 'Dynamically allocated' (selected with a radio button) and 'Fixed size' (unselected with a radio button). Descriptive text for each option is provided. At the bottom right are 'Next' and 'Cancel' buttons.

← 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).

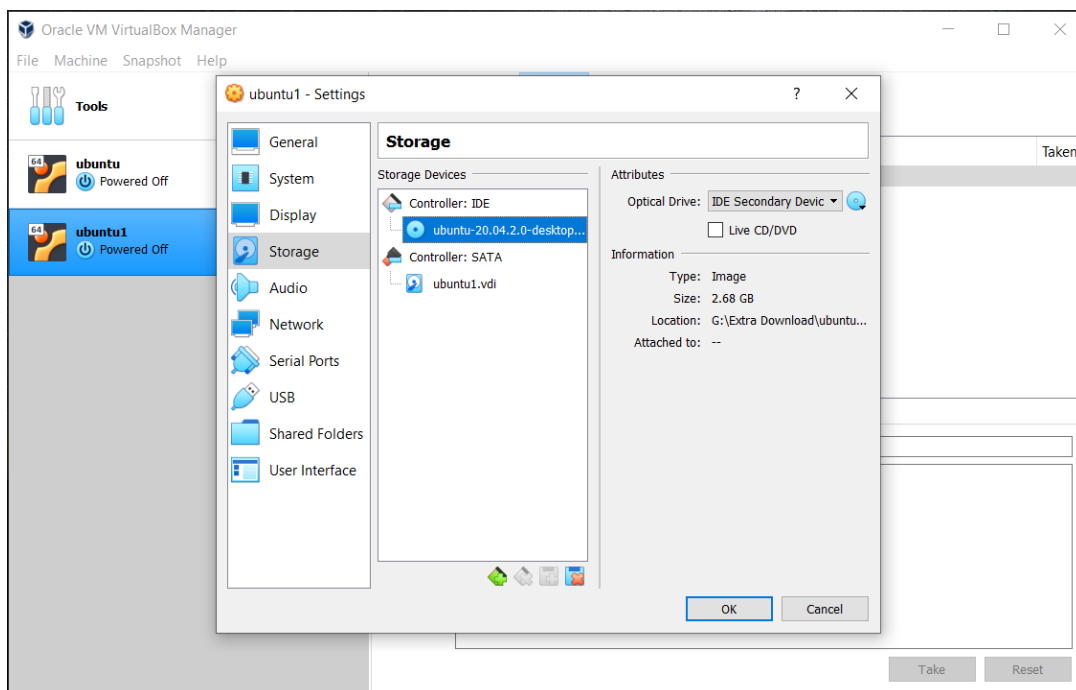
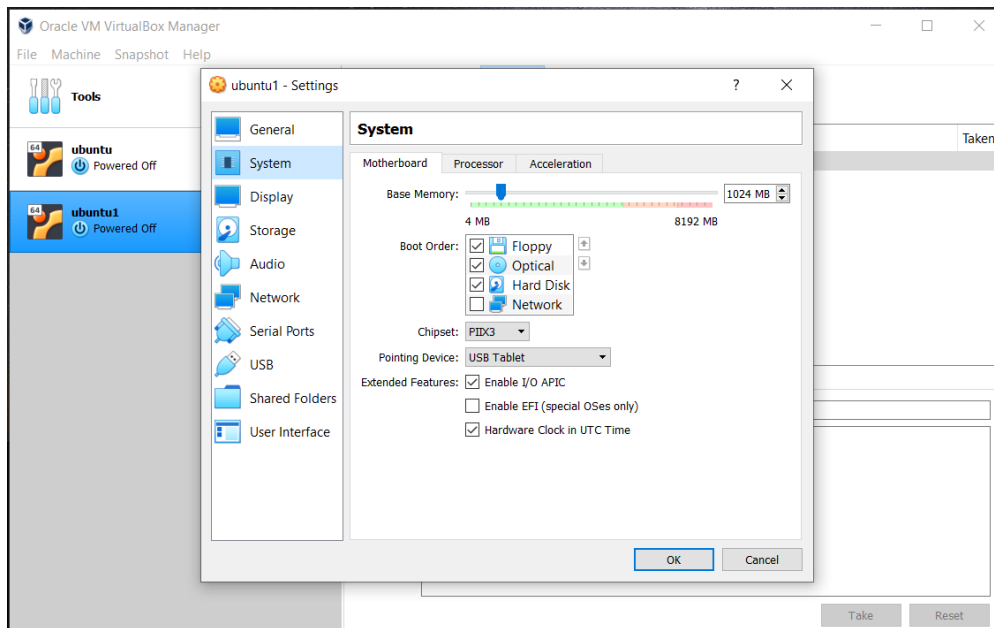
A **dynamically allocated** hard disk file will only use space on your physical hard disk as it fills up (up to a maximum **fixed size**), although it will not shrink again automatically when space on it is freed.

A **fixed size** hard disk file may take longer to create on some systems but is often faster to use.

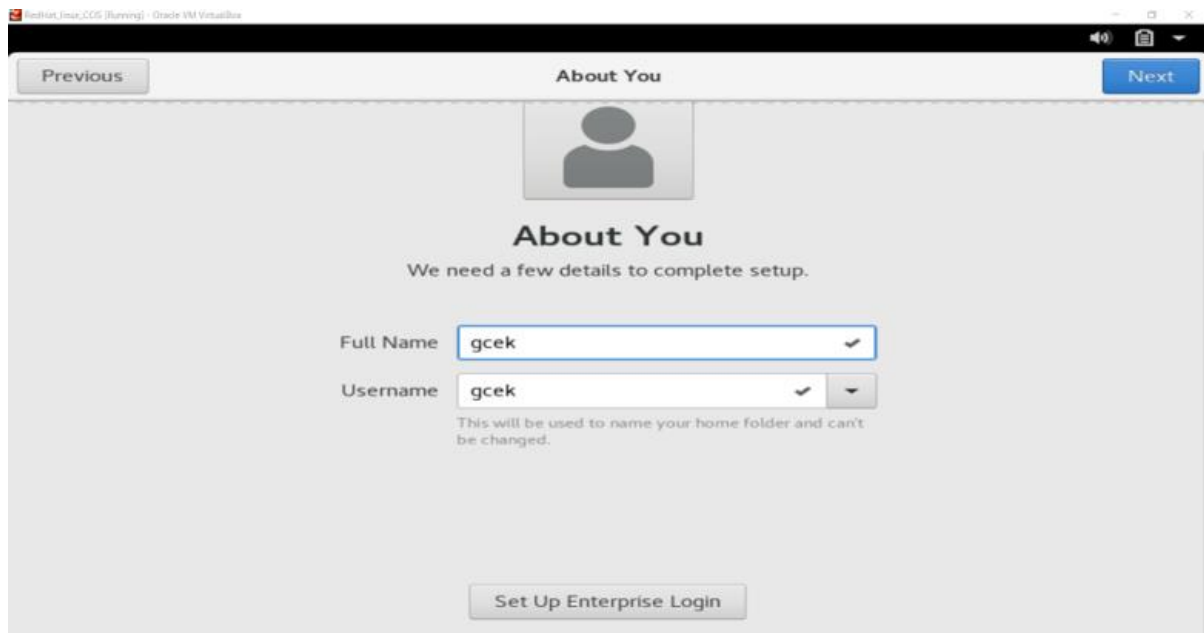
☒ Dynamically allocated

☐ Fixed size

Next Cancel



Running Virtual Machine:



Conclusion:

Thus, we have performed installation and configuration of Virtualization.