PERI INSTITUTE OF TECHNOLOGY

(Autonomous)

Mannivakkam, Chennai-600048

PERI
INSTITUTE OF TECHNOLOGY
(AN AUTONOMOUS INSTITUTION)

NAME :……

REGISTER No.: ……

YEAR/SEM. :……

DEPARTMENT: ……

SUBJECT :……

PERI INSTITUTE OF TECHNOLOGY

(Autonomous)

Mannivakkam,Chennai-600048

BONAFIDE CERTIFICATE

Certified that this is the bonafide record work done by **Mr./Ms.**……**Register No.**…….. of …….. **Department** ...……**Year**/…… **Semester** during the **academic year**…….……in the **Subject code/Subject name**…….……...……

Staff In-Charge **Head of the Department**

Submitted for Practical Examination held on…….....……

Internal Examiner **External Examiner**

PERI INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VISION AND MISSION OF THE INSTITUTION

VISION

- To be an internationally recognized seat of higher learning in Engineering, Technology & Science in future.
- It also visualizes being a research incubator for academicians, industrialists and researchers from across the country/world.

MISSION

- It strives to provide quality technical education at affordable cost.
- Providing state-of-the-art infrastructure facilities to achieve excellence in teaching learning, Research & Development.
- Aligning with leading industries to create competent engineers through internships and placement focused training.
- Create an environment which is conducive to learn skills which will solve pressing issues along with foundation in moral values and ethics.

VISION AND MISSION OF THE DEPARTMENT

VISION

- The vision of the department is to prepare industry-ready competent professionals with moral values by imparting scientific knowledge and skill-based education.

MISSION

- To provide exposure of latest tools and technologies in the broad area of computing.
- To promote research-based projects / activities in the emerging areas of technology.
- To enhance Industry Institute Interaction program to get acquainted with corporate culture and to develop entrepreneurship skills
- To induce ethical values and spirit of social commitment.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To enable graduates to pursue higher education and research, or a successful career in industries associated with Computer Science and Engineering, or as entrepreneurs.

PEO2: To ensure that graduates will have the ability and attitude to adapt to emerging technological changes.

PEO3: To exhibit professional attitude, teamwork and practice code of ethics in the area of specialization.

PROGRAM OUTCOMES (POs)

1. **Engineering knowledge**: Apply the knowledge of Mathematics, Science, Engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of Mathematics, Natural Sciences, and Engineering Sciences.

3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

1. To analyze, design and develop computing solutions by applying foundational concepts of Computer Science and Engineering.
2. To apply software engineering principles and practices for developing quality software for scientific and business applications
3. To adapt to emerging Information and Communication Technologies (ICT) to innovate ideas and solutions to existing/novel problems.

CCS372 VIRTUALIZATION

COURSE OBJECTIVES:

- To Learn the basics and types of Virtualization
- To understand the Hypervisors and its types
- To Explore the Virtualization Solutions
- To Experiment the virtualization platforms

LIST OF EXPERIMENTS

1.Create type 2 virtualization in VMWARE or any equivalent Open Source Tool. Allocate memory and storage space as per requirement. Install Guest OS on that VMWARE.

2.

a.Shrink and extend virtual disk
b. Create, Manage, Configure and schedule snapshots
c. Create Spanned, Mirrored and Striped volume
d. Create RAID 5 volume

3.

a.Desktop Virtualization using VNC
b.Desktop Virtualization using Chrome Remote Desktop

4.Create type 2 virtualization on ESXI 6.5 server

5.Create a VLAN in CISCO packet tracer

6.Install KVM in Linux

7.Create Nested Virtual Machine (VM under another VM)

COURSE OUTCOMES:

Upon completion of the course, the students will be able to

CO1: Analyze the virtualization concepts and Hypervisor
CO2: Apply the Virtualization for real-world applications
CO3: Install & Configure the different VM platforms
CO4: Experiment with the VM with various software

Ex. No.	Date	Title of the Experiment	Page No.	Marks Obtained	Signature
1		Create type 2 virtualization in VMWARE or any equivalent Open Source Tool. Allocate memory and storage space as per requirement. Install Guest OS on that VMWARE			
2		a. Shrink and extend virtual disk b. Create, Manage, Configure and schedule snapshots c. Create Spanned, Mirrored and Striped volume d. Create RAID 5 volume			
3		a. Desktop Virtualization using VNC b. Desktop Virtualization using Chrome Remote Desktop			
4		Create type 2 virtualization on ESXI 6.5 server			
5		Create a VLAN in CISCO packet tracer			
6		Install KVM in Linux			
7		Create Nested Virtual Machine (VM under another VM)			

Ex. No.1 :

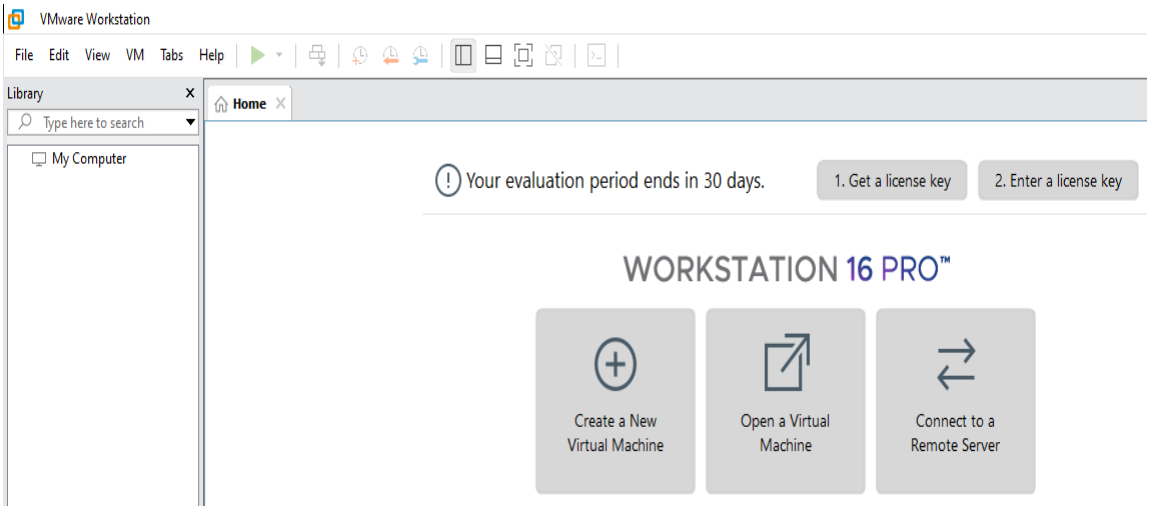
Create type 2 virtualization in VMWARE or any equivalent Open Source Tool. Allocate memory and storage space as per requirement. Install Guest OS on that VMWARE

Aim:

To find the procedure to run VM of different configuration and Allocate memory and storage space as per requirement

Procedure: Step 1:

Download and install VMware Workstation Player
(Or) Download and install VMware Workstation Pro :
https://vmware-workstation.en.softonic.com/download

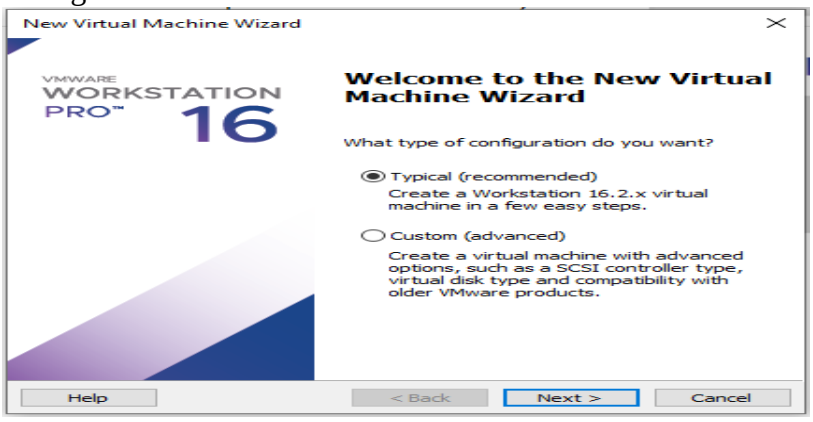


Step 2:

Create a New Virtual Machine Open VMware Workstation Player Click on "Create a New Virtual Machine" or go to File > New Virtual Machine

Step 3:

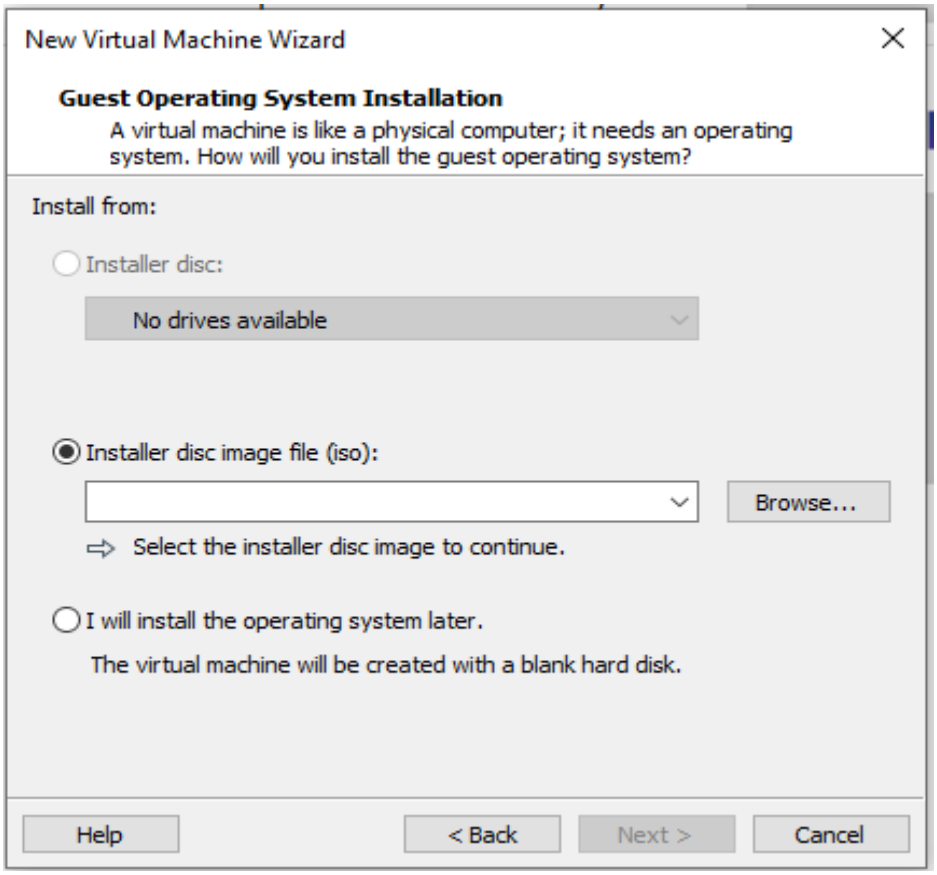
Virtual Machine Configuration Wizard



The Virtual machine configuration Wizard will appear. Choose “Typical” configuration and click “Next”.

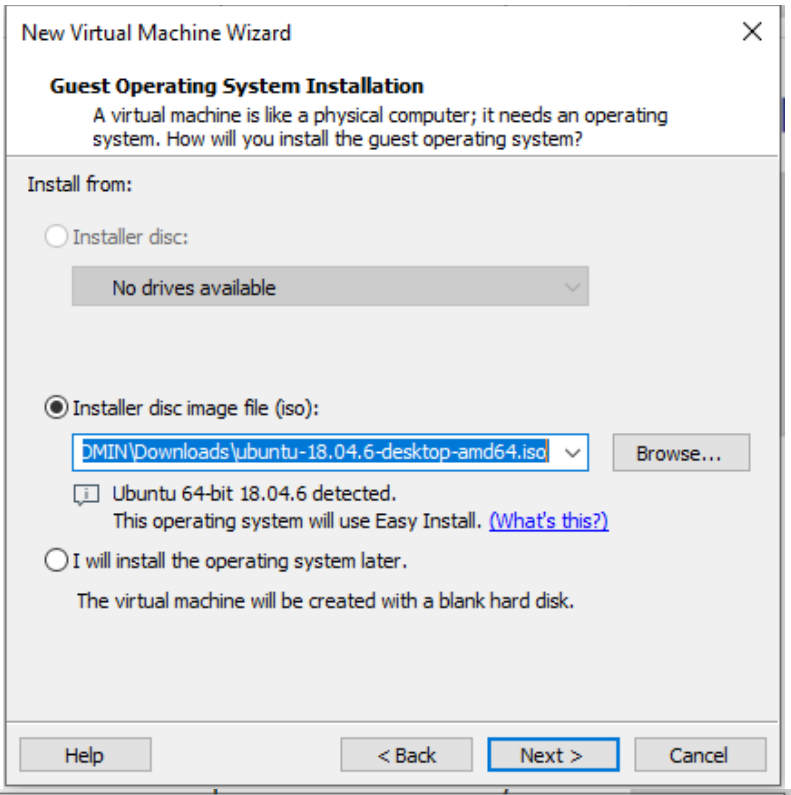
Step 4:
Install Guest Operating System

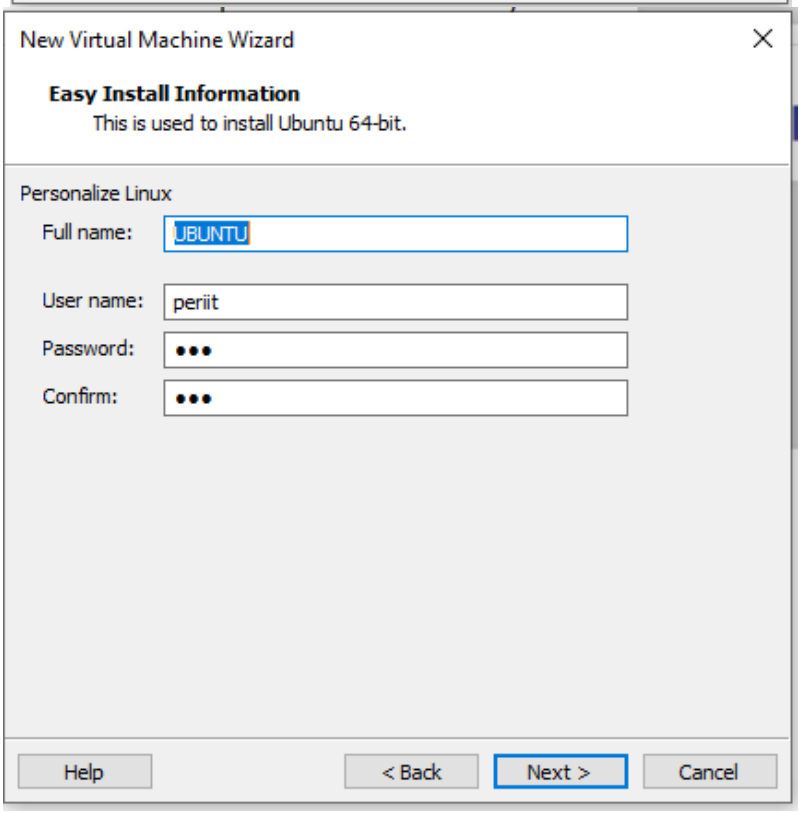
- Choose the installation method for the guest OS. You can either install from a disc or image file (ISO) or choose to install later. If you have the ISO file for your guest OS, select it during this step
- Click “Next”

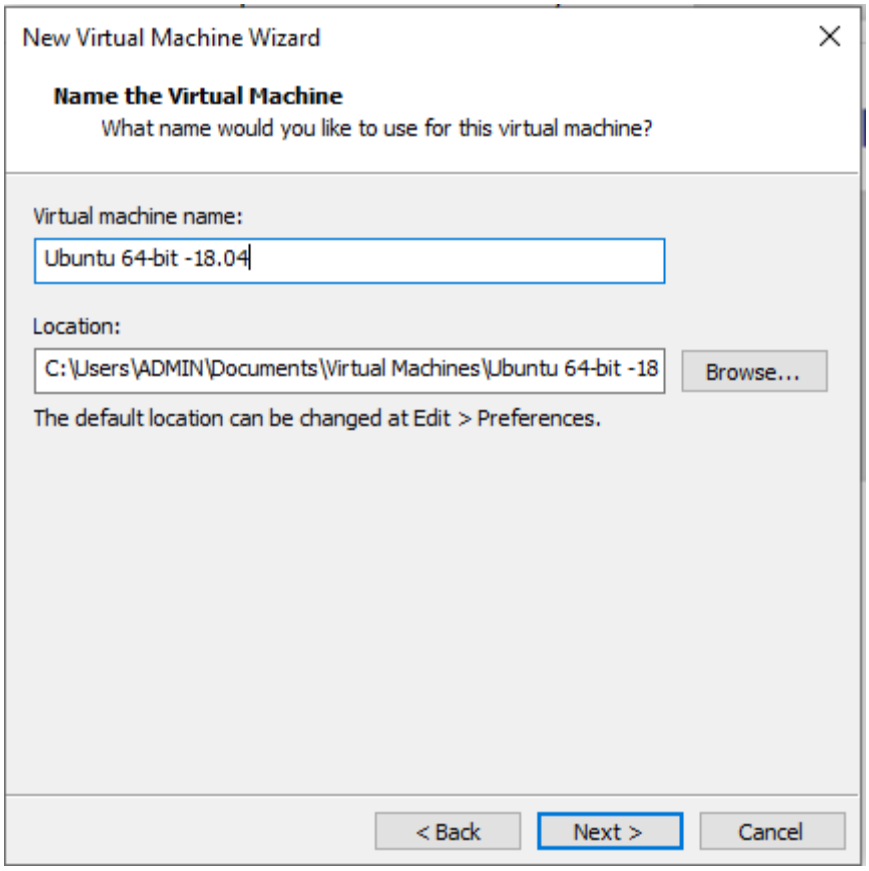


Step 5:
Enter Guest OS Details

- Enter the name of your virtual machine and choose the location where you want to save it.
- Select the appropriate guest operating system and version. For example, if you are installing Ubuntu 18.04, choose "Ubuntu" as the guest OS and "Ubuntu 18.04" as the version.
- Click "Next."


New Virtual Machine Wizard
Guest Operating System Installation
A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?
Install from:
Installer disc:
No drives available
Installer disc image file (iso):
DMIN\Downloads\ubuntu-18.04.6-desktop-amd64.iso
Browse...
Ubuntu 64-bit 18.04.6 detected.
This operating system will use Easy Install. (What's this?)
I will install the operating system later.
The virtual machine will be created with a blank hard disk.
Help
< Back
Next >
Cancel

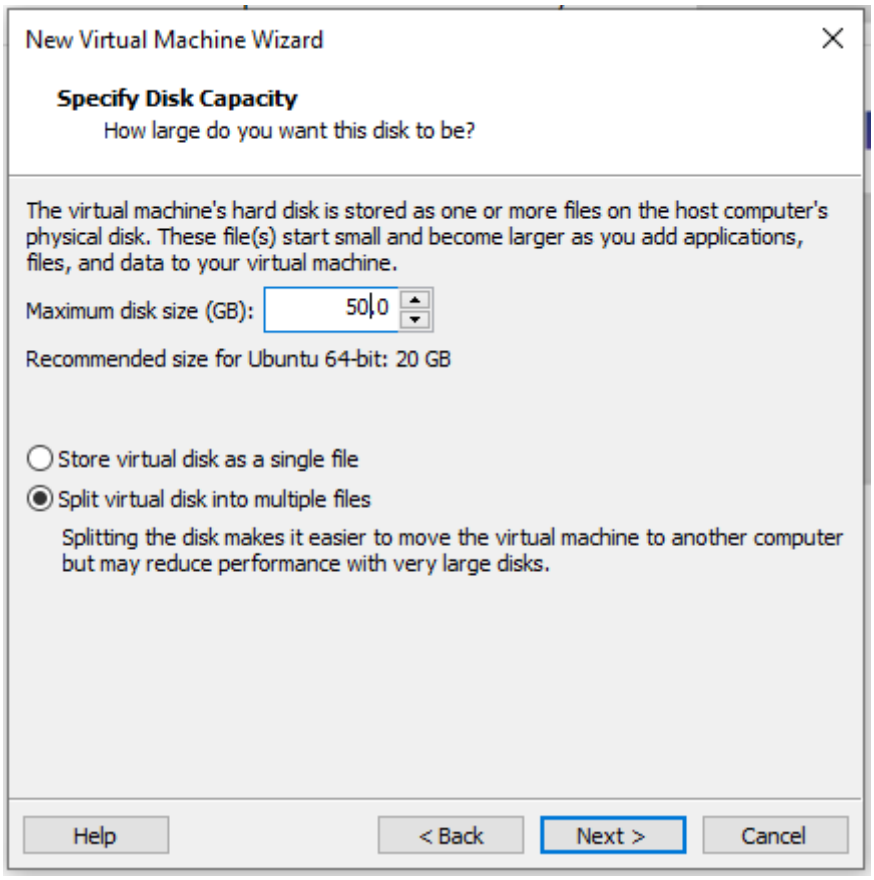

New Virtual Machine Wizard
Easy Install Information
This is used to install Ubuntu 64-bit.
Personalize Linux
Full name:
UBUNTU
User name:
periit
Password:
Confirm:
Help
< Back
Next >
Cancel



Step 6:

Configure Virtual Machine Hardware

- Allocate memory: Choose how much RAM you want to allocate to the virtual machine. Make sure to leave enough memory for your host OS to run smoothly as well.
- Allocate storage: Choose whether to store the virtual disk as a single file or split into multiple files. Specify the disk size, and you can also choose to allocate all disk space now or let it grow as needed.
- Click "Next."



Step 8:

Customize Hardware (Optional)

- If needed, you can customize the virtual machine's hardware settings like CPU cores, network adapters, graphics memory, etc. Otherwise, you can leave them as default.
- Click "Finish" once you are satisfied with the settings.

Step 8:

Install Guest OS

- Start the virtual machine you just created. The virtual machine will boot from the ISO or installation media you provided earlier.
- Follow the standard installation process for your guest OS.

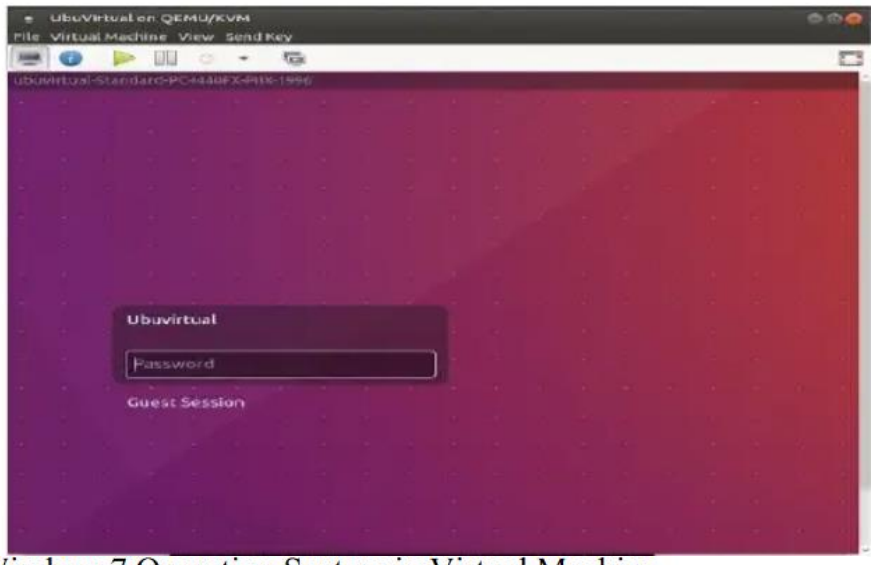
Step 9:

Install VMware Tools (Optional but Recommended)

- After installing the guest OS, it is advisable to install VMware Tools within the guest OS. VMware Tools provides better integration between the host and guest OS, enabling features like shared folders, improved graphics, and more. In the same way, we can install windows OS also. The output screens for the virtual machines of different configurations.

OUTPUT

(i)Ubuntu Operating System in Virtual Machine



(ii)Windows7 Operating System in Virtual Machine

Program (3)	Output & Result (3)	Viva (4)	Total (10)

RESULT:

Thus, various configurations of Virtual machines has been created and run.

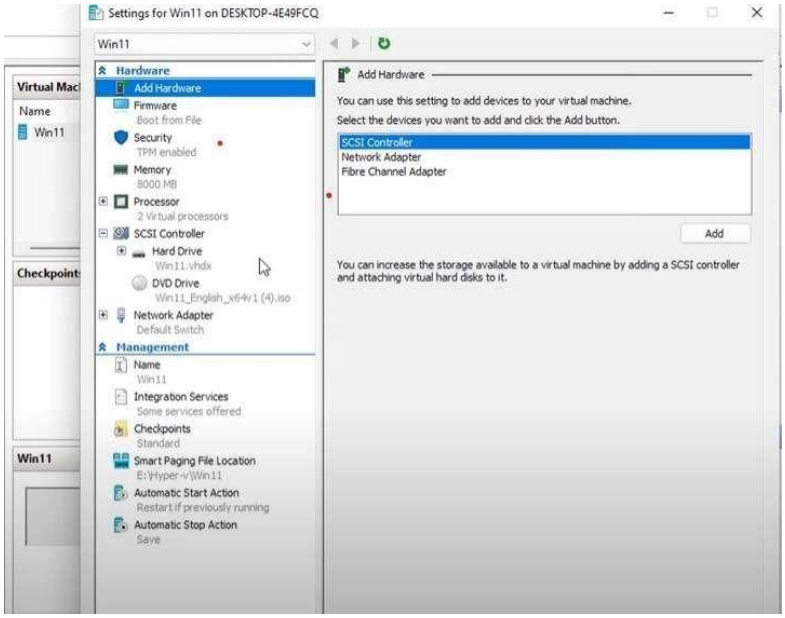
Ex 2(a): Shrink and Extend Virtual Disk

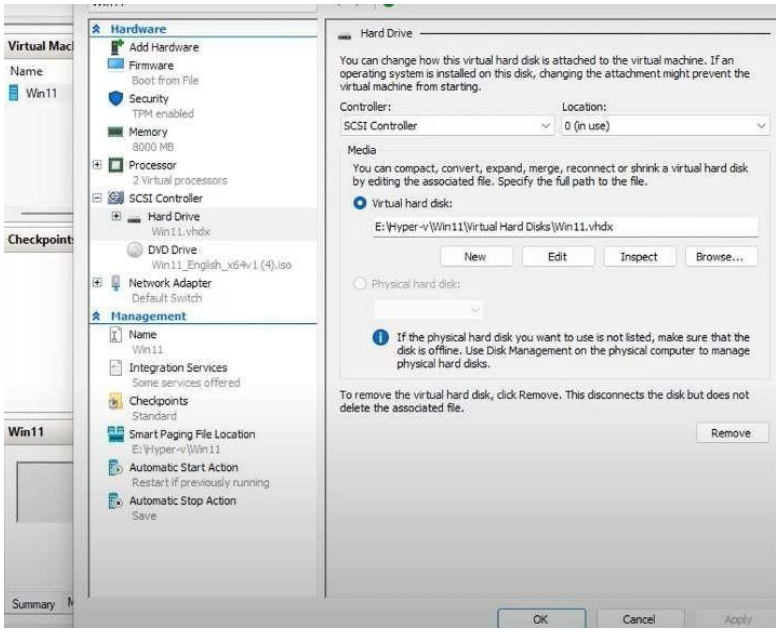
Aim:
To find the procedure of Shrink a virtual disk involves reducing its size to reclaim unused space and extend a virtual disk allows you to increase its size to accommodate more data.

Procedure:
(a) Shrink a Virtual Disk:
Step1:
Inside the virtual machine, delete unnecessary files and empty the recycle bin/trash to free up space.
Step 2:
Defragment the virtual machine's disk to move all the data to the beginning of the disk.
Step 3:
Shutdown the virtual machine
Step 4:
On the host system, open the virtualization software
Step 5:
Navigate to the virtual machine's settings or configuration
.**Step 6:**
Select the virtual disk you want to shrink.
Step 7:
Look for an option to shrink or compact the disk and follow the prompts.
Step 8:
The process might take some time, and it's essential to back up your virtual machine before proceeding, as data loss can occur in some cases.

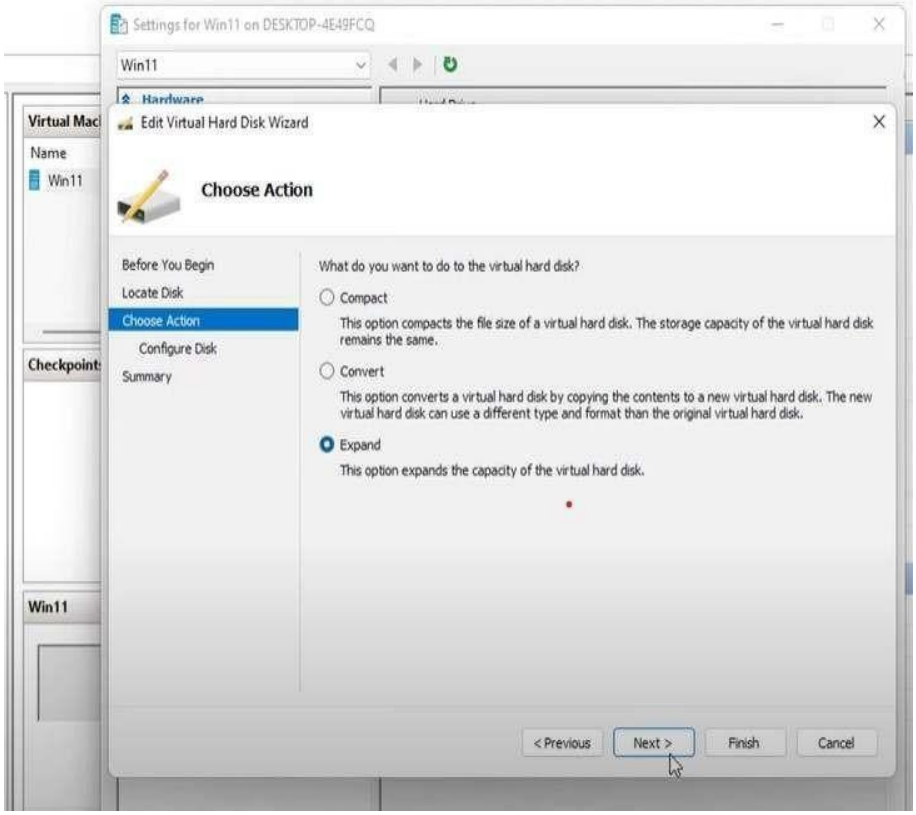
(a) Extend Virtual Disk:
Step 1:
Shutdown the virtual machine.
Step 2:
On the host system, open the virtualization software (e.g., VMware, VirtualBox).
Step 3:
Navigate to the virtual machine's settings or configuration.
Step 4:
Select the virtual disk you want to extend.
Step 5:
Look for an option to increase or extend the disk and follow the prompts.
Step 6:
Specify the new size for the virtual disk (make sure to allocate enough space for your needs).
Step 7:
The process might take some time, and it's crucial to back up your virtual machine before proceeding, as extending the disk involves modifying the underlying file system.

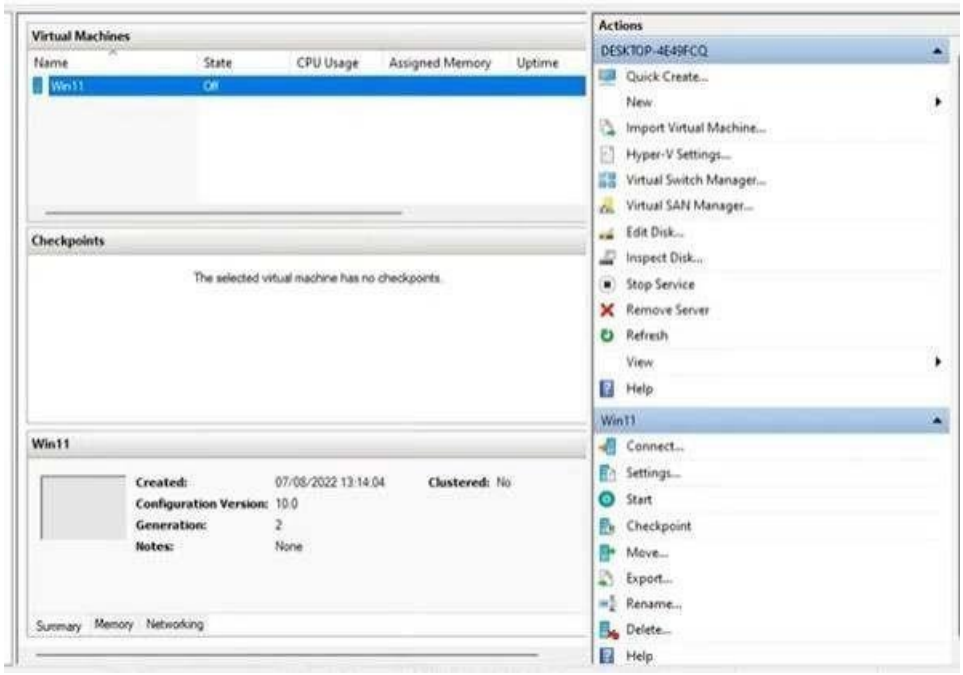
OUTPUT:


Settings for Win11 on DESKTOP-4E49FCQ
Win11
Hardware
Add Hardware
Firmware
Boot from File
Security
TPM enabled
Memory
8000 MB
Processor
2 Virtual processors
SCSI Controller
Hard Drive
Win11.vhdx
DVD Drive
Win11_English_x64v1 (4).iso
Network Adapter
Default Switch
Management
Name
Win11
Integration Services
Some services offered
Checkpoints
Standard
Smart Paging File Location
E:\Hyper-v\Win11
Automatic Start Action
Restart if previously running
Automatic Stop Action
Save
Add Hardware
You can use this setting to add devices to your virtual machine.
Select the devices you want to add and click the Add button.
SCSI Controller
Network Adapter
Fibre Channel Adapter
Add
You can increase the storage available to a virtual machine by adding a SCSI controller and attaching virtual hard disks to it.


Hardware
Add Hardware
Firmware
Boot from File
Security
TPM enabled
Memory
8000 MB
Processor
2 Virtual processors
SCSI Controller
Hard Drive
Win11.vhdx
DVD Drive
Win11_English_x64v1 (4).iso
Network Adapter
Default Switch
Management
Name
Win11
Integration Services
Some services offered
Checkpoints
Standard
Smart Paging File Location
E:\Hyper-v\Win11
Automatic Start Action
Restart if previously running
Automatic Stop Action
Save
Hard Drive
You can change how this virtual hard disk is attached to the virtual machine. If an operating system is installed on this disk, changing the attachment might prevent the virtual machine from starting.
Controller:
SCSI Controller
Location:
0 (in use)
Media
You can compact, convert, expand, merge, reconnect or shrink a virtual hard disk by editing the associated file. Specify the full path to the file.
Virtual hard disk:
E:\Hyper-v\Win11\Virtual Hard Disks\Win11.vhdx
New
Edit
Inspect
Browse...
Physical hard disk:
If the physical hard disk you want to use is not listed, make sure that the disk is offline. Use Disk Management on the physical computer to manage physical hard disks.
To remove the virtual hard disk, click Remove. This disconnects the disk but does not delete the associated file.
Remove
OK
Cancel
Apply

Edit Virtual Hard Disk Wizard
Completing the Edit Virtual Hard Disk Wizard
Before You Begin
Locate Disk
Choose Action
Configure Disk
Summary
You have successfully completed the Edit Virtual Hard Disk Wizard. You are about to make the following changes.
Description:
Virtual Hard Disk: Win11.vhdx (VHDX, dynamically expanding)
Action: Expand
Configuration: New virtual disk size: 75 GB
To complete the action and close the wizard, click Finish.
< Previous
Next >
Finish
Cancel


Settings for Win11 on DESKTOP-4E49FCQ
Win11
Edit Virtual Hard Disk Wizard
Choose Action
Before You Begin
Locate Disk
Choose Action
Configure Disk
Summary
What do you want to do to the virtual hard disk?
Compact
This option compacts the file size of a virtual hard disk. The storage capacity of the virtual hard disk remains the same.
Convert
This option converts a virtual hard disk by copying the contents to a new virtual hard disk. The new virtual hard disk can use a different type and format than the original virtual hard disk.
Expand
This option expands the capacity of the virtual hard disk.
< Previous
Next >
Finish
Cancel



Program (3)	Output & Result (3)	Viva (4)	Total (10)

Result:

Thus, the shrink and extend of virtual disk has been created and run successfully.

Ex 2(b): Create, Manage, Configure and schedule snapshots.

Aim:

To find the procedure of Creating, managing, configuring, and scheduling snapshots is a fundamental part of virtual machine management.

Procedure:

Step 1:

Creating a Snapshot: To create a snapshot, follow these steps:

a. Select the virtual machine in the management interface (e.g., vSphere Client).

b. Right-click on the virtual machine and choose "Snapshot" or "Take Snapshot."

c. Provide a name and description for the snapshot.

d. Optionally, select the memory state to capture the virtual machine's running state (requires the virtual machine to be powered off).

e. Click "OK" to create the snapshot.

Step 2:

Managing Snapshots: Managing snapshots involves tasks such asviewing, reverting, deleting, and consolidating snapshots.

a. Viewing Snapshots: To see the list of snapshots for a virtual machine, navigate to the "Snapshots" tab in the virtual machine's details.

b. Reverting to a Snapshot: To revert a virtual machine to a specificsnapshot, right-click on the snapshot and choose "Revert to Snapshot." This action will roll back the virtual machine to the state captured in the selected snapshot.

c. Deleting Snapshots: To delete a snapshot, right-click on the snapshot and choose "Delete Snapshot." You can choose to delete the snapshot only or delete the snapshot and consolidate its changes into the base virtual machine disk.

d.Consolidating Snapshots: If you have multiple snapshots, you can perform a "Snapshot Consolidation" to merge all snapshots into the base disk.This helps to reduce storage requirements and improves performance.

Step 3:

Configuring Snapshot Settings: The snapshot settings allow you to define how snapshots are managed and stored.

a. Snapshot Location: Configure the location where snapshot files are stored, which can be on the same data store as the virtual machine or on a different storage location.

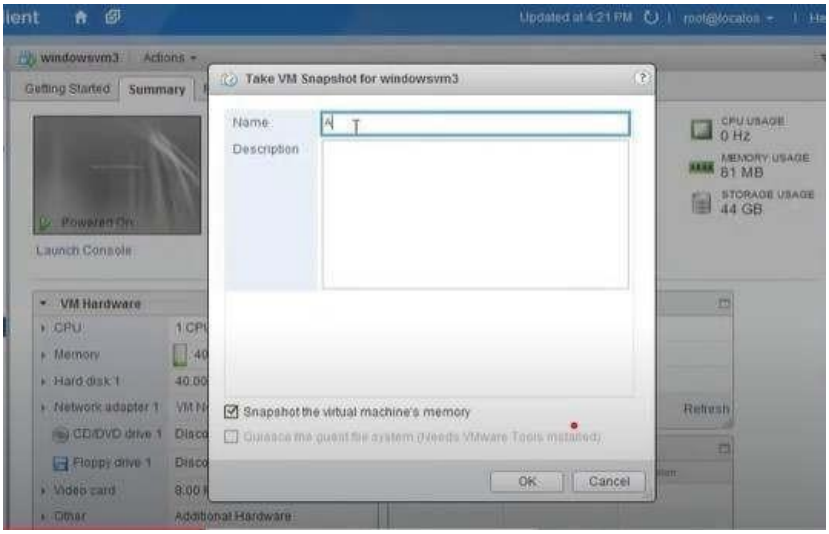
b. Snapshot Quiescent: Enable or disable the use of VMware Tools toquiesce the file system inside the virtual machine before taking a snapshot. This helps ensure application consistency during the snapshot.

Step 4:

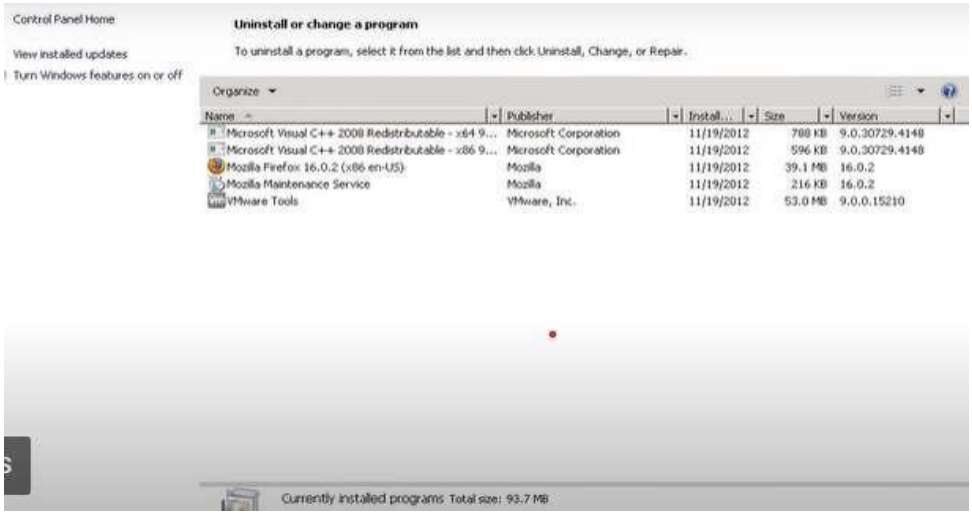
Scheduling Snapshots: Some virtualization platforms allow you toschedule snapshots to be taken automatically at specific intervals.

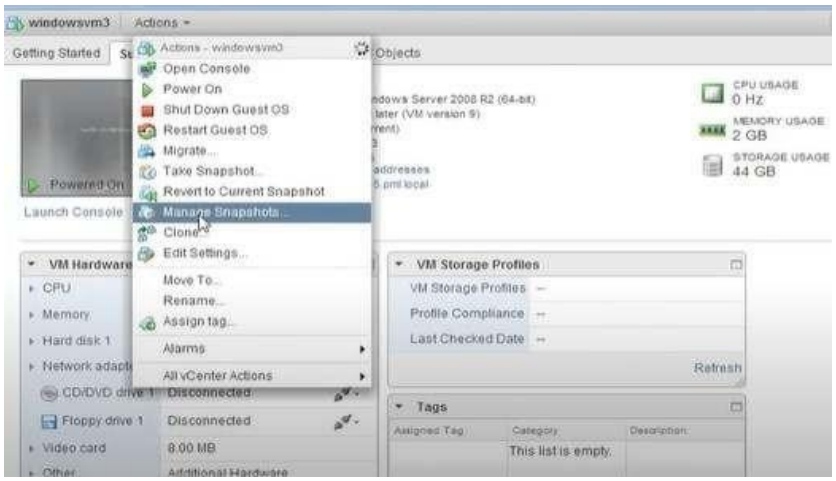
Scheduled Snapshots: Navigate to the virtual machine's settings, find the "Snapshot Schedule" option, and configure the frequency and retention policy for automatic snapshots.

Output:


Take VM Snapshot for windowsvm3
Name
Description
Snapshot the virtual machine's memory
OK
Cancel
windowsvm3
Actions
Getting Started
Summary
Launch Console
VM Hardware
CPU
Memory
Hard disk 1
Network adapter 1
CD/DVD drive 1
Floppy drive 1
Video card
Other
Additional Hardware
CPU USAGE
0 Hz
MEMORY USAGE
81 MB
STORAGE USAGE
44 GB
Refresh

Firefox Setup 16.0.2
11/19/2012 1:30 PM
Application
17,811 KB
Mozilla Firefox Setup
Setup Type
Choose setup options
Choose the type of setup you prefer, then click Next.
Standard
Firefox will be installed with the most common options.
Custom
You may choose individual options to be installed. Recommended for experienced users.
< Back
Next >
Cancel
Firefox Setup 16.0.2 Date modified: 11/19/2012 1:30 PM
Application
Size: 17.3 MB
Date created: 11/19/2012 1:39 PM
Desktop
Libraries
Music
Pictures
Videos
Computer
Network


Control Panel Home
View installed updates
Turn Windows features on or off
Uninstall or change a program
To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.
Organize
Name
Publisher
Install...
Size
Version
Microsoft Visual C++ 2008 Redistributable - x64 9...
Microsoft Corporation
11/19/2012
788 KB
9.0.30729.4148
Microsoft Visual C++ 2008 Redistributable - x86 9...
Microsoft Corporation
11/19/2012
596 KB
9.0.30729.4148
Mozilla Firefox 16.0.2 (x86 en-US)
Mozilla
11/19/2012
39.1 MB
16.0.2
Mozilla Maintenance Service
Mozilla
11/19/2012
216 KB
16.0.2
VMware Tools
VMware, Inc.
11/19/2012
53.0 MB
9.0.0.15210
Currently installed programs Total size: 93.7 MB



Program (3)	Output & Result (3)	Viva (4)	Total (10)

Result:

Thus, Create, Manage, Configure and schedule snapshots and run successfully.

Ex.2(c) Create Spanned, Mirrored and striped volume.

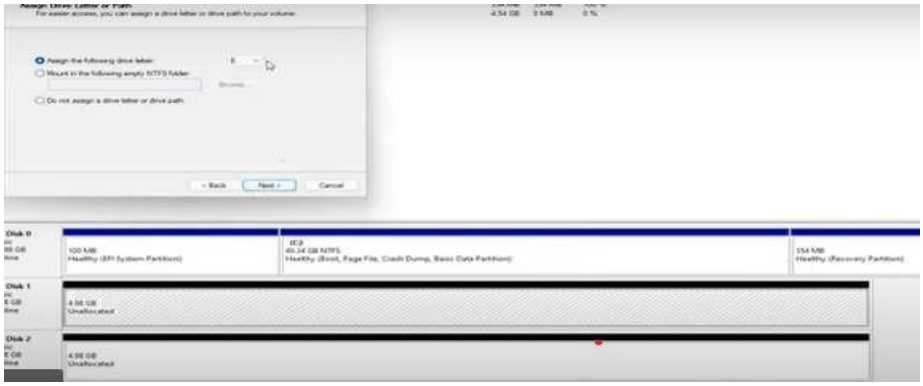
Aim: To create spanned , mirrored and striped volume.

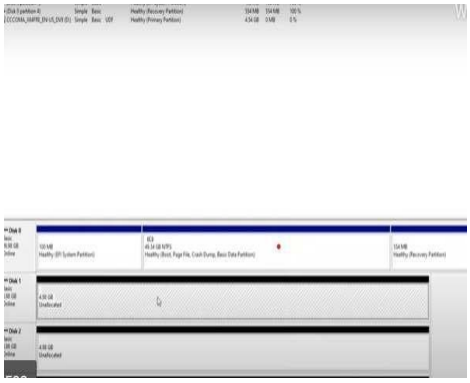
Procedure:

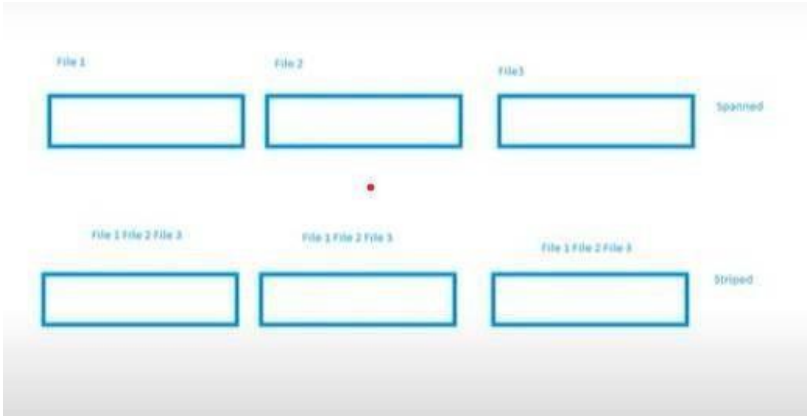
Step 1: How to create a **spanned volume**:
a. Right-click on "This PC" or "My Computer" and select "Manage."
b. In the Computer Management window, click on "Disk Management"under "Storage" in the left pane.
c. Identify the disks you want to use in the spanned volume. They should be unallocated or have empty space available.
d. Right-click on the first disk and choose "New Spanned Volume."
e. Follow the on-screen instructions to select additional disks and allocate space for the spanned volume.
f. Assign a drive letter or mount point to the new volume and format it with a file system.
Step 2: How to create a **mirrored volume**:
a. Follow steps a to c from the spanned volume creation process to open Disk Management.
b. Right-click on one of the disks you want to use in the mirror and choose "New Mirrored Volume."
c. Select the additional disk(s) to mirror the first disk, and then allocate space for the mirrored volume.
d. Assign a drive letter or mount point to the new volume and format it with a file system.
e. Windows will start the synchronization process, where data is copied from the source disk to the mirror disk(s).
Step 3: How to create a **striped volume**:
a. Follow steps a to c from the spanned volume creation process to open Disk Management.

b. Right-click on one of the disks you want to use in the stripe and choose "New Striped Volume."
c. Select the additional disk(s) to include in the stripe, and then allocate space for the striped volume. d. Assign a drive letter or mount point to the new volume and format it with a file system.

Output:







Program (3)	Output & Result (3)	Viva (4)	Total (10)

Result:

Thus, the Create Spanned, Mirrored and striped volume have been completed successfully.

Ex.2(d): Create RAID 5 Volume

Aim: To create RAID 5 volume.

Procedure:

Step 1: Backup Data: Before creating the RAID 5 volume, back up all your critical data to ensure it is safe in case of any unforeseen issues.

Step 2: Initialize and Convert Disks to Dynamic: If your disks are currently basic disks, you need to convert them to dynamic disks to create a RAID 5volume. Follow these steps:

a. Right-click on "This PC" or "My Computer" and select "Manage."

b. In the Computer Management window, click on "Disk Management" under "Storage" in the left pane.

c. Identify the disks you want to use in the RAID 5 array. They should be unallocated or have empty space available.

d. Right-click on each disk and select "Convert to Dynamic Disk." Repeat this for all the disks you want to include in the RAID 5 array.

Step 3: Create the RAID 5 Volume: Once you have converted the disks to dynamic, you can proceed to create the RAID 5 volume:

a. Right-click on one of the disks you want to use in the RAID 5 array.

b. Select "New Spanned Volume."

c. Follow the on-screen instructions to select the other disks you want to include in the RAID 5 array. There should be at least three disks in total.

d. Allocate the desired amount of space for the RAID 5 volume. RAID 5requires a minimum of three disks, and the volume size will be the total capacity of all disks minus one disk's worth of space. For example, if you have three 1TB disks, the RAID 5 volume will have a total capacity of 2TB.

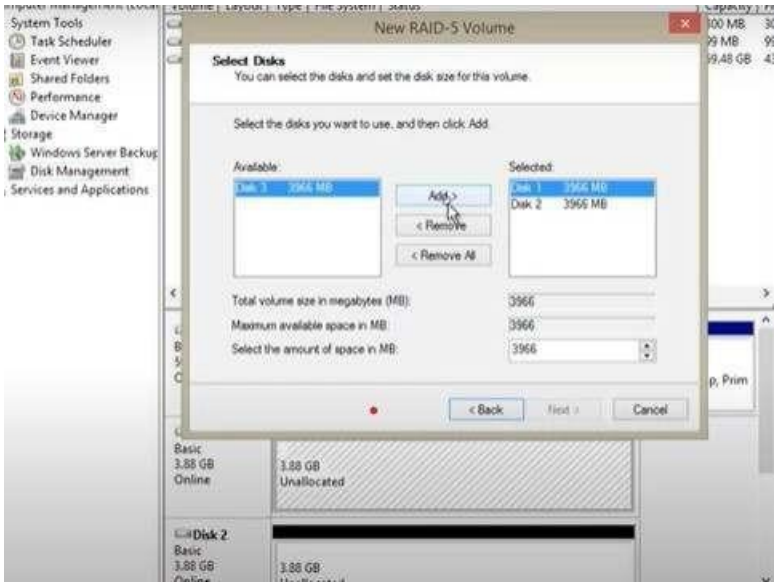
e. Assign a drive letter or mount point to the new RAID 5 volume and format it with a file system.

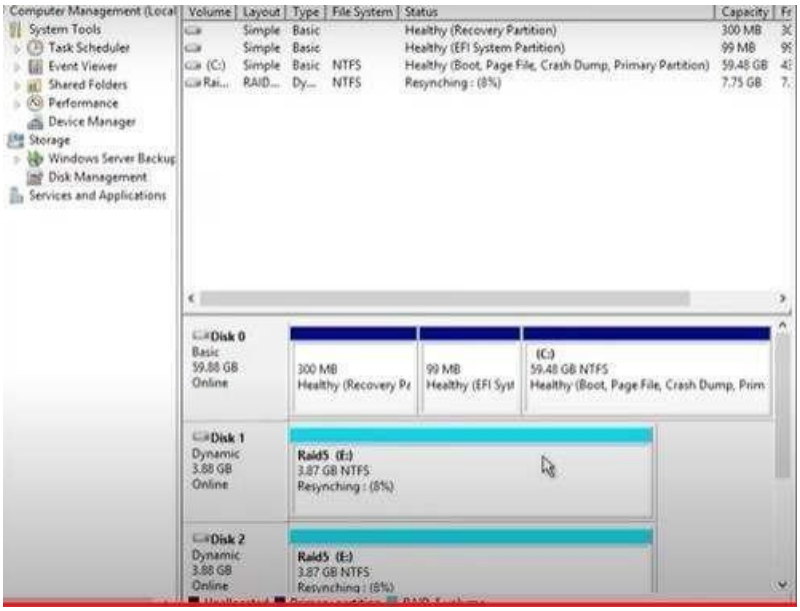
Step 4: Initialize and Format the RAID 5 Volume: After creating the RAID 5volume, you need to initialize and format it:

a. When prompted, initialize the disks using the default partition style (usually GPT).

b. Format the RAID 5 volume with your desired file system (e.g., NTFS) and assign a drive letter or mount point. Output:

Output:





Program (3)	Output & Result (3)	Viva (4)	Total (10)

Result:

Thus, the Create RAID 5 volume has been created successfully.

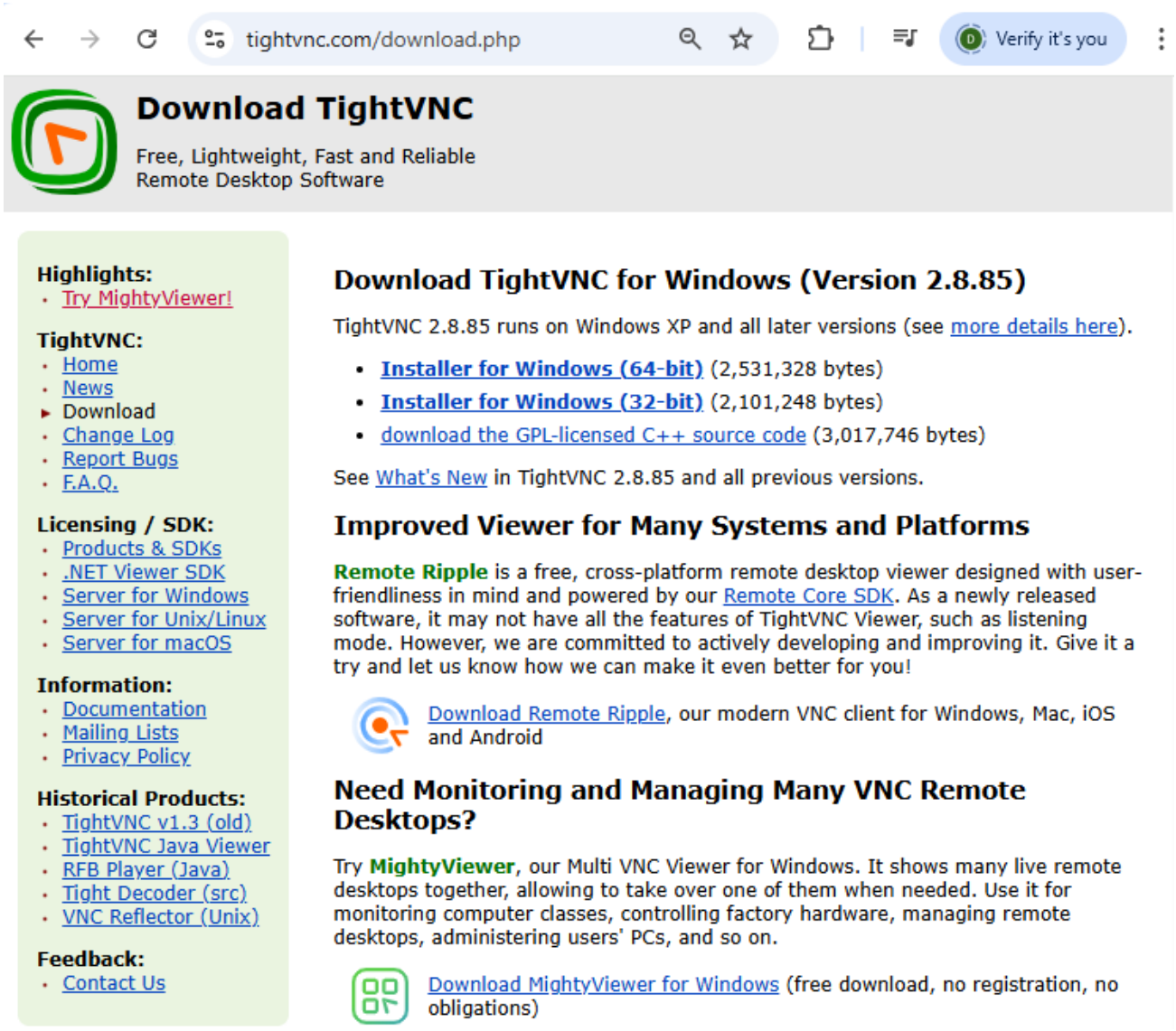
Ex.3(a): Desktop Virtualization using VNC

Aim:

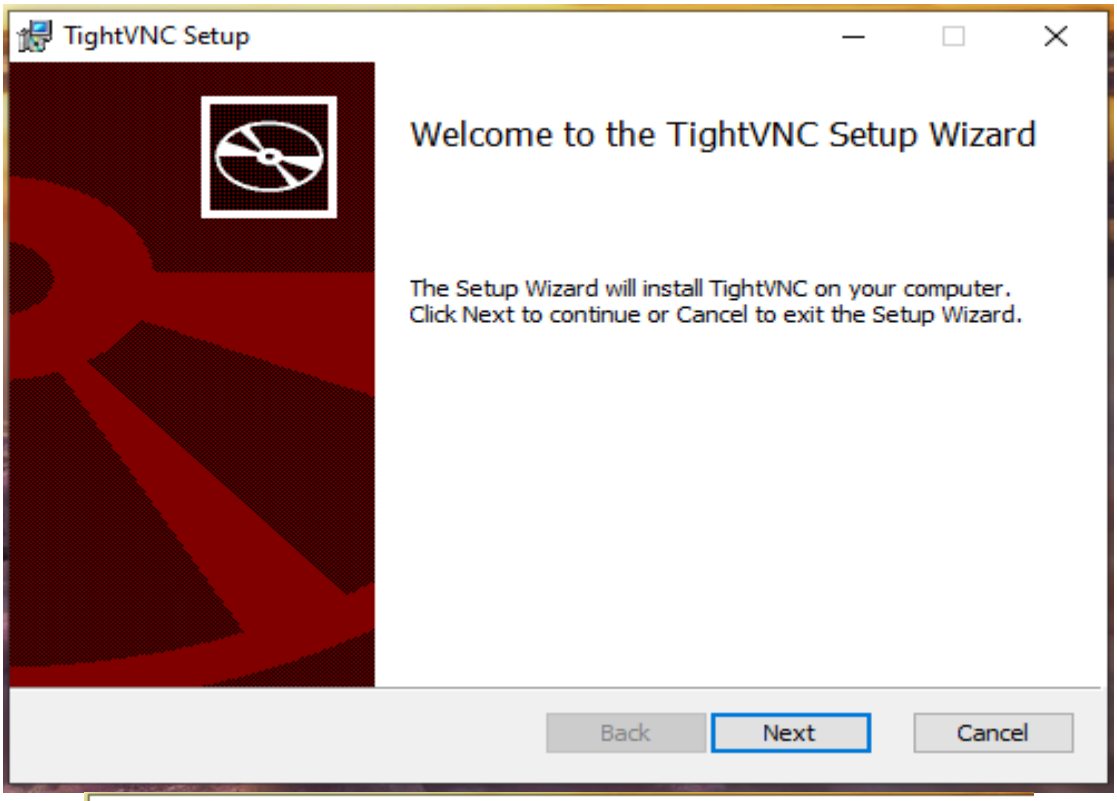
To demonstrate desktop virtualization using Tight VNC.

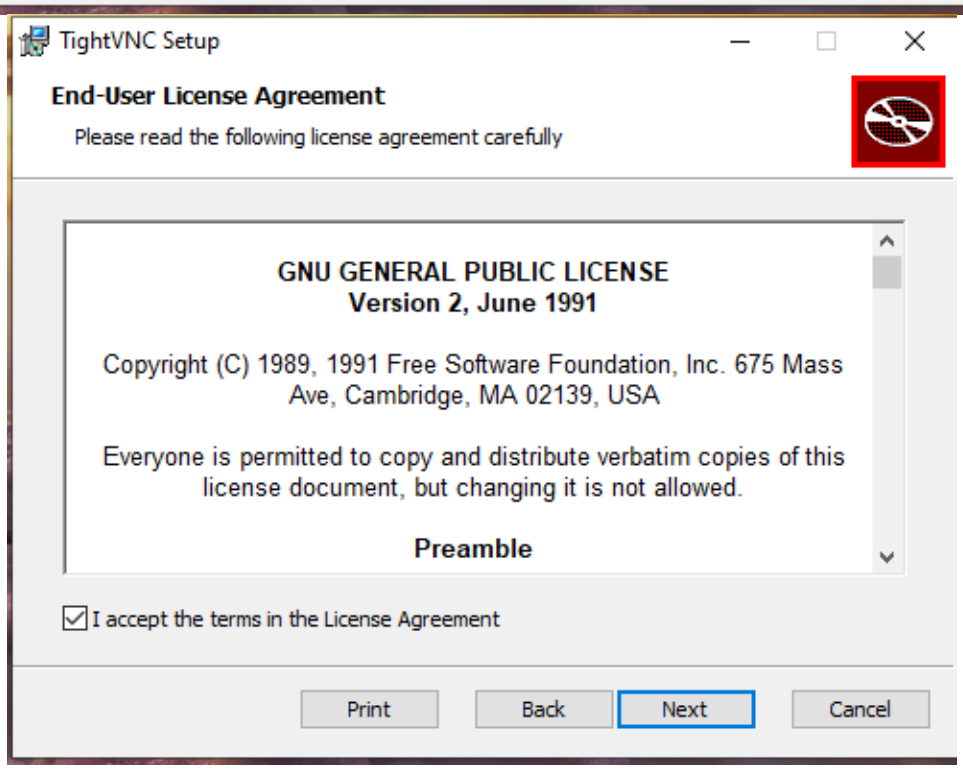
Procedure:

Step 1: Download TightVNC Server
https://www.tightvnc.com/download.php

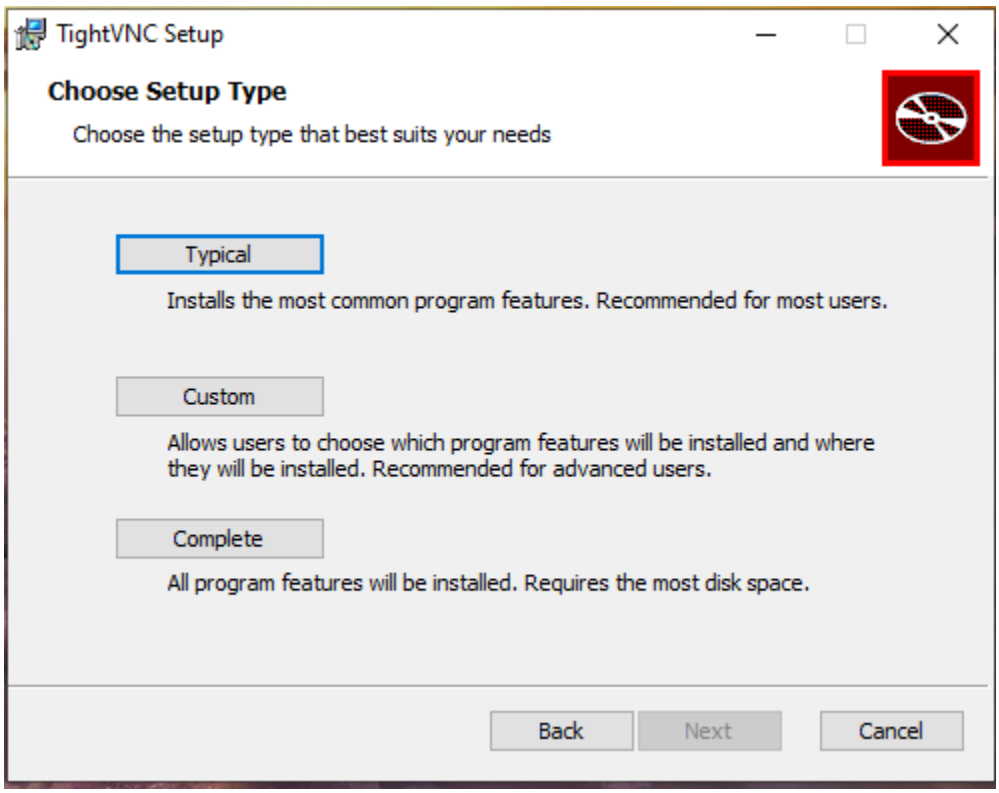


Click **Installer for Windows (64-bit)**
Install TightVNC Server.

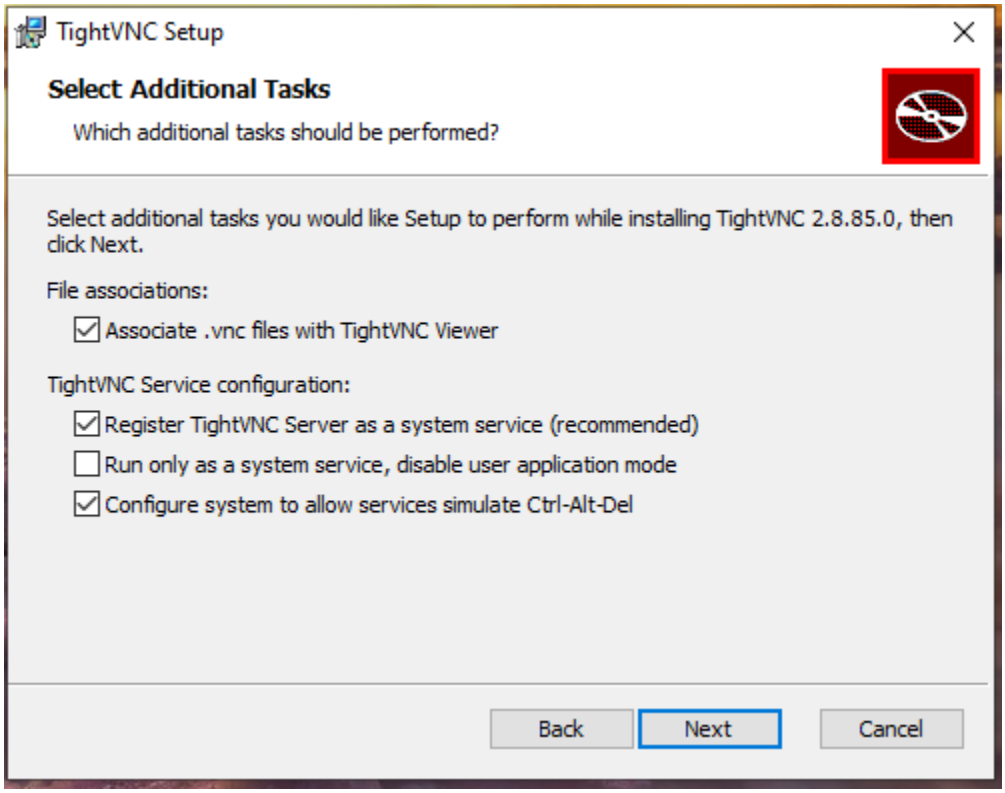




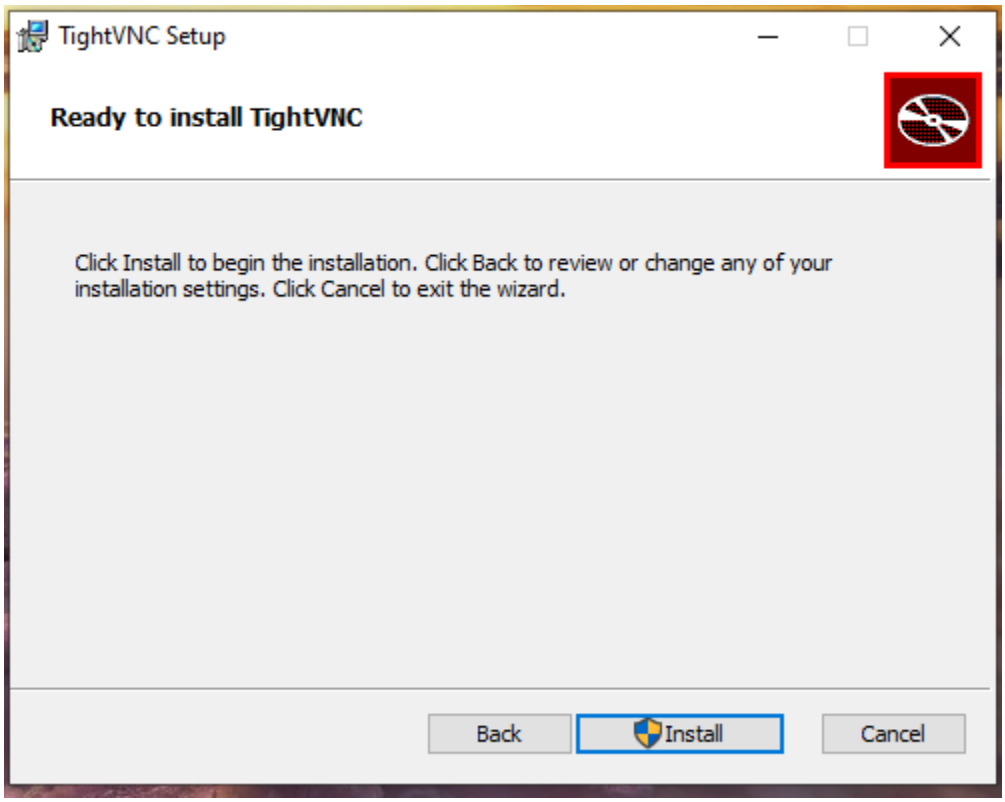
Step 2:
Configure VNC Server: After installing the VNC server, you'll need to configure it by setting a password or access control options to secure the remote access. Ensure that the VNC server is running and ready to accept incoming connections.



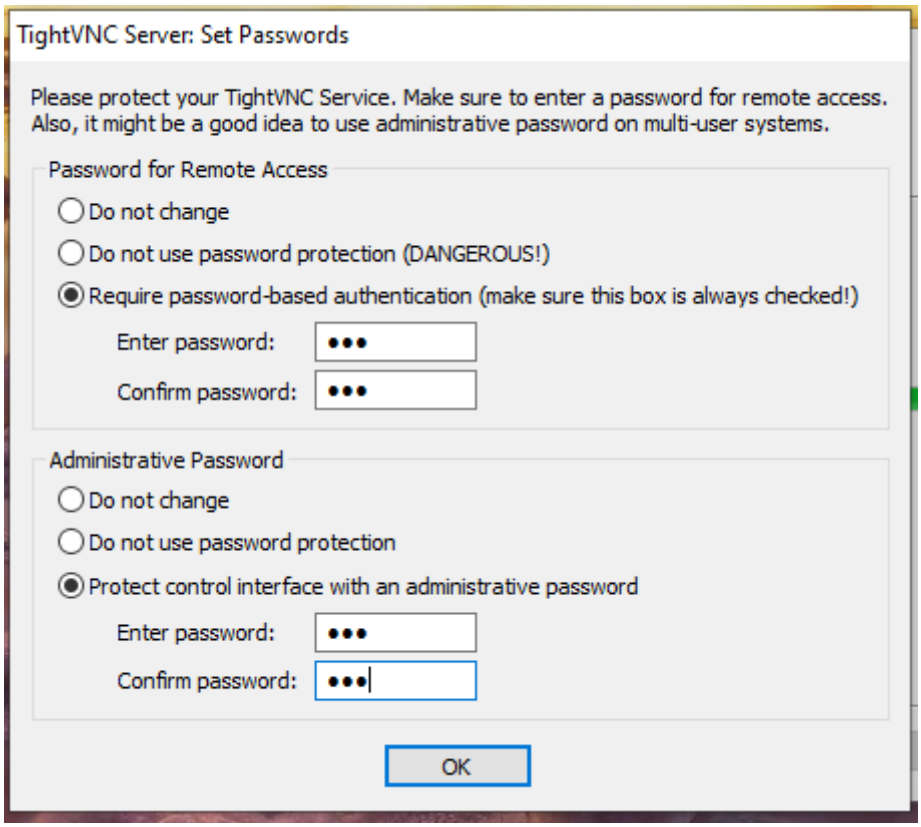
Click **Typical**



Click **Next**

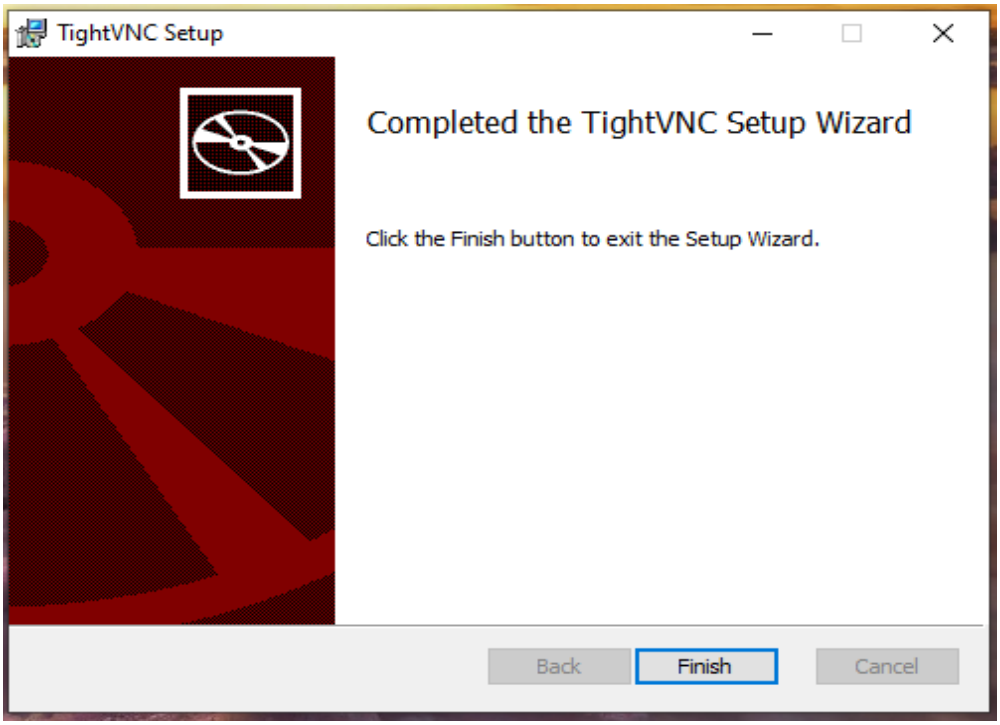


Click **Install**



Type password

Click **OK**



Click **Finish**

Step 3:

Install VNC Viewer.

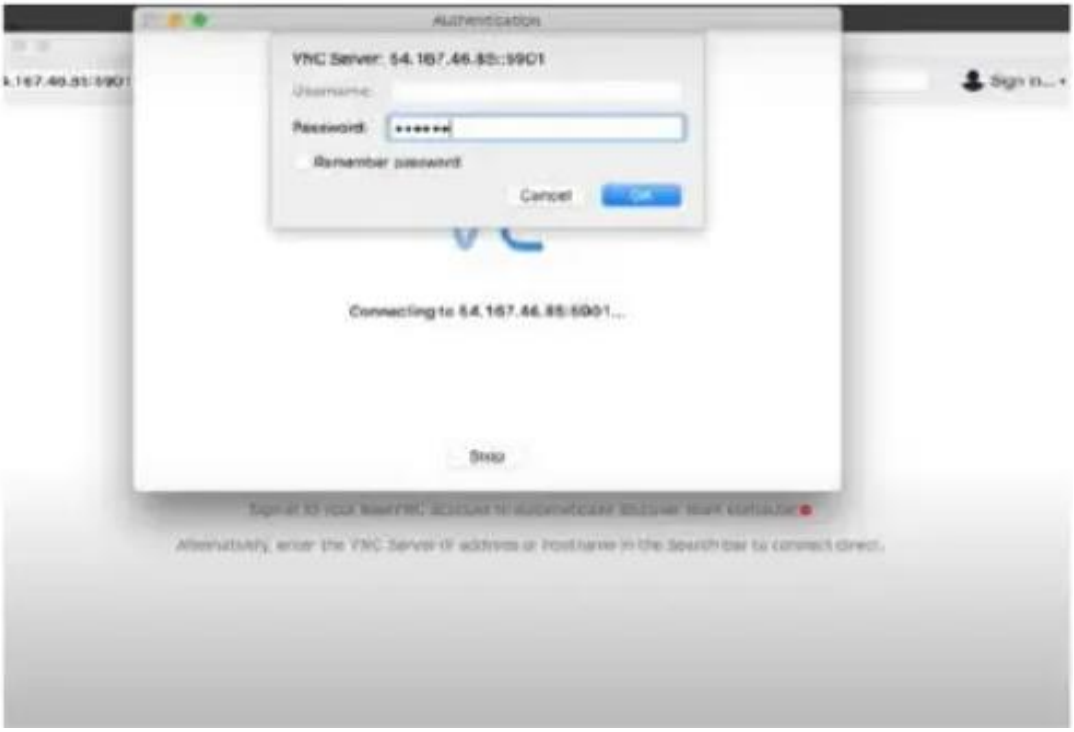
Step 4:

Connect to the Remote Desktop: Launch the VNC viewer and enter the IP address or host name of the remote computer (the host) you want to connect to. If you have configured a password or access control options on the VNC server, you will be prompted to enter the credentials. Once authenticated, the VNC viewer establishes a connection to the remote desktop.

Step 5:

Control the Remote Desktop: After the connection is established, you will see the remote desktop environment displayed in the VNC viewer. You can now interact with the remote desktop as if you were physically sitting in front of it. You can run applications, access files, and perform any tasks on the remote computer just as if you were using it directly.

Output:



Program (3)	Output & Result (3)	Viva (4)	Total (10)

Result:

Thus Desktop Virtualization using VNC run successfully.

Ex.3(b)

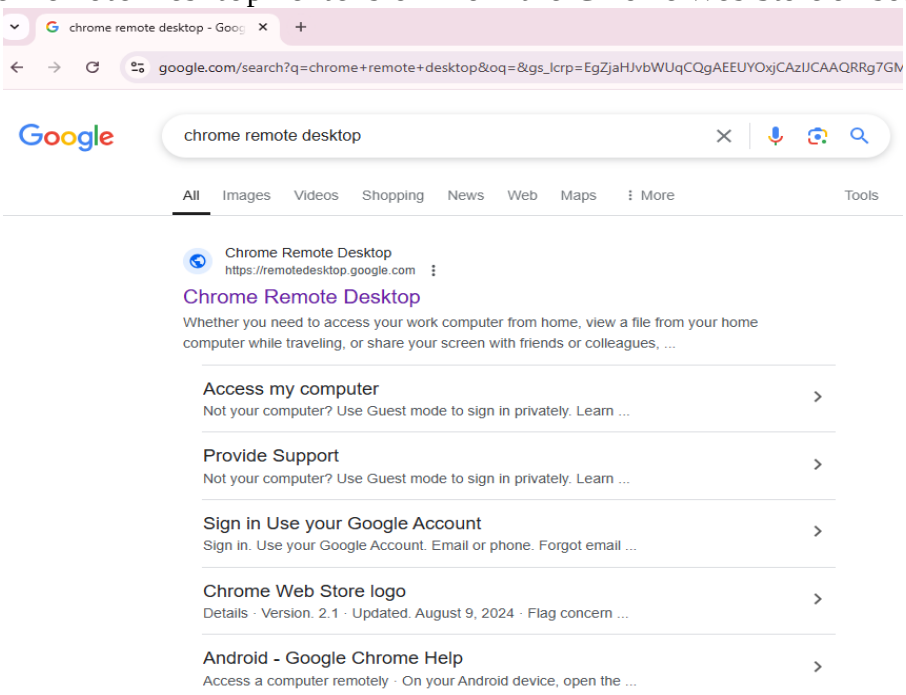
Desktop Virtualization using Chrome Remote Desktop

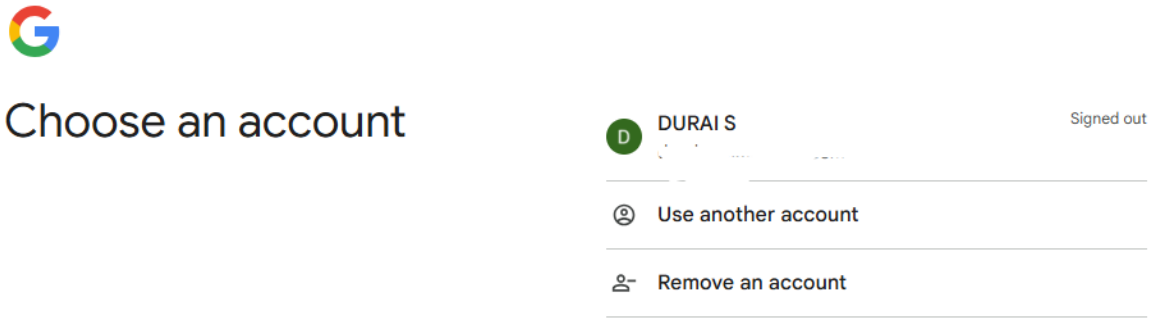
Aim: To demonstrate desktop virtualization using Chrome Remote Desktop.

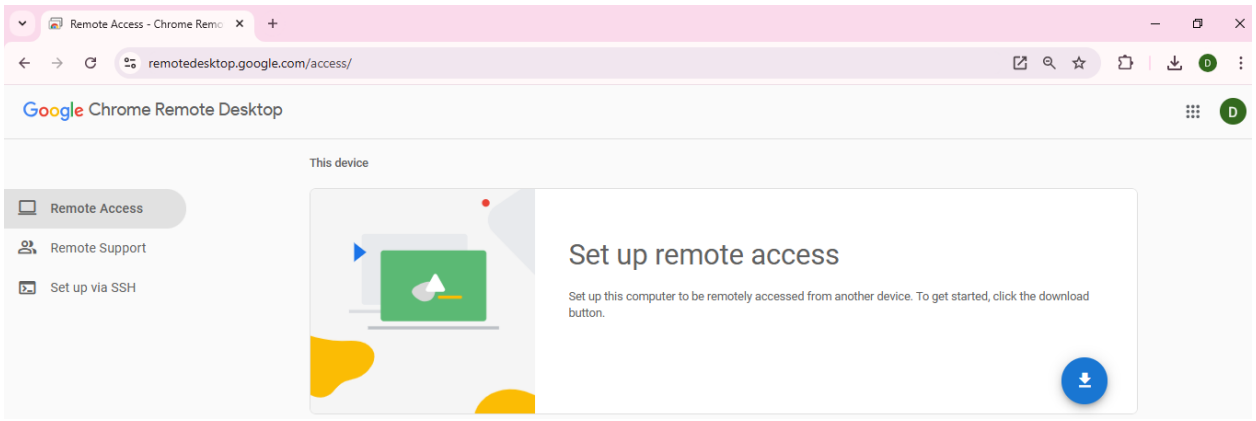
Procedure:

Step 1:

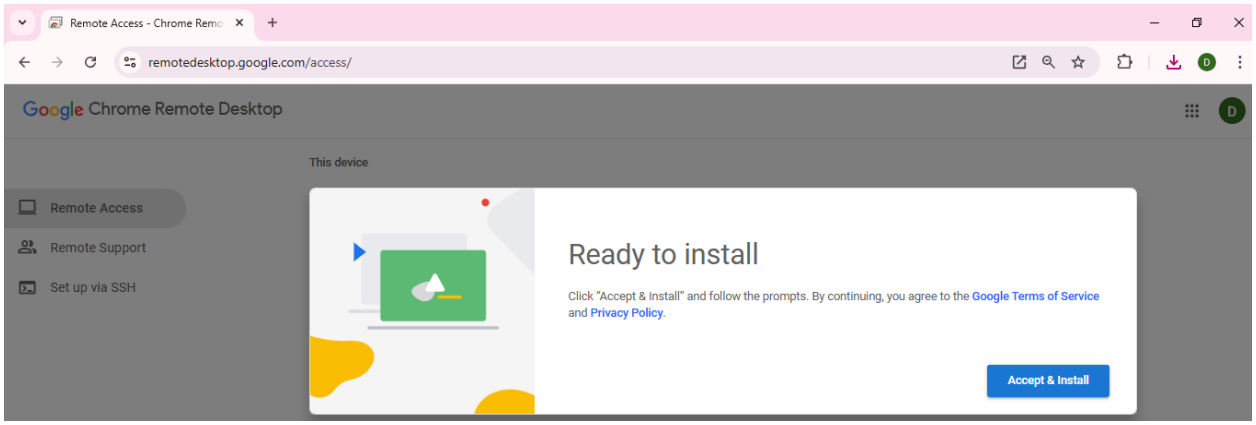
Install Chrome Remote Desktop Extension: Make sure you have the Google Chrome web browser installed on both the computer you want to access remotely (the host) and the computer or device you want to use for remote access (the client). Install the "Chrome Remote Desktop" extension from the Chrome Web Store on both devices.



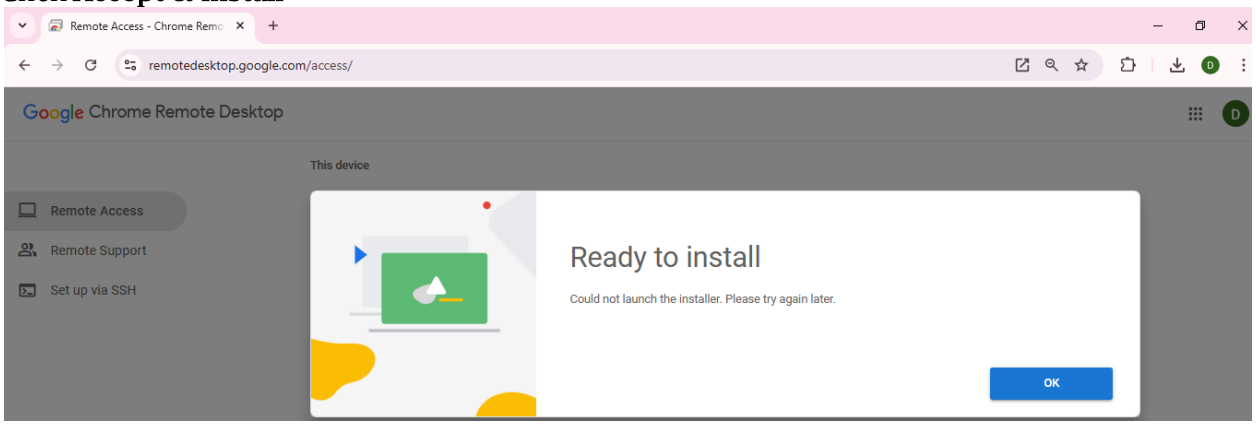




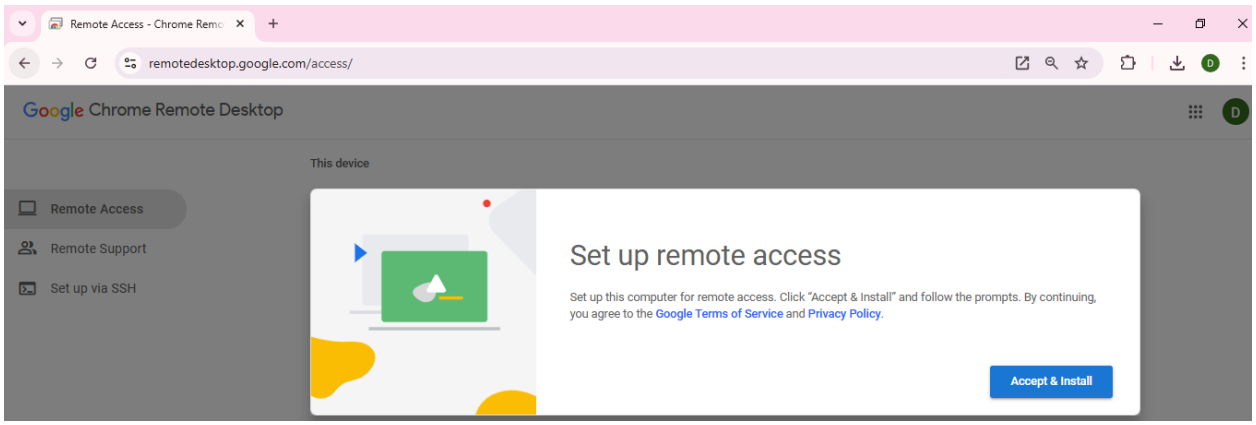
Click Download button

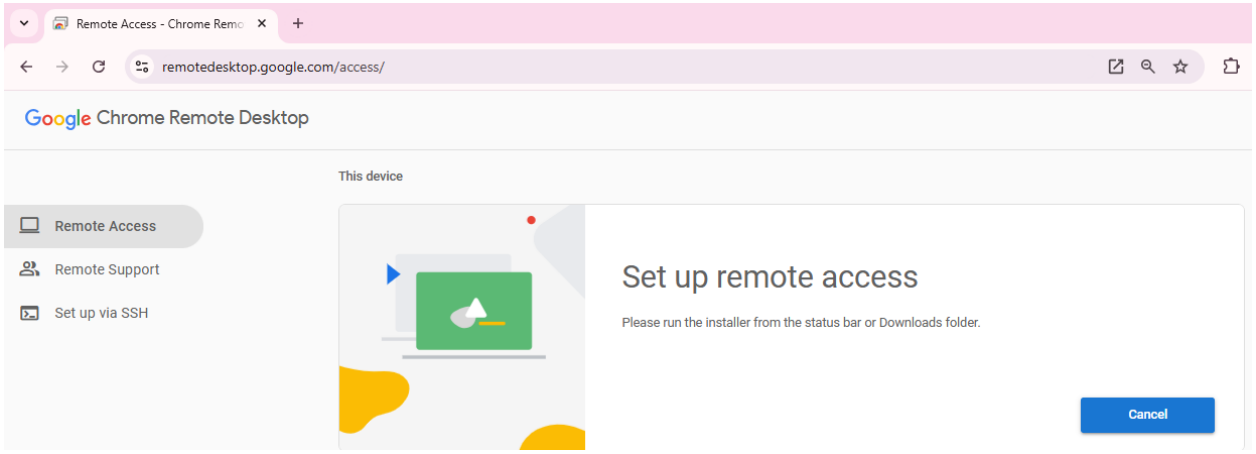


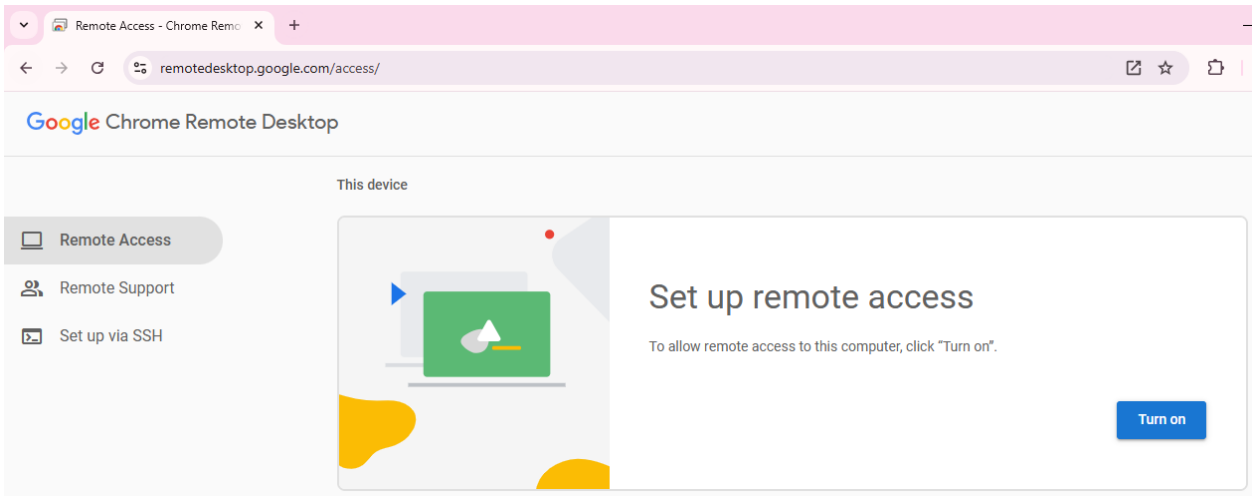
Click **Accept & Install**



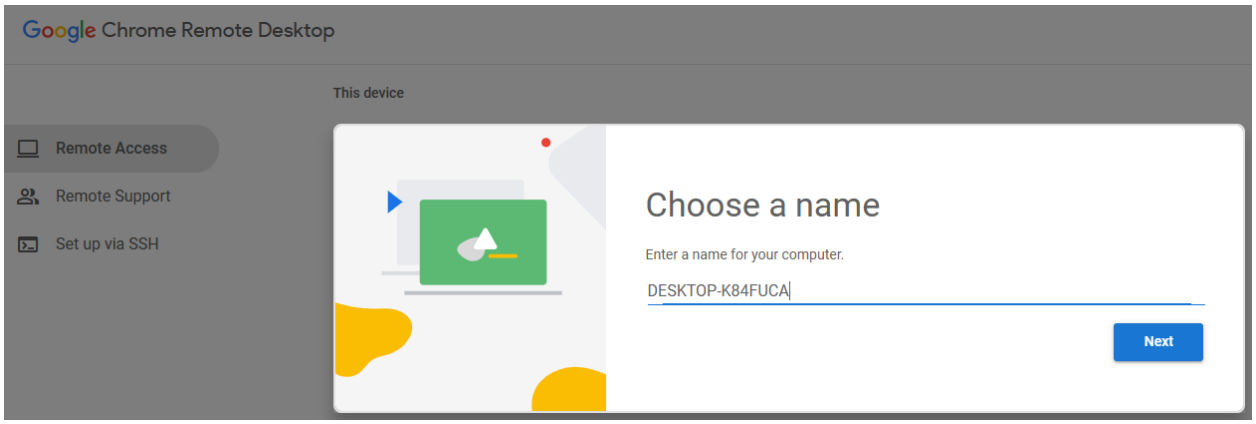
Click **OK**



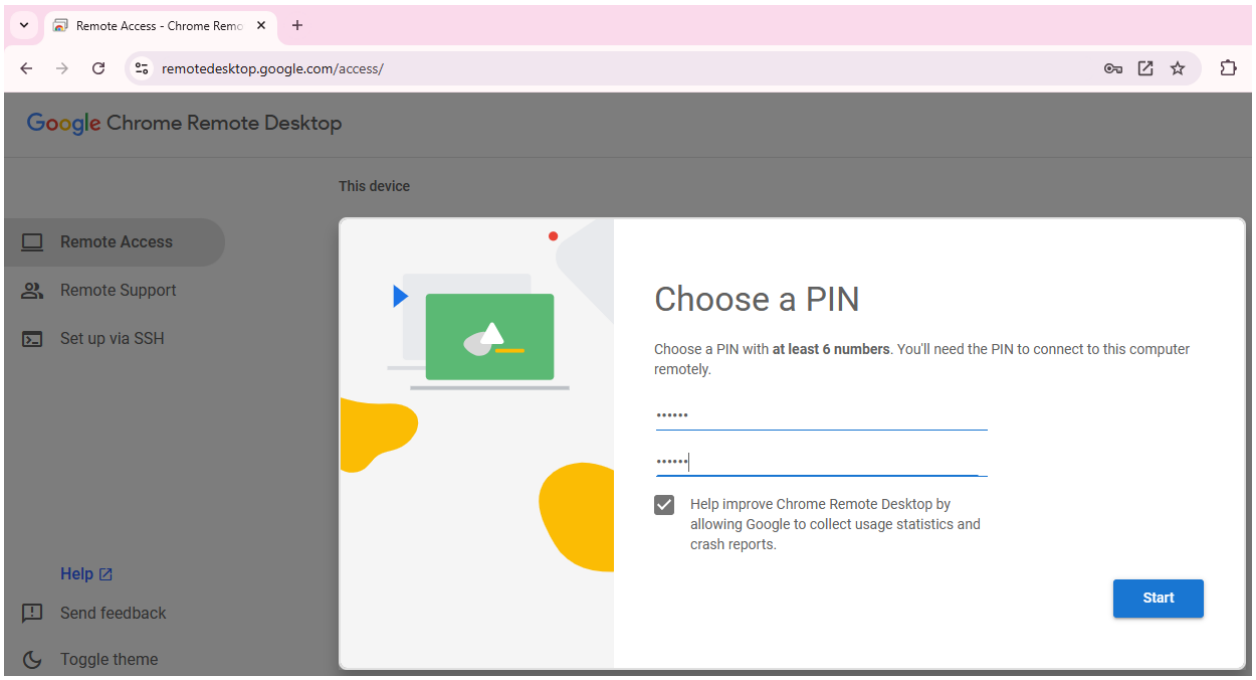




Click **Turn on**



Click **Next**



Click **Start**

Step 2:

Set Up Host Computer (Computer to be Accessed):

a. Open Google Chrome on the host computer.
b. In the address bar, type "chrome://apps" and press Enter.
c. Click on the "Chrome Remote Desktop" icon to open the application.
d. Follow the on-screen instructions to grant necessary permissions and set up remote access for the host computer.
e. Create a secure PIN to use for remote access authentication.

Step 3:

Access Host Computer (Client Device):

a. Open Google Chrome on the client device (the computer or device from which you want to access the host computer remotely).
b. In the address bar, type "remotedesktop.google.com/access" and press Enter.
c. Click on the "Access" button under the "Remote Access" section.
d. Sign in with your Google Account (the same account used on the host computer).

Step 4:

Choose the Host Computer:

After signing in, you should see a list of available computers set up for remote access. Choose the host computer you want to access.

Step 5:

Authenticate and Connect:

a. If you have set up a PIN for the host computer, you will be prompted to enter it to authenticate the remote access.
b. Once authenticated, the remote connection will be established, and you will see the host computer's desktop in the Chrome browser window.

Step 6:

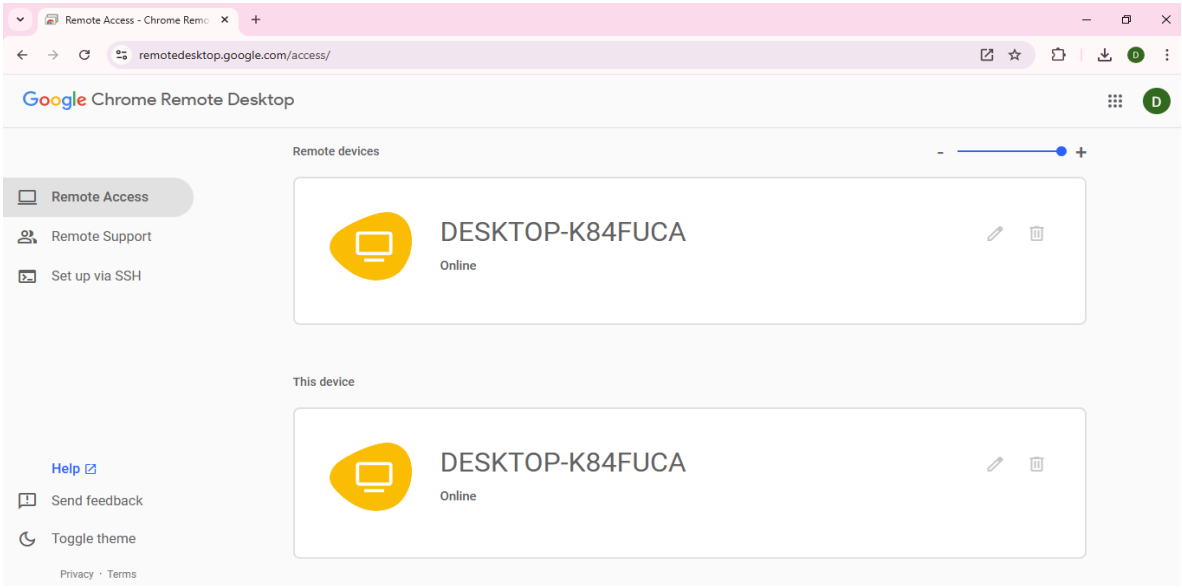
Control the Host Computer:

a. You can now interact with the host computer's desktop through the Chrome browser on your client device. Use your mouse and keyboard to control the remote desktop.
b. To switch between full-screen and windowed mode, click the "Toggle full screen" button on the top right corner of the remote desktop window.

Step 7:

End the Remote Session: To end the remote session, click the "Stop Sharing" button at the bottom of the remote desktop window.

Output:



Program (3)	Output & Result (3)	Viva (4)	Total (10)

Result:

Thus Desktop Virtualization using Chrome Remote Desktop run successfully.

Ex.4 Create type 2 virtualization on ESXI 6.5 server

Aim:

To Create type 2 virtualization on ESXI 6.5 server.

Procedure:

Step 1:

Install ESXi 6.5: First, you need to install VMware ESXi 6.5 on your server.

Step 2:

Access ESXi Web Client: Once ESXi is installed and running, access the ESXi Web Client through a web browser on a separate computer. Enter the IP address or hostname of your ESXi server to log in to the management interface.

Step 3:

Create a Virtual Machine: To create a virtual machine within ESXi, follow these steps:

a. In the ESXi Web Client, navigate to the "Hosts and Clusters" view.

b. Select your ESXi server from the list of hosts.

c. Click on the "Create/Register VM" button or right-click on the host and choose "New Virtual Machine."

d. The "Create New Virtual Machine" wizard will appear. Follow the steps in the wizard to configure the virtual machine, including providing a name, selecting the guest operating system, setting the desired resources (CPU, memory, disk space, etc.), and selecting a storage location for the virtual machine files.

e. Finish the wizard, and the virtual machine will be created.

Step 4:

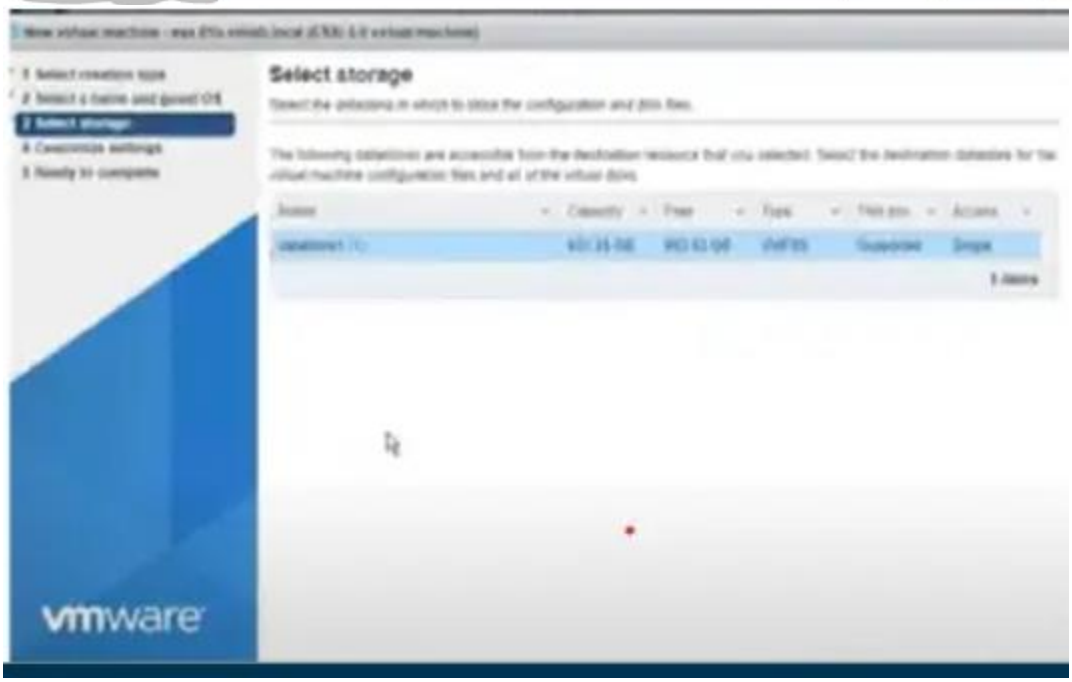
Install Guest Operating System: Once the virtual machine is created, you can power it on and install the guest operating system of your choice (e.g., Windows, Linux, etc.) using an ISO image or CD/DVD.

Step 5:

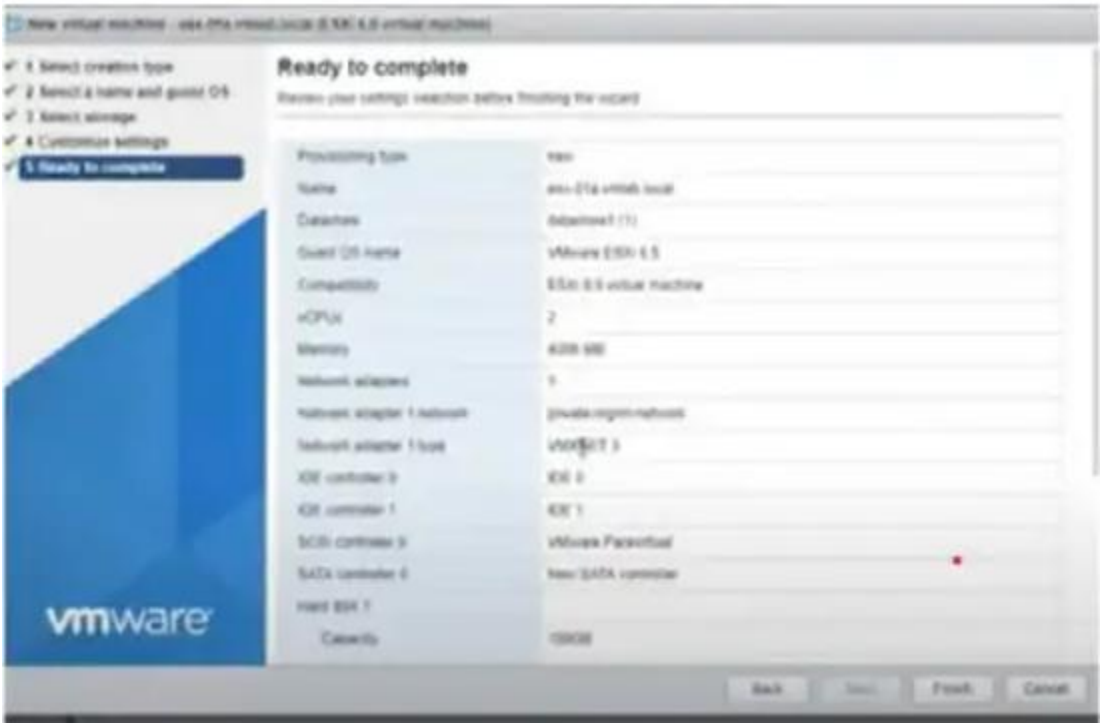
Access and Manage the Virtual Machine: After the guest operating system is installed, you can access the virtual machine through the VMware Remote Console (VMRC) or use remote access tools like VNC or RDP to interact with the guest operating system.

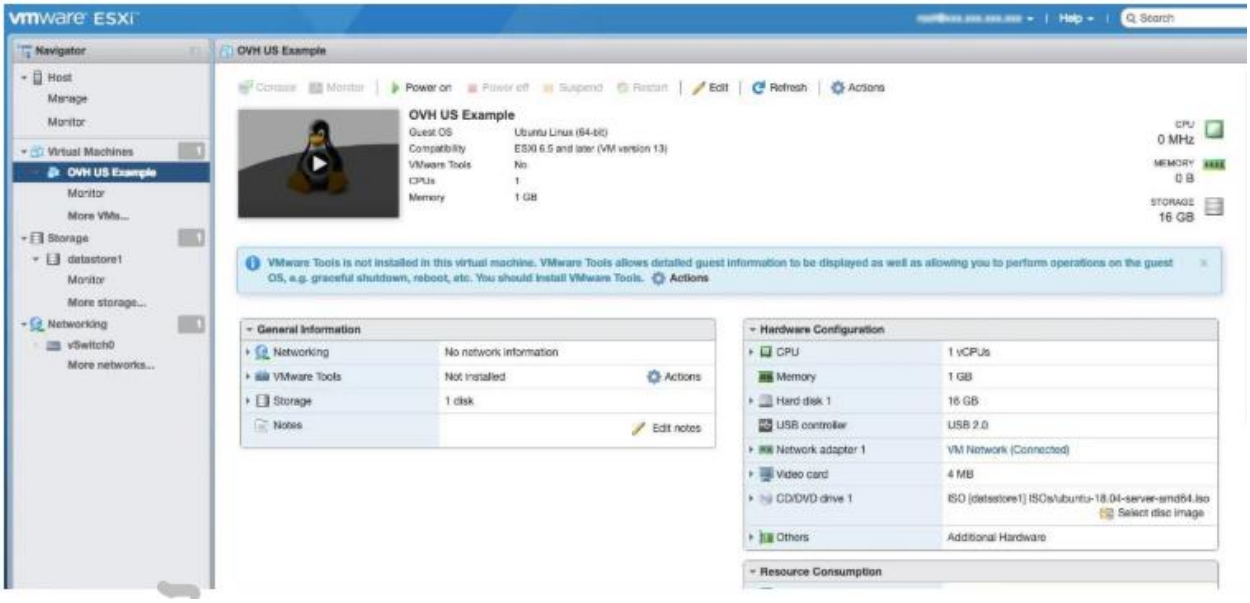
Output:

New virtual machine - OVH US Example (ESXi 6.5 virtual machine)
1 Select creation type
2 Select a name and guest OS
3 Select storage
4 Customize settings
5 Ready to complete
Select a name and guest OS
Specify a unique name and OS
Name
OVH US Example
Virtual machine names can contain up to 80 characters and they must be unique within each ESXi instance.
Identifying the guest operating system here allows the wizard to provide the appropriate defaults for the operating system installation.
Compatibility
ESXi 6.5 virtual machine
Guest OS family
Linux
Guest OS version
Ubuntu Linux (64-bit)
vmware
Back
Next
Finish
Cancel


Select storage
vmware

New virtual machine - OVH US Example (ESXi 6.5 virtual machine)
1 Select creation type
2 Select a name and guest OS
3 Select storage
4 Customize settings
5 Ready to complete
Customize settings
Configure the virtual machine hardware and virtual machine additional options
CPU
1
Memory
1024
MB
Hard disk 1
16
GB
SCSI Controller 0
LSI Logic Parallel
SATA Controller 0
USB controller 1
USB 2.0
Network Adapter 1
VM Network
Connect
CD/DVD Drive 1
Host device
Connect
Video Card
Specify custom settings
vmware
Back
Next
Finish
Cancel


Ready to complete
vmware



Program (3)	Output & Result (3)	Viva (4)	Total (10)

Result:

Thus create type 2 virtualization on ESXI 6.5 server run successfully.

Ex.5:

Create a VLAN in CISCO packet tracer.

Aim:
To demonstrate create a VLAN in CISCO packet tracer.

Procedure:
Step 1:
Launch Cisco Packet Tracer: Start Cisco Packet Tracer and open a new or existing project.
Step 2: Add Switches: Drag and drop switches from the "Switches" section of the "Devices" pane onto the workspace. You can use any Cisco switch model available in Packet Tracer.
Step 3:
Connect Switches: Connect the switches using Ethernet cables. Click on the Ethernet interfaces of the switches and then click on the other switch's Ethernet interfaces of the switches and then click on the other switch's Ethernet interfaces to create connections.
Step 4: Access the CLI: Double-click on the first switch to access its CLI (Command Line Interface). The CLI window will open.

Step 5: Configure VLANs: Enter the configuration mode by typing the following command:

enable

configure terminal

Step 6: Create VLANs: To create VLANs, use the **vlan** command followed by the VLAN number. For example, to create VLAN 10 and VLAN 20, you would do:

vlan 10

vlan 20

Step 7: Assign Ports to VLANs: To assign ports to VLANs, use the

interface command followed by the port number and then the **switchport access vlan** command. For example, to assign port 1 to VLAN 10 and port 2 to VLAN 20, you would do:

interface FastEthernet0/1

switchport mode access

switchport access vlan 10

interface FastEthernet0/2

switchport mode access

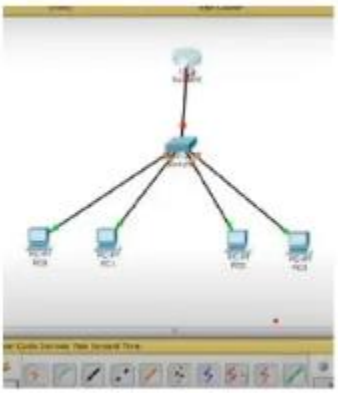
switchport access vlan 20

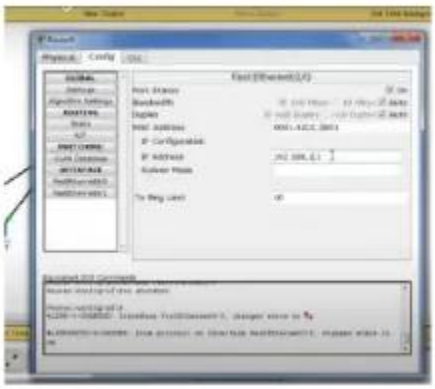
Step 8: Exit Configuration Mode: After assigning VLANs to the desired ports, exit the configuration mode by typing **exit**.

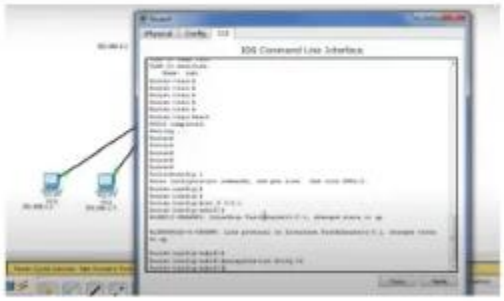
Step 9: Save Configuration: Save the configuration by typing **write** or **copy running-config startup-config** to make sure the changes are saved.

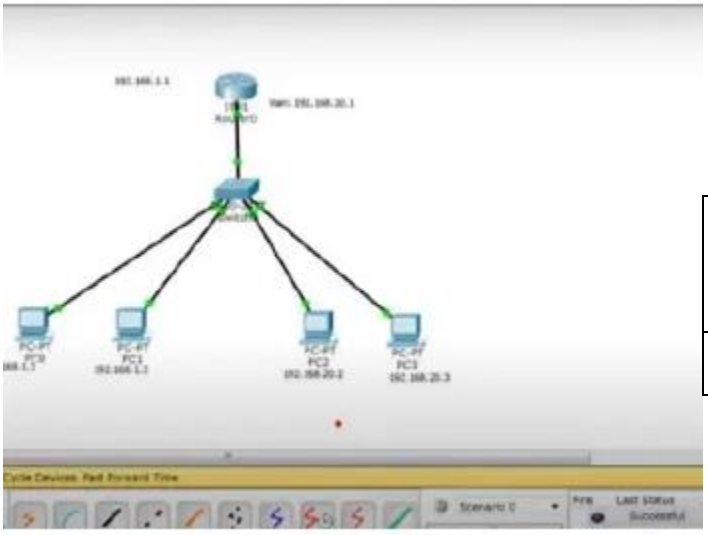
Step 10: Test VLANs: Now that you have created VLANs and assigned ports, you can test the connectivity between devices connected to the switches. Devices in the same VLAN should be able to communicate with each other, while devices in different VLANs should not have direct communication unless you configure inter-VLAN routing.

Output:









Program (3)	Output & Result (3)	Viva (4)	Total (10)

Result:
Thus create a VLAN in CISCO packet tracer has been executed successfully.

Ex.No.6 Install KVM in Linux.

Aim:

Procedure:

Step 1: Check Hardware Support: Before installing KVM, ensure that your system's CPU supports hardware virtualization extensions (Intel VT-x or AMD-V). You can check this by running the following command:

egrep -c '(vmx|svm)' /proc/cpuinfo

If the output is greater than zero (1 or more), it means your CPU supports hardware virtualization.

Step 2: Install KVM Packages: The package names may vary depending on your Linux distribution. Here are the package names for some popular distributions:

For Ubuntu/Debian:

sudo apt update

sudo apt install qemu-kvm libvirt-daemon-system libvirt-clients bridge-utils virt-manager

For CentOS/RHEL:

sudo yum install qemu-kvm libvirt virt-install bridge-utils

sudo systemctl enable libvirtd

sudo systemctl start libvirtd

For Fedora:

sudo dnf install @virtualization

sudo systemctl enable libvirtd

sudo systemctl start libvirtd

Step 3: Verify Installation: After installing the required packages, check if KVM kernel modules are loaded correctly:

lsmod | grep kvm

The output should show **kvm** and **kvm_intel** or **kvm_amd** modules loaded, depending on your CPU.

Step 4: Configure Permissions: For non-root users to manage virtual machines using KVM, add them to the **libvirt** group:

sudo usermod -aG libvirt <username>

Remember to log out and log back in for the changes to take effect.

Step 5: Enable Nested Virtualization (Optional): If you plan to run virtual machines with nested virtualization (e.g., running KVM inside a KVM guest), you may need to enable nested virtualization on the host. This step is only required if you intend to run virtual machines with KVM as guests.

For Intel CPUs:

echo "options kvm-intel nested=1" | sudo tee /etc/modprobe.d/kvm-intel.conf

sudo modprobe -r kvm_intel

sudo modprobe kvm_intel

For AMD CPUs:

echo "options kvm-amd nested=1" | sudo tee /etc/modprobe.d/kvm-amd.conf

sudo modprobe -r kvm_amd

sudo modprobe kvm_amd

Step 6: Install and Configure Virt-Manager (Optional): Virt-Manager is a graphical user interface tool to manage virtual machines using KVM. If you prefer a GUI interface, you can install Virt-Manager:

For Ubuntu/Debian:

sudo apt install virt-manager

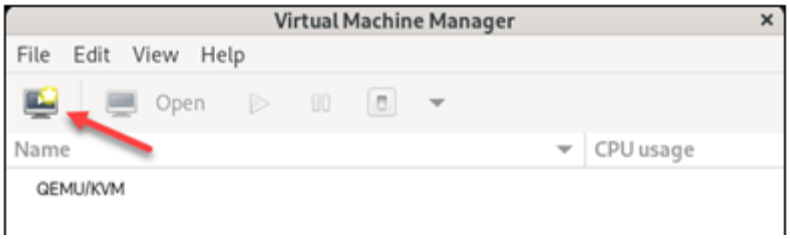
For CentOS/RHEL:

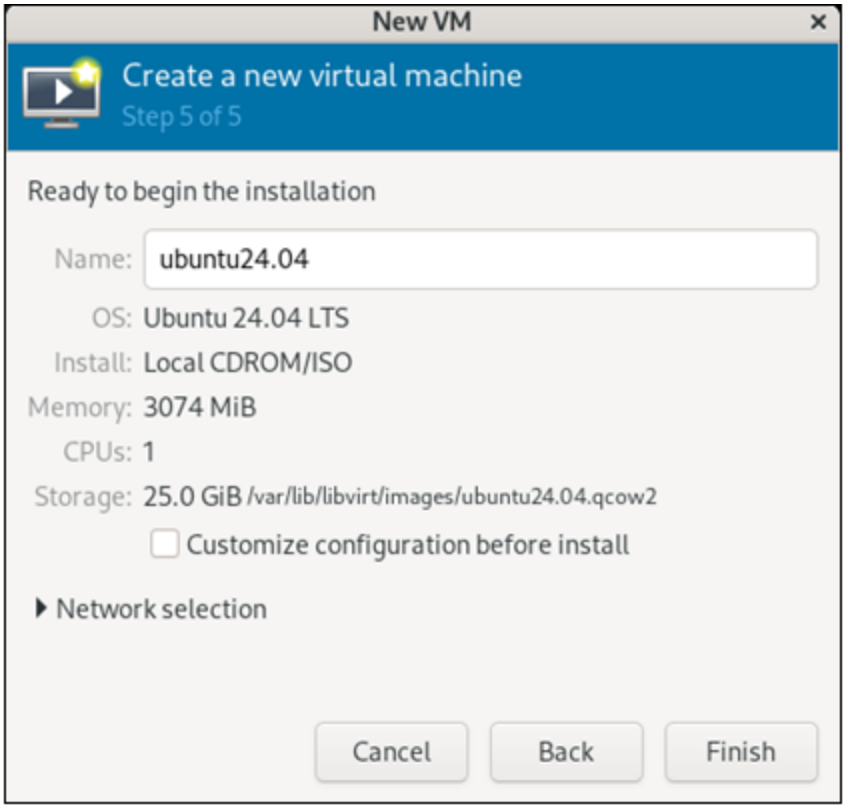
sudo yum install virt-manager

sudo dnf install virt-manager

Once the installation is complete, you can start creating and managing virtual machines using KVM. You can use command-line tools like **virsh** or a graphical interface like Virt-Manager to interact with KVM.

Output:





Result: Thus, Installed KVM in Linux (UBUNTU) successfully.

Ex.7: Create Nested Virtual Machine (VM under another VM)

Aim:

To Create Nested Virtual Machine (VM under another VM).

Procedure:

Step 1:

Enable Nested Virtualization: Before creating a nested VM, ensure nested virtualization is enabled on the host VM (the VM that will run other VMs).
For VirtualBox:
Open VirtualBox and select the host VM from the list. Go to "Settings" >"System" > "Processor" and check the "Enable Nested VT-x/AMD-V" option.

Step 2:

Install an Operating System in the Host VM: Ensure you have an operating system installed in the host VM. This will be the environment in which you'll run the nested VMs.

Step 3:

Install VirtualBox within the Host VM: Inside the host VM, download and install VirtualBox (or any other virtualization software you prefer) as if you were installing it on a physical machine.

Step 4:

Create the Nested VM: Now that you have VirtualBox installed within the host VM, you can create a new VM inside it.

a. Open VirtualBox within the host VM.
b. Click on "New" to create a new VM.
c. Follow the VM creation wizard to set up the nested VM, including selecting the guest operating system, allocating memory, creating a virtual hard disk, etc.

Step 4:

Install the Guest Operating System in the Nested VM: With the nested VM created, start it and install the guest operating system, just as you would with any regular VM installation.

Step 5;

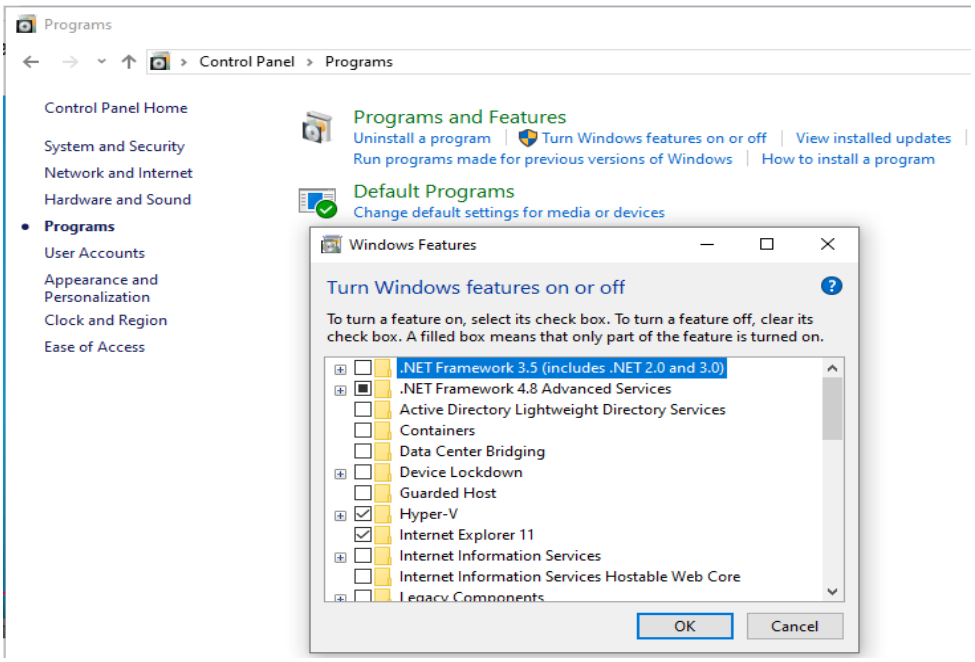
Configure Networking (Optional): Depending on your requirements, you may need to configure the networking of the nested VM to allow communication with other VMs or external networks.

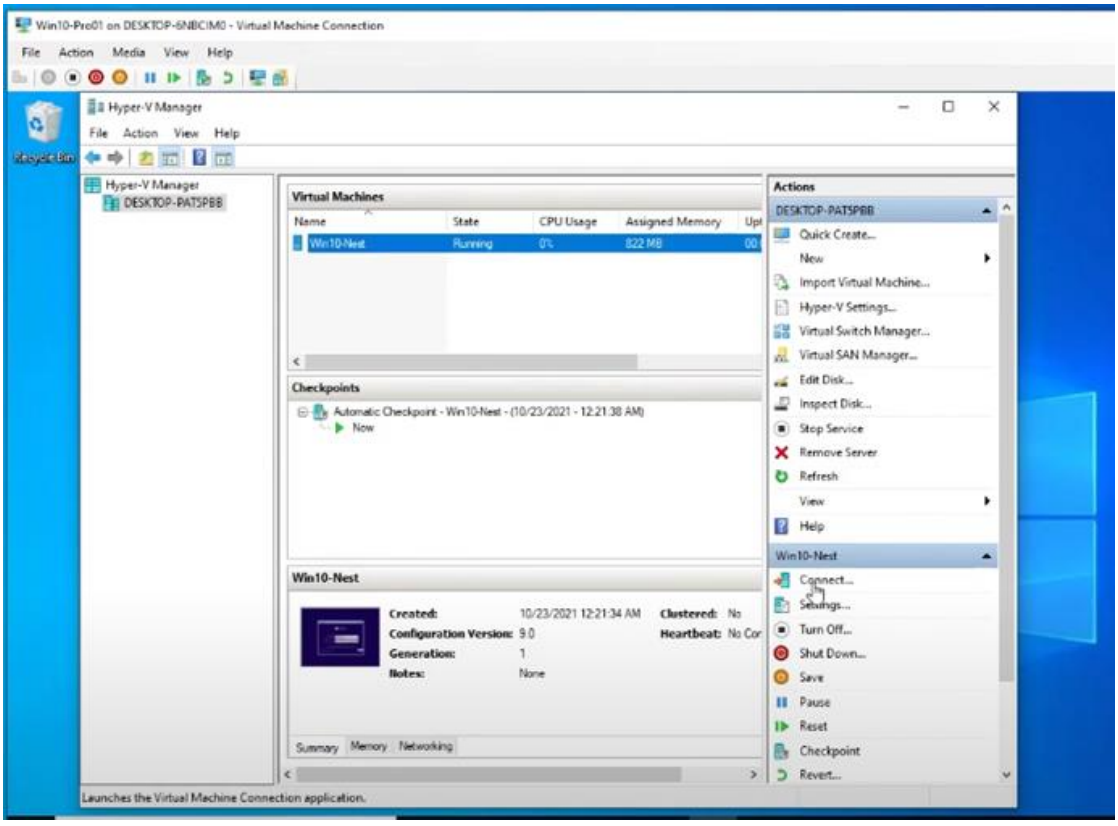
Step 6:

Use the Nested VM: Once the nested VM is set up and the guest operating system is installed, you can use it just like any other VM. Install applications, run tests, or perform any tasks within the nested VM.

Using Hyper – V

Output:





Result:

Thus, create nested Virtual Machine using Hyper –V (VM under another VM) has been executed successfully.