Theory:

Linux

Linux is a free and open-source operating system kernel that forms the core of many operating systems, known as Linux distributions (e.g., Ubuntu, CentOS, Fedora, Debian). It is highly valued for its stability, security, and flexibility. Linux can run on a variety of hardware, from personal computers to servers and embedded devices, and is widely used in software development, cloud computing, and networking.

Fig: Various types of Linux

VirtualBox

VirtualBox is a free and open-source virtualization application developed by Oracle. It allows users to run multiple operating systems as virtual machines on a single physical computer. VirtualBox supports a wide variety of guest operating systems and can be installed on multiple host platforms, making it ideal for testing software, learning new operating systems, and creating isolated development environments.

Fig: VirtualBox logo

VMware

VMware is a leading provider of virtualization and cloud computing solutions. Its products, such as VMware Workstation and VMware vSphere, allow users to create, run, and manage multiple virtual machines on a single physical computer. VMware is widely used in enterprises for server virtualization, testing applications, and building scalable IT infrastructures due to its high performance, reliability, and advanced management features.

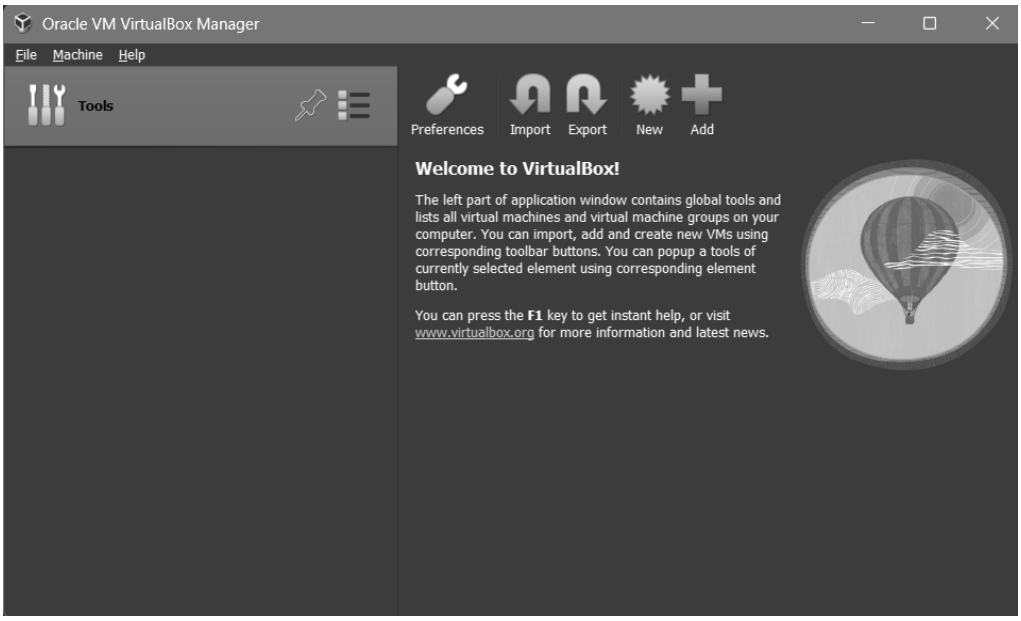
Fig: VMware logo

Installing the Virtual box:

Oracle VM Virtual Box is cross-platform virtualization software that allows users to run multiple operating systems including Microsoft Windows, Mac OS X, Linux, and Oracle Solaris, at the same time on a single physical machine as virtual machine. It is a versatile tool that can meet a wide range of virtualization needs.

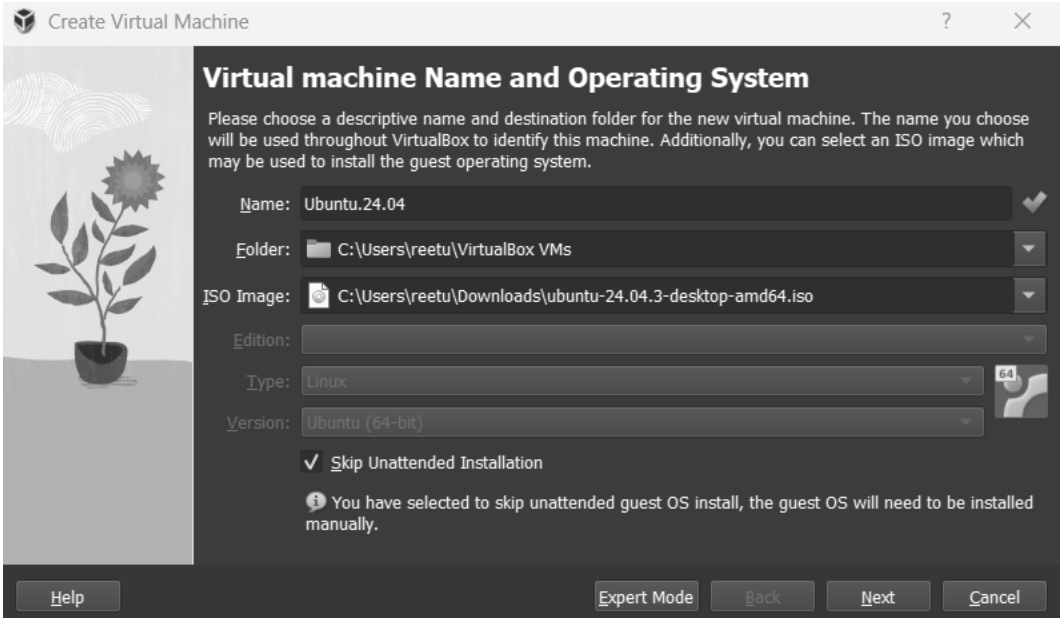
Here, click Next and proceed.

Once Virtual Box is installed then we can create, add or import new VMs using toolbar buttons.

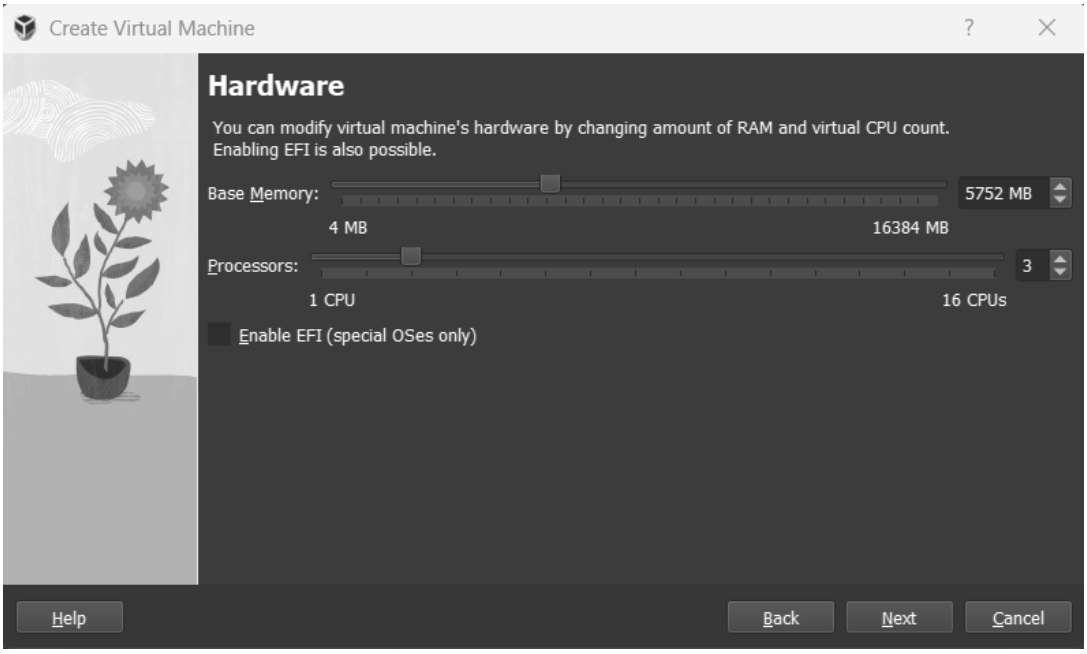


Installing Linux (Ubuntu) Desktop OS:

Step 1: Click New on Virtual Machine toolbar and add details about the new VM and required OS.

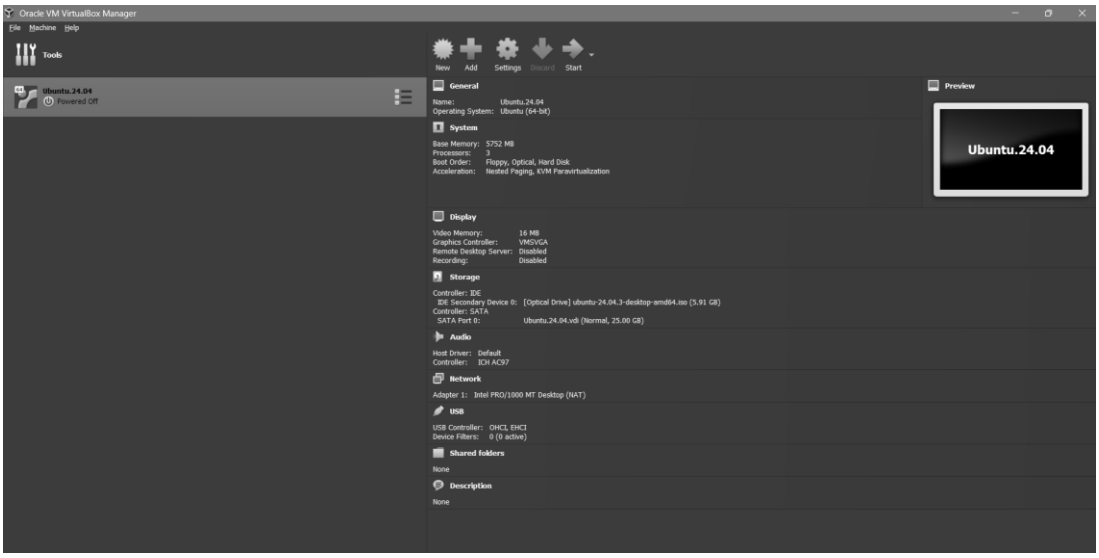


Step 2: Select the Base Memory and Processors to be allocated to the Virtual Machine as per your need.

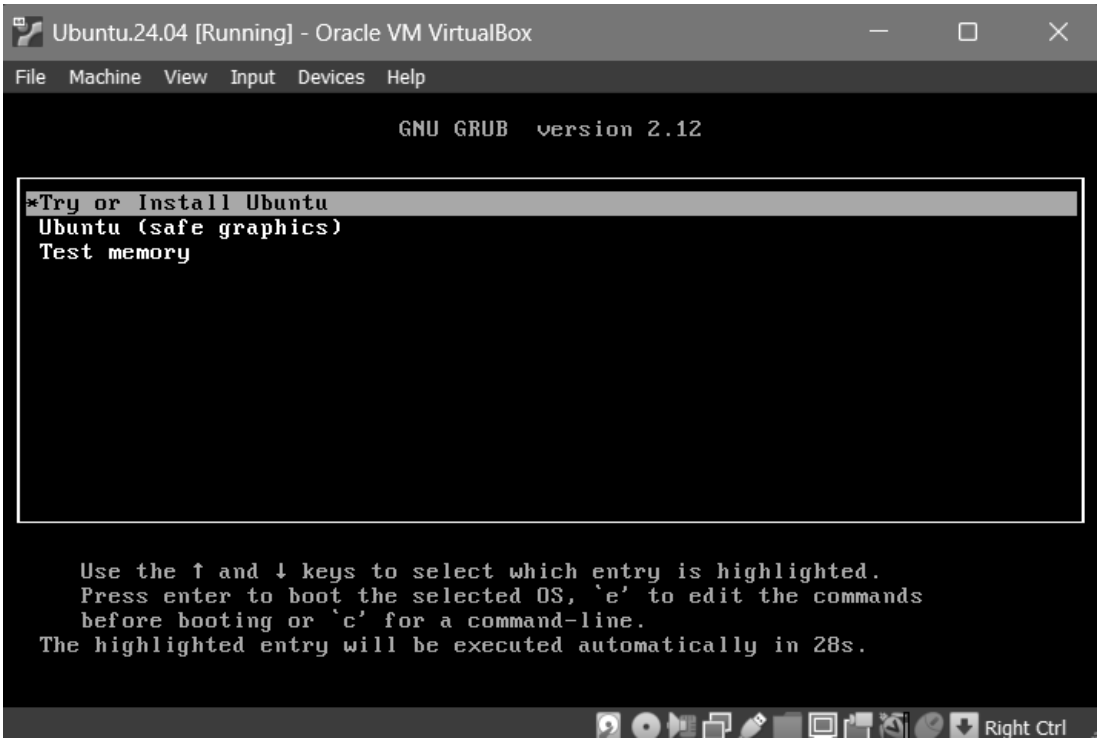


Step 3: Select the size of memory to be allocated for Virtual Hard Disk.

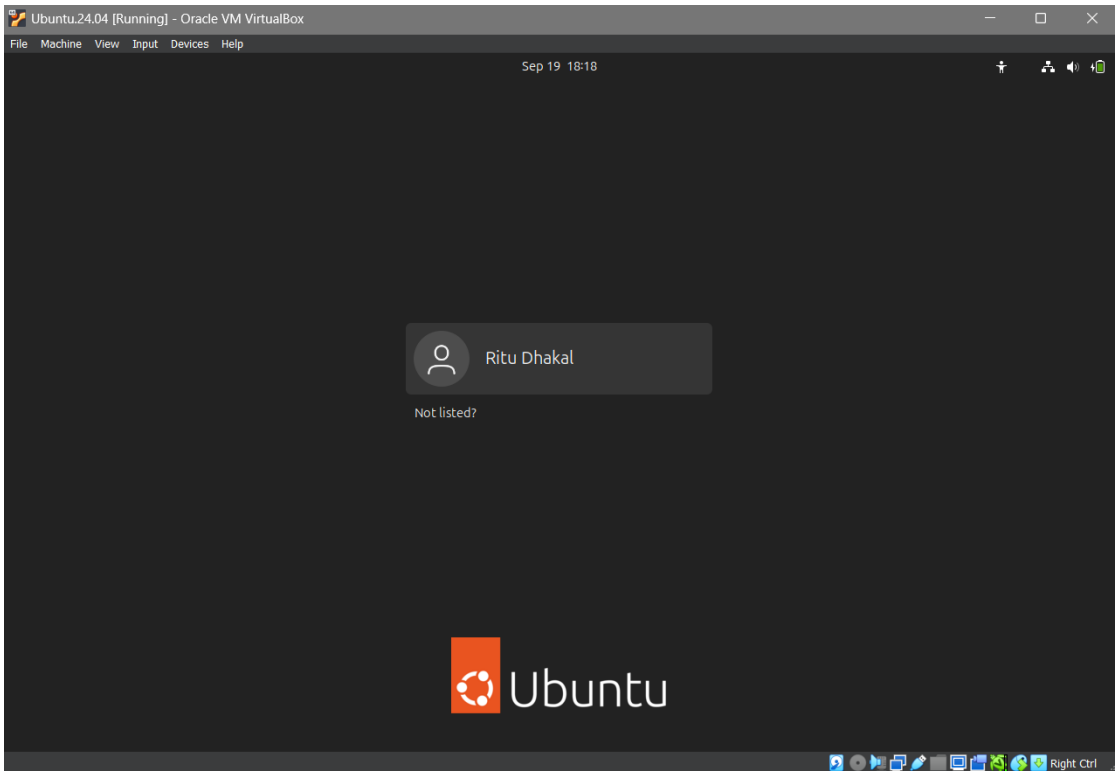
Step 4: This is the interface for the newly created Virtual Machine for Ubuntu Desktop OS. Select Server and click on Start to run the Virtual Machine.



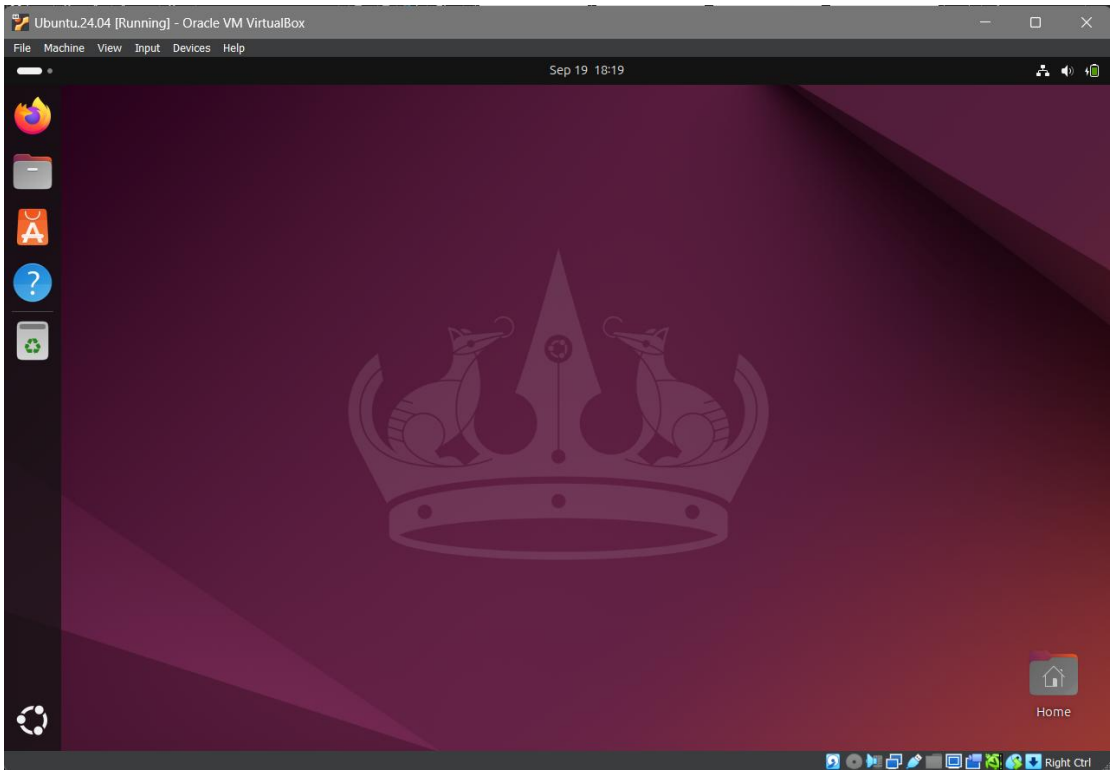
Step 5: Press Enter to install Ubuntu Server.



Step 6: Now enter the Login details on the screen and press Enter to login into the system.



Step 7: Now our system is ready, and Ubuntu is installed completely.



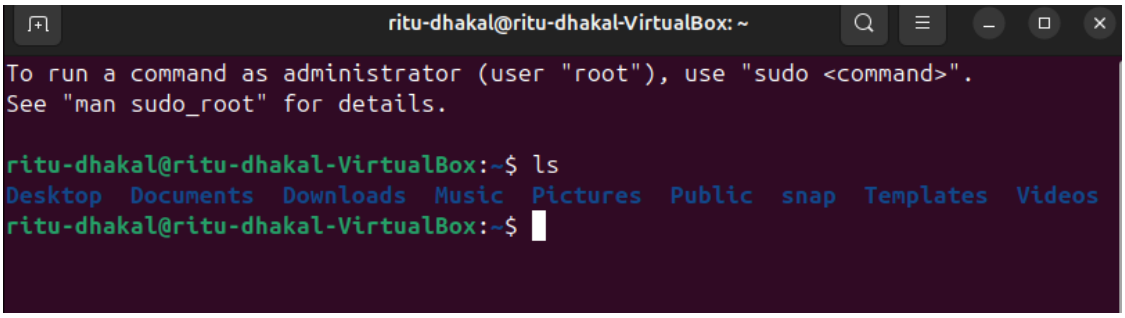
Basic Networking Commands

1. **LS:**

   ls is used to list the files and directories in the current directory.

   Syntax: ls

   Uses: Commonly used to view files and folders in a directory.

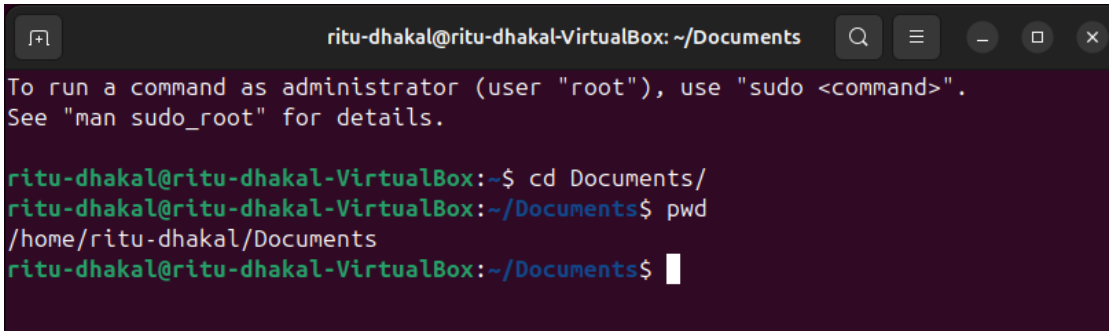


2. **PWD:**

   pwd prints the current working directory path.

   Syntax: pwd

   Uses: Used to know the exact location of the user in the file system.

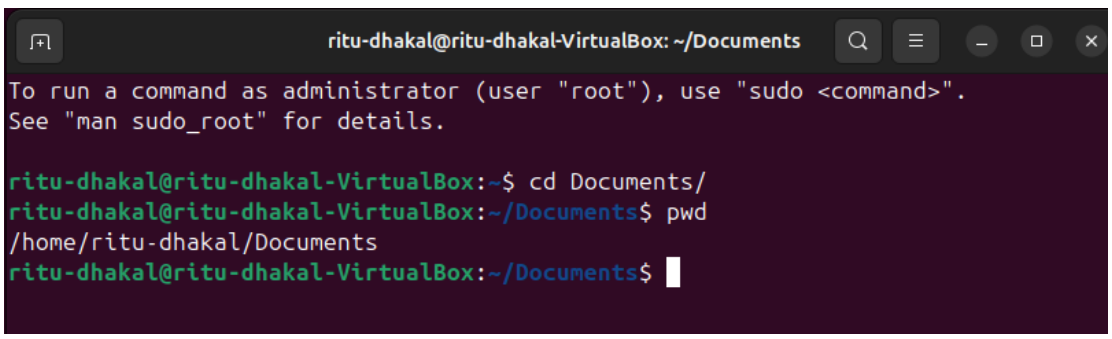


3. **CD:**

   cd is used to change the current directory.

   Syntax: cd <directory>

   Uses: Helps in navigating between different directories.

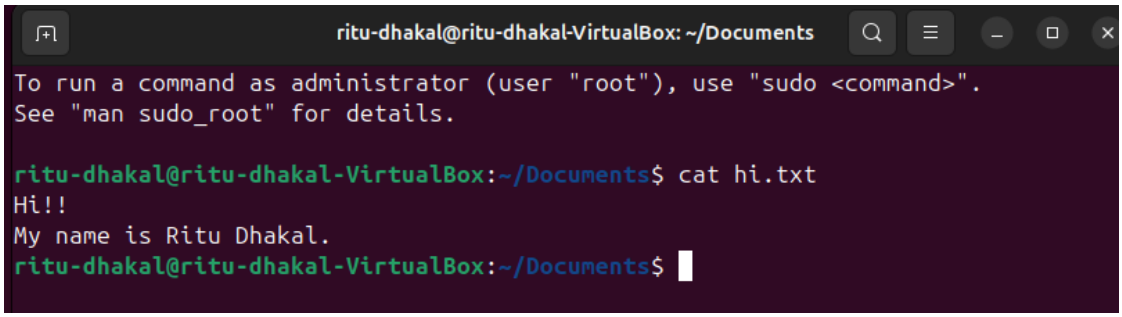


4. **CAT:**

   cat is used to display the contents of a file.

   Syntax: cat <filename>

   Uses: Commonly used to read files and combine multiple files.



Conclusion:

In this lab, we installed Linux using Oracle VM VirtualBox and practiced using essential networking commands such as ping, CAT, CD, PWD and LS. These exercises helped us understand how to gather system information, monitor network activity, and troubleshoot technical issues effectively. Through hands-on experimentation, we learned the significance of meticulous system setup, proactive network management, and the use of diagnostic tools to maintain system reliability and performance. Overall, this lab emphasized the practical skills required for managing operating systems and networks in real-world scenarios.