

**SIES COLLEGE OF ARTS, SCIENCE & COMMERCE**  
**(EMPOWERED AUTONOMOUS), SION(W), MUMBAI-22**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**MSc (IT), SEMESTER I**

**Practical Journal**

**for the Subject**

**Cloud Computing**

**Submitted by**

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**FMIT2526179**

**For the Academic Year**

**2025-2026**



**SIES College of Arts, Science and Commerce (Empowered Autonomous),**

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**Department of Information Technology**

**CERTIFICATE**

This is to certify that Mr. **Yogesh Chatrooram Sahu**, of MSc [Information Technology] Semester - I, Seat No. **FMIT2526179** has successfully completed the practicals for the subject of **Cloud Computing** as a partial fulfilment of the degree **M.Sc. (I.T.)** during the academic year 2025-2026.

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Course Co-Ordinator

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Date:



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# PRACTICAL 1

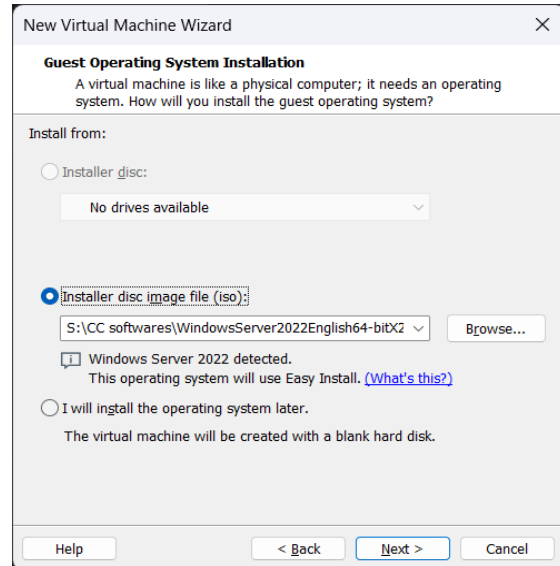
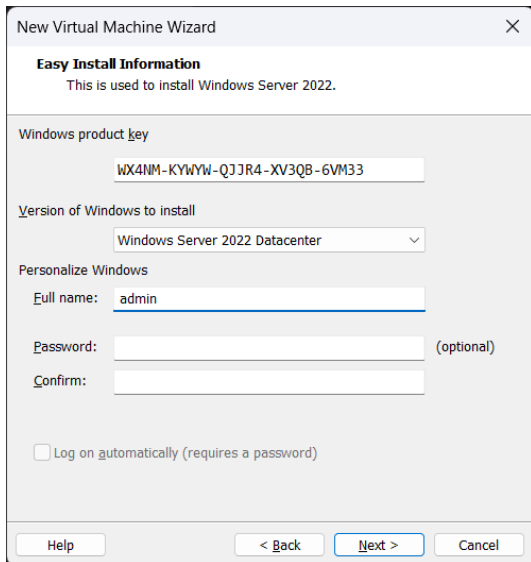
**Aim: - Implementing Failover Cluster on Windows**

**File used: - Windows Server 2022.iso file**

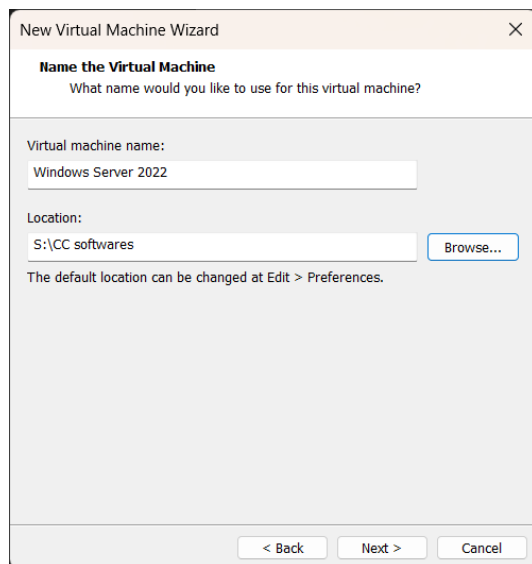
**Steps: -**

**Step1: - Create a new VM**

**Step2: - Browse the iso file-**



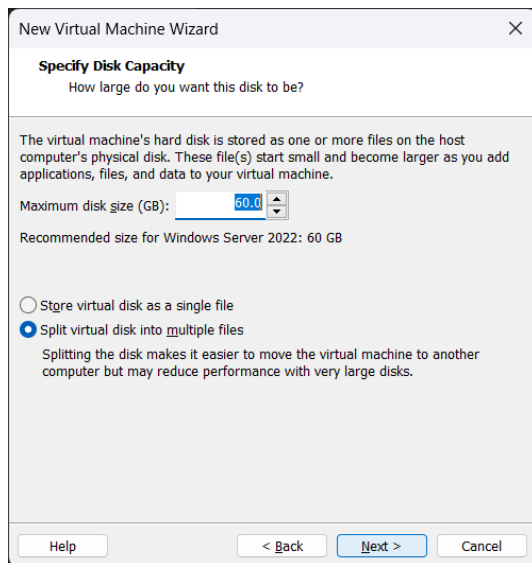
“windowserver2022....”



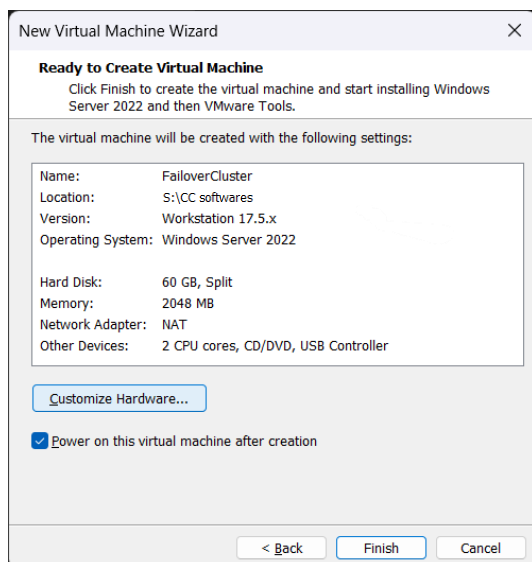
**Step3: - Give a Name → Next.**



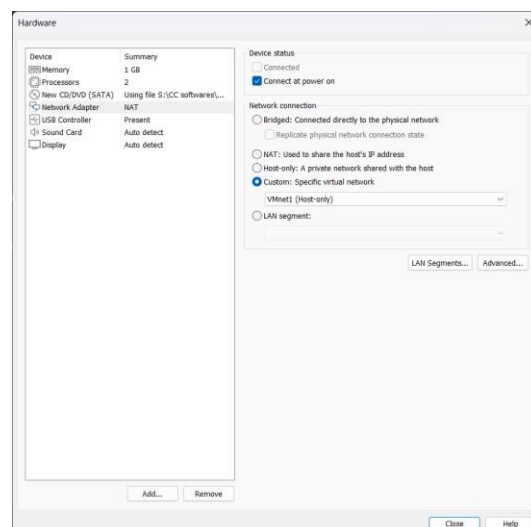
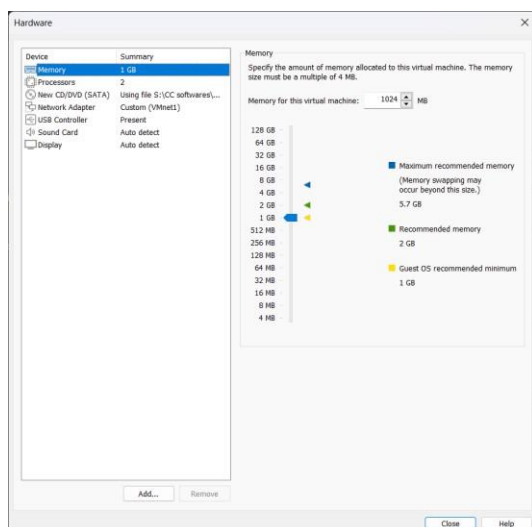
Step4: - Keep default storage capacity → split virtual disk into multiple files.



Step5: - Click on Customize Hardware

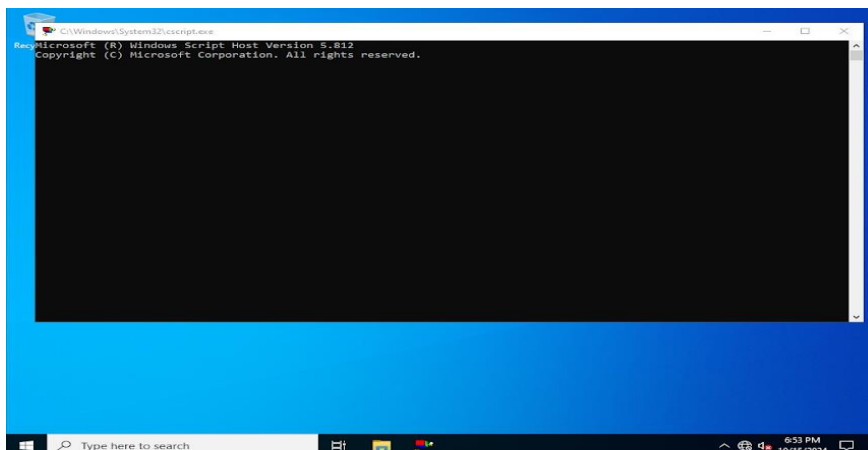
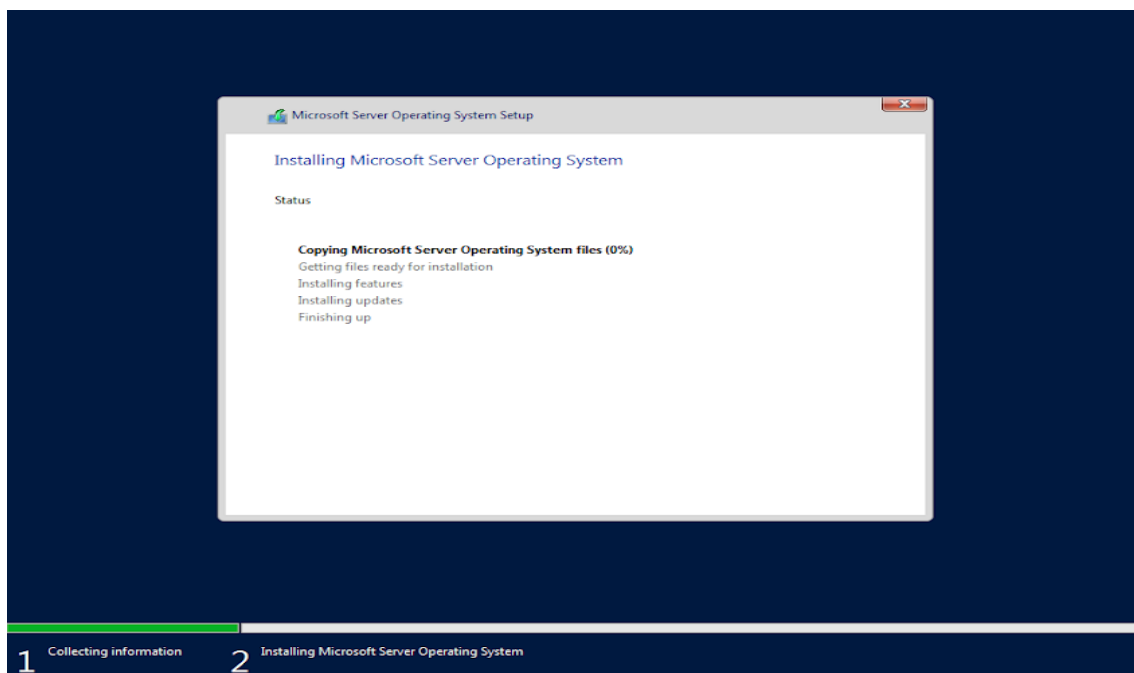
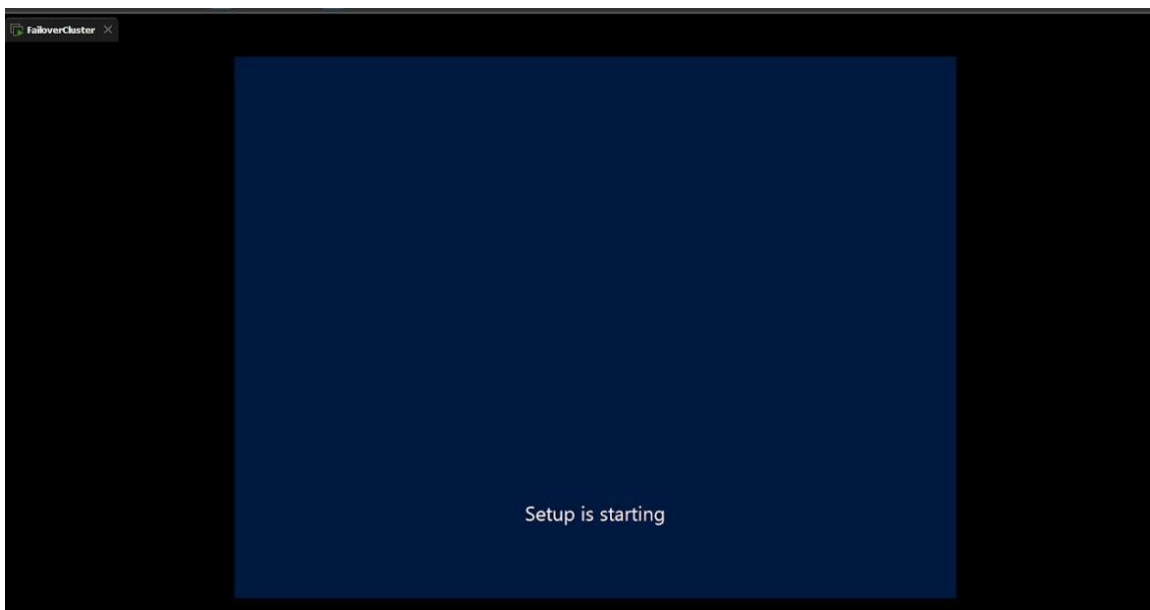


Step6: - Set Memory to 1GB → Network Adapter → Custom specific Virtual network.



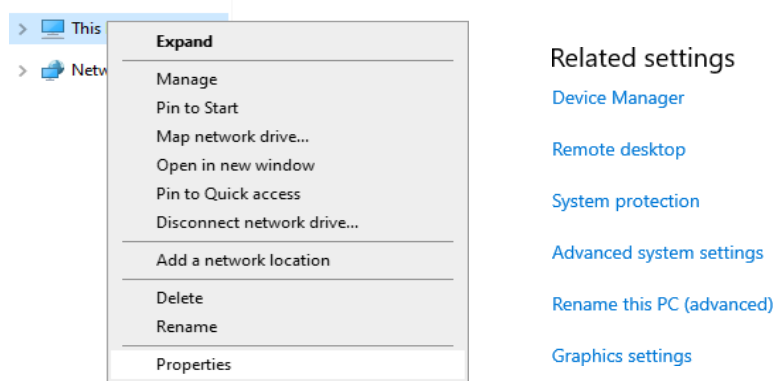


## Step7: - Now Power on the virtual machine

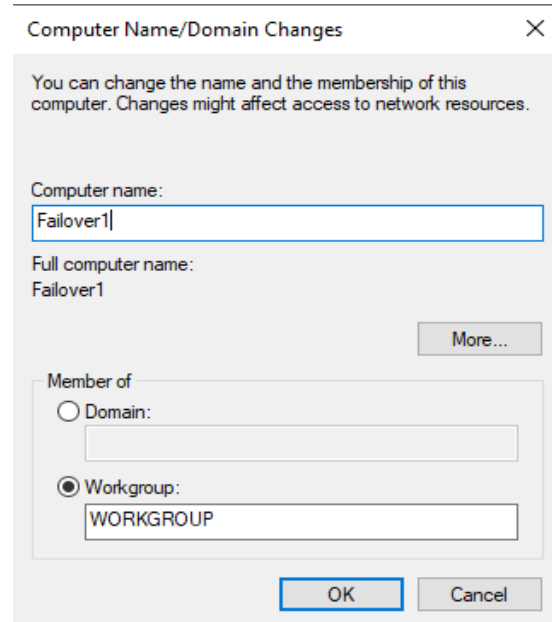
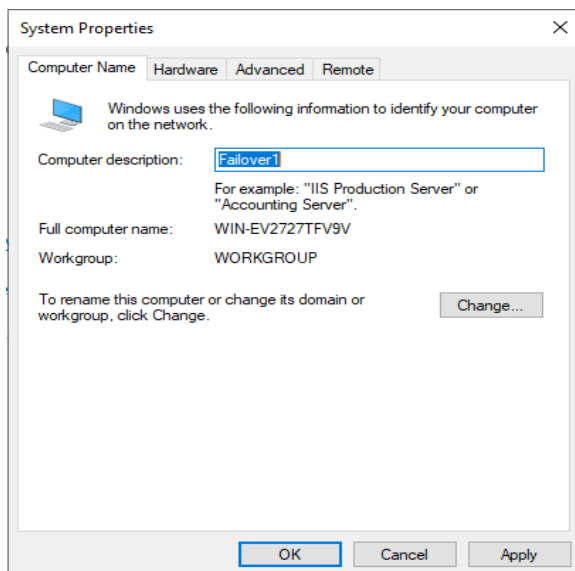




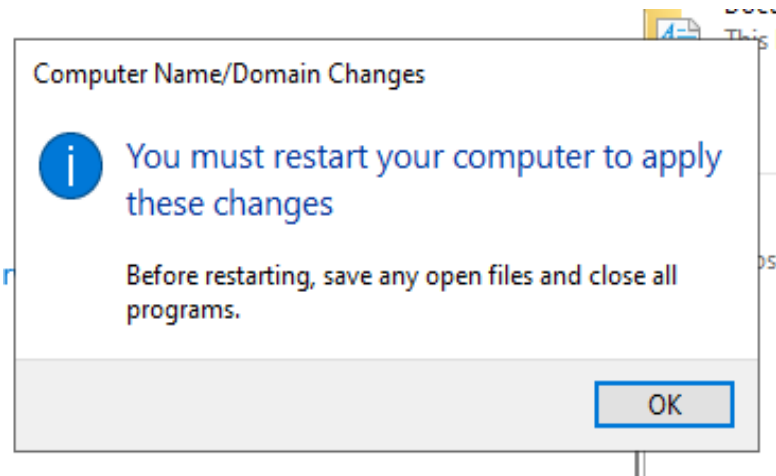
Step8: - Ctrl + E → This Pc → Right Click → Properties.



Step9: - Click on Rename this Pc (advanced) → give a name → Click on change → Ok.

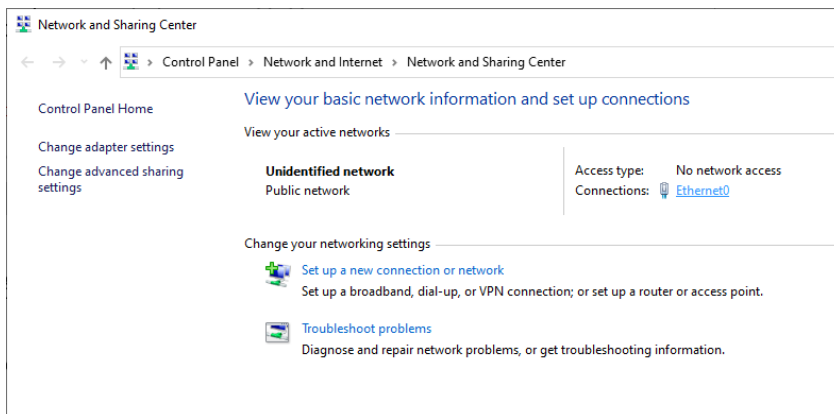
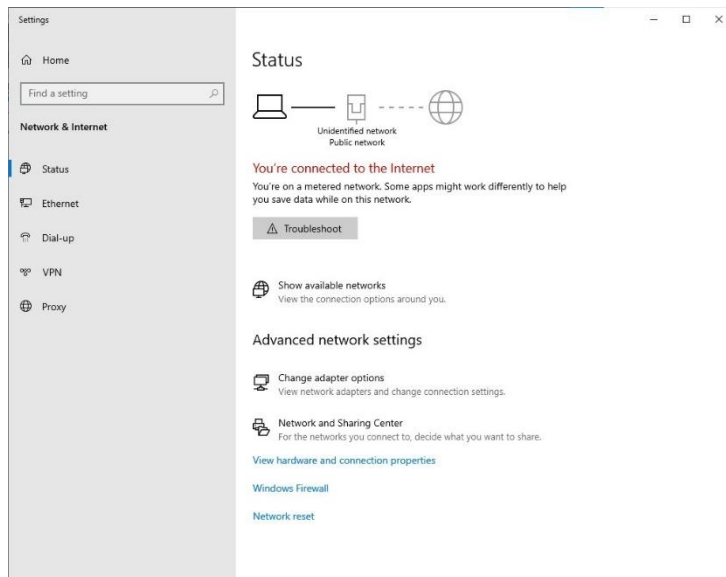


Step10: - After restart

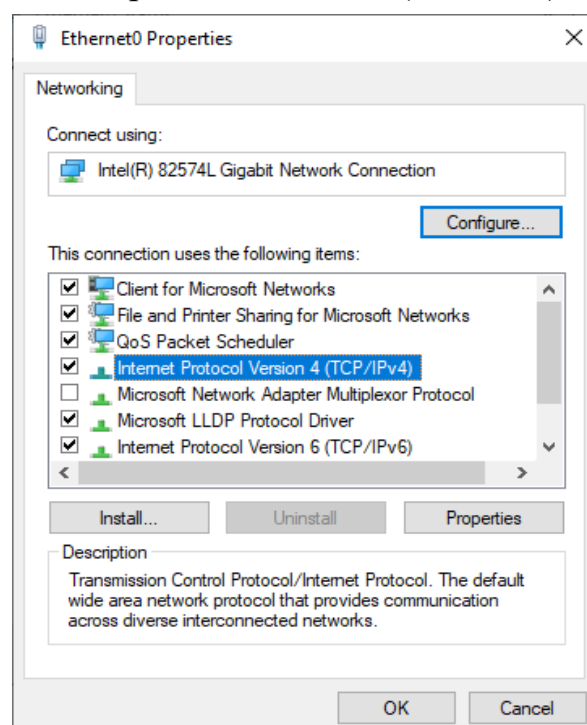
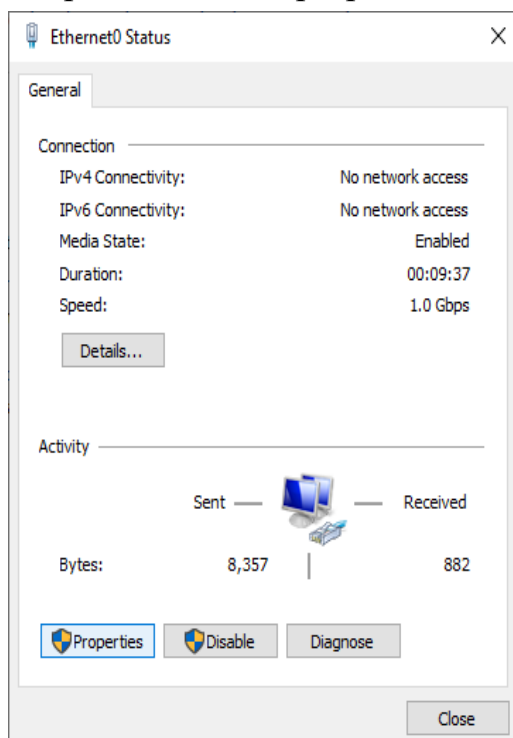




Step12: - Go to setting → network and sharing center → Click on Ethernet ()

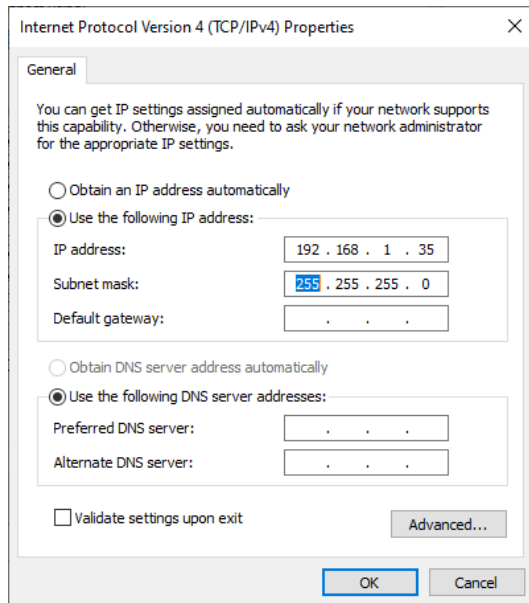


Step13: - Click on properties → Click internet protocol version 4(TCP/IPv4)

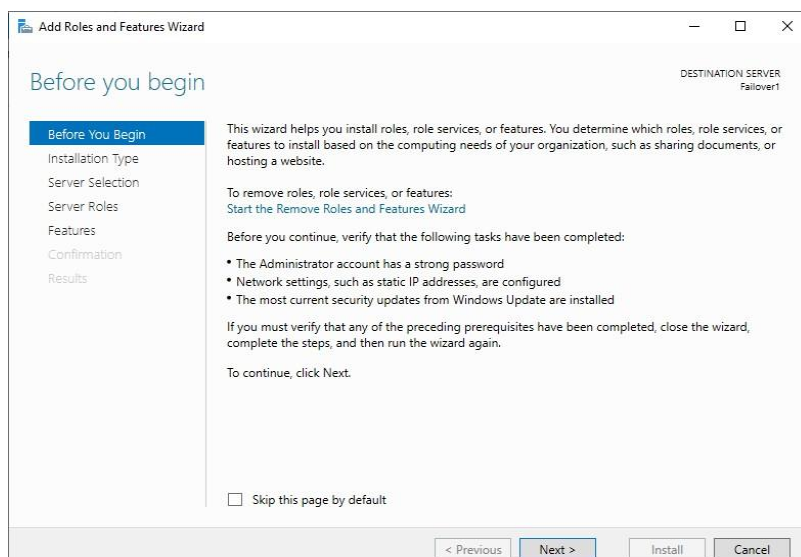
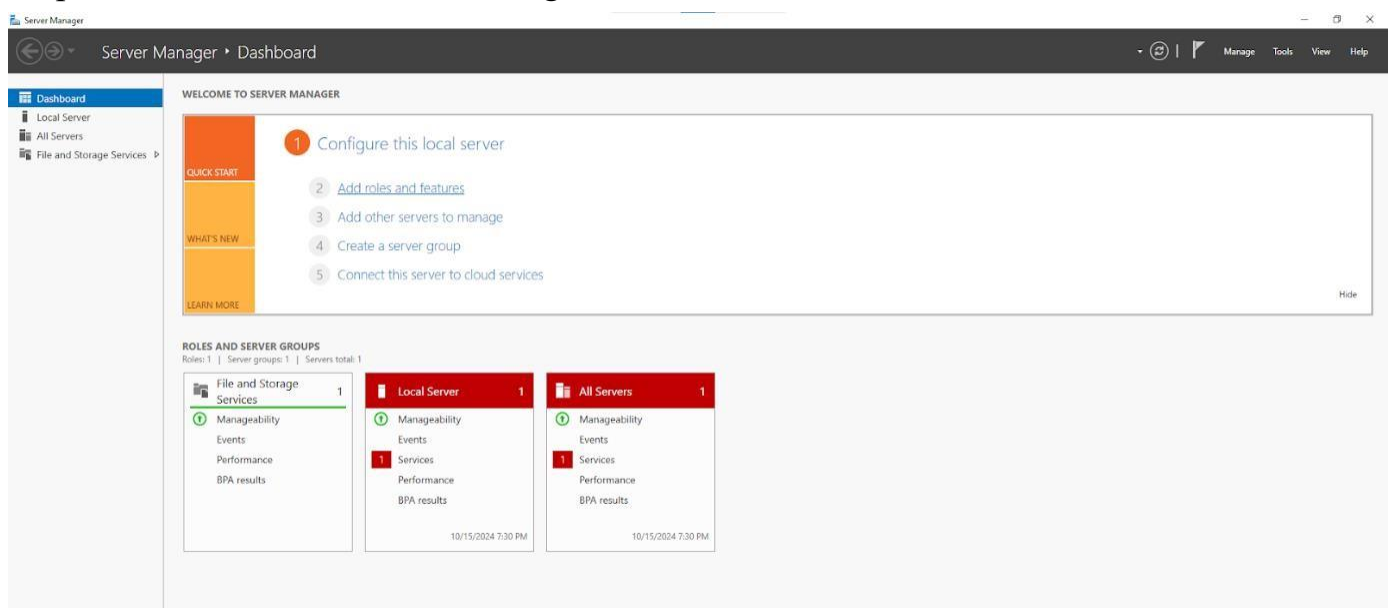




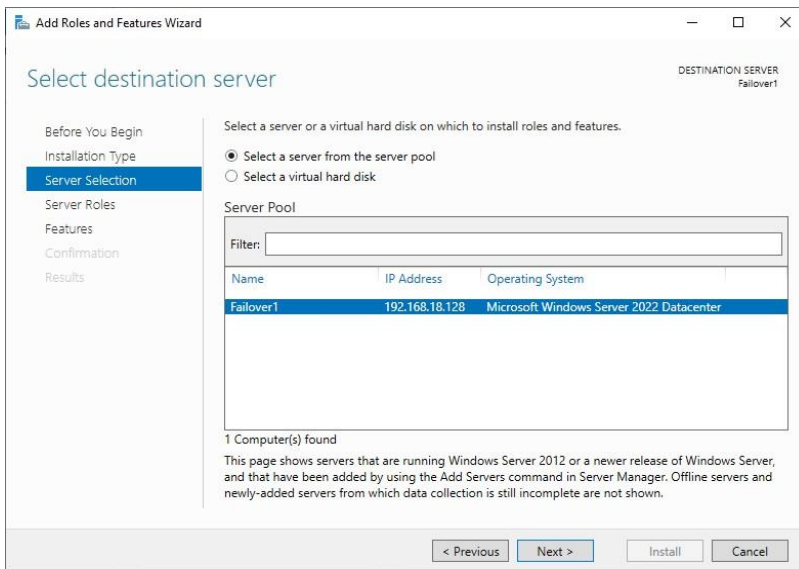
Step14: - Now add Ip address 192.168.1.35, subnet mask.



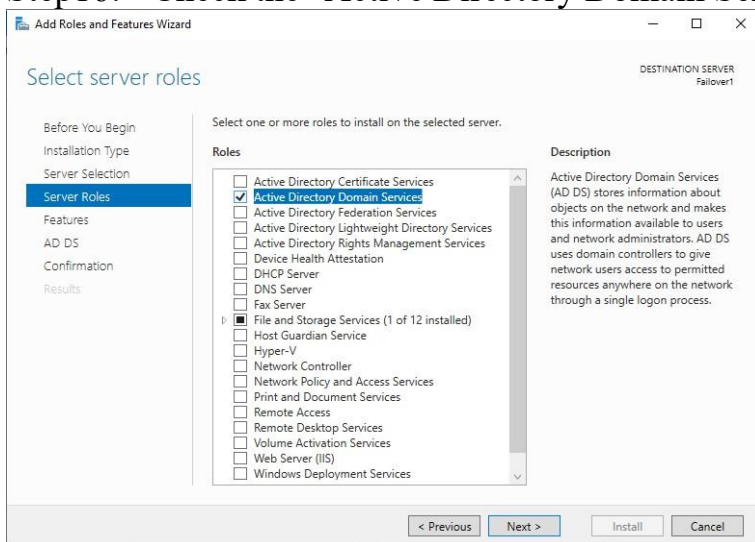
Step15: - Now click on server manager → Add roles and features.



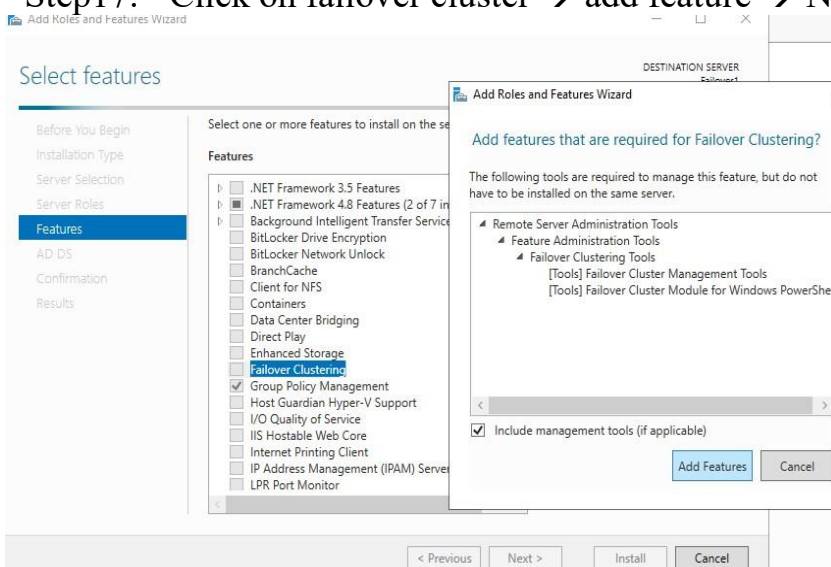




Step16: - Check the “Active Directory Domain Services” → Add feature → next.

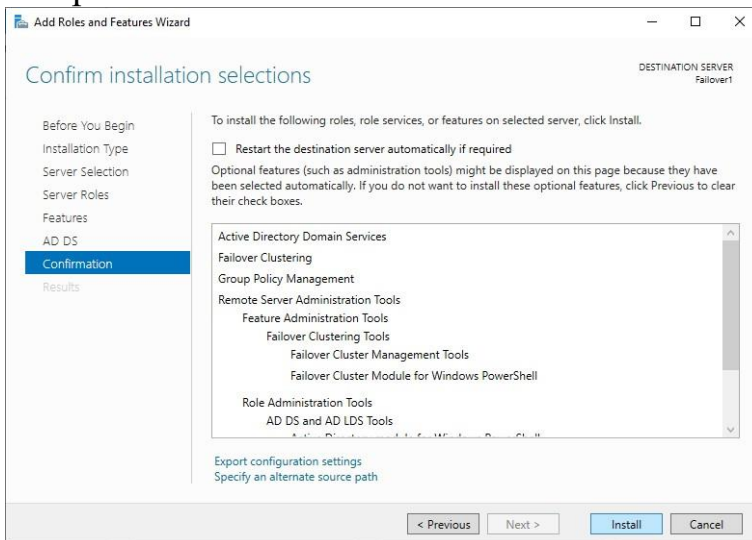


Step17: - Click on failover cluster → add feature → Next.

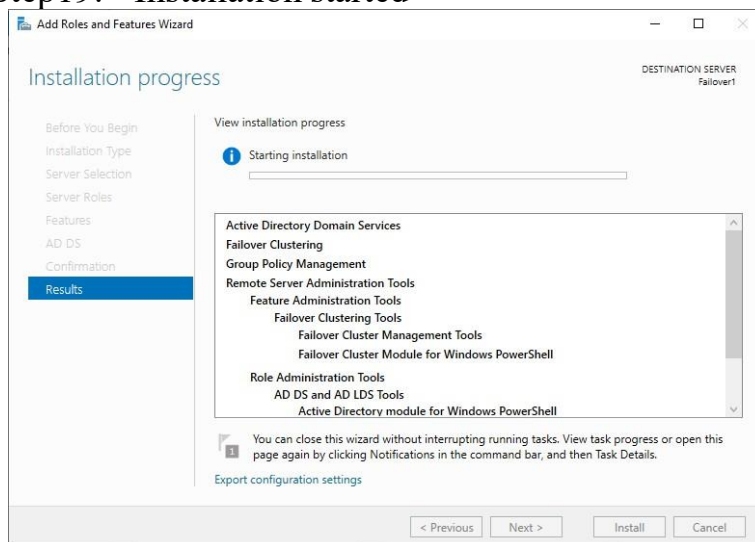




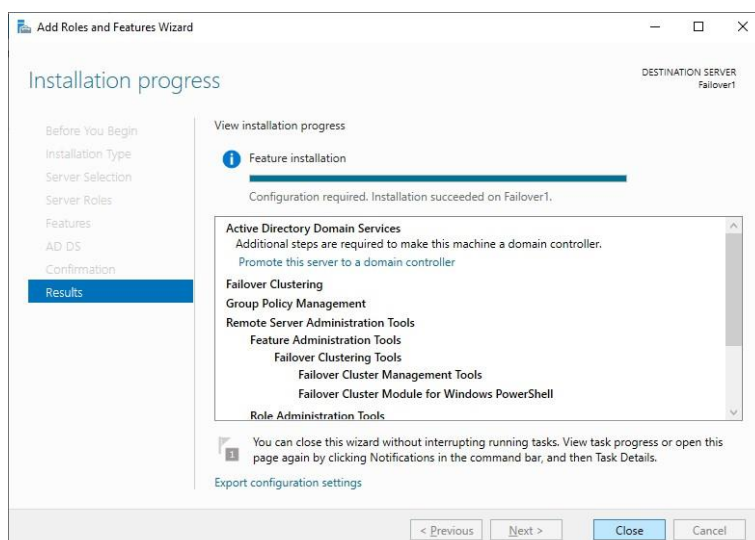
## Step18: - Click on installation.



## Step19: - Installation started

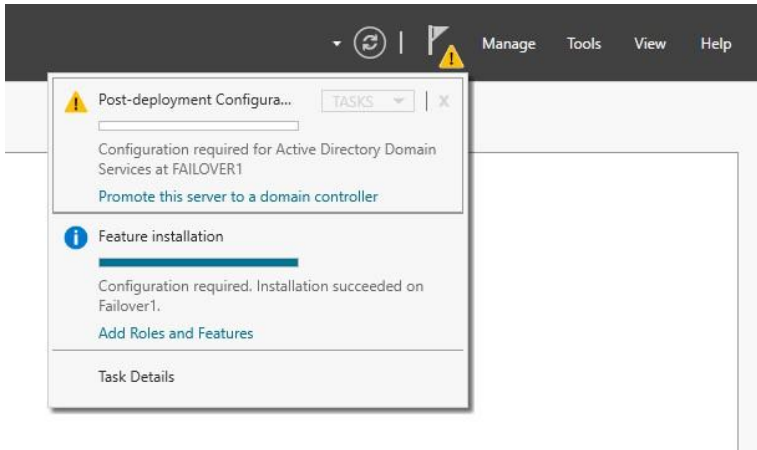


## Step20: - After installation click on close.

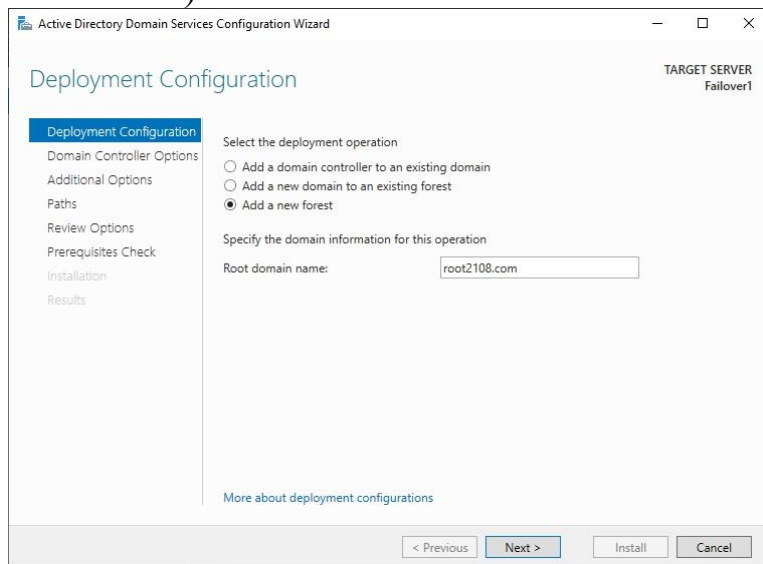




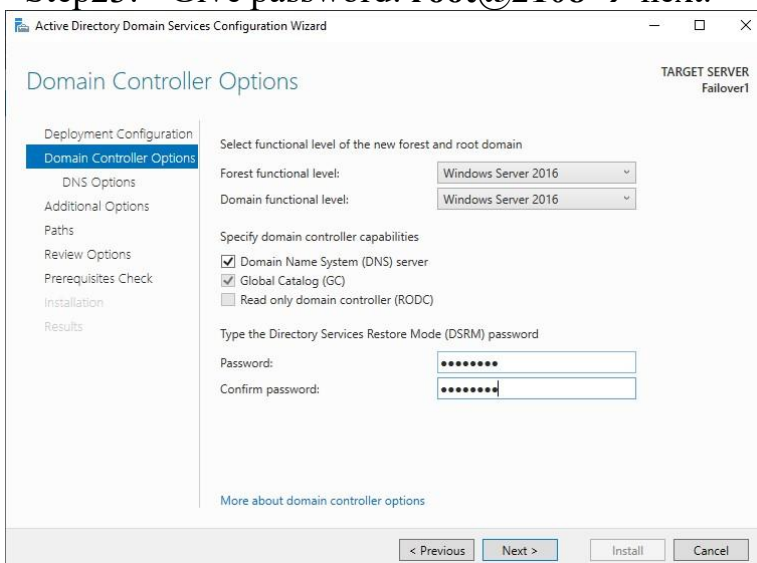
Step21: - Now click on flag (notification) icon → promote this to server to a domain controller.



Step22: - Click on Add a new forest → give root domain name (.com is necessary at the end of the name)



Step23: - Give password: root@2108 → next.





Step24: - Click on next.

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar includes the Microsoft icon, the window title, and standard minimize, maximize, and close buttons. The main window has a light blue header with 'DNS Options' on the left and 'TARGET SERVER Failover1' on the right. Below the header is a yellow warning bar with an exclamation mark icon and the text: 'A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found... Show more X'. The left sidebar contains a list of steps: 'Deployment Configuration', 'Domain Controller Options', 'DNS Options' (highlighted in blue), 'Additional Options', 'Paths', 'Review Options', 'Prerequisites Check', 'Installation', and 'Results'. The main content area is titled 'Specify DNS delegation options' and contains a checkbox labeled 'Create DNS delegation' which is currently unchecked. At the bottom of the main content area is a link that says 'More about DNS delegation'. The bottom of the window features a grey bar with four buttons: '< Previous', 'Next >', 'Install', and 'Cancel'.

Step25: - Don't do anything ... it comes automatically → next.

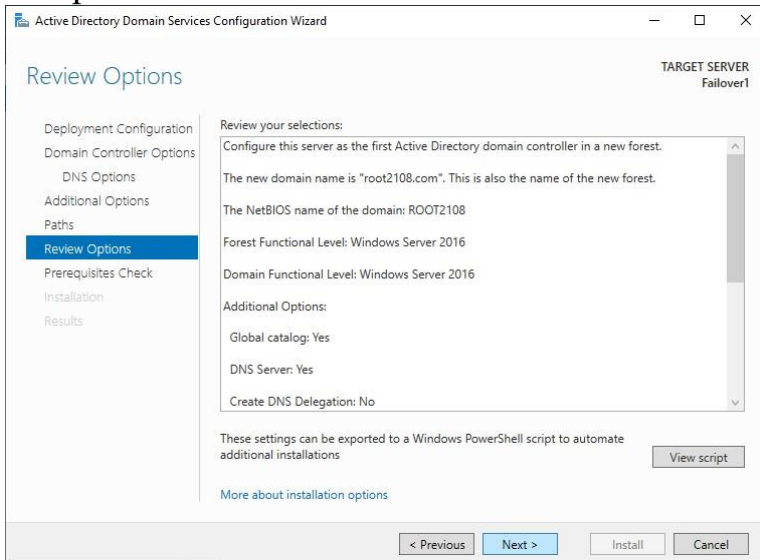
The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window at the 'Additional Options' step. The title bar and window structure are consistent with the previous step. The left sidebar highlights 'Additional Options'. The main content area is titled 'Verify the NetBIOS name assigned to the domain and change it if necessary'. It contains a label 'The NetBIOS domain name:' followed by a text input field containing the value 'ROOT2108'. Below the input field is a link that says 'More about additional options'. The bottom of the window features a grey bar with four buttons: '< Previous', 'Next >', 'Install', and 'Cancel'.

Step26: - Click Next

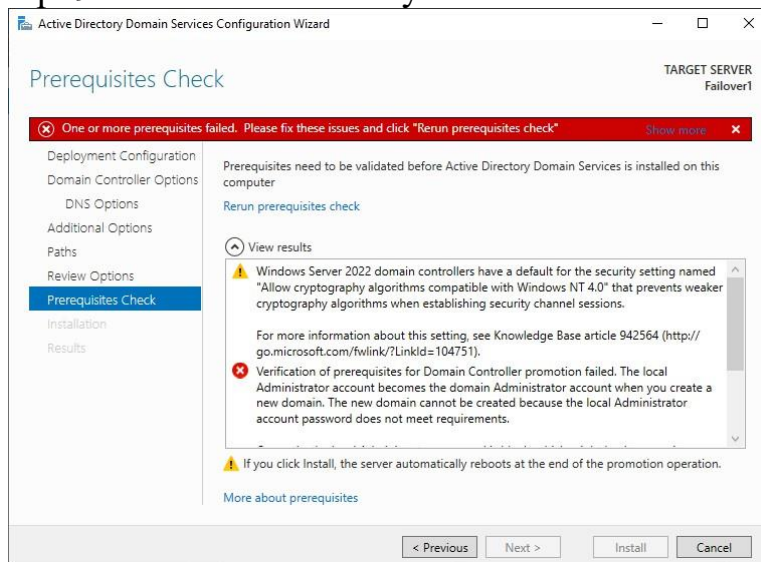
The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window at the 'Paths' step. The title bar and window structure are consistent with the previous steps. The left sidebar highlights 'Paths'. The main content area is titled 'Specify the location of the AD DS database, log files, and SYSVOL'. It contains three rows of configuration options: 'Database folder:' with a text input field containing 'C:\Windows\NTDS' and a browse button (...); 'Log files folder:' with a text input field containing 'C:\Windows\NTDS' and a browse button (...); and 'SYSVOL folder:' with a text input field containing 'C:\Windows\SYSVOL' and a browse button (...). Below the input fields is a link that says 'More about Active Directory paths'. The bottom of the window features a grey bar with four buttons: '< Previous', 'Next >', 'Install', and 'Cancel'.



## Step27: - Click on next.



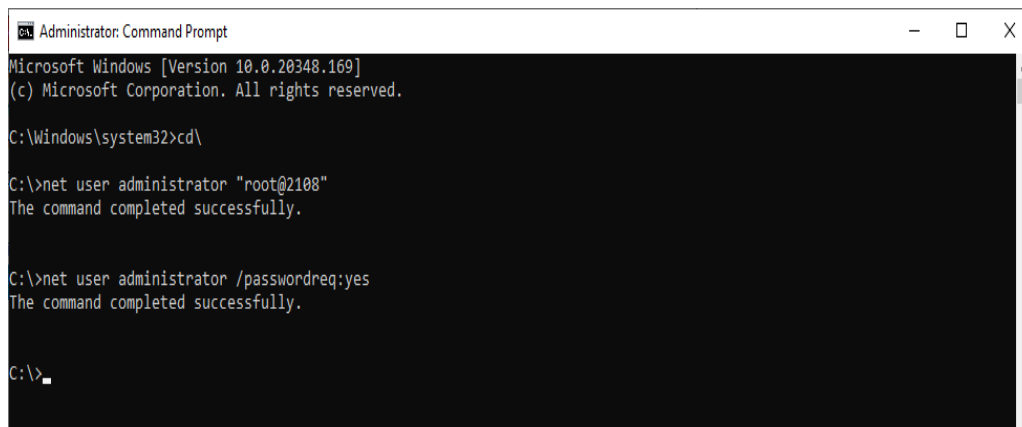
## Step29: - Now it will make you an error.



## Step30: - Open cmd → run as administrator → Now type the following commands: -

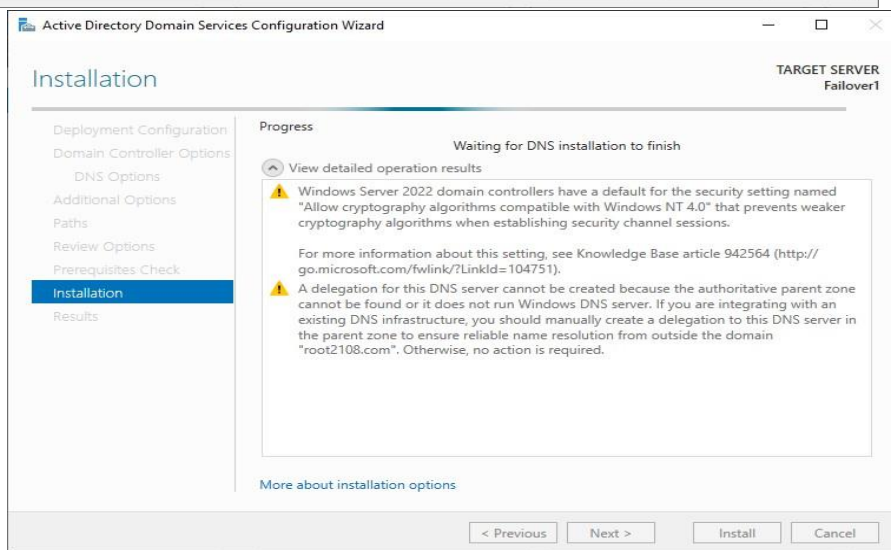
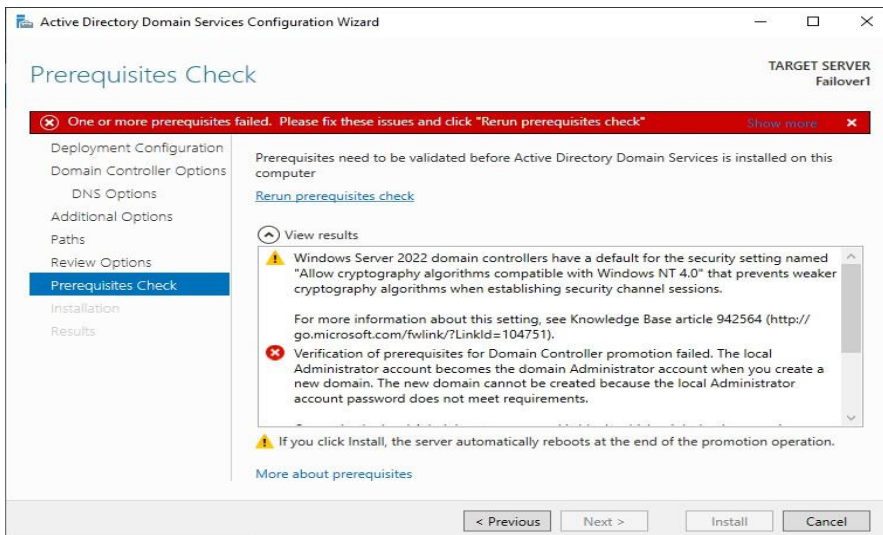
- `cd\`
- `net user administrator "root@2108"`
- `net user administrator /passwordreq:yes`

root@2108 – this is the password u set before

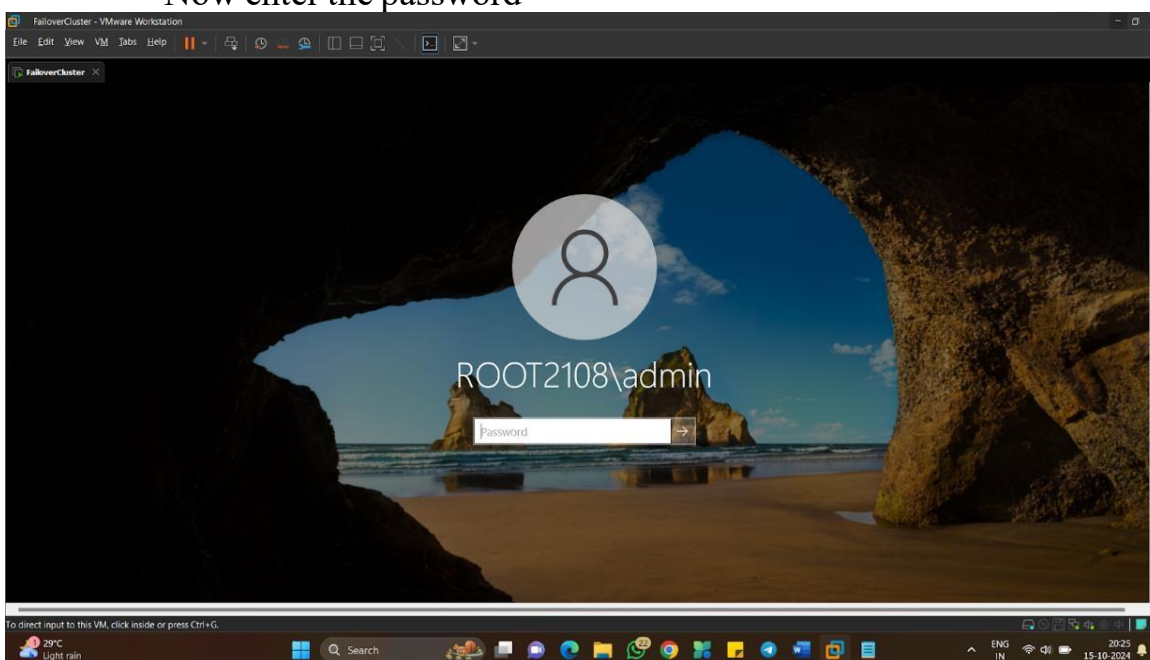




Step31: - Now click on rerun prerequisites check → install.

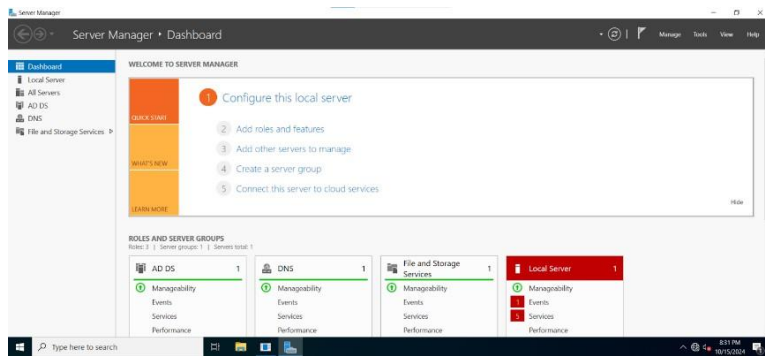


Step32: - After this the PC will restart.  
Now enter the password

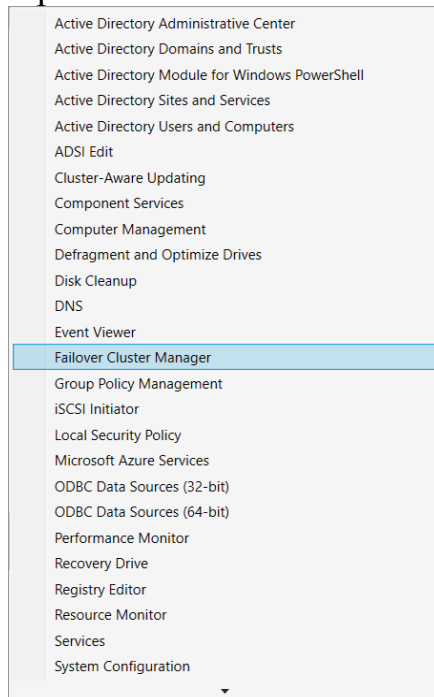




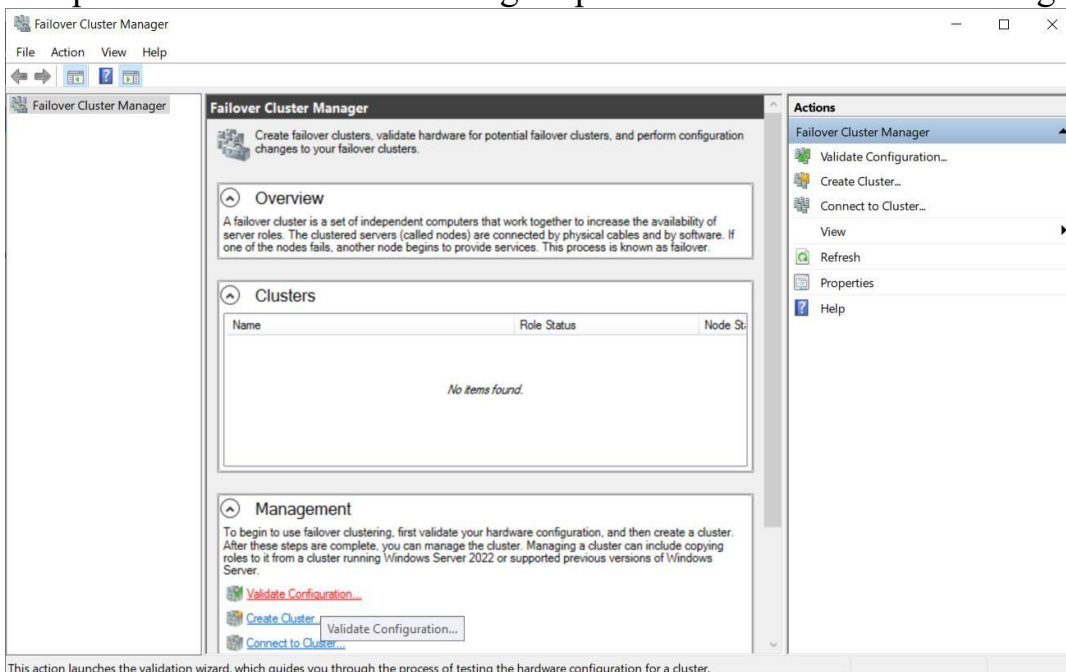
### Step33: - Click on tools.



### Step34: - Now click on tools → failover cluster manager.

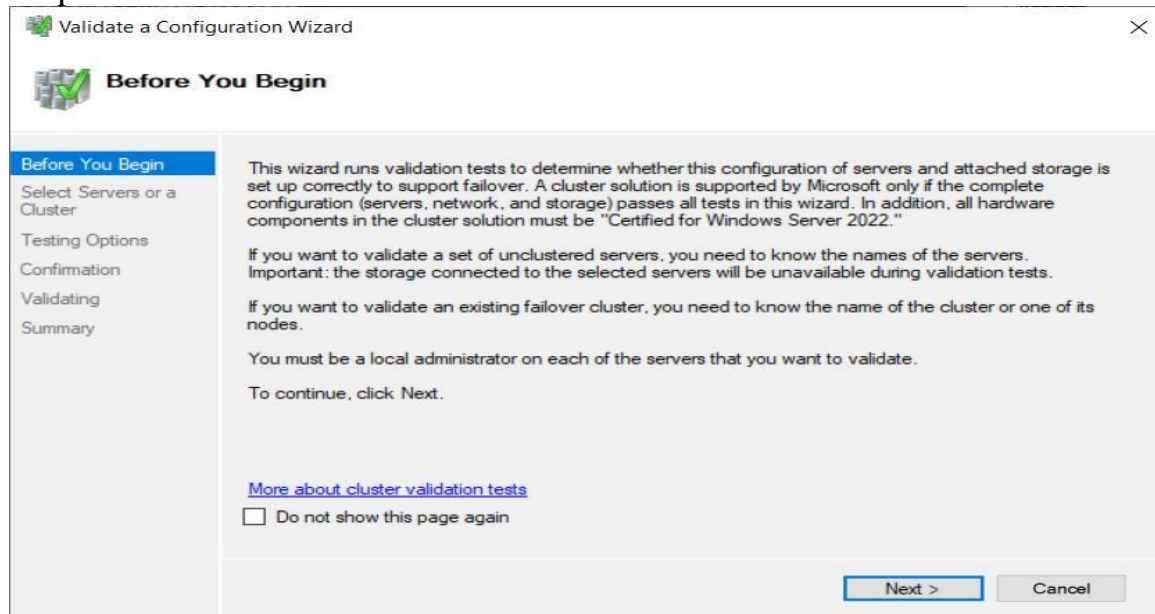


### Step35: - Failover Cluster manager opens → Click on validate configuration.





Step36: - Now click on next.



**Validate a Configuration Wizard**

**Before You Begin**

This wizard runs validation tests to determine whether this configuration of servers and attached storage is set up correctly to support failover. A cluster solution is supported by Microsoft only if the complete configuration (servers, network, and storage) passes all tests in this wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2022."

If you want to validate a set of unclustered servers, you need to know the names of the servers. Important: the storage connected to the selected servers will be unavailable during validation tests.

If you want to validate an existing failover cluster, you need to know the name of the cluster or one of its nodes.

You must be a local administrator on each of the servers that you want to validate.

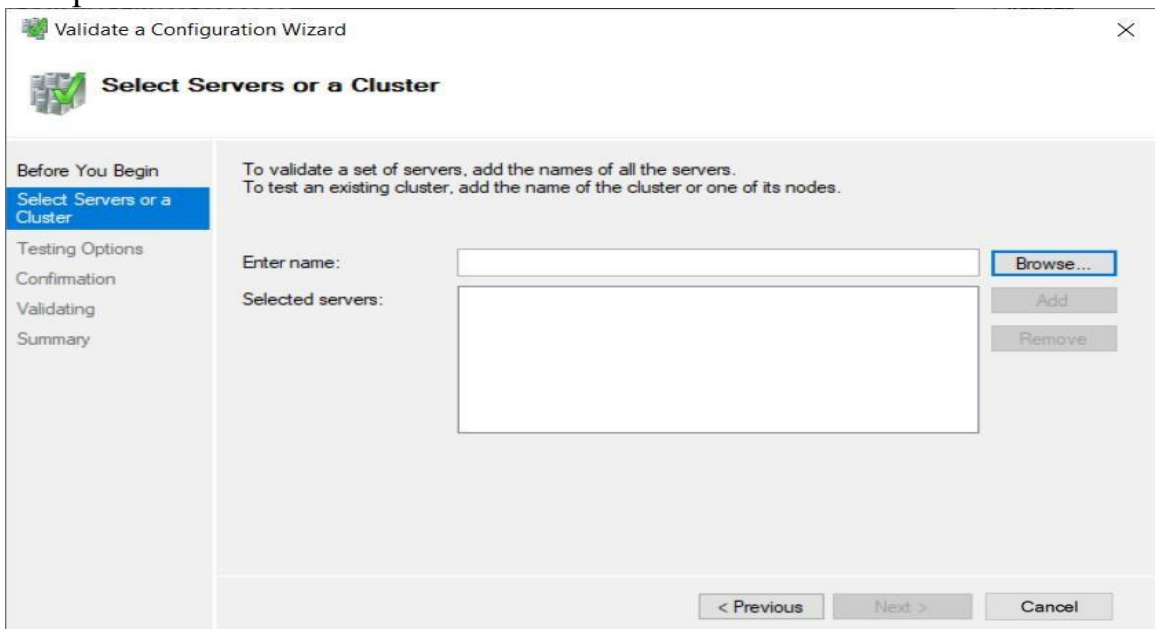
To continue, click Next.

[More about cluster validation tests](#)

☐ Do not show this page again

**Next >** **Cancel**

Step37: - Click on browse →Advanced →Find now →Next.



**Validate a Configuration Wizard**

**Select Servers or a Cluster**

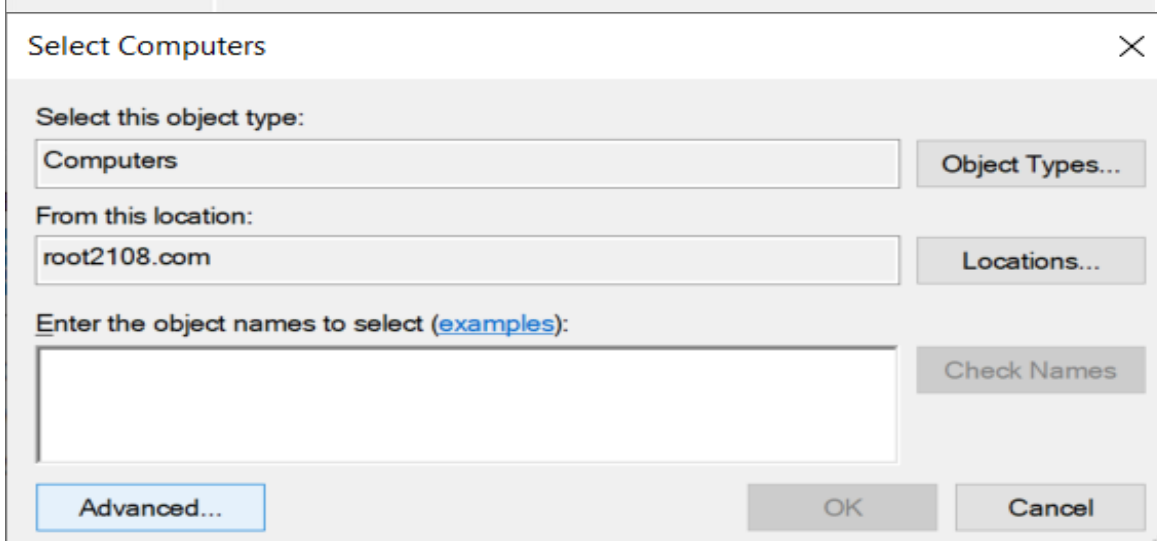
To validate a set of servers, add the names of all the servers.  
To test an existing cluster, add the name of the cluster or one of its nodes.

Enter name:  **Browse...**

Selected servers:

**Add** **Remove**

**< Previous** **Next >** **Cancel**



**Select Computers**

Select this object type:  
 **Object Types...**

From this location:  
 **Locations...**

Enter the object names to select (examples):

**Check Names**

**Advanced...** **OK** **Cancel**



Select Computers

Select this object type:  
**Computers** Object Types...

From this location:  
root2108.com Locations...

Common Queries

Name: Starts with

Description: Starts with

☐ Disabled accounts

☐ Non expiring password

Days since last logon:

Columns... Find Now Stop

Search results: OK Cancel

Name	In Folder
------	-----------

Validate a Configuration Wizard

Select Servers or a Cluster

Before You Begin

Select Servers or a Cluster

Testing Options

Confirmation

Validating

Summary

To validate a set of servers, add the names of all the servers.  
To test an existing cluster, add the name of the cluster or one of its nodes.

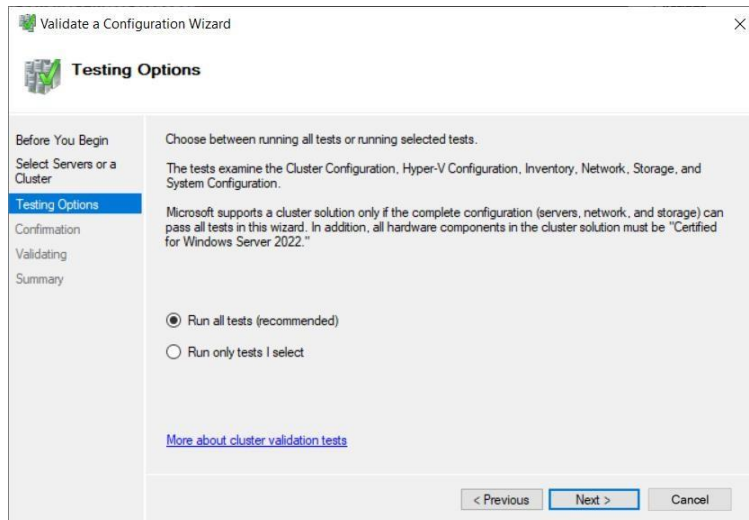
Enter name:  Browse...

Selected servers: Failover1.root2108.com Add Remove

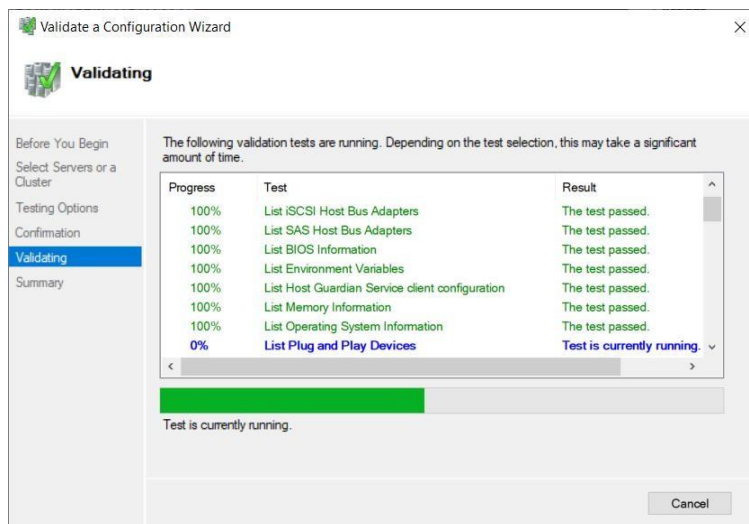
< Previous Next > Cancel



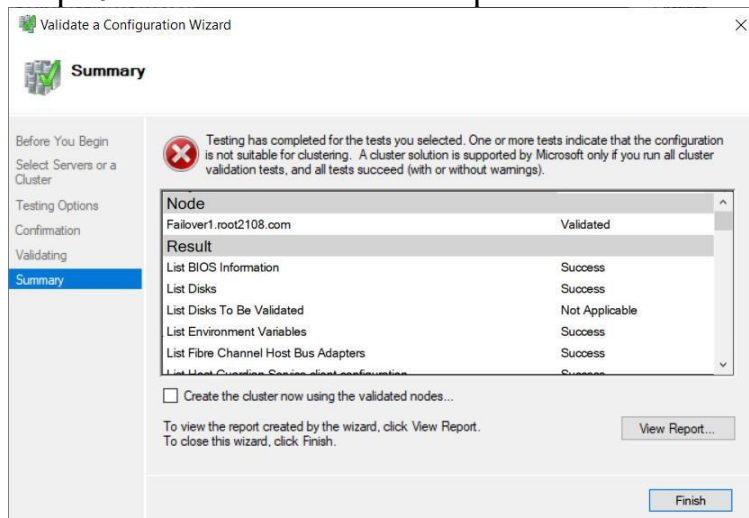
## Step38: - Now run all tests.



## Step39: - Now click on next.



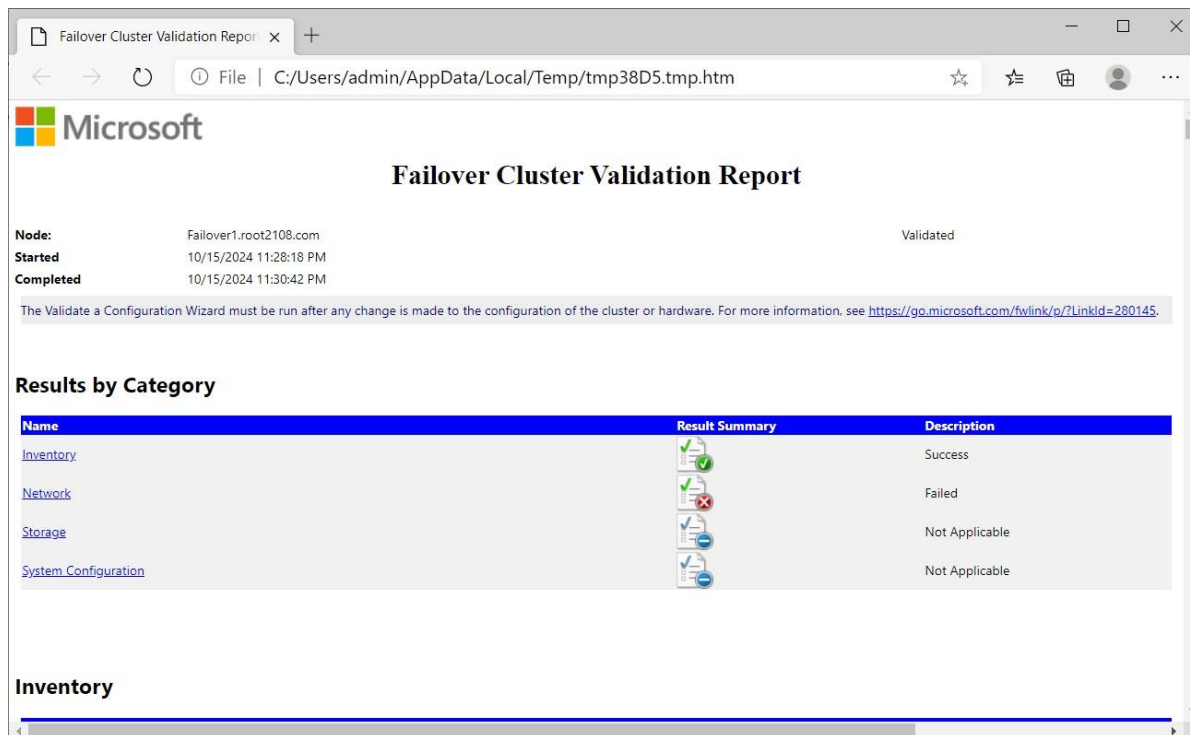
## Step40: - Now click on view report.





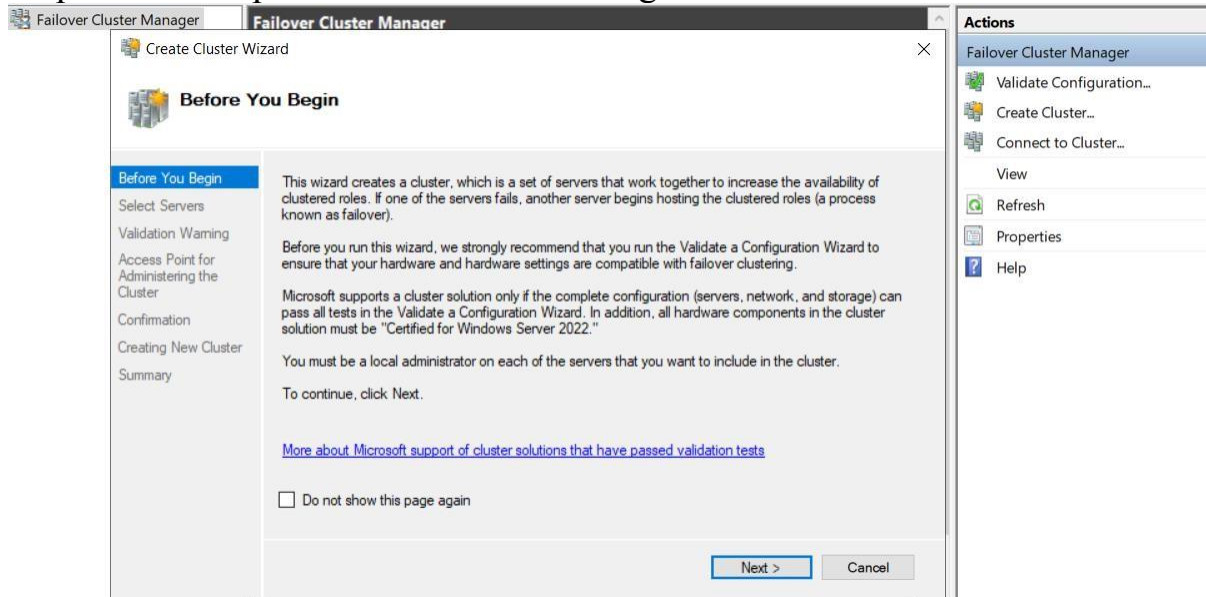
Then it will display the following page

Step41: - After viewing the report click on finish.



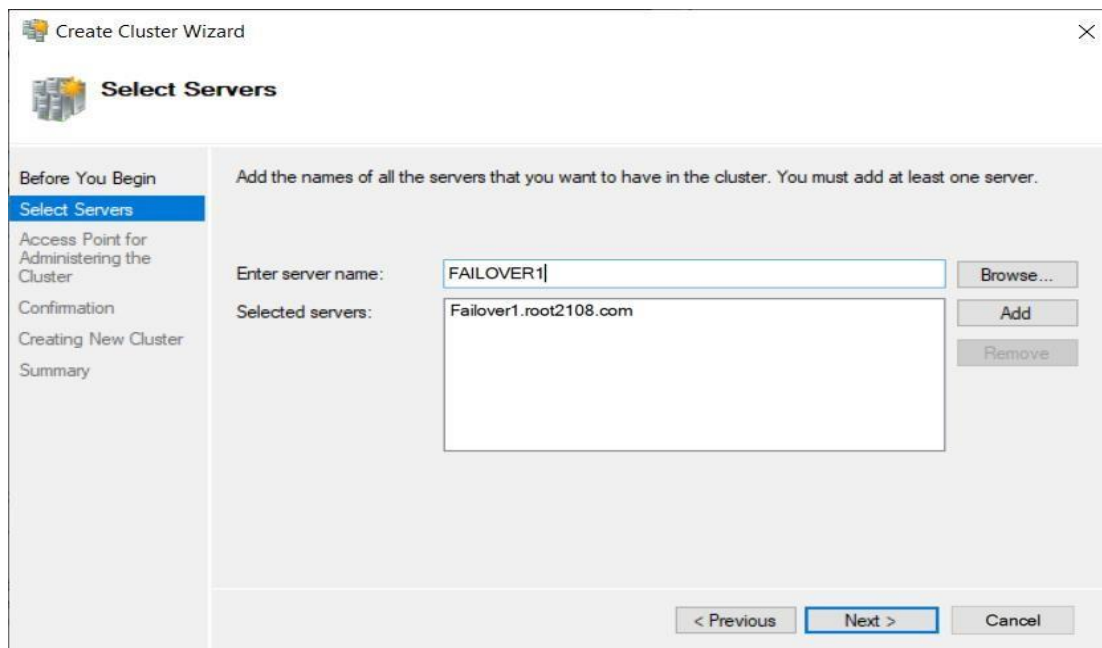
## Creating Cluster

Step42: - Now open failover cluster manager → Create Cluster → next.





Step43: - Click on browse → Advanced → Find now → Next.



**Create Cluster Wizard**

**Select Servers**

Before You Begin  
**Select Servers**  
 Access Point for Administering the Cluster  
 Confirmation  
 Creating New Cluster  
 Summary

Add the names of all the servers that you want to have in the cluster. You must add at least one server.

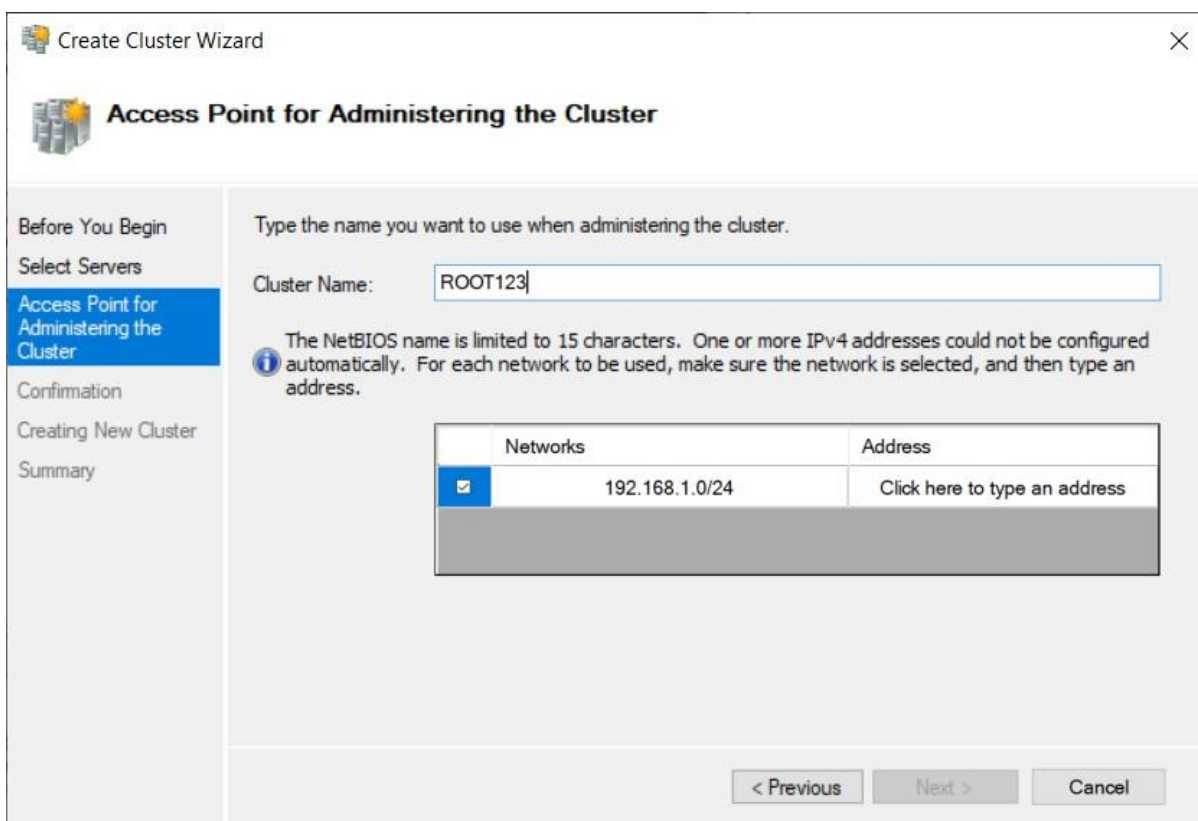
Enter server name:

Selected servers: 

Failover1.root2108.com

< Previous **Next >** Cancel

Step44: - Name the Cluster As “ROOT\_123”



**Create Cluster Wizard**

**Access Point for Administering the Cluster**

Before You Begin  
 Select Servers  
**Access Point for Administering the Cluster**  
 Confirmation  
 Creating New Cluster  
 Summary

Type the name you want to use when administering the cluster.

Cluster Name:

**i** The NetBIOS name is limited to 15 characters. One or more IPv4 addresses could not be configured automatically. For each network to be used, make sure the network is selected, and then type an address.

	Networks	Address
<input checked="" type="checkbox"/>	192.168.1.0/24	Click here to type an address

< Previous **Next >** Cancel



## Step45: - Click on NEXT

Create Cluster Wizard

**Access Point for Administering the Cluster**

Before You Begin  
Select Servers  
**Access Point for Administering the Cluster**  
Confirmation  
Creating New Cluster  
Summary

Type the name you want to use when administering the cluster.

Cluster Name:

The NetBIOS name is limited to 15 characters. All networks were configured automatically.

	Networks	Address
<input checked="" type="checkbox"/>	192.168.1.0/24	192.168.1.24

< Previous   Next >   Cancel

## Step46: - Click on NEXT

Create Cluster Wizard

**Confirmation**

Before You Begin  
Select Servers  
Access Point for Administering the Cluster  
**Confirmation**  
Creating New Cluster  
Summary

You are ready to create a cluster.  
The wizard will create your cluster with the following settings:

ROOT_123
Node
Failover1.root2108.com
Cluster registration
DNS and Active Directory Domain Services
IP Address
192.168.1.24

To continue, click Next.

< Previous   Next >   Cancel

## Step47: -Click on NEXT

Create Cluster Wizard

**Creating New Cluster**

Before You Begin  
Select Servers  
Access Point for Administering the Cluster  
Confirmation  
**Creating New Cluster**  
Summary

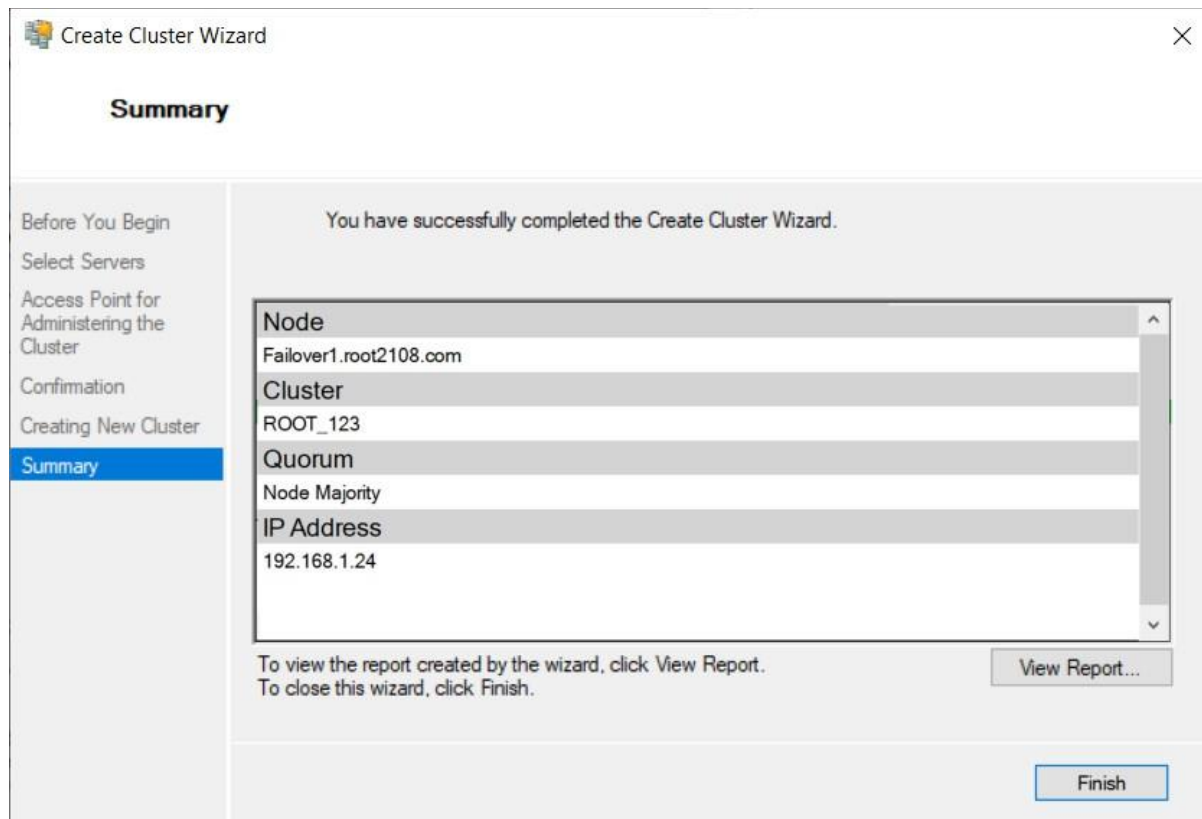
Please wait while the cluster is configured.

Beginning to configure the cluster ROOT\_123.

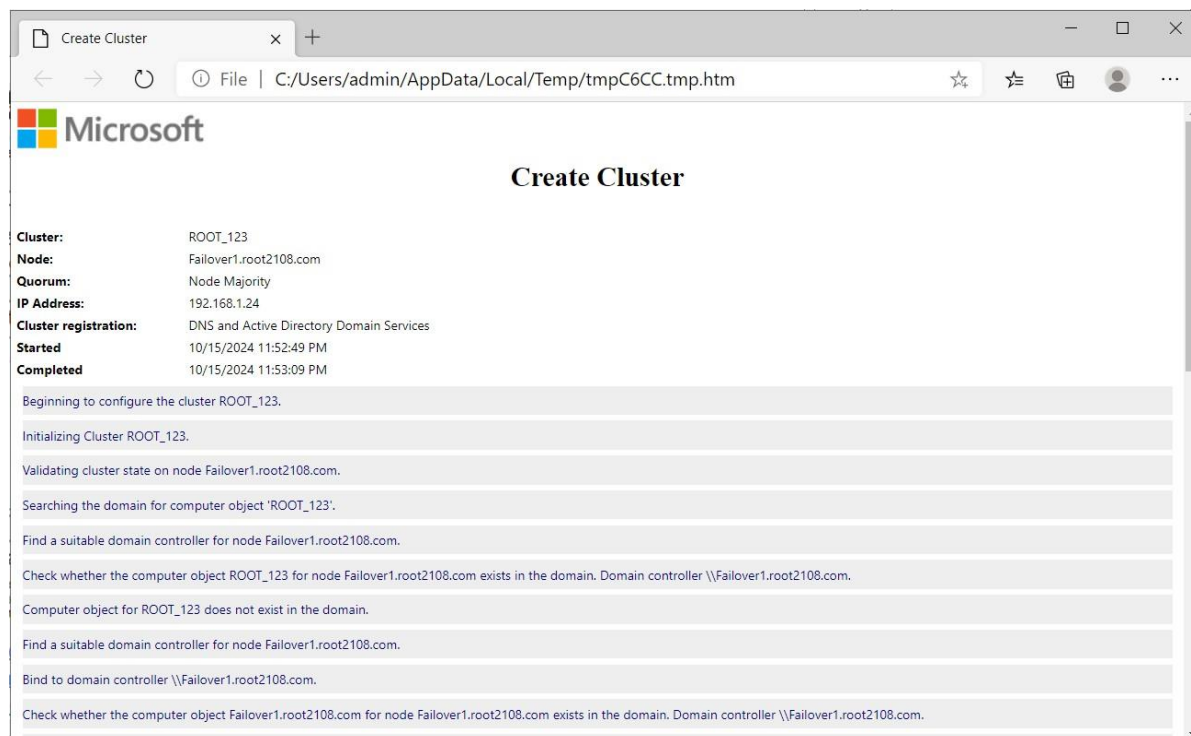
Cancel



Step48: -Click on VIEW REORT... → Click on FINISH



### Created Cluster Report View





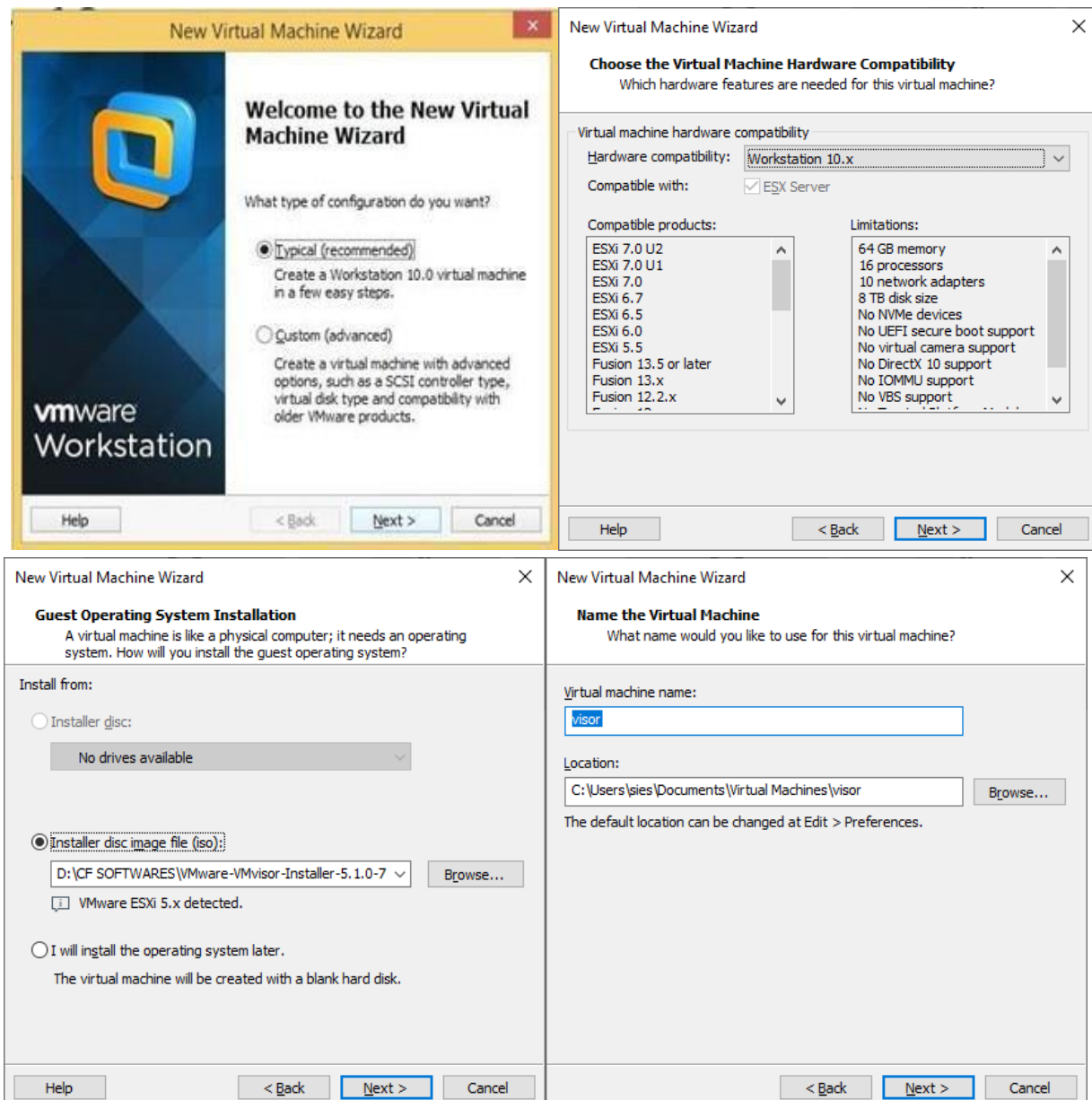
## PRACTICAL 2

**Aim: - Implement VMware ESXi Server with VSphere Client**

**File: - VMware-VMvisor-installer-5.1.0..... iso**

**Step: -**

**Step1: - Create a new VM.**





<p><b>New Virtual Machine Wizard</b></p> <p><b>Specify Disk Capacity</b> How large do you want this disk to be?</p> <p>Maximum disk size (GB): <input type="text" value="100"/></p> <p>Recommended size for VMware ESXi 5.x: 40 GB</p> <p><input type="checkbox"/> Allocate all disk space now. Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.</p> <p><input checked="" type="radio"/> Store virtual disk as a single file Split virtual disk into multiple files Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.</p> <p>Help &lt; Back <b>Next &gt;</b> Cancel</p>	<p><b>New Virtual Machine Wizard</b></p> <p><b>Specify Disk File</b> Where would you like to store the disk file?</p> <p>Disk file One 100 GB disk file will be created using this file name.</p> <p><input type="text" value="visor.vmdk"/> Browse...</p> <p>Help &lt; Back <b>Next &gt;</b> Cancel</p>
<p><b>New Virtual Machine Wizard</b></p> <p><b>Network Type</b> What type of network do you want to add?</p> <p>Network connection</p> <p><input checked="" type="radio"/> Use bridged networking Give the guest operating system direct access to an external Ethernet network. The guest must have its own IP address on the external network.</p> <p><input type="radio"/> Use network address translation (NAT) Give the guest operating system access to the host computer's dial-up or external Ethernet network connection using the host's IP address.</p> <p><input type="radio"/> Use host-only networking Connect the guest operating system to a private virtual network on the host computer.</p> <p><input type="radio"/> Do not use a network connection</p> <p>Help &lt; Back <b>Next &gt;</b> Cancel</p>	<p><b>New Virtual Machine Wizard</b></p> <p><b>Select I/O Controller Types</b> Which SCSI controller type would you like to use for SCSI virtual disks?</p> <p>I/O controller types</p> <p>SCSI Controller:</p> <p><input type="radio"/> BusLogic (Not available for 64-bit guests)</p> <p><input checked="" type="radio"/> LSI Logic (Recommended)</p> <p><input type="radio"/> LSI Logic SAS</p> <p><input type="radio"/> Paravirtualized SCSI</p> <p>Help &lt; Back <b>Next &gt;</b> Cancel</p>
<p><b>New Virtual Machine Wizard</b></p> <p><b>Select a Disk Type</b> What kind of disk do you want to create?</p> <p>Virtual disk type</p> <p><input type="radio"/> IDE</p> <p><input checked="" type="radio"/> SCSI (Recommended)</p> <p><input type="radio"/> SATA</p> <p><input type="radio"/> NVMe</p> <p><input checked="" type="checkbox"/> NVMe disks are not supported by VMware ESXi 5.x.</p> <p>Help &lt; Back <b>Next &gt;</b> Cancel</p>	<p><b>New Virtual Machine Wizard</b></p> <p><b>Select a Disk</b> Which disk do you want to use?</p> <p>Disk</p> <p><input checked="" type="radio"/> Create a new virtual disk A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.</p> <p><input type="radio"/> Use an existing virtual disk Choose this option to reuse a previously configured disk.</p> <p><input type="radio"/> Use a physical disk (for advanced users) Choose this option to give the virtual machine direct access to a local hard disk. Requires administrator privileges.</p> <p>Help &lt; Back <b>Next &gt;</b> Cancel</p>



### New Virtual Machine Wizard

**Processor Configuration**  
Specify the number of processors for this virtual machine.

Processors

Number of processors:

Number of cores per processor:

Total processor cores: 2

### New Virtual Machine Wizard

**Memory for the Virtual Machine**  
How much memory would you like to use for this virtual machine?

Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.

Memory for this virtual machine:  MB

64 GB -  
32 GB -  
16 GB -  
8 GB -  
4 GB -  
2 GB -  
1 GB -  
512 MB -  
256 MB -  
128 MB -  
64 MB -  
32 MB -  
16 MB -  
8 MB -  
4 MB -

Maximum recommended memory: 6.0 GB

Recommended memory: 4 GB

Guest OS recommended minimum: 4 GB

[Help](#)
[< Back](#)
[Next >](#)
[Cancel](#)

[Help](#)
[< Back](#)
[Next >](#)
[Cancel](#)

Step2: - At the final window click on “Finish” button.

### New Virtual Machine Wizard

**Ready to Create Virtual Machine**  
Click Finish to create the virtual machine and start installing VMware ESXi 5.x.

The virtual machine will be created with the following settings:

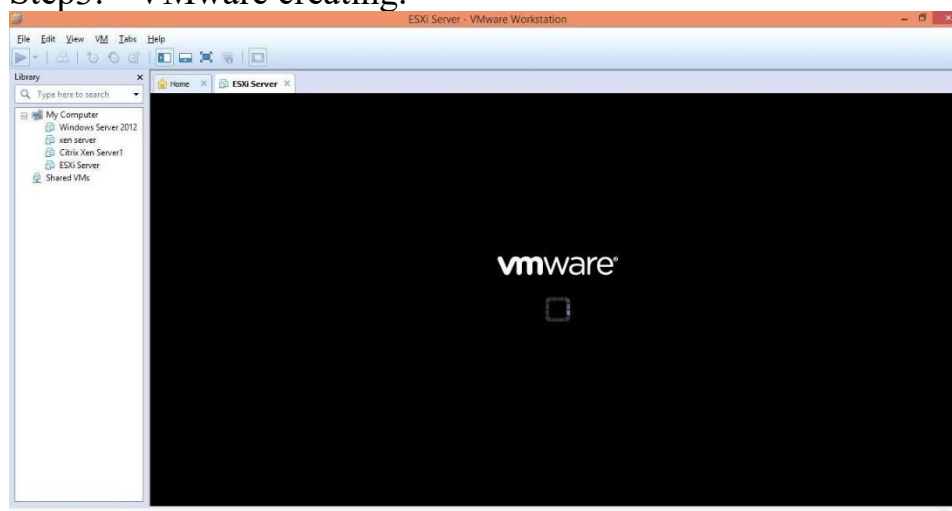
Name:	visor
Location:	C:\Users\sies\Documents\Virtual Machines\visor
Version:	Workstation 10.x
Operating System:	VMware ESXi 5.x
Hard Disk:	100 GB
Memory:	4096 MB
Network Adapter:	Bridged (Automatic)
Other Devices:	2 CPU cores, CD/DVD, USB Controller

[Customize Hardware...](#)

☒ Power on this virtual machine after creation

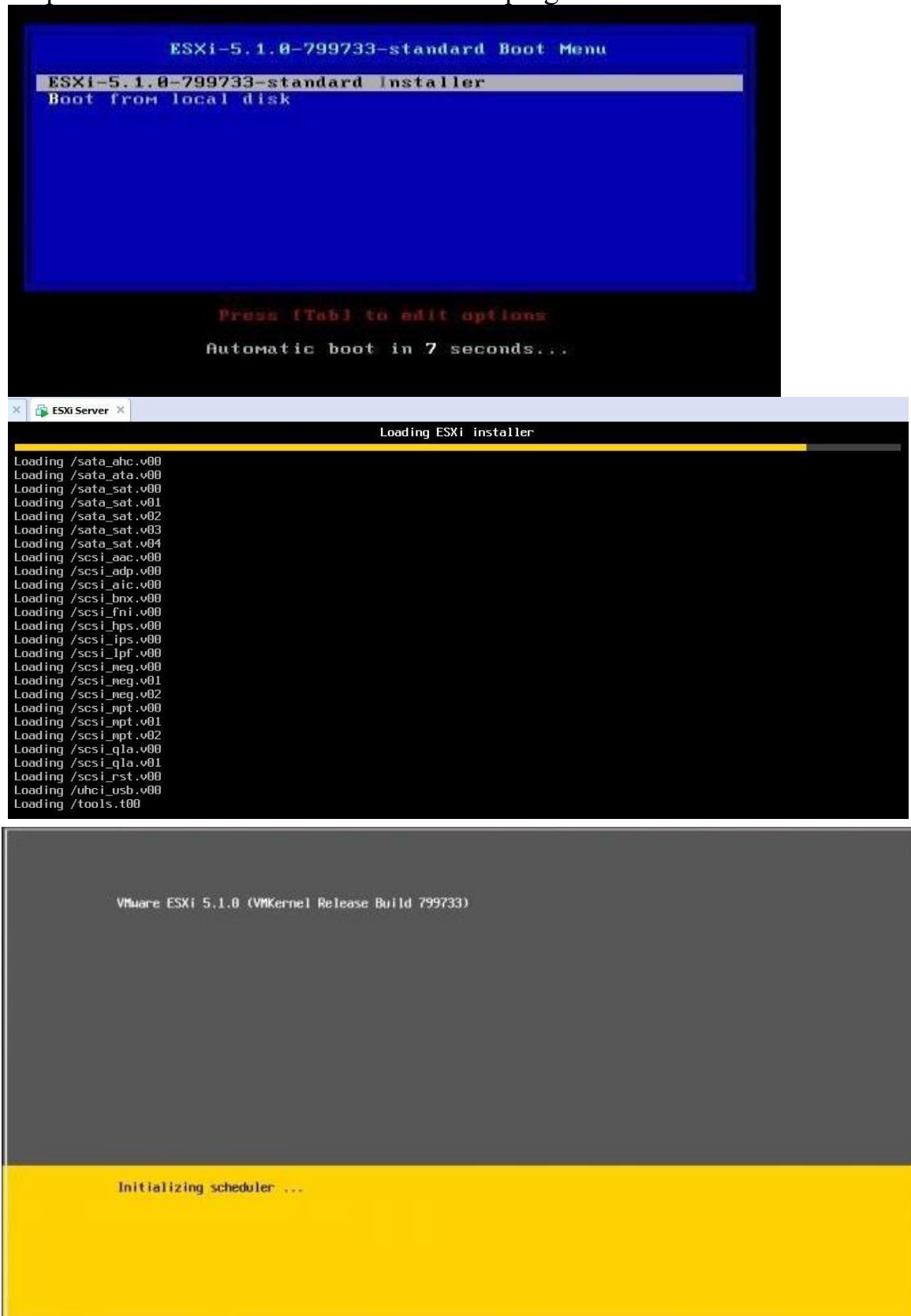
[< Back](#)
[Finish](#)
[Cancel](#)

Step3: - VMware creating.





Step4: - Creation of Virtual Machine is in progress...

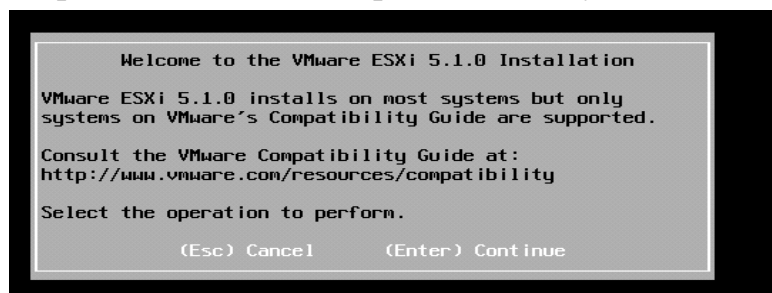




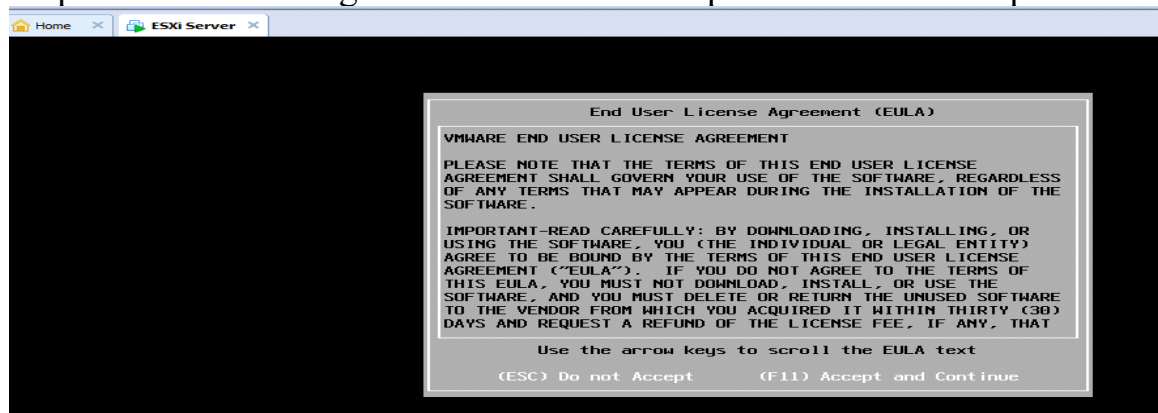
Step5: - In the following screen click on Continue or press Enter key.



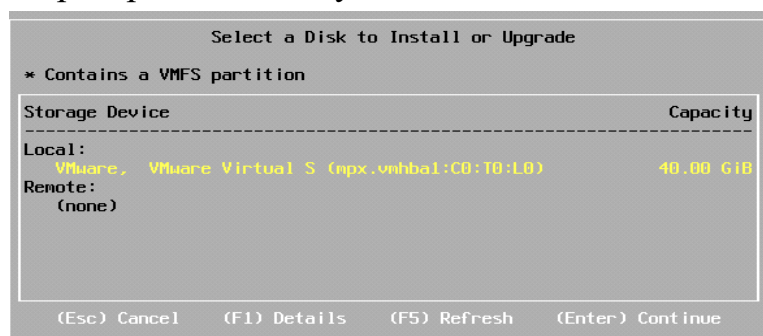
Step6: - For Installation press Enter key.



Step7: -For License Agreement click on "Accept and Continue" or press F11 key.

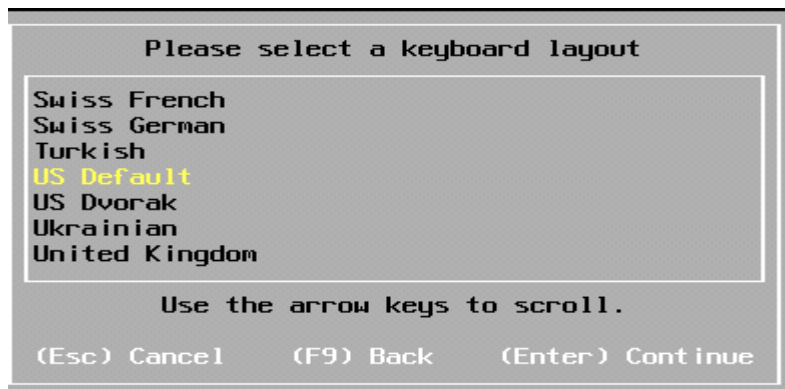


Step8: -press Enter key to Continue.





Step9: -Keep the default settings for keyboard settings and press Enter key.

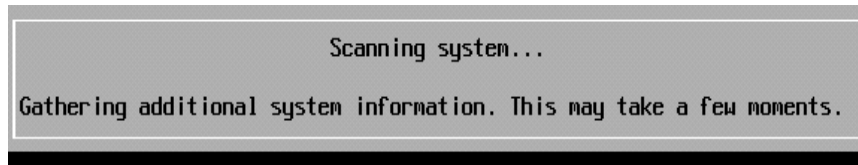


Step10: -Enter the root and confirmation password (1234567) and click on Continue or press Enter key.

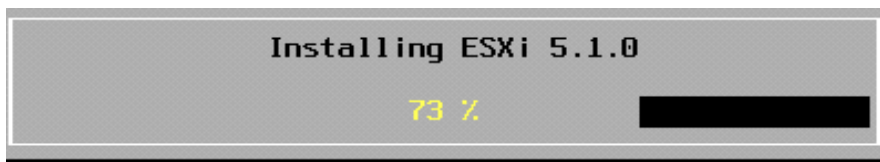
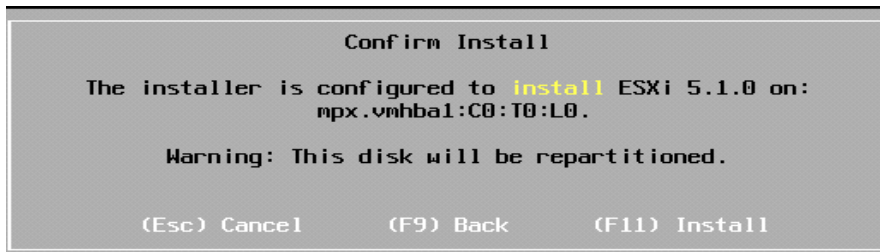




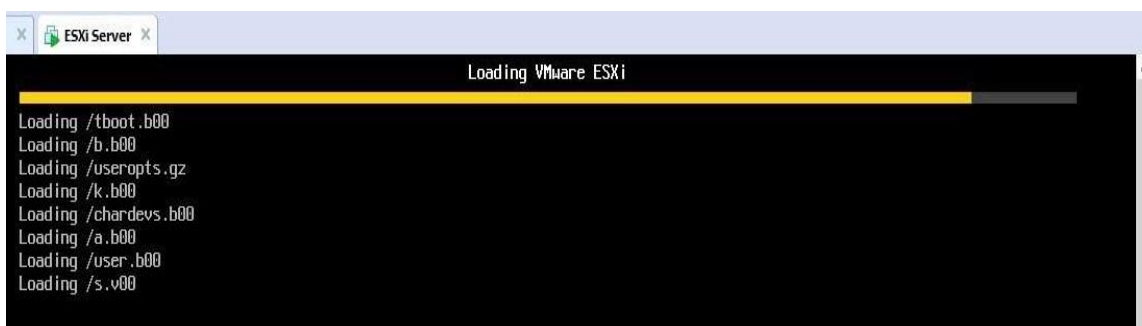
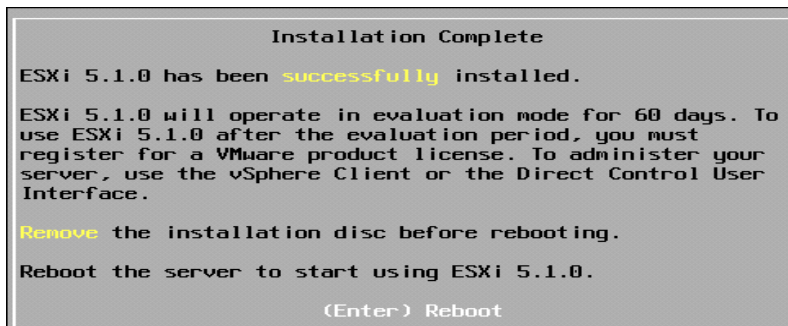
Step11: -The Installation is in progress...



Step12: -Press F11 key to Install. Installing ESXi 5.1.0...



Step13: -Press Enter key to Reboot.

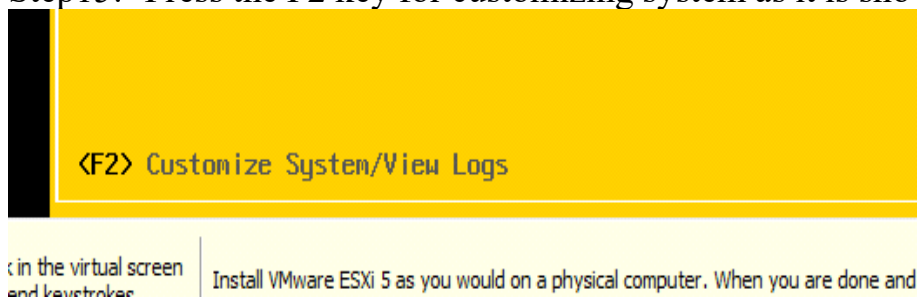




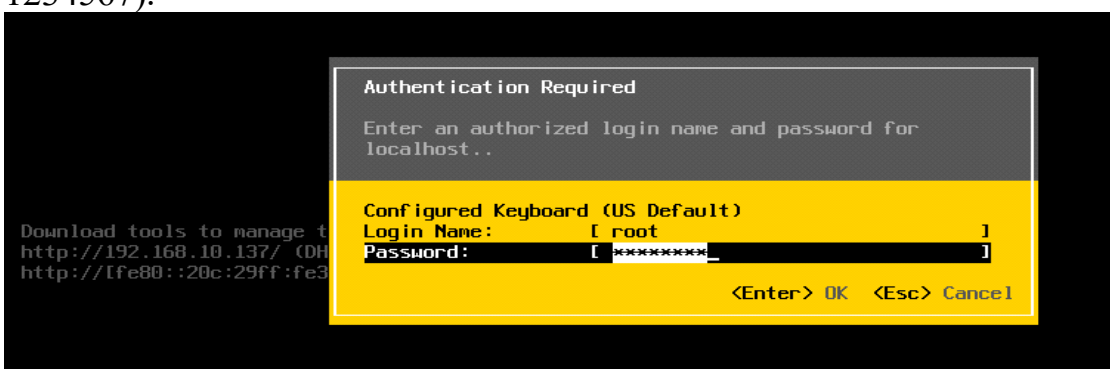
Step14: -Note the DHCP IP Address. Here it is-192.168.10.137



Step15: -Press the F2 key for customizing system as it is shown at the bottom of the VM.

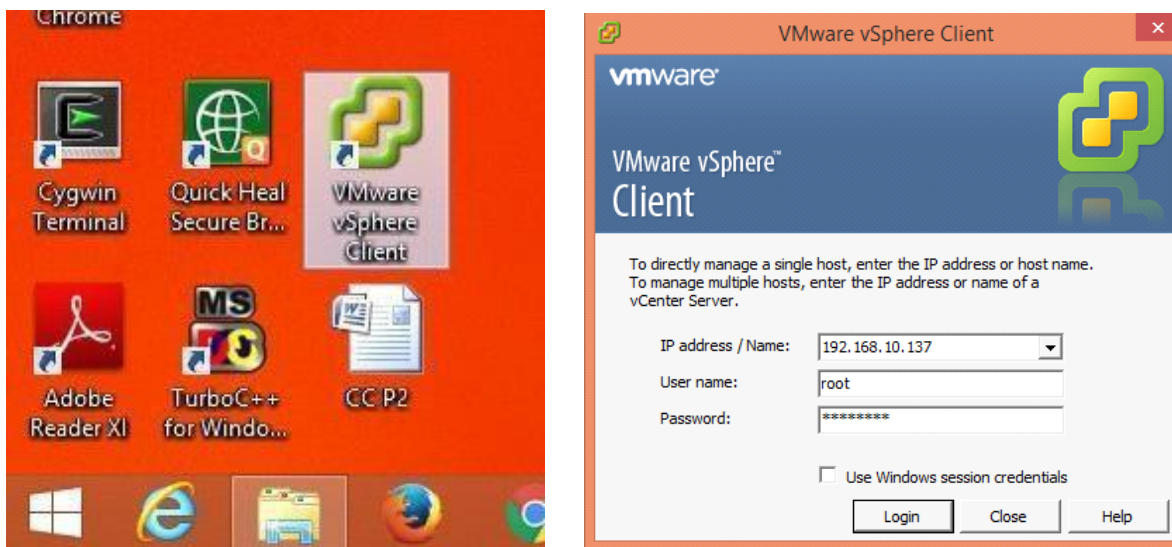


Step16: -Enter the username as root and the root password (which was used earlier-1234567).





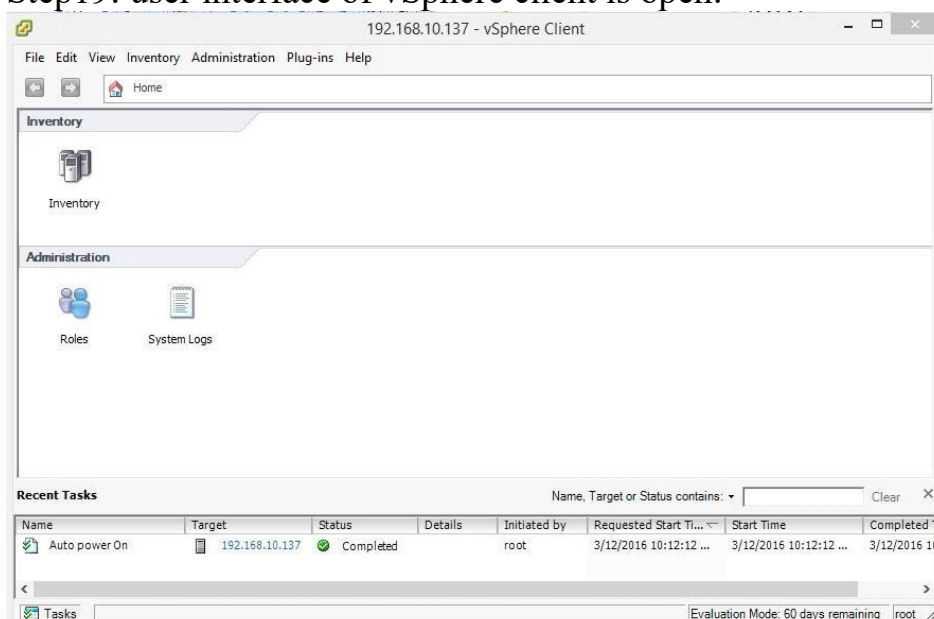
Step17: -Now start the VMware vSphere Client. Enter the IP address (*DHCP IP address of ESXi Server*), username as root and the same password as the ESXi System. Click on “Login” button.



Step18: -Click on the Ignore for the Security Warning.



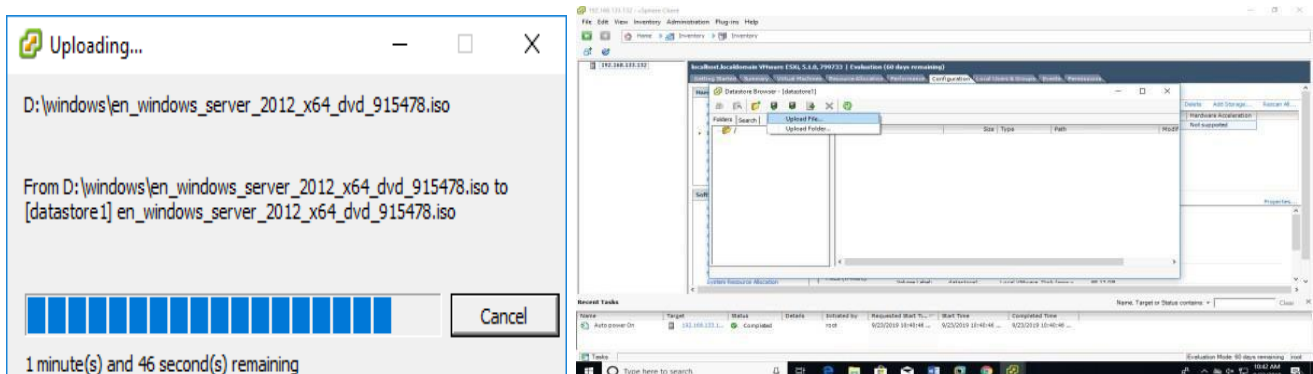
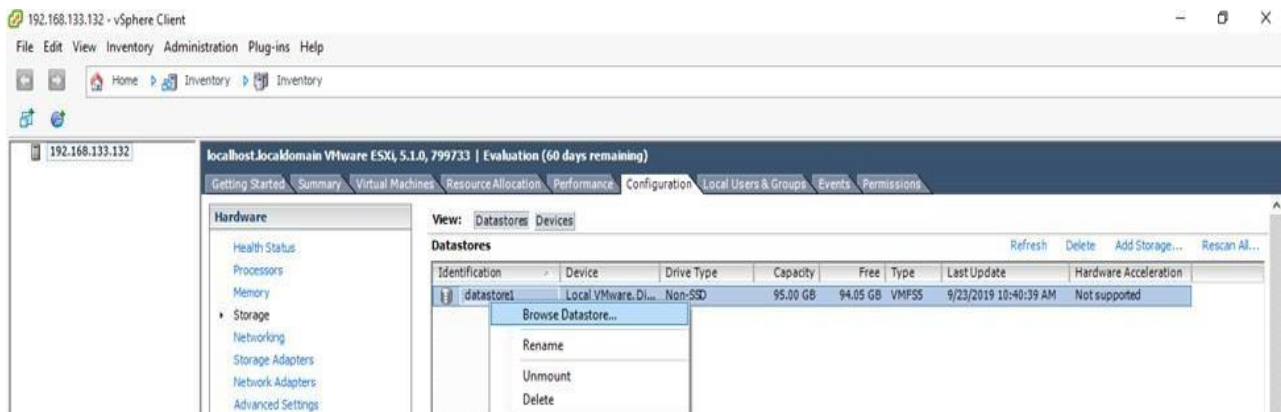
Step19: user interface of vSphere client is open.





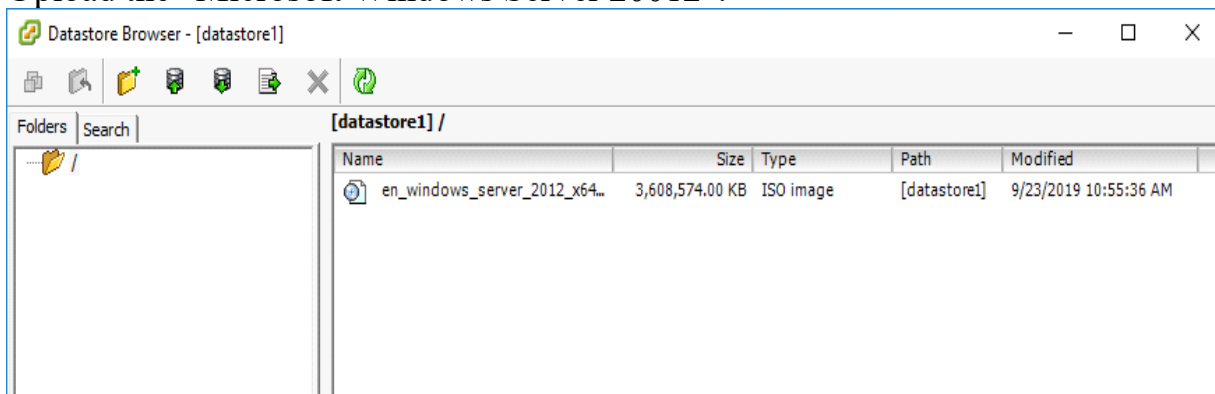
Step20: After login, the VMware vSphere Client looks like the following image. At the bottom of this screen the connectivity of VMware vSphere Client where the target IP address is the ESXi Server's DHCP IP address. Click on the Inventory.

In Configuration tab click on Hardware Storage. Right click on “datastore1” and select “Browse Datastore...”.



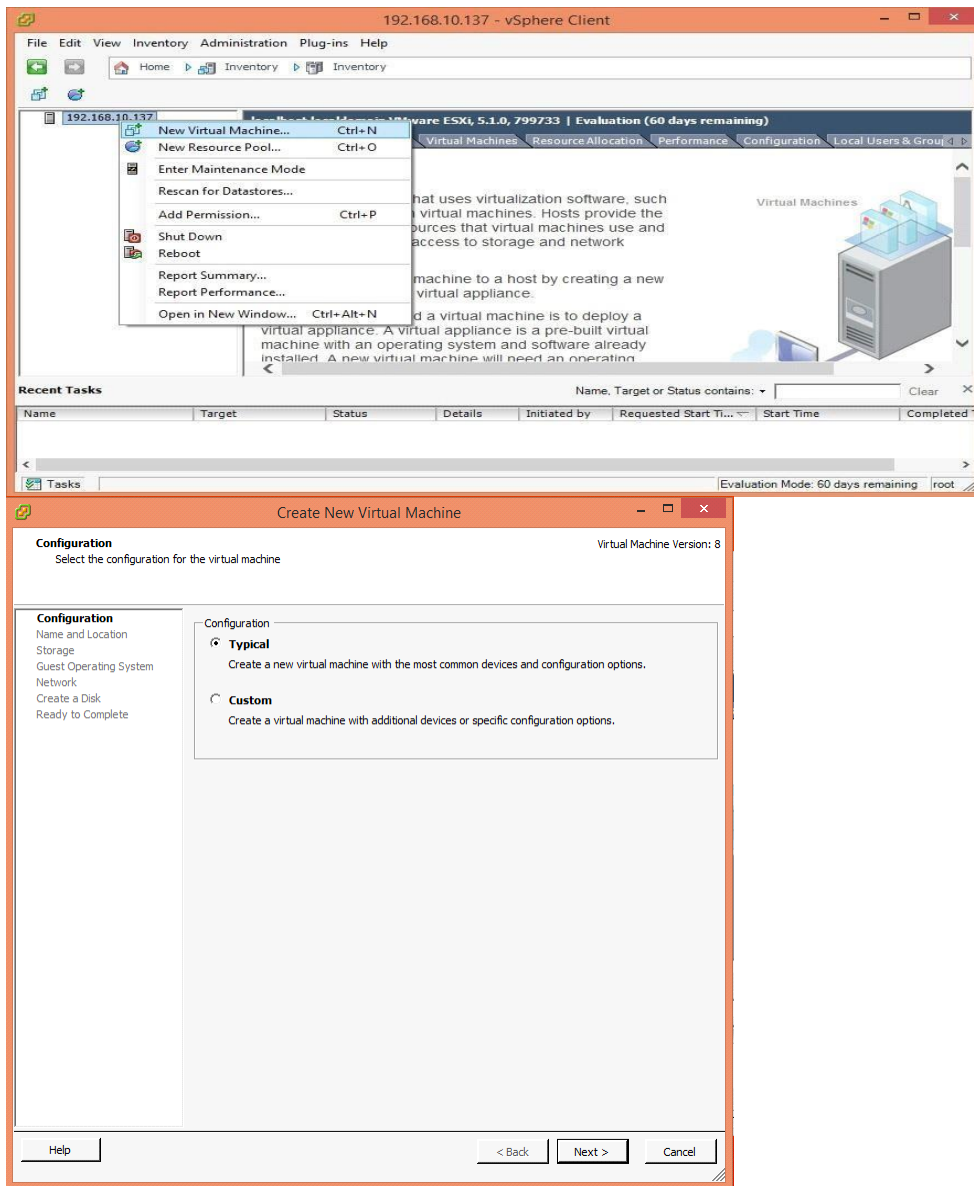
Step21: In the Datastore Browser – [datastore1] window click on Upload files to this datastore tool and select “Upload File...” option.

Upload the “Microsoft Windows Server 20012”.





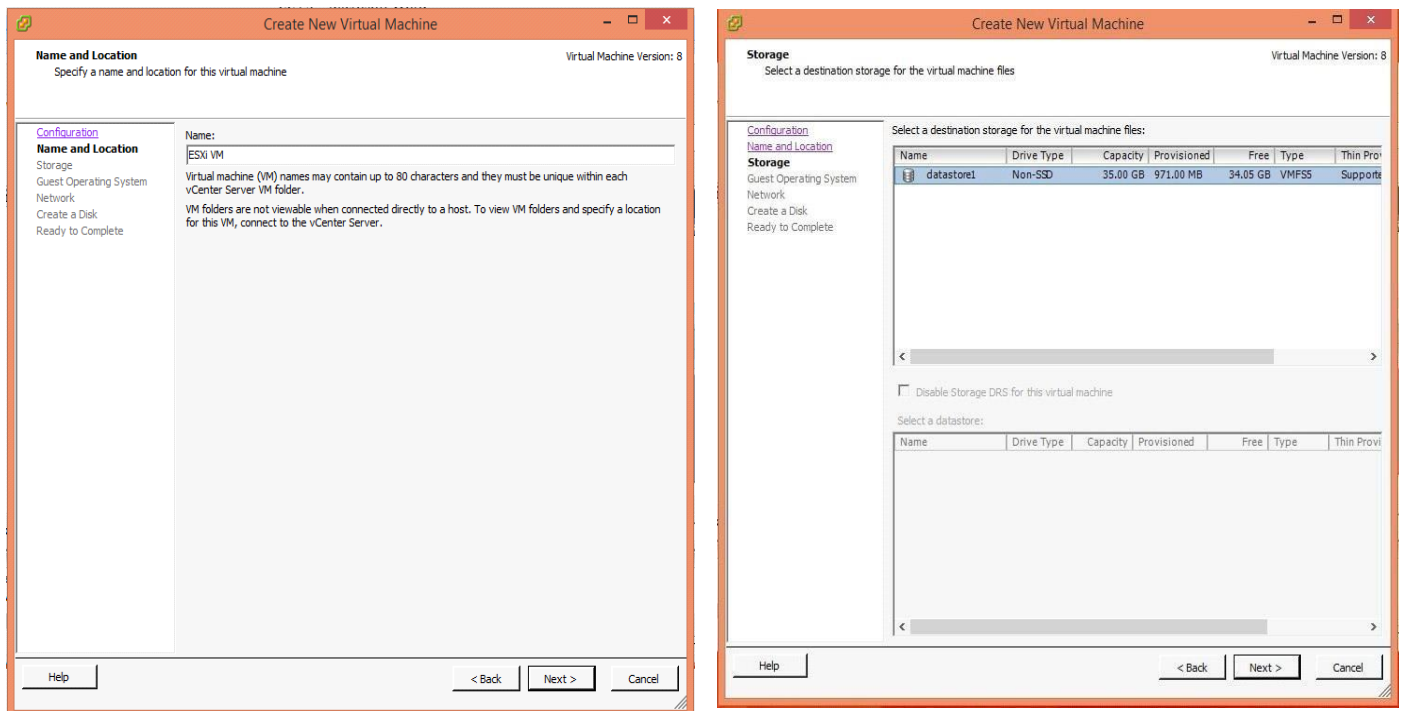
Step22: It shows the IP Address (192.168.10.137) listed on the left page. Right click on the IP address and select the option “New Virtual Machine....”



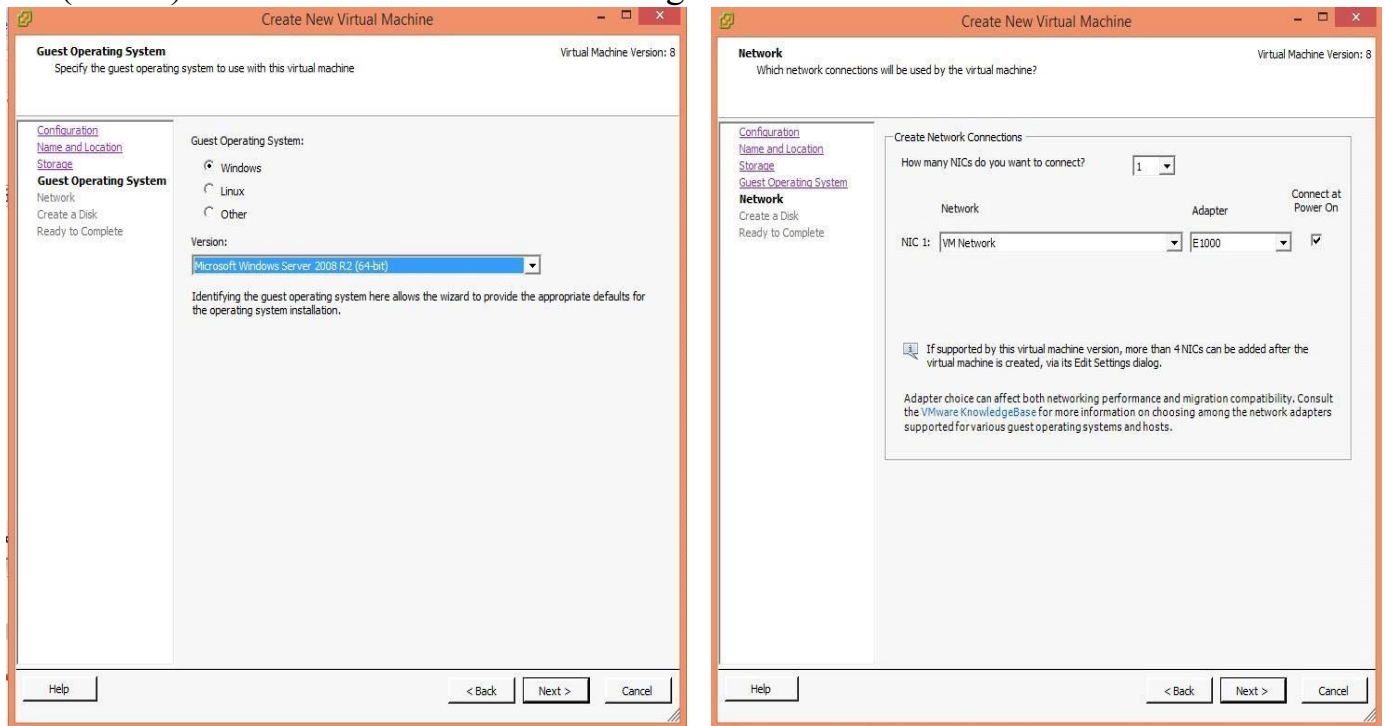


**Step23:** In the Create New Virtual Machine window select the Typical option and click on “Next.” Give a name to the Virtual Machine. Here it is given as ESXi VM. Click on the “Next button.

In the next screen keep the settings default for Storage and click on “Next.”

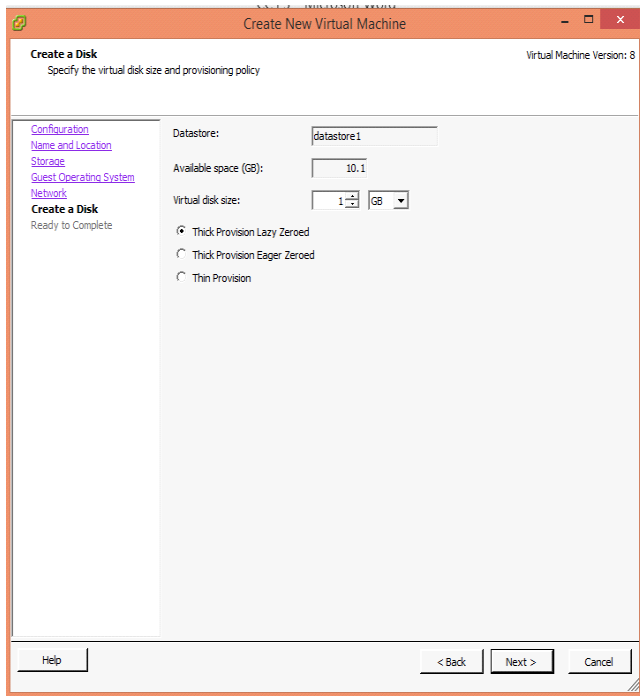


**Step24:** Select the Guest OS as Windows and Version as “Microsoft Windows Server 2008 R2 (32- bit)”. And Leave the Network settings default and click on “Next.”

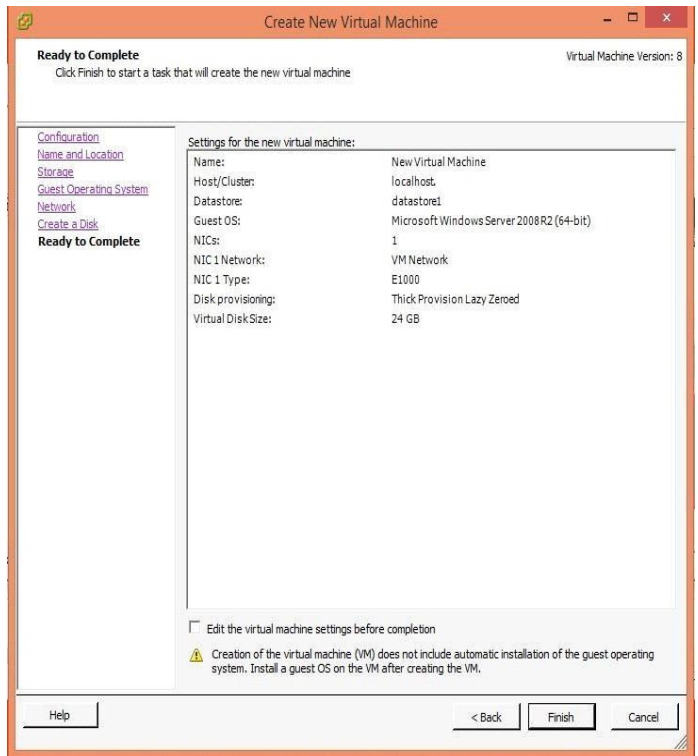




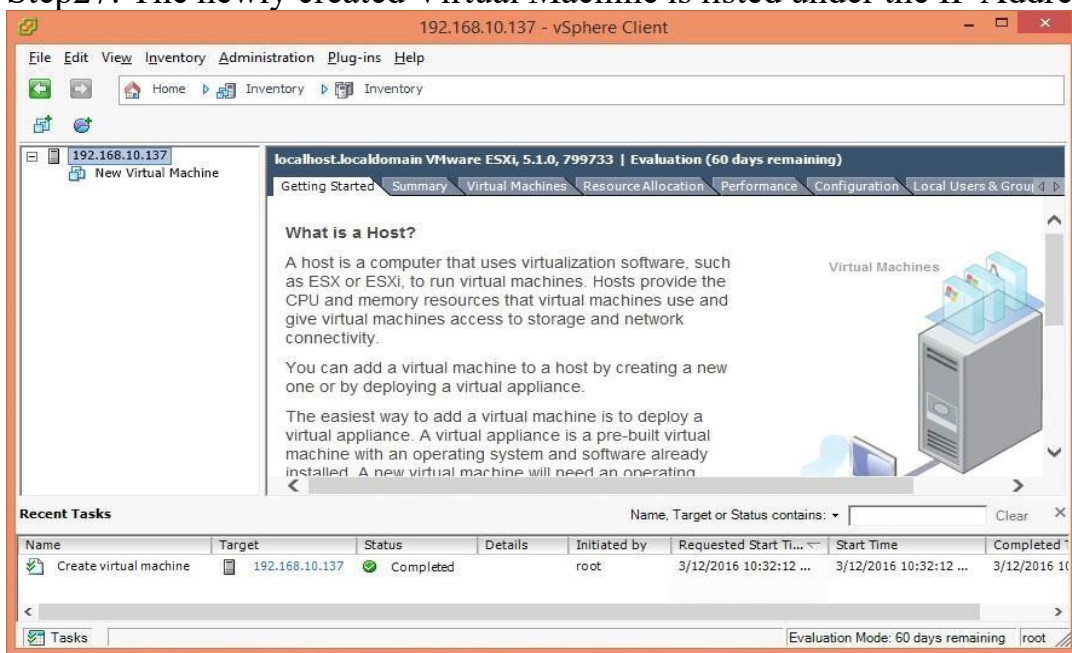
Step25: Choose the Disk space (depending on the available space of user's system. Here it is 1GB) of the VM in GB. Click on the "Next" button.



Step26: At the final screen click on "Finish" button.

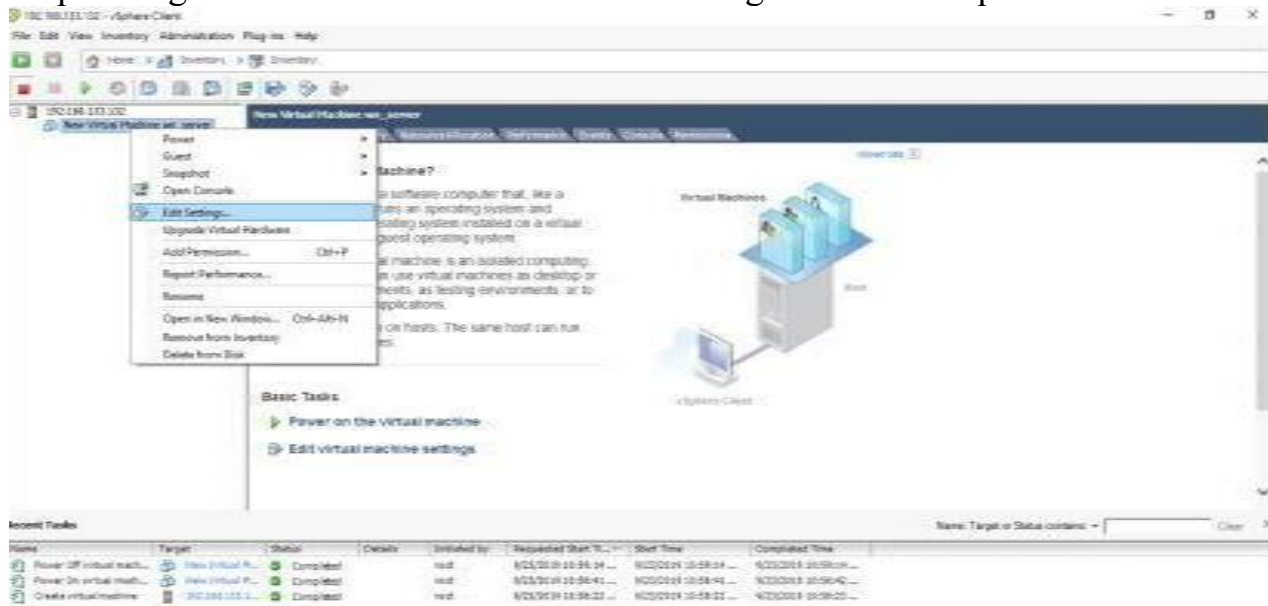


Step27: The newly created Virtual Machine is listed under the IP Address.

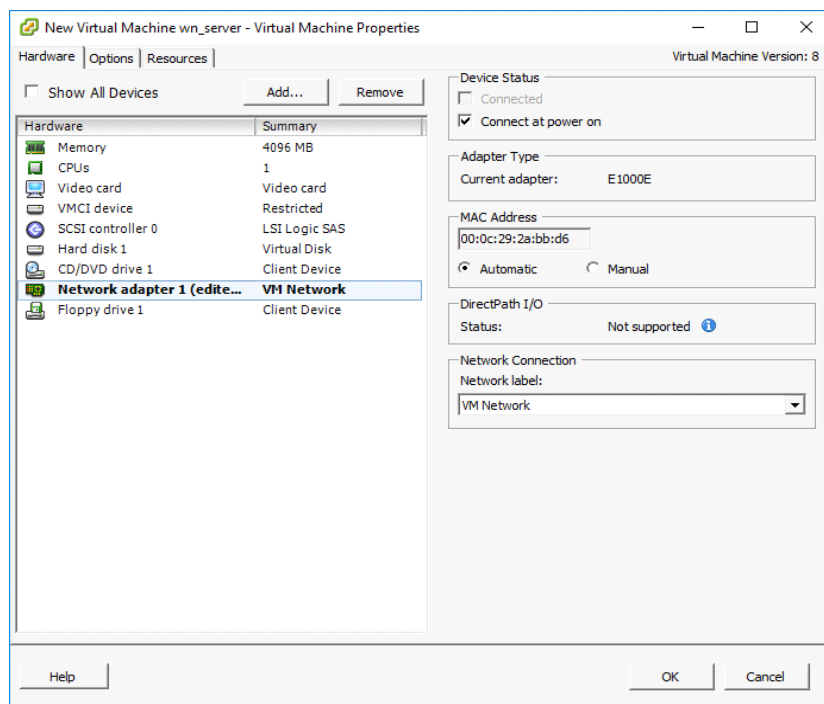




Step28: Right click on virtual machine Edit settings Network adapter.

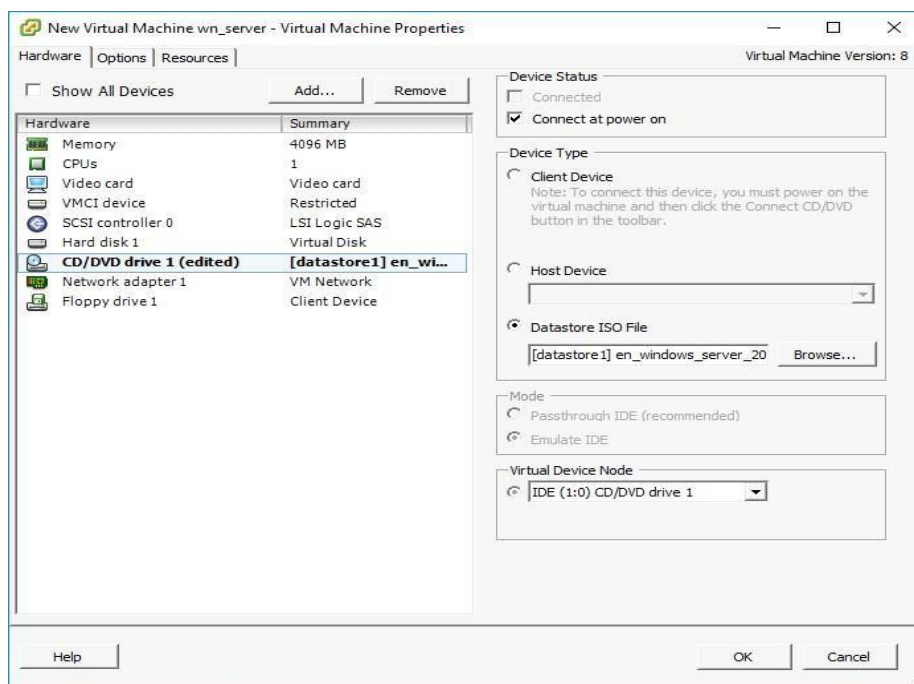
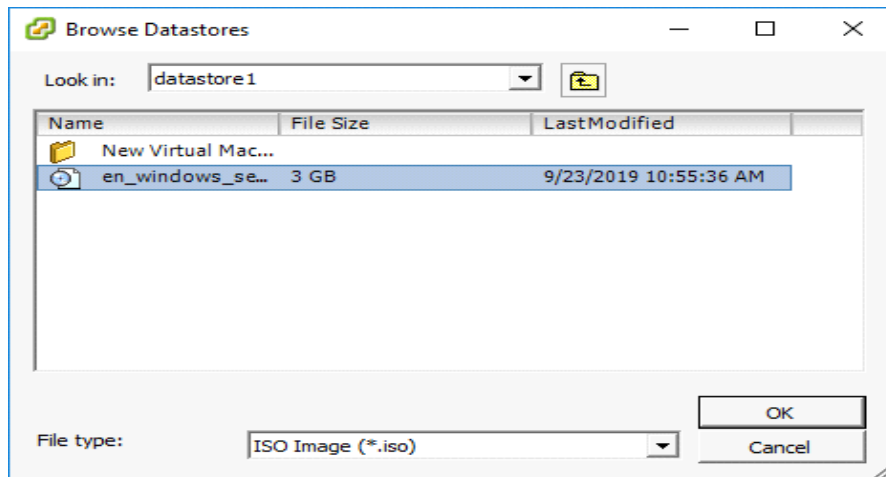


Step29: Right click on virtual machine Edit settings Network adapter” Check on Connect at power on.”





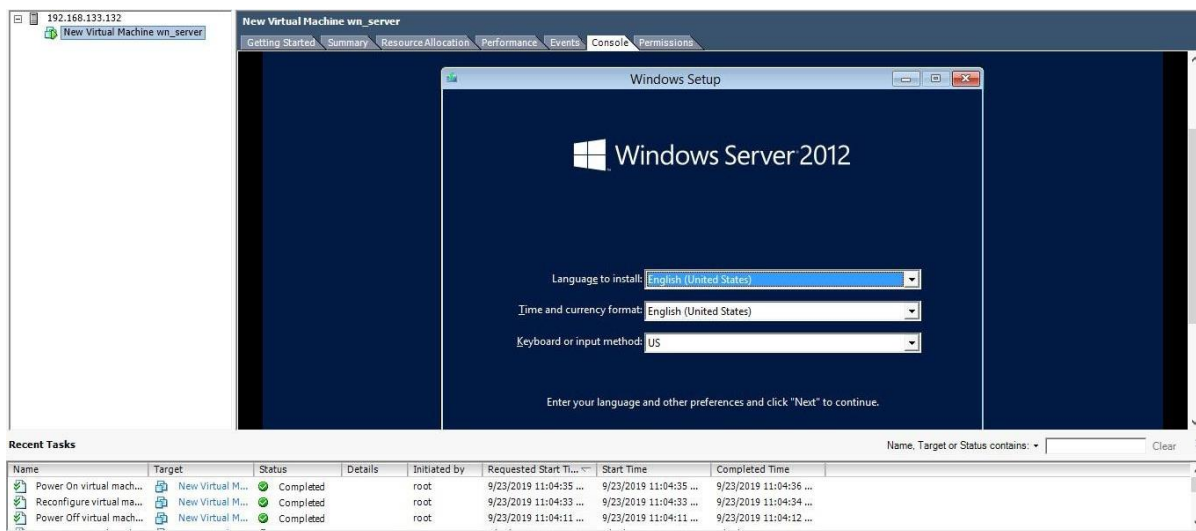
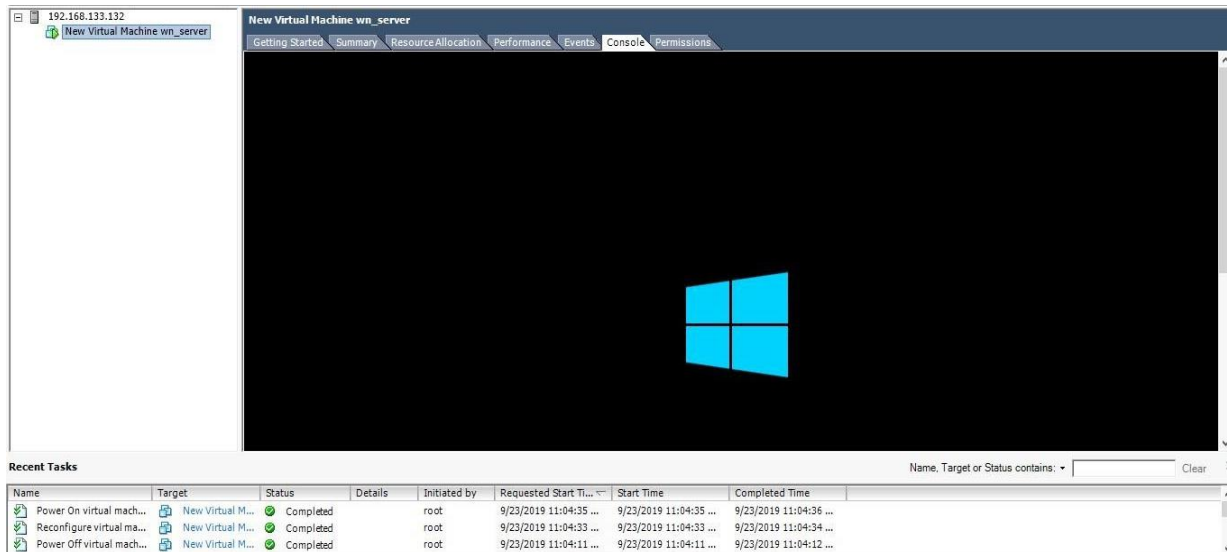
Step30: Right click on virtual machine Edit settings CD/DVD Drive Check on Datastore ISO file and browse the iso.





Step31: “Check on Connect at power on.”

## Power on VM





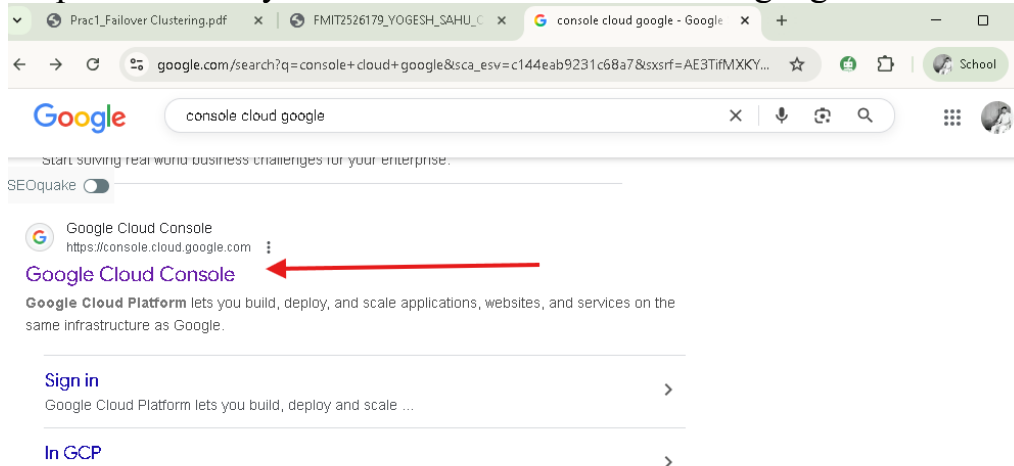
## PRACTICAL 3

**Aim: - Implementing Google App**

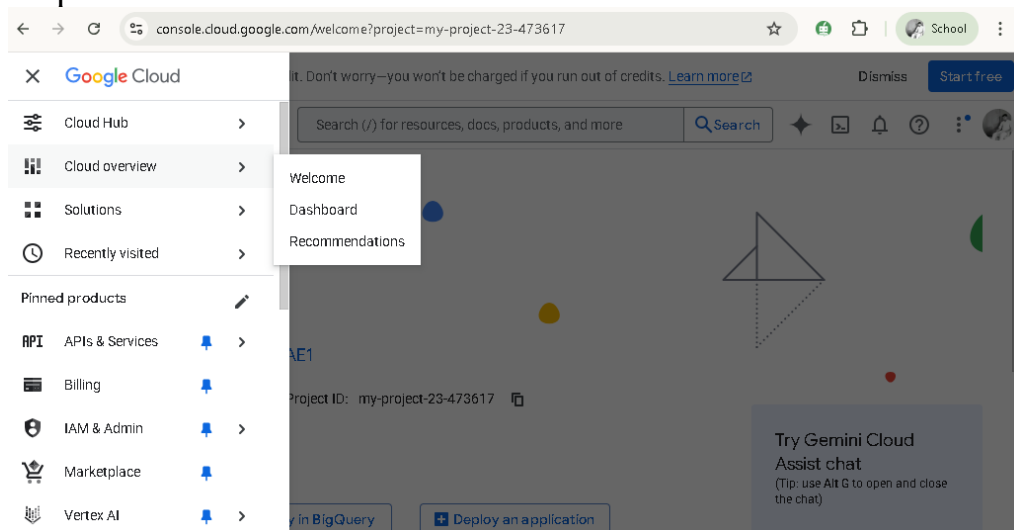
**Engine Software: - Google cloud console**

**Steps: -**

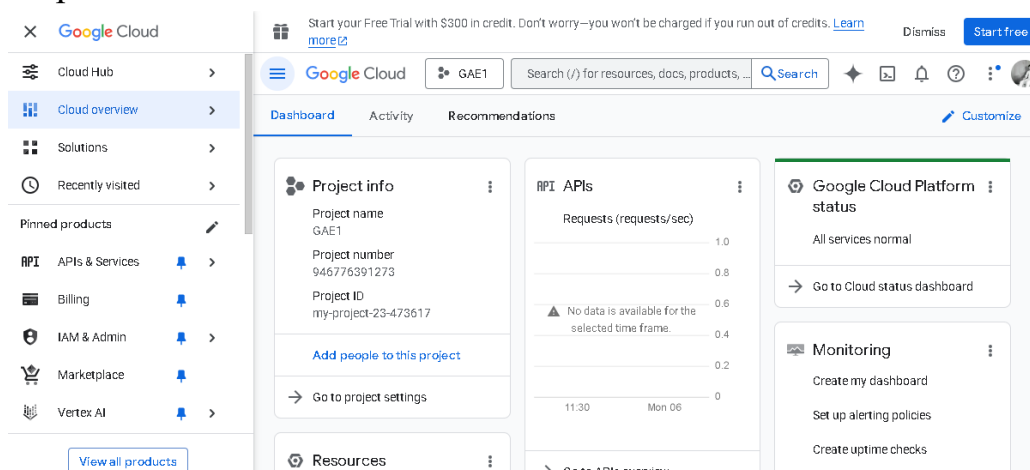
**Step1: - Go to any browser search “console cloud googles”**



**Step2: - Now click on cloud overview → dashboard.**

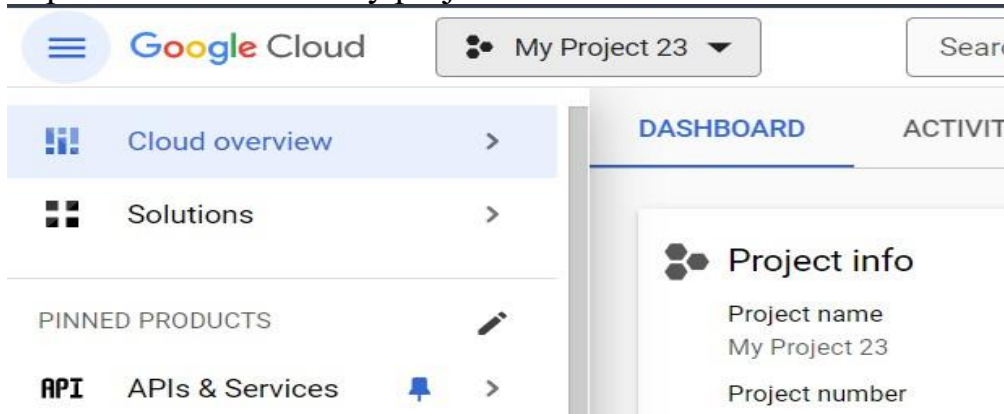


**Step3: - Now u can see this interface.**





Step4: - Now click on My project 23.



Step5: - Now create a project by clicking on new project.

Select a project NEW PROJECT

Search projects and folders

RECENT   STARRED   ALL

Name	ID
✓ ☆ ● My Project 23	vocal-well-438219-i8

You have 9 projects remaining in your quota. Request an increase or delete projects. [Learn more](#)

[Manage Quotas](#)

Project name \*  ?

Project ID: gae1-474218. It cannot be changed later. [Edit](#)

Organization \*  ▼ ?

Select an organization to attach it to a project. This selection can't be changed later.

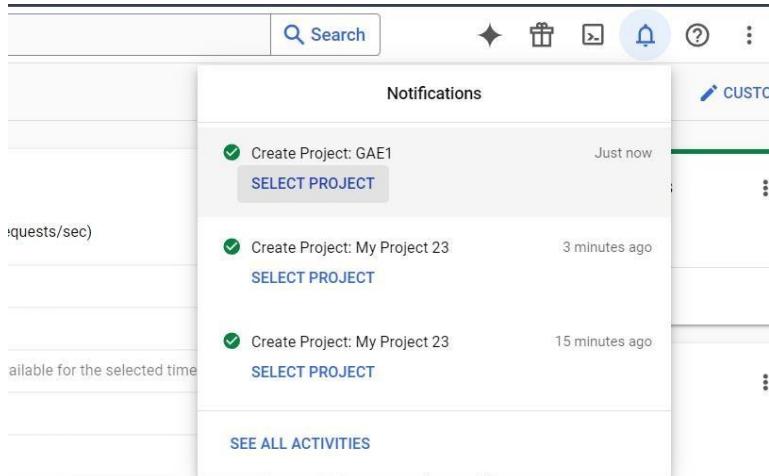
Location \*  Browse

Parent organization or folder

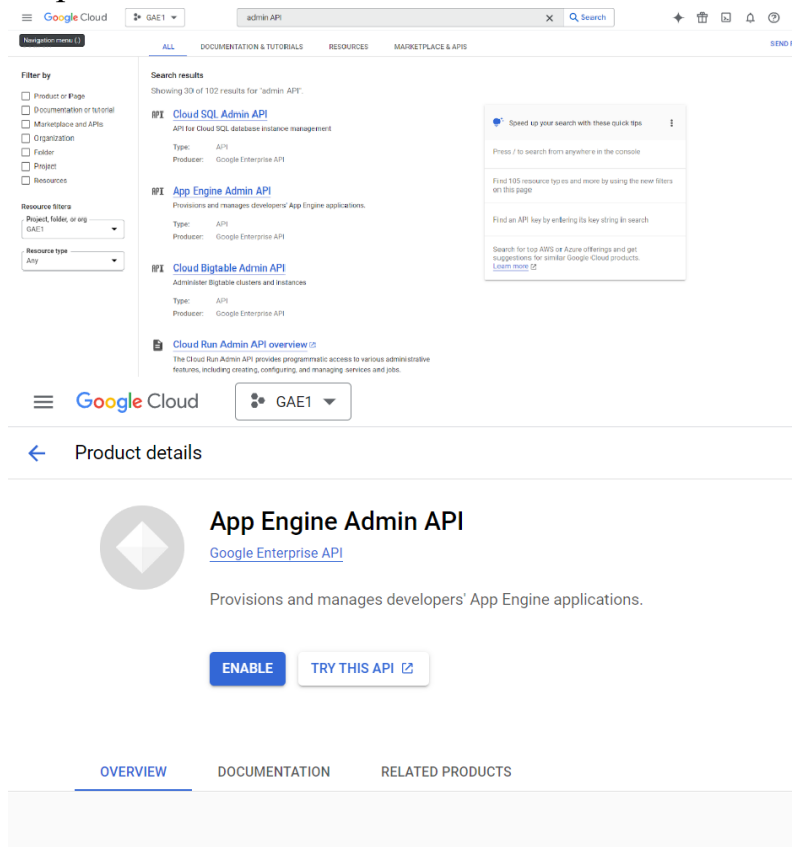
Create Cancel



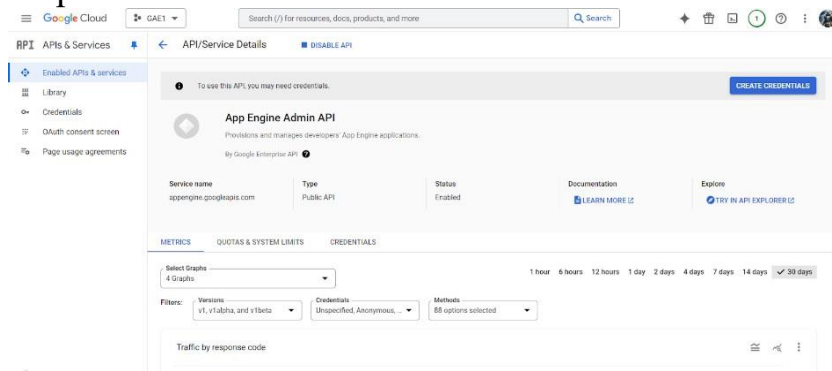
Step6: - Now click on project that you created.



Step7: - Now search “Admin API”



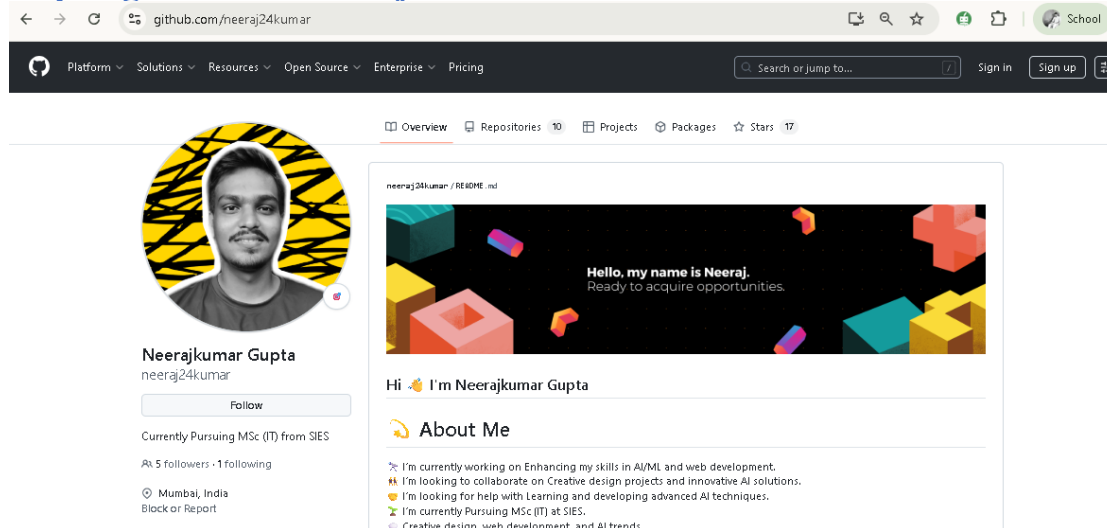
Step8: - Click on enable.





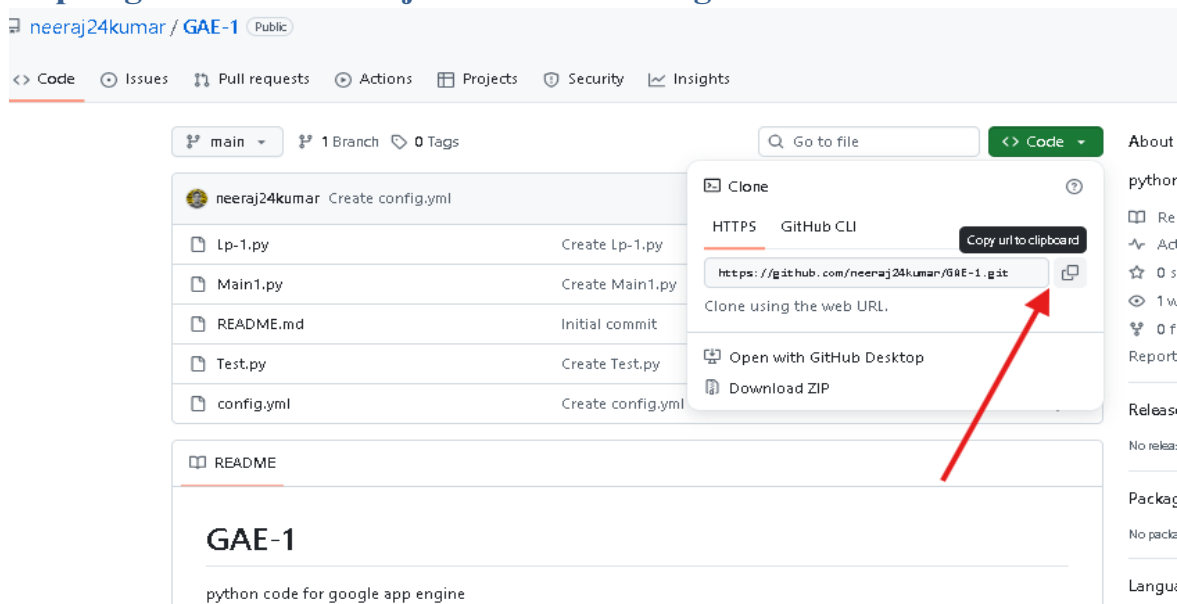
Step9: - Now open chrome and type neeraj24kumar in GitHub

<https://github.com/neeraj24kumar>

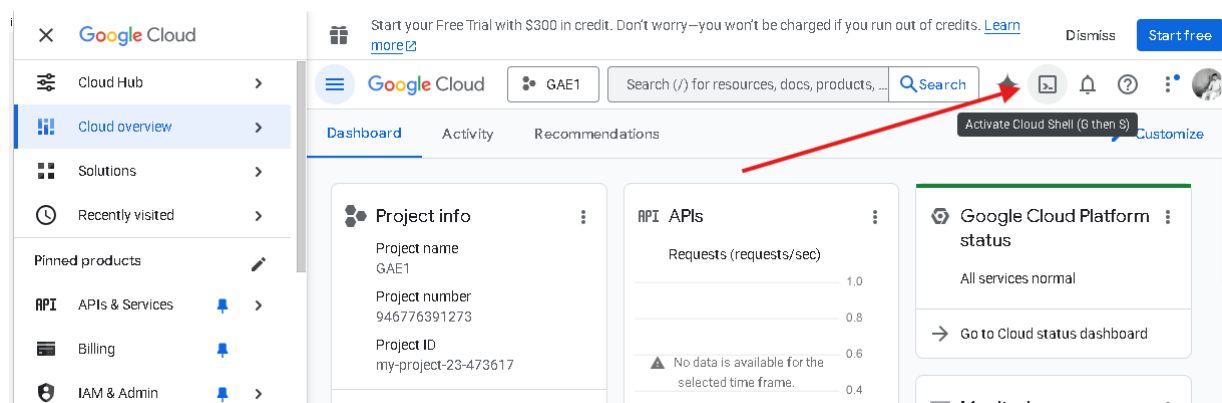


Step10: - GO to Repositories → Now click on GAE-1 and then copy the link→

<https://github.com/neeraj24kumar/GAE-1.git>

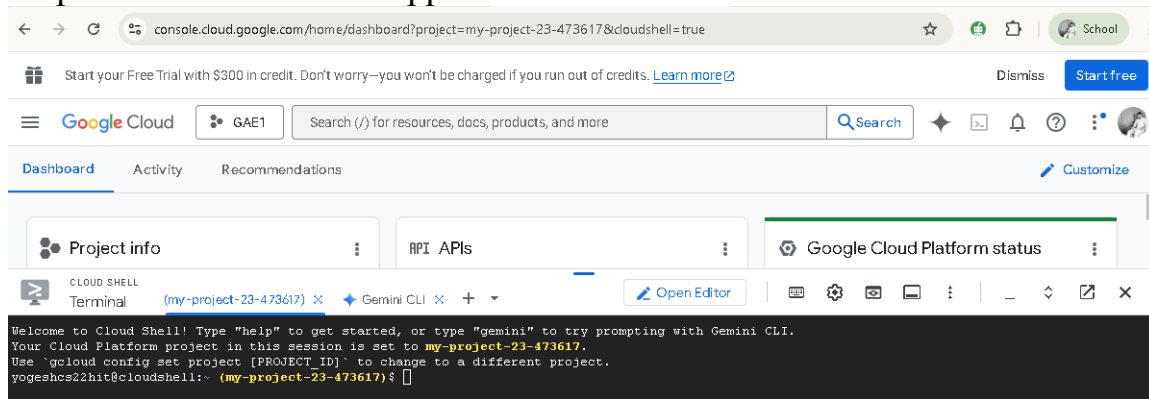


Step11: - Now go back to google console and open “Activate Cloud Shell”





Step12: - A terminal will appear from bottom.



Step13: - Now type the following cmd.

- **git clone** <https://github.com/neeraj24kumar/GAE-1.git>

```
Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to gae1-438219.
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
knighttech2804@cloudshell:~ (gae1-438219)$ git clone https://github.com/neeraj24kumar/GAE-1.git
Cloning into 'GAE-1'...
remote: Enumerating objects: 19, done.
remote: Counting objects: 100% (19/19), done.
remote: Compressing objects: 100% (15/15), done.
remote: Total 19 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (19/19), 5.46 KiB | 1.37 MiB/s, done.
Resolving deltas: 100% (2/2), done.
knighttech2804@cloudshell:~ (gae1-438219)$
```

- **ls** (To view all the list of folders in the repository)
- **cd GAE-1** (to change the directory in order to access the GAE-1 folder files)
- **ls**

```
Resolving deltas: 100% (2/2), done.
knighttech2804@cloudshell:~ (gae1-438219)$ ls
GAE-1  README-cloudshell.txt
knighttech2804@cloudshell:~ (gae1-438219)$ cd GAE-1
knighttech2804@cloudshell:~/GAE-1 (gae1-438219)$ ls
config.yml  Lp-1.py  Main1.py  README.md  Test.py
knighttech2804@cloudshell:~/GAE-1 (gae1-438219)$
```

You will see the “Lp-1.py” file that we need to execute.

- **python Lp-1.py**

```
config.yml  Lp-1.py  Main1.py  README.md  Test.py
knighttech2804@cloudshell:~/GAE-1 (gae1-438219)$ python Lp-1.py
hello
```

“hello” is seen which means the print statement inside code has been executed successfully.

Step14: - **Now to remove all the above read folders and files, do the following steps: -**

- **cd ..**
- **rm -rf GAE-1** (Remove the folder)
- **ls**

Step15: - Now you will not see any files in it.

```
hello
knighttech2804@cloudshell:~/GAE-1 (gae1-438219)$ cd ..
knighttech2804@cloudshell:~ (gae1-438219)$ rm -rf GAE-1
knighttech2804@cloudshell:~ (gae1-438219)$ ls
README-cloudshell.txt
```



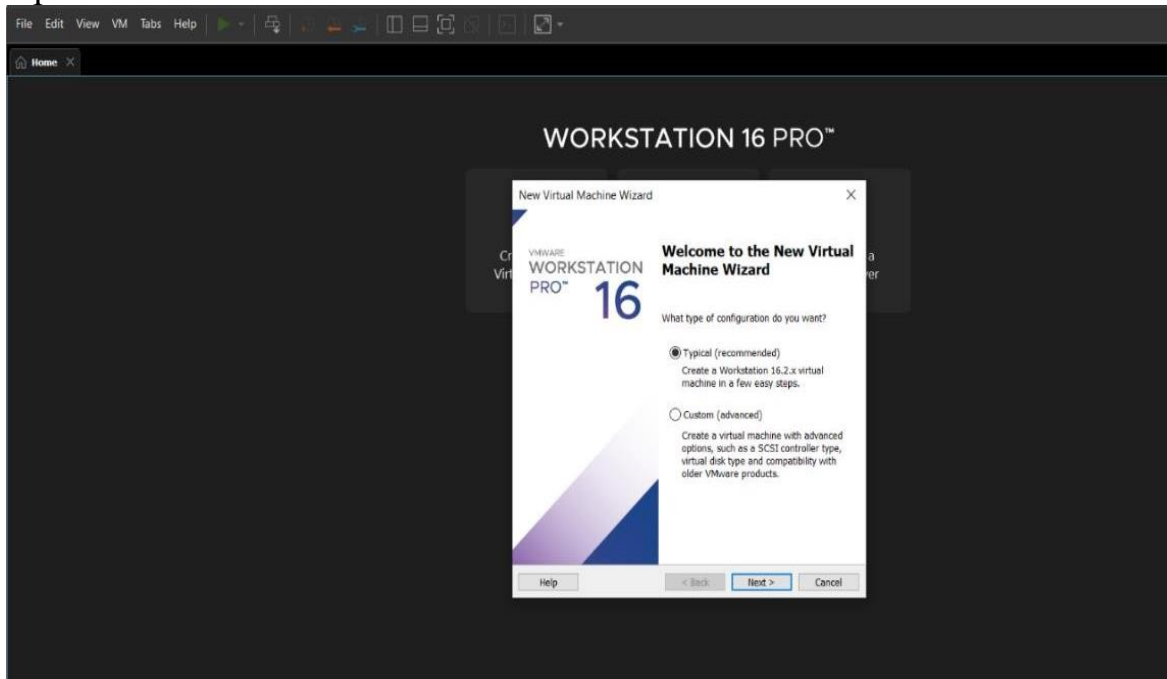
## PRACTICAL 4

**Aim: -Implementing IaaS using Eucalyptus**

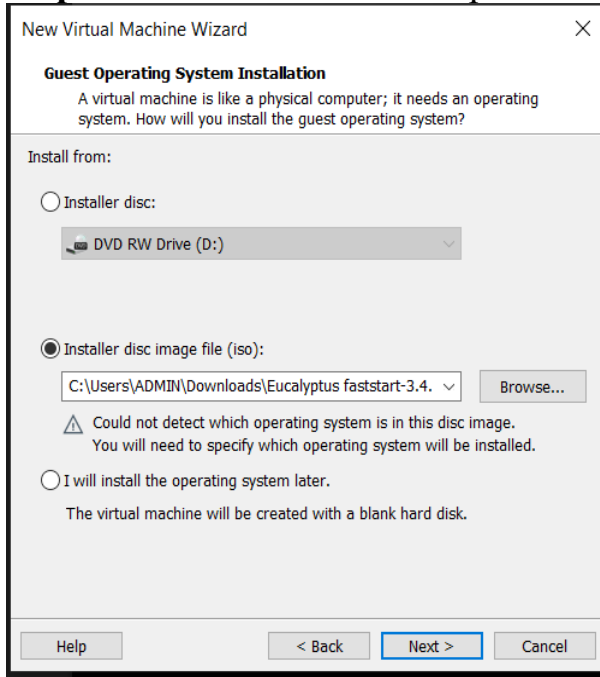
**Requirements: - VMware Workstation 17x, Eucalyptus faststart 3.4.1.iso file**

**Steps: -**

Open VMware workstation clicks on next.

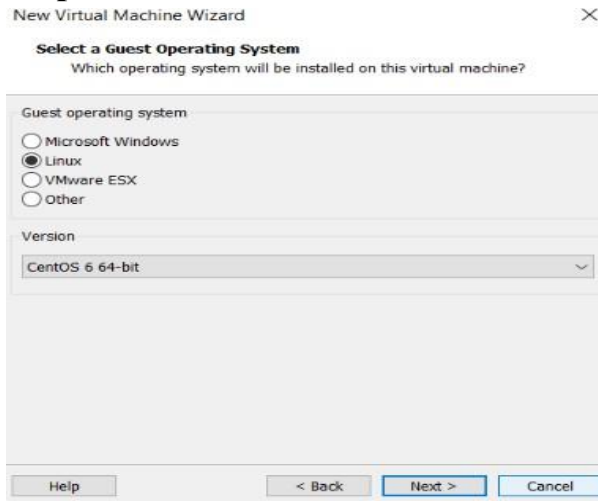


**Step1: -Click on Browse and upload the Eucalyptusfaststsr-3.4.1**

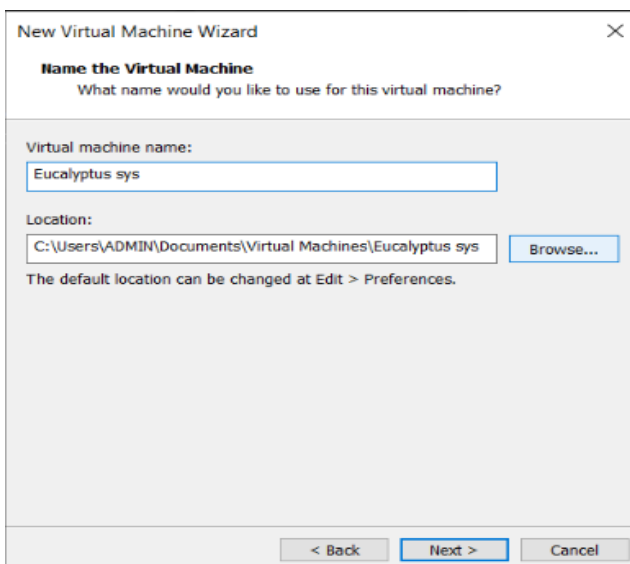




**Step2:** Click on Linux and version is CentOS 6 64-bit.



**Step3:** Name for virtual machine as “Eucalyptus”

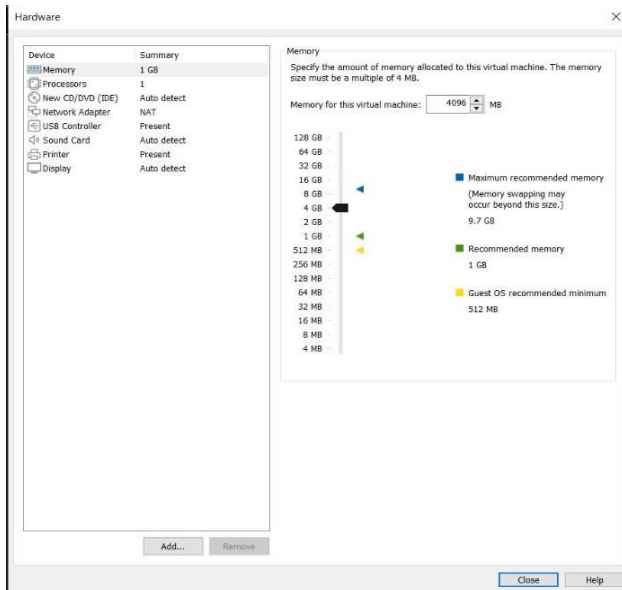


**Step4:** Manual disk :40.0 and select -store virtual disk as single file.





**Step5:** Click on Custom Hardware & Give the memory storage as 4GB and then click on next & also Change the number of cores per processor as 2 and select virtualize intel VT-x/EPT and then in Network Adapters select bridge network connection and close and start the vm.



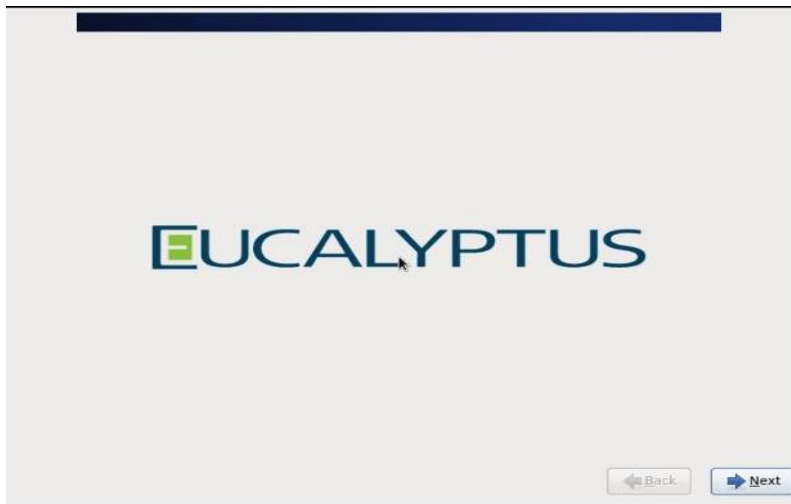
**Step6:** Select Install CentOS 6 with Eucalyptus Cloud-in-a-box and press enter.

**Step7:** Skip and then OK

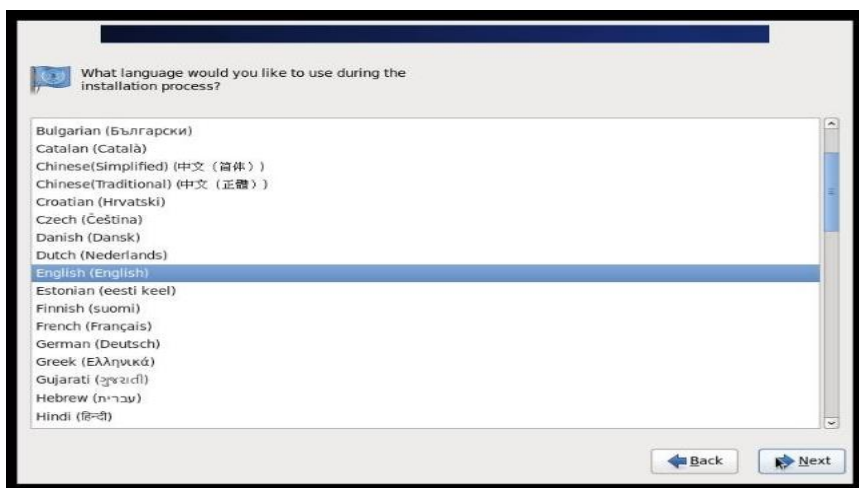




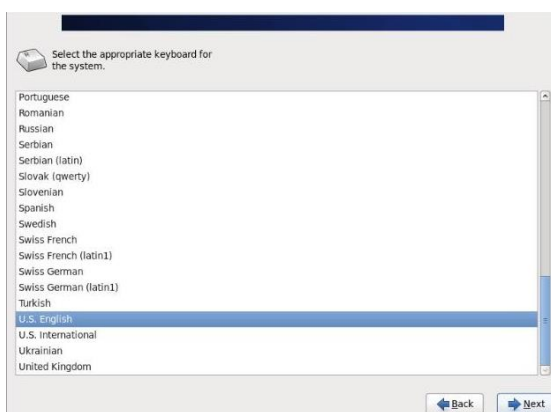
**Step8:** When the installation screen pops up **Click on Next**



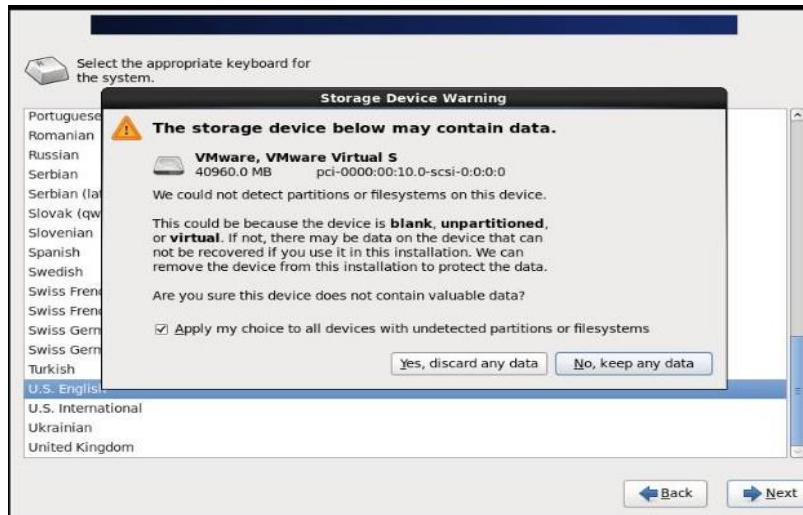
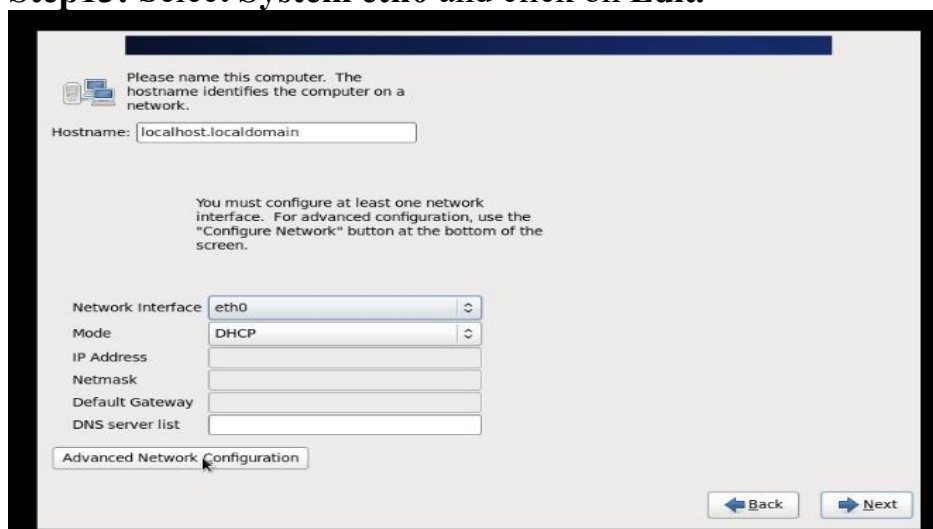
**Step9:** Select **English** Press Enter



**step10:** Select **U.S English** & Press Enter

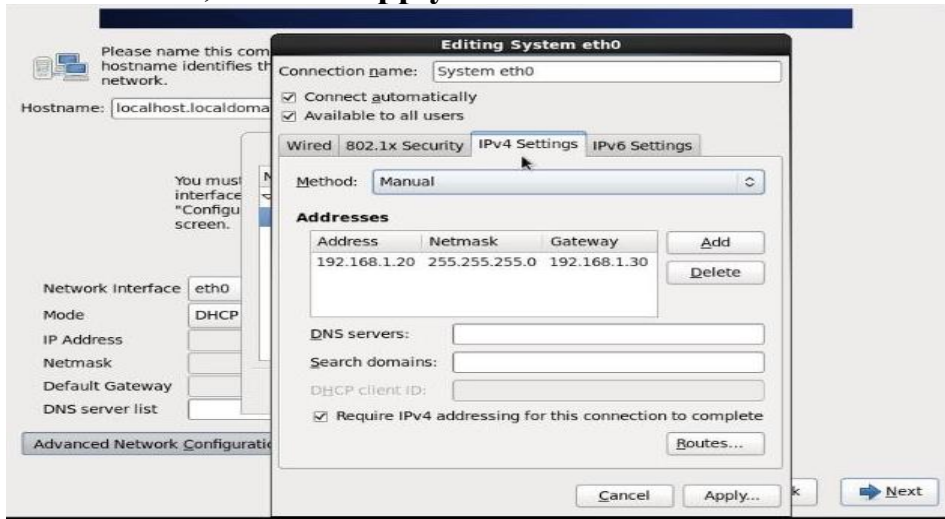




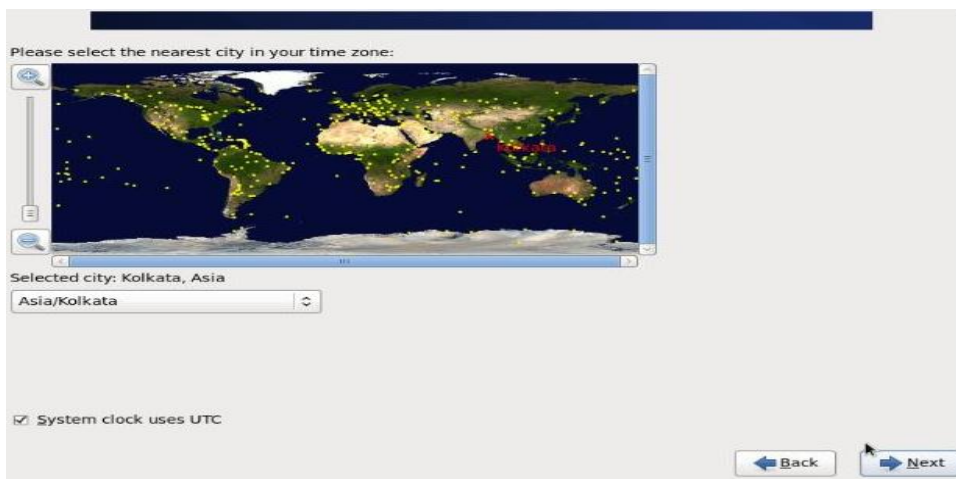
**Step11: Click on Yes, Discard any Data.****Step12: Click on Advance Network Configuration****Step13: Select System eth0 and click on Edit.**



**Step14:** Click on Add Address as 192.168.1.20, Netmasks 255.255.255.0, Gateway as 192.168.1.30, click on Apply and click on Next.

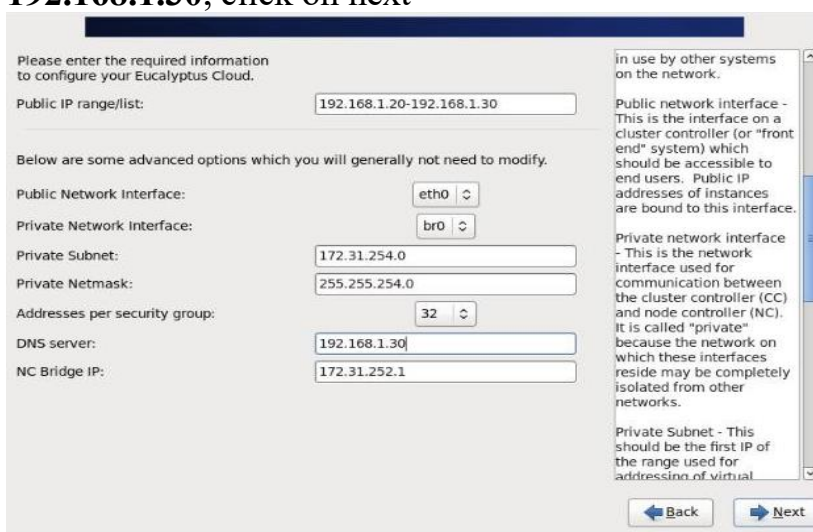


**Step15:** Select Asia, Kolkata and then next.



**Step16:** Create password and next.

**Step17:** Place *public IP range* 192.168.1.20-192.168.1.30 and *DNS server* as 192.168.1.30, click on next





**Step18: Select Create Custom layout, click on Next.**

Which type of installation would you like?

☐ **Use All Space**  
Removes all partitions on the selected device(s). This includes partitions created by other operating systems.  
**Tip:** This option will remove data from the selected device(s). Make sure you have backups.

☐ **Replace Existing Linux System(s)**  
Removes only Linux partitions (created from a previous Linux installation). This does not remove other partitions you may have on your storage device(s) (such as VFAT or FAT32).  
**Tip:** This option will remove data from the selected device(s). Make sure you have backups.

☐ **Shrink Current System**  
Shrinks existing partitions to create free space for the default layout.

☐ **Use Free Space**  
Retains your current data and partitions and uses only the unpartitioned space on the selected device(s), assuming you have enough free space available.

☒ **Create Custom Layout**  
Manually create your own custom layout on the selected device(s) using our partitioning tool.

☐ Encrypt system  
☒ Review and modify partitioning layout

**Step19: Select Standard partition and click on Create.**

Drive /dev/sda (40960 MB) (Model: VMware, VMware Virtual S)

Free 40955 MB

Device	Size (MB)	Mount	RAID
Hard Drives			
sda (/dev/sda)			
Free	40954		

**Create Storage**

☒ **Create Partition**  
General purpose partition creation

☐ **Create Software RAID** Information  
RAID Partition  
Create a RAID formatted partition  
RAID Device  
Requires at least 2 free RAID formatted partitions

☐ **Create LVM** Information  
LVM Volume Group  
Requires at least 1 free LVM formatted partition  
LVM Logical Volume  
Create a logical volume on selected volume group  
LVM Physical Volume  
Create an LVM formatted partition

**Step20: Give mount point as /boot, size as 100MB and click on OK.**

Drive /dev/sda (40960 MB) (Model: VMware, VMware Virtual S)

**Add Partition**

Mount Point: /boot

File System Type: ext4

Drive	Size	Model
<input checked="" type="checkbox"/> sda	40960 MB	VMware, VMware Virtual S

Allowable Drives:

Size (MB): 100

Additional Size Options:

☒ Fixed size

☐ Fill all space up to (MB): 100

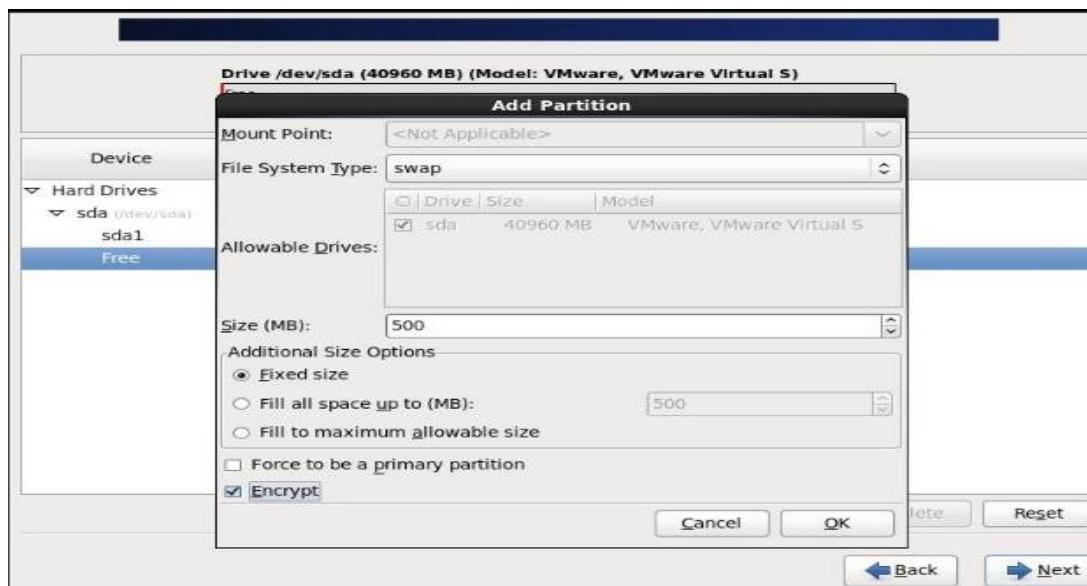
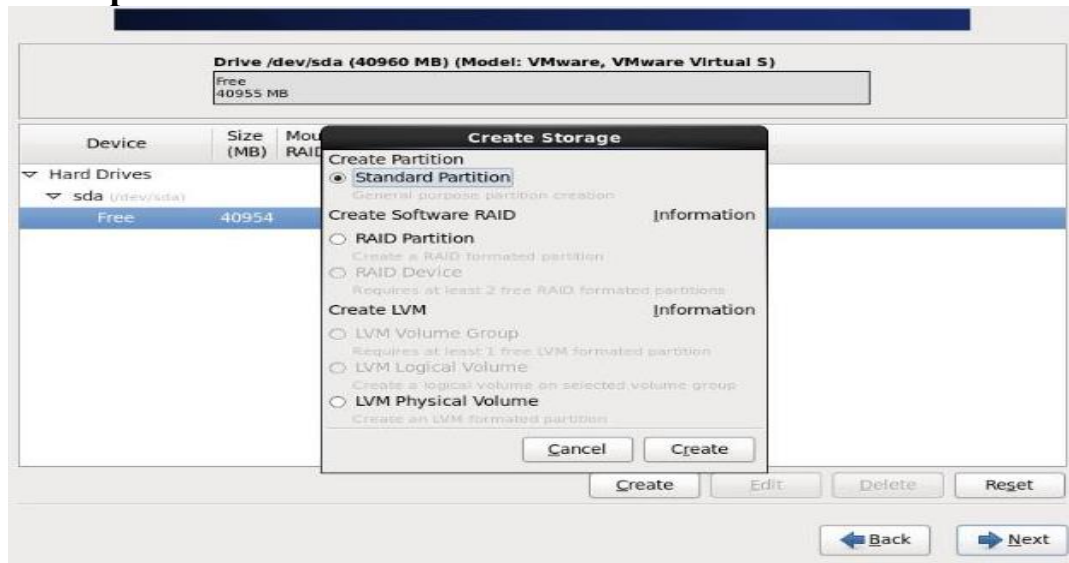
☐ Fill to maximum allowable size

☐ Force to be a primary partition

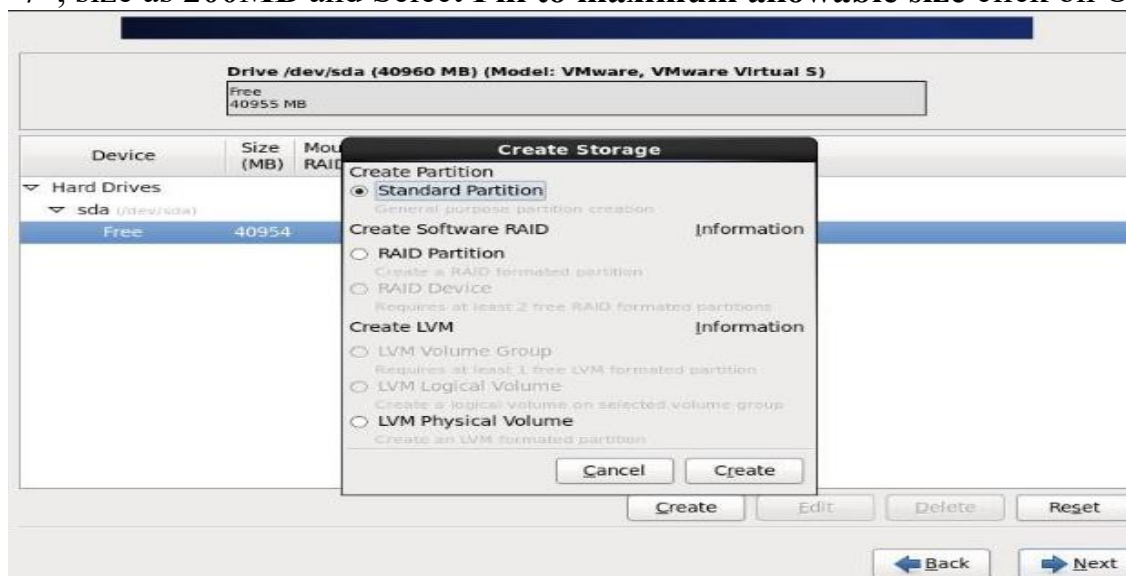
☐ Encrypt



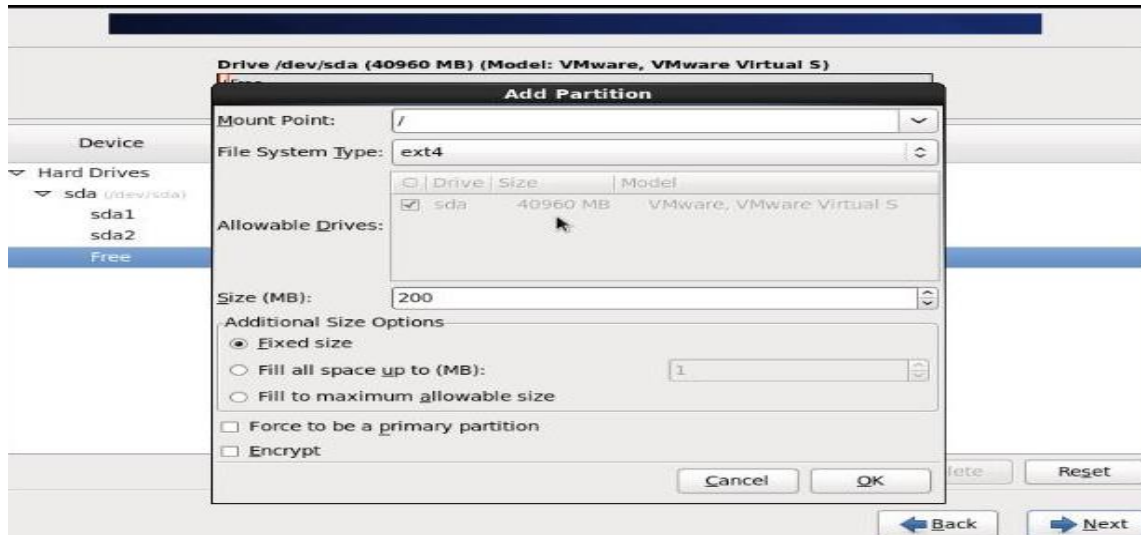
**Step21:** Again, Select **Standard partition** and click on Create & Select File System Type as **swap** size as **200MB** and click on OK.



**Step22:** Again, Select **Standard partition** and click on Create & Give mount point as **"/"**, size as **200MB** and Select **Fill to maximum allowable size** click on OK.







**Step23:** Click on Next

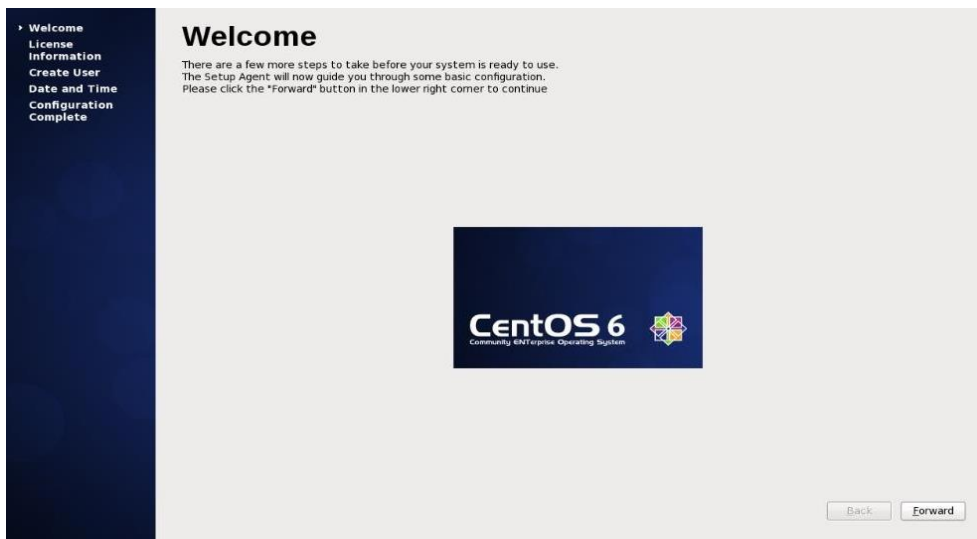
**Step24:** Click on **Format** & click on **Write changes to disk**.



**Step25:** Click Next and Finish





**Step26: Click on Reboot****Step27: Click on Forward**


The screenshot shows the CentOS 6 installation 'Welcome' screen. On the left is a dark blue sidebar with a list of steps: 'Welcome' (selected), 'License Information', 'Create User', 'Date and Time', and 'Configuration Complete'. The main area has the title 'Welcome' and a paragraph: 'There are a few more steps to take before your system is ready to use. The Setup Agent will now guide you through some basic configuration. Please click the "Forward" button in the lower right corner to continue.' In the center is the CentOS 6 logo with the text 'CentOS 6' and 'Community Enterprise Operating System'. At the bottom right are 'Back' and 'Forward' buttons.

**Step28: Click on “Yes, I agree the license Agreement” and Forward**


The screenshot shows the 'License Information' screen. The sidebar on the left has 'License Information' selected. The main area is titled 'License Information' and contains the 'CentOS-6 EULA' text. At the bottom, there are two radio buttons: 'Yes, I agree to the License Agreement' (which is selected) and 'No, I do not agree'. 'Back' and 'Forward' buttons are at the bottom right.

**Step29: Fill up username, Full name, password & confirm Password of your choice.**


The screenshot shows the 'Create User' screen. The sidebar on the left has 'Create User' selected. The main area is titled 'Create User' and contains instructions: 'You must create a "username" for regular (non-administrative) use of your system. To create a system "username", please provide the information requested below.' There are four input fields: 'Username:' (containing 'yogesh'), 'Full Name:' (containing 'yogesh'), 'Password:' (masked with dots), and 'Confirm Password:' (masked with dots). Below these are two buttons: 'Use Network Login...' and 'Advanced...'. At the bottom right are 'Back' and 'Forward' buttons.



### Step30: Click Forward & Finish

**Welcome**  
License  
Information  
Create User  
Date and Time  
Configuration  
Complete

## Date and Time

Please set the date and time for the system.

Date and Time  
Current date and time: Mon 14 Oct 2024 04:13:10 AM IST  
☒ Synchronize date and time over the network

Synchronize date and time on your computer with a remote time server using the Network Time Protocol:

**NTP Servers**

0.centos.pool.ntp.org	Add Edit Delete
1.centos.pool.ntp.org	
2.centos.pool.ntp.org	

Advanced Options

Back Forward

### Step31: Click on Name & Enter the password and login.

**Welcome**  
License  
Information  
Create User  
Date and Time  
Configuration  
Complete

## Configuration Complete

Your eucalyptus installation is now complete. You may now login to the local desktop environment on this system, or you can use a web browser to connect from a remote system. Please make note of the following login credentials:

User Console URL (for managing instances, volumes, etc.):  
https://192.168.1.20:8888/

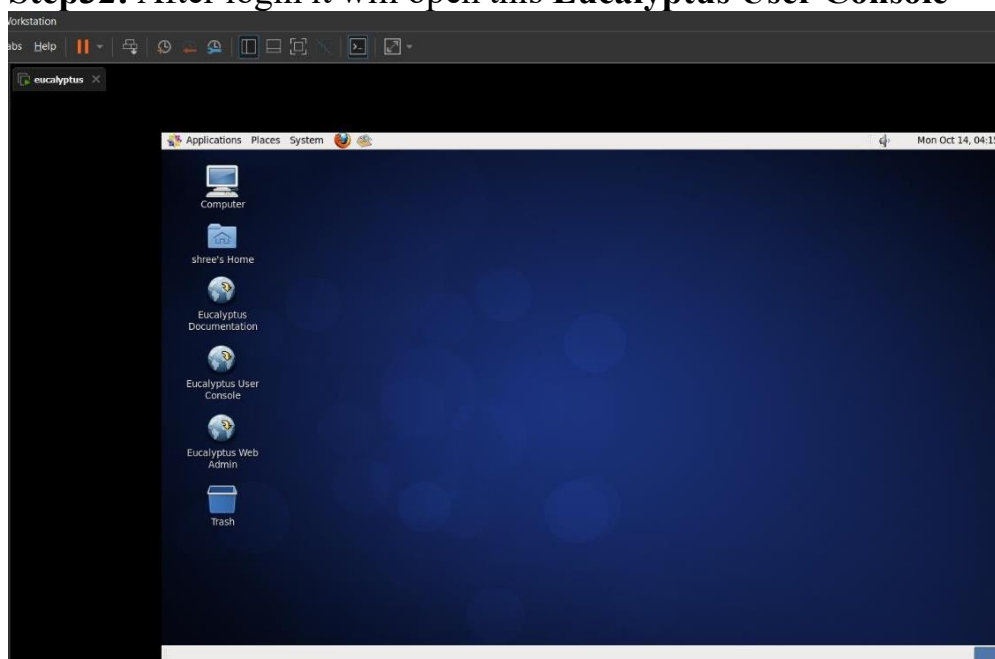
User Credentials:  
\* Account: demo  
\* Username: admin  
\* Password: password

Admin Console URL (for managing user accounts, VM types, etc.):  
https://192.168.1.20:8443

Admin Credentials:  
\* Account: eucalyptus  
\* Username: admin  
\* Password: admin

Back Finish

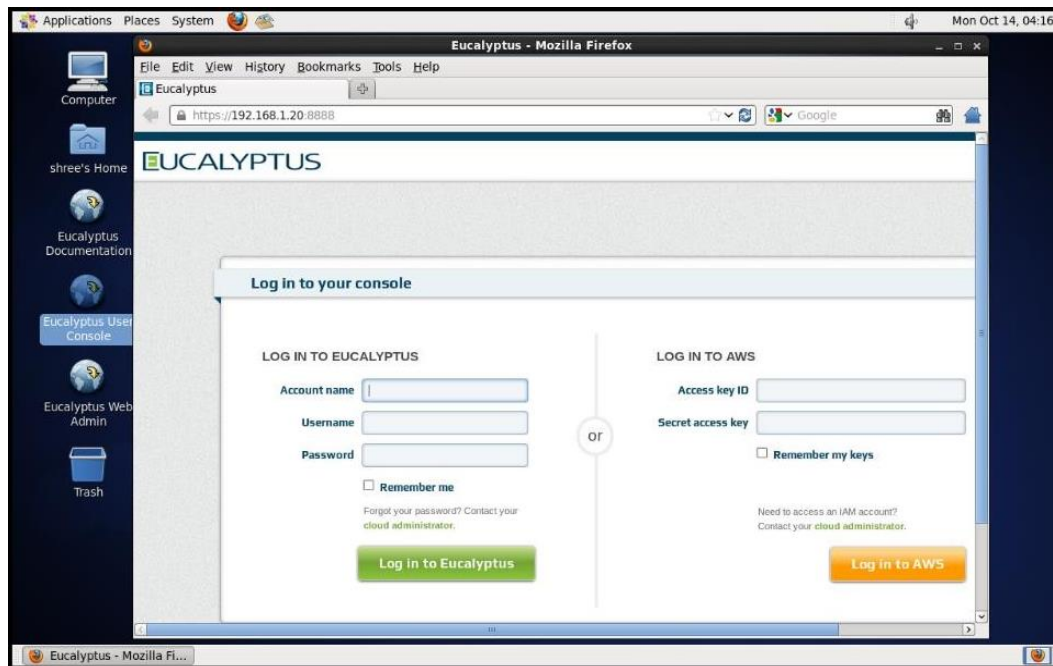
### Step32: After login it will open this Eucalyptus User Console



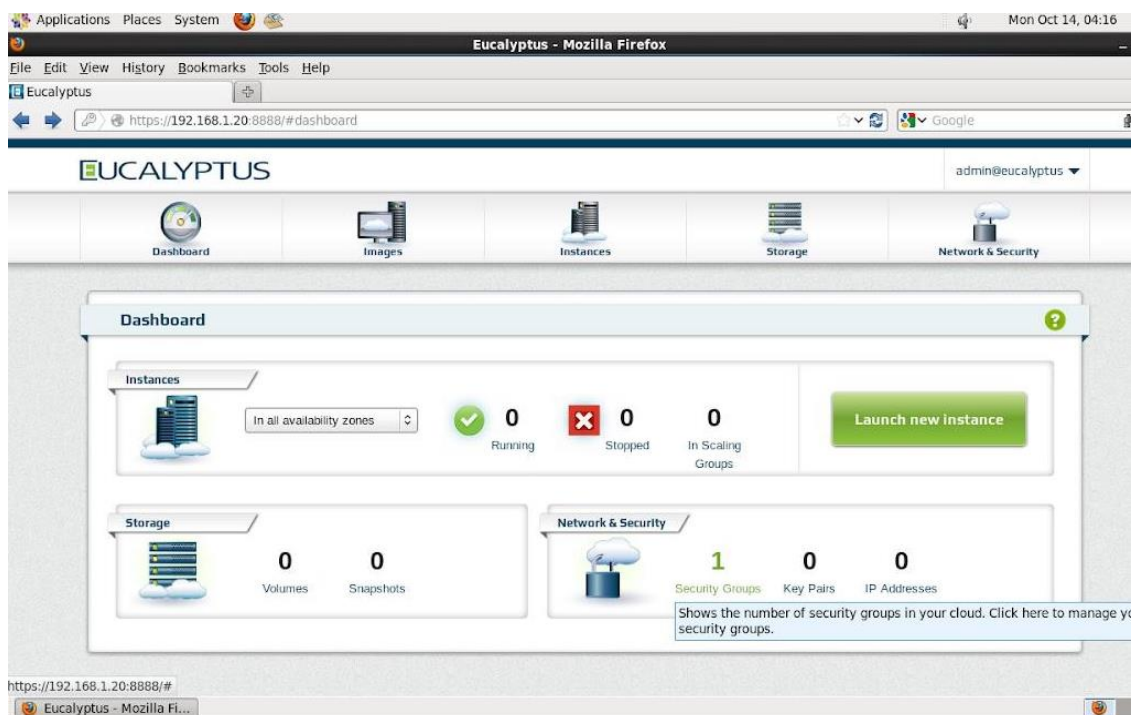


**Step33:** Now First Click on **Understand the risk** and then add exception

**Step34:** Login to Eucalyptus

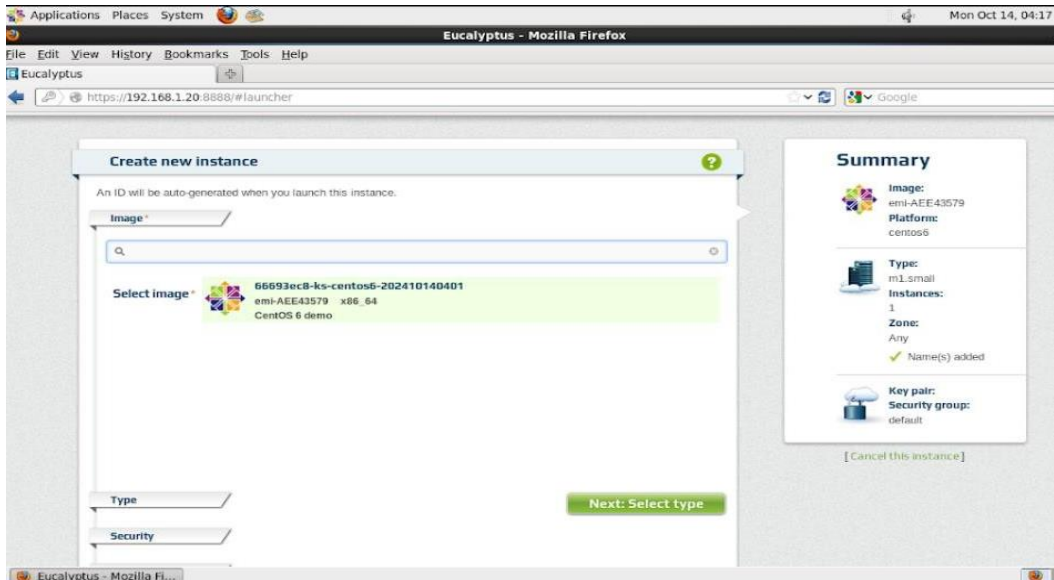


**Step35:** Create instance by Clicking on “Launch new Instance”

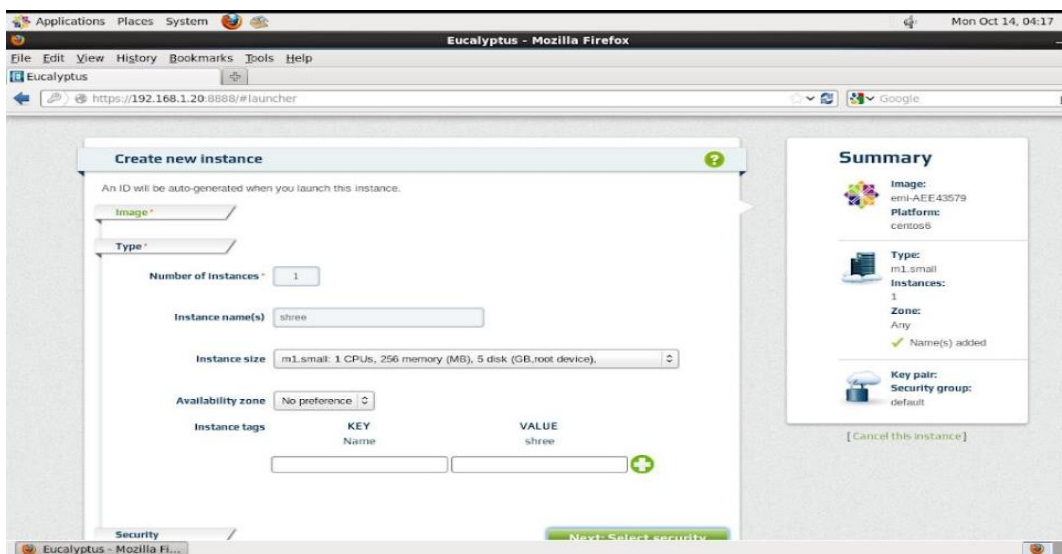




**Step36:** Click on **Next: Select Type** and give the **instance name** as **Eucalyptus** and **key name** is **yogesh**.

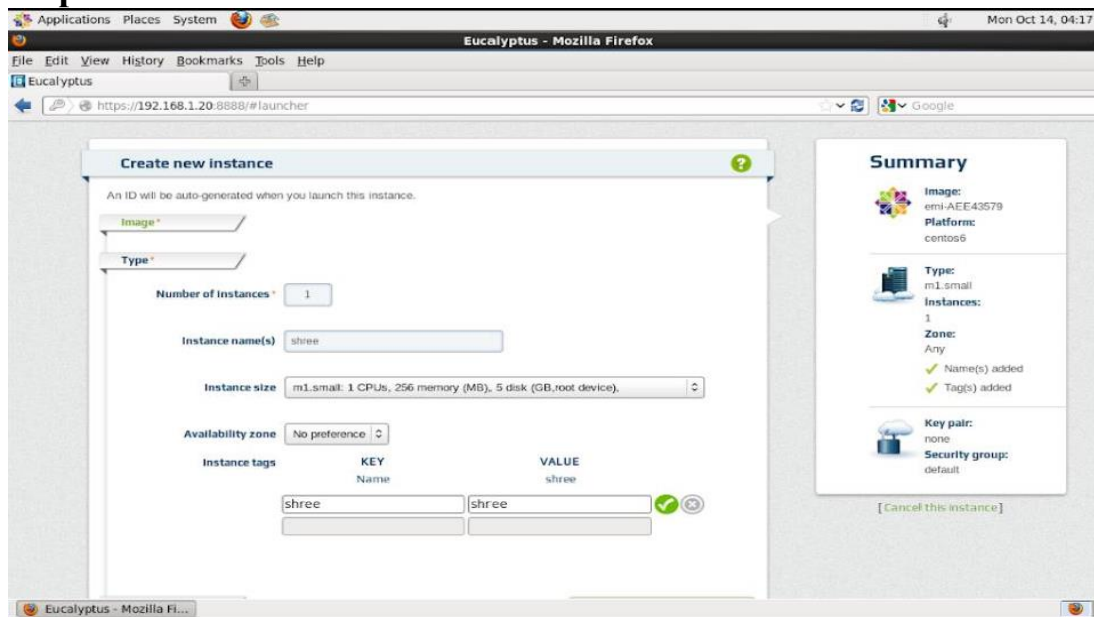


**Step37:** In security, **Select key name: none** and leave others by default.

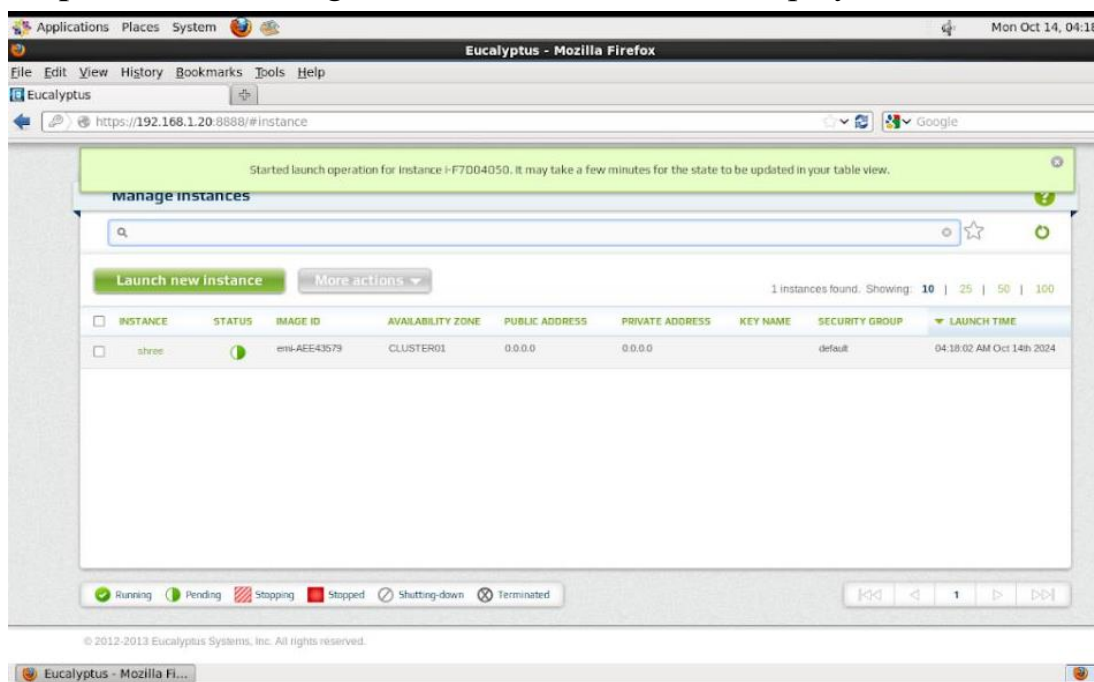




## Step38: Click on Launch Instance



## Step39: After clicking on launch instance, it will display this window.





## PRACTICAL 5

**Aim: Manage XenServer with XenCenter**

**Requirements: - 1.VM Ware**

**2. Xen Center**

**3.Xen Server 8**

**Steps:**

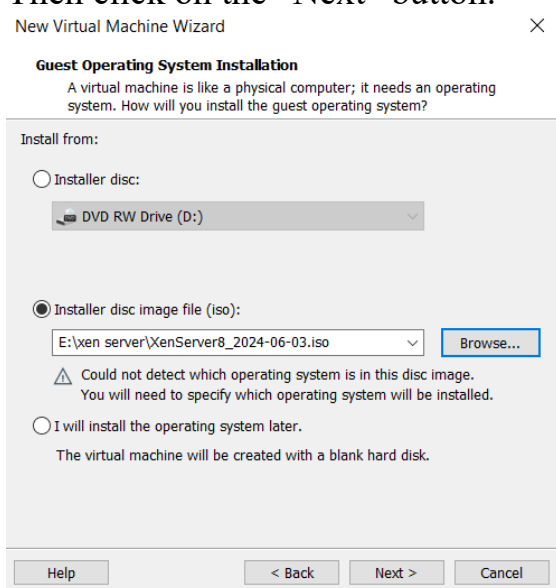
Step1: - Create a new Virtual Machine in VMware Workstation

File → New Virtual Machine

Step2: Select Typical (recommended) and click on “Next” button.



Step3: Select the iso file click on the Browse & select “XenServer-8.2.0- install-cd” file. Then click on the “Next” button.





Step4: Select Guest OS as “VMware ESXi” and Version as “VMware ESXi 5”. Give a name to the Virtual Machine as “Xen Server”.

New Virtual Machine Wizard

**Select a Guest Operating System**  
Which operating system will be installed on this virtual machine?

Guest operating system

☐ Microsoft Windows

☐ Linux

☒ VMware ESX

☐ Other

Version

VMware ESXi 5.x

Help < Back Next > Cancel

New Virtual Machine Wizard

**Name the Virtual Machine**  
What name would you like to use for this virtual machine?

Virtual machine name:

XEN SERVER

Location:

C:\Users\ADMIN\Documents\Virtual Machines\XEN SERVER Browse...

The default location can be changed at Edit > Preferences.

< Back Next > Cancel

Step5: Select Maximum disk size 100 GB. Store virtual disk as a single file” and click on “Next.” Click on “Customize Hardware”

New Virtual Machine Wizard

**Specify Disk Capacity**  
How large do you want this disk to be?

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (GB): 100

Recommended size for VMware ESXi 5.x: 40 GB

☒ Store virtual disk as a single file

☐ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

Help < Back Next > Cancel

Step6: At the Hardware window select Memory size as 2GB, Close and Click on “Finish”

Hardware

Device	Summary
Memory	4 GB
Processors	2
New CD/DVD (IDE)	Using file E:\xen server\Xen...
Network Adapter	NAT
USB Controller	Present
Display	Auto detect

Add... Remove

**Memory**

Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.

Memory for this virtual machine: 4096 MB

128 GB  
64 GB  
32 GB  
16 GB  
8 GB  
4 GB  
2 GB  
1 GB  
512 MB  
256 MB  
128 MB  
64 MB  
32 MB  
16 MB  
8 MB  
4 MB

Maximum recommended memory  
(Memory swapping may occur beyond this size.)  
9.7 GB

Recommended memory  
4 GB

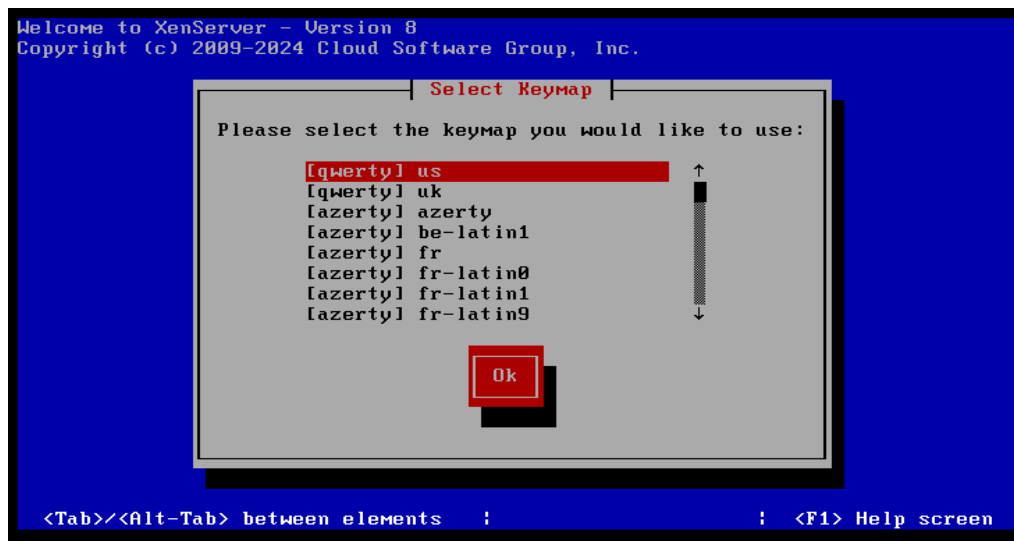
Guest OS recommended minimum  
4 GB

Close Help



Step7: Power ON the Xen Server

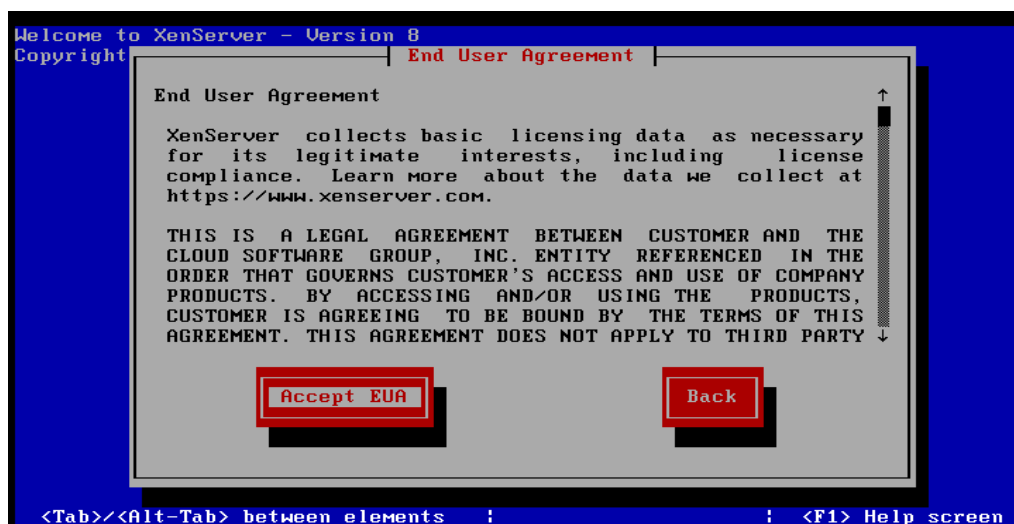
Step8: Select Keymap as [qwerty] us and press Enter.



Step9: In the Welcome to XenServer Setup screen press Enter to choose Ok.

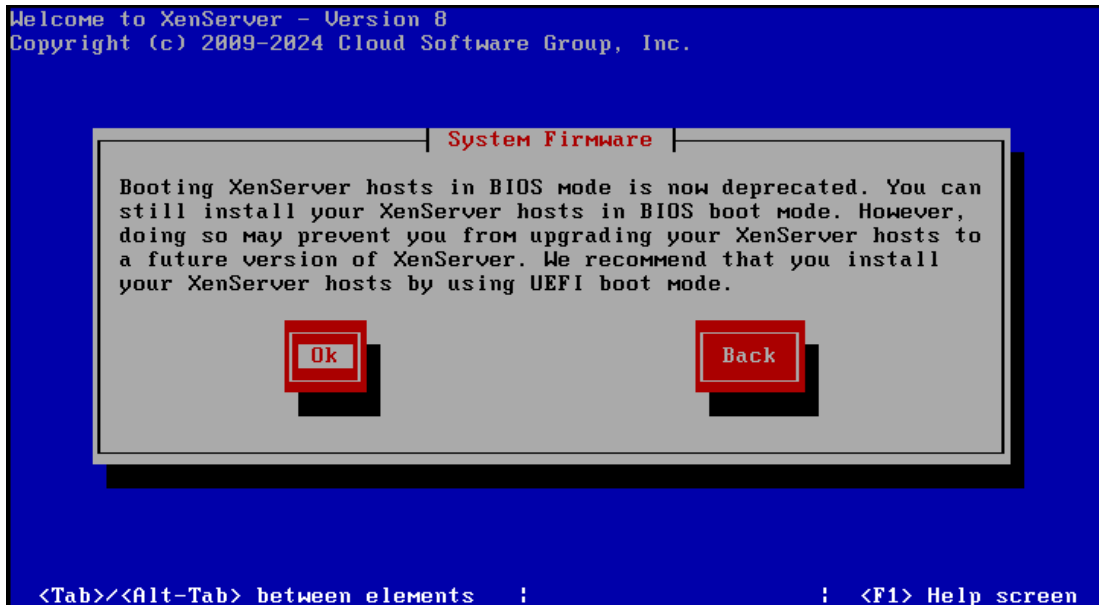


Step10: In End User Agreement Select Accept EUA

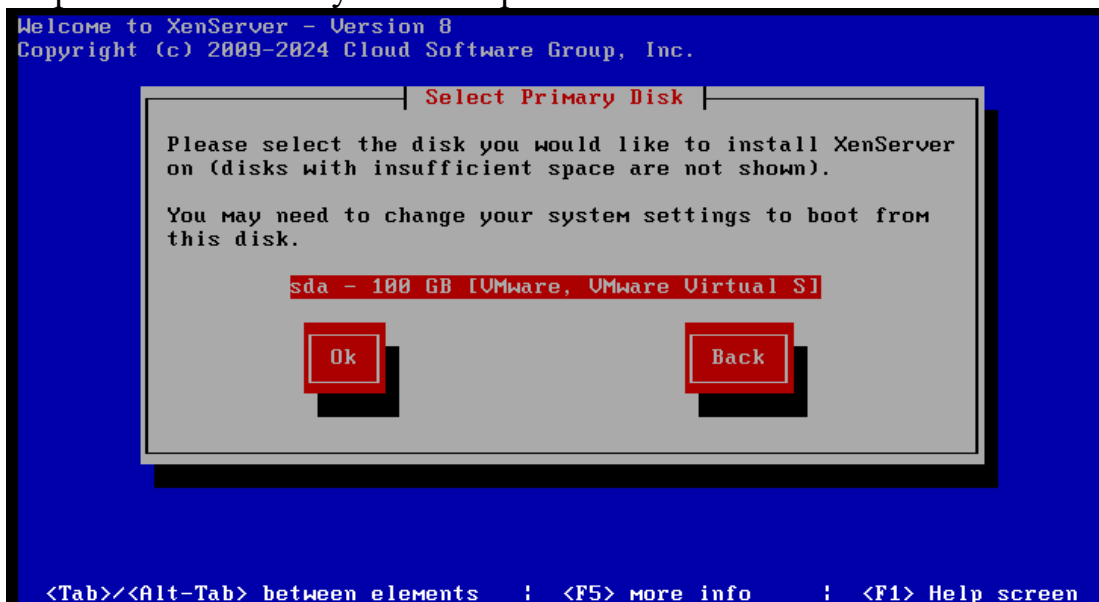




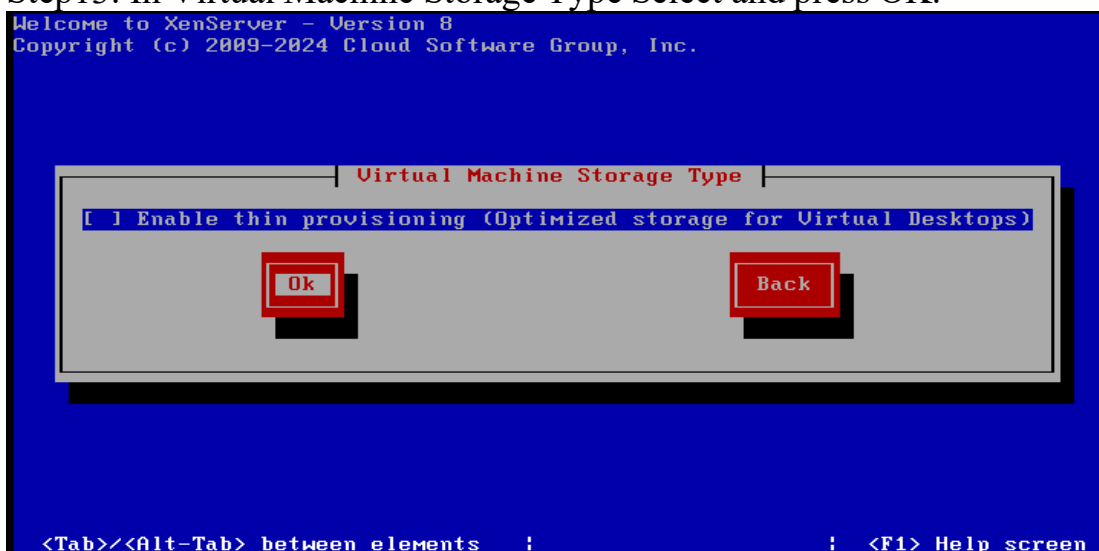
## Step11: In system Firmware Select OK



## Step12: Select Primary Disk and press OK.

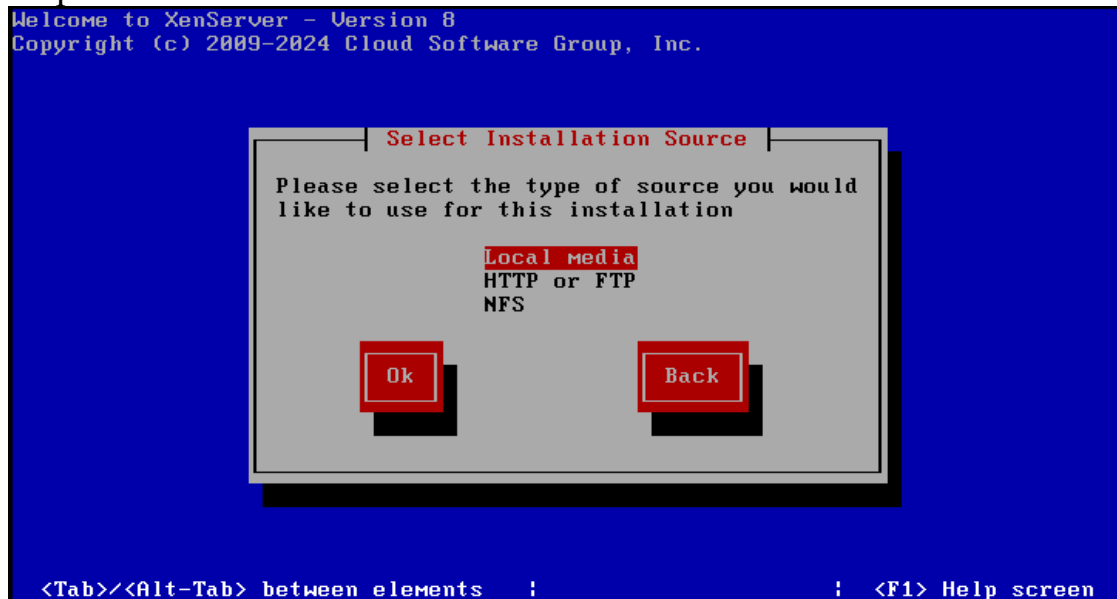


## Step13: In Virtual Machine Storage Type Select and press OK.

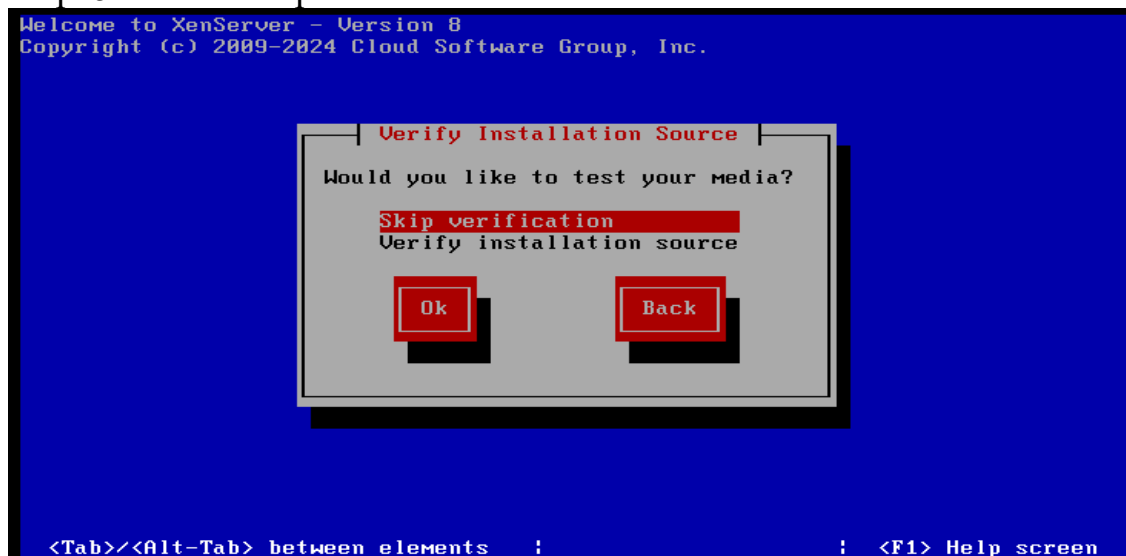




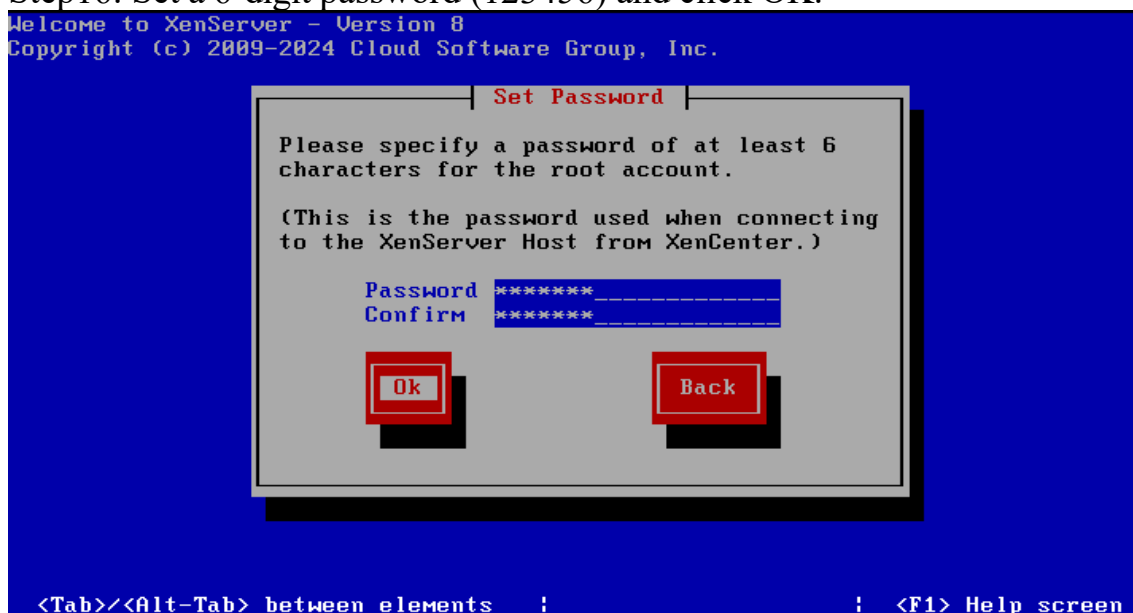
## Step14: Select Installation Source as Local Media



## Step15: Choose skip verification and click on ok.

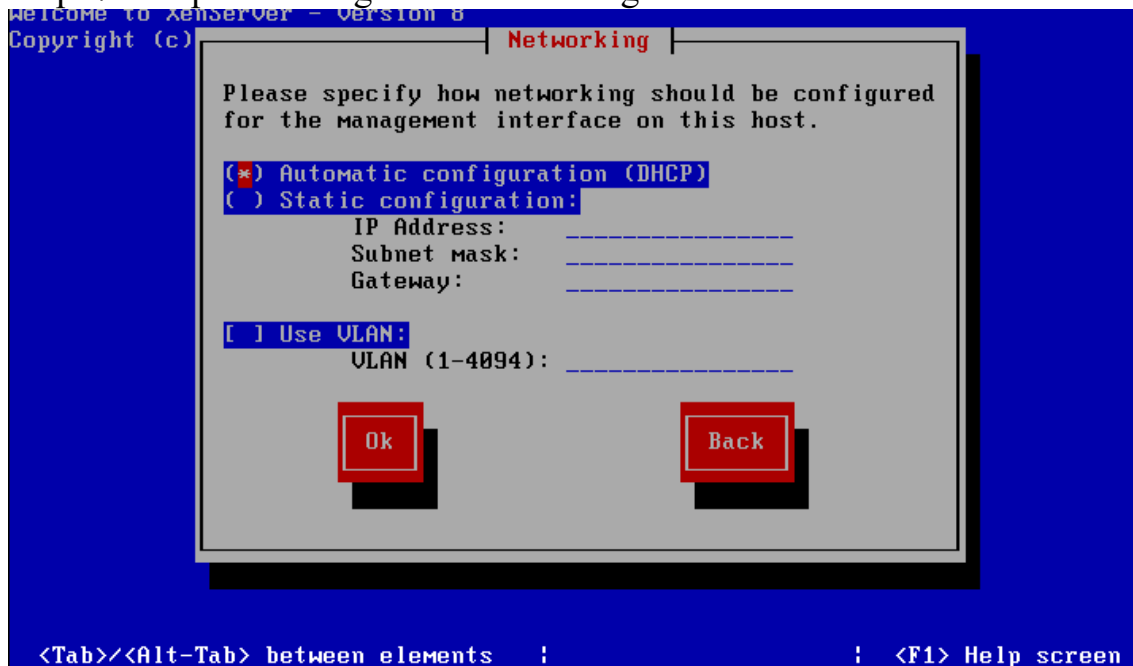


## Step16: Set a 6-digit password (123456) and click OK.





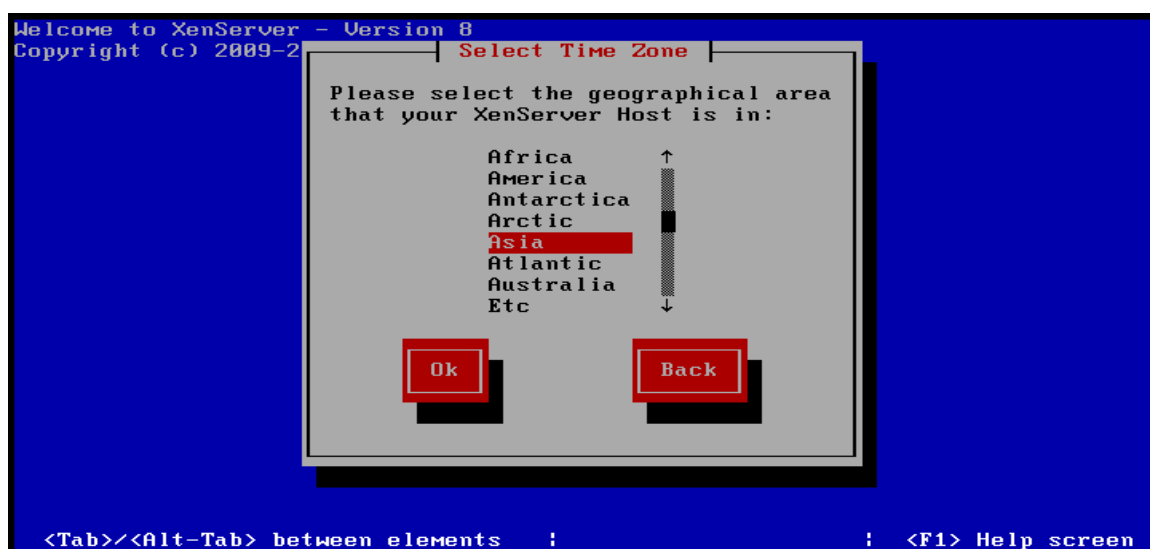
Step17: Keep the setting default and navigate to OK Button



Step18: Keep the setting default and navigate to OK Button

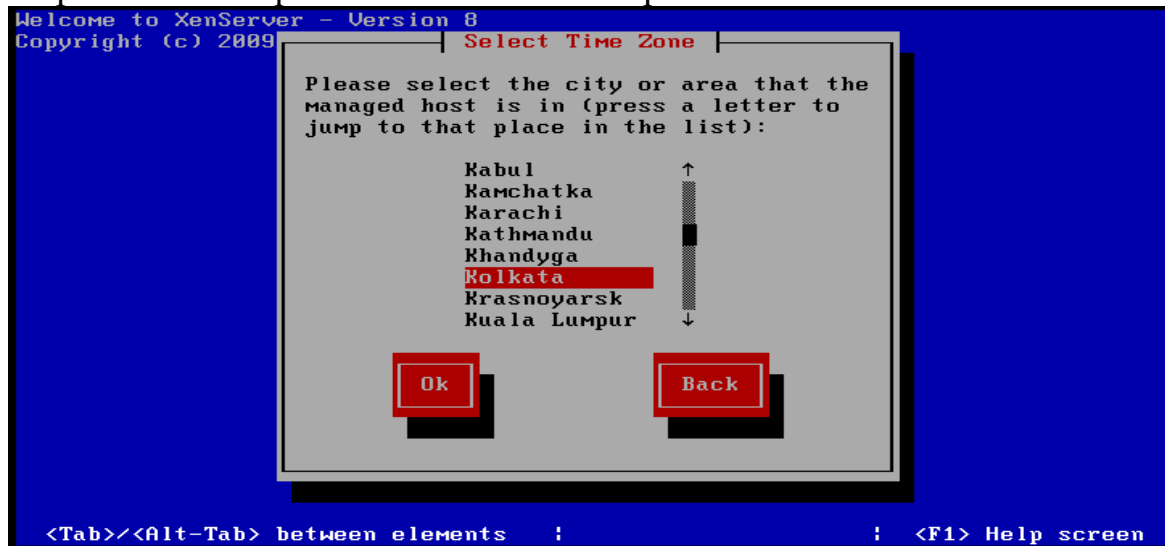


Step19: In the dropdown find Asia and press Enter.

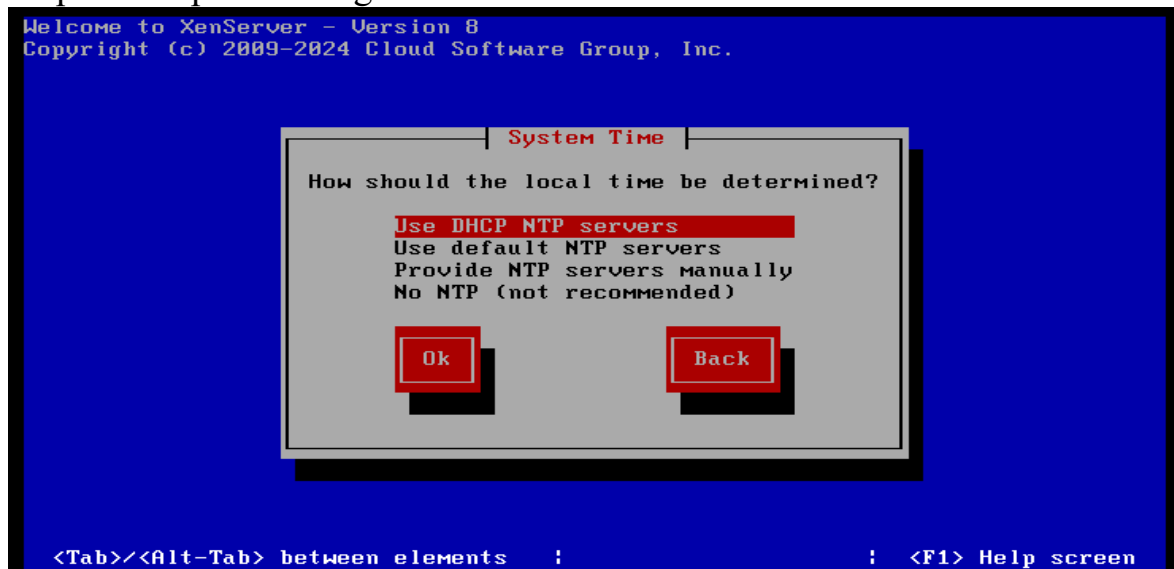




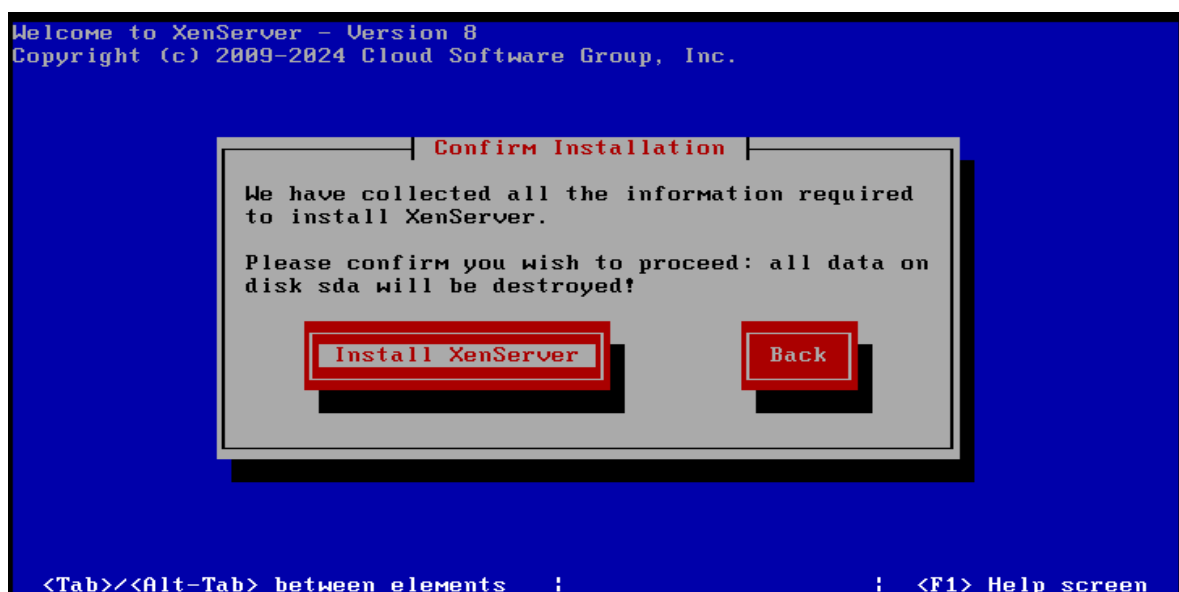
Step20: In the dropdown find Kolkata and press Enter.



Step21: Keep the setting default & click on OK.

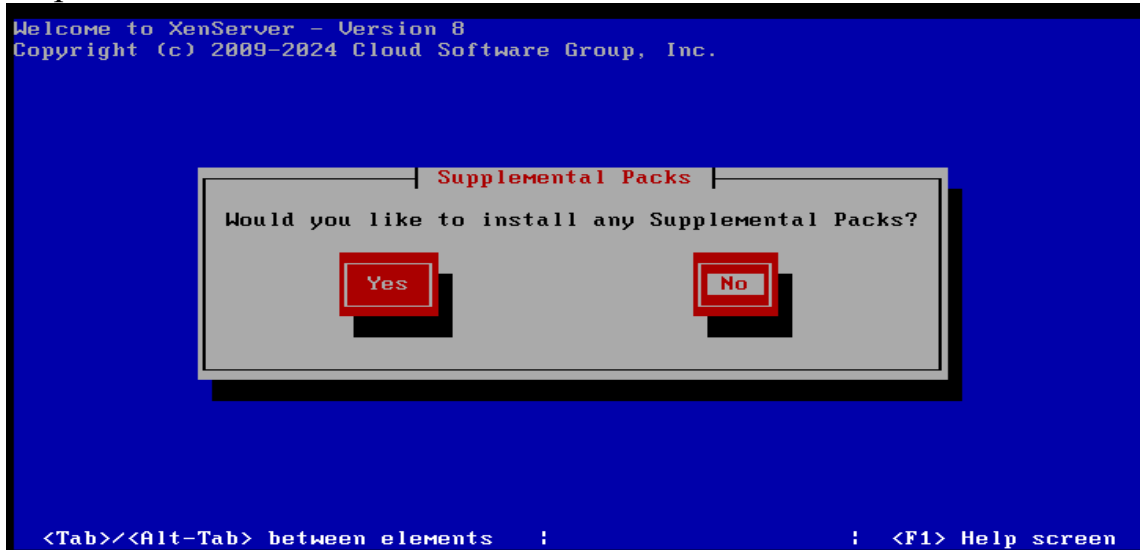


Step22: Click on Install XenServer.

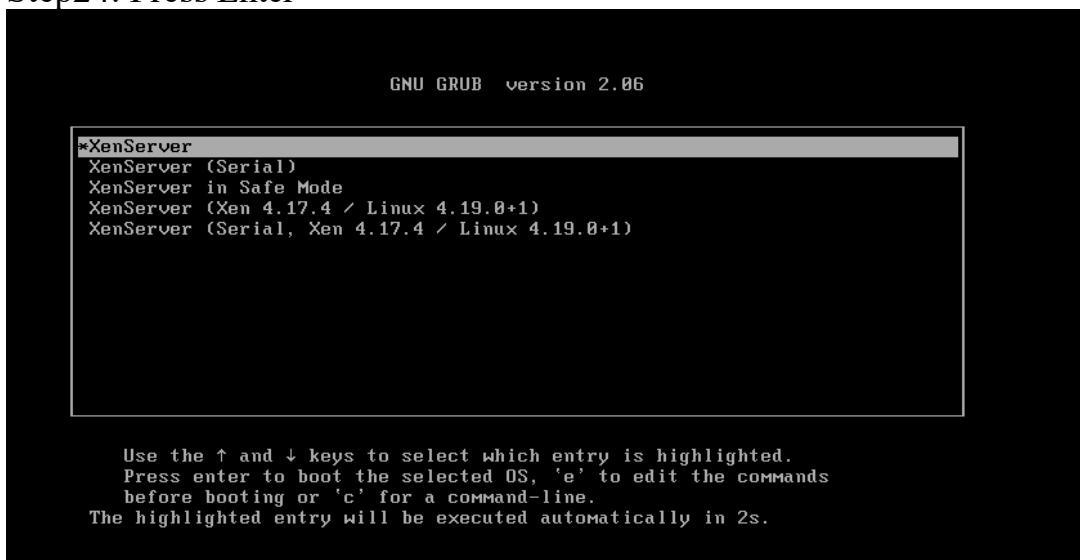




Step23: Select No and the vm will reboot.

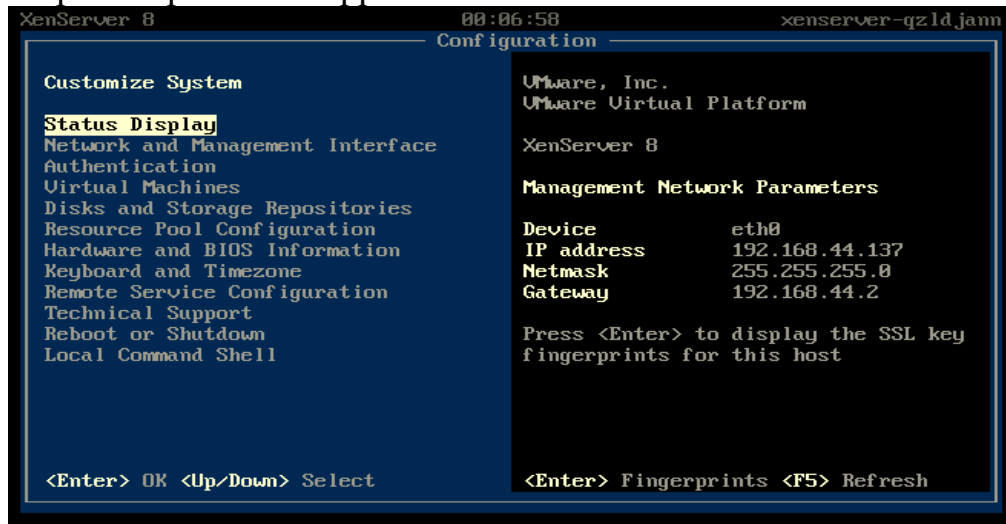


Step24: Press Enter

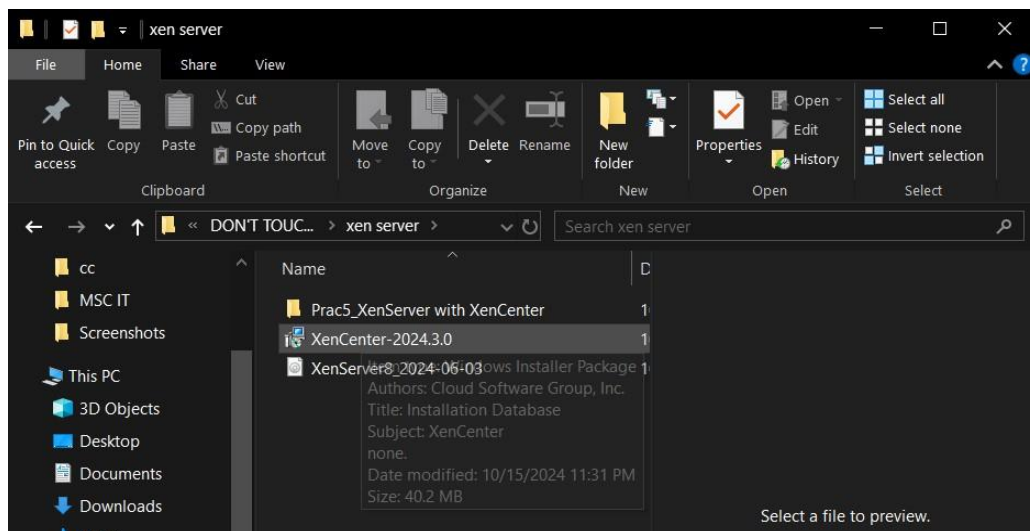




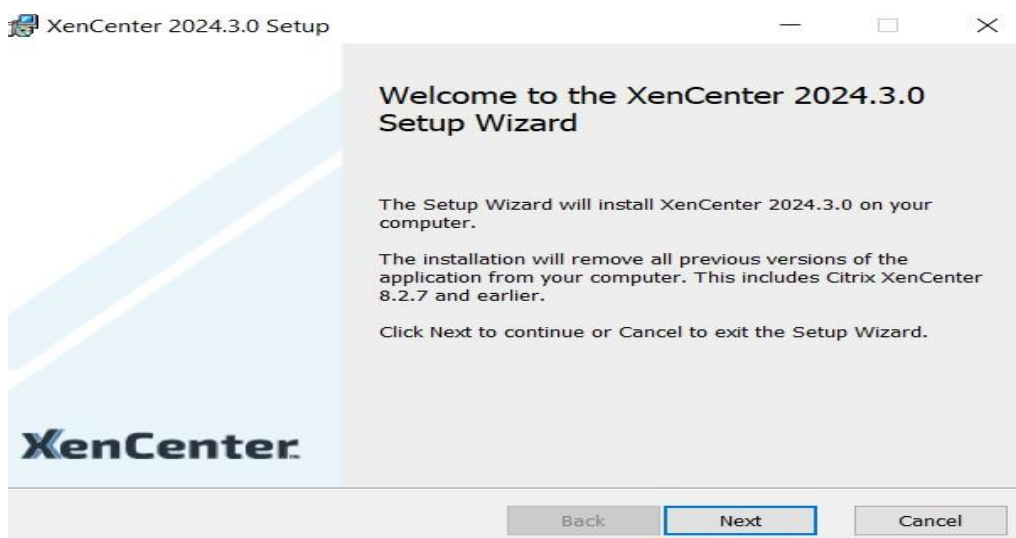
Step25: A panel will appear with wealth of information.



Step26: Now Install the Xen center application.

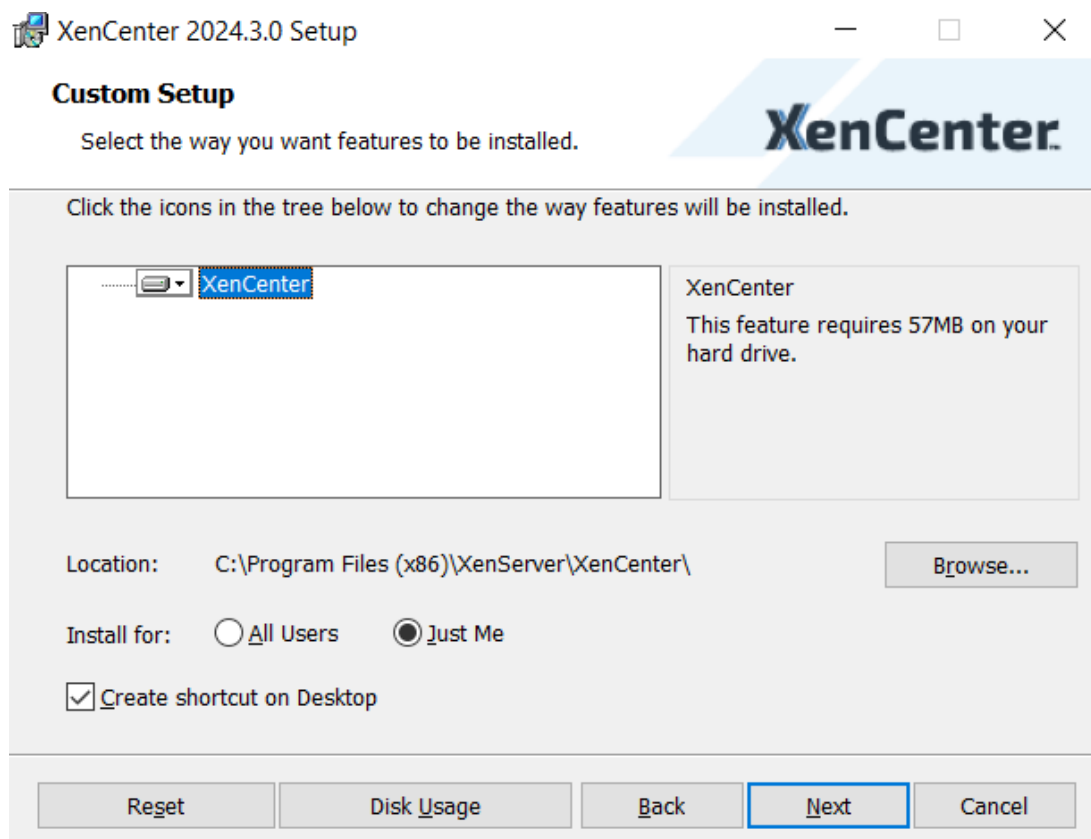
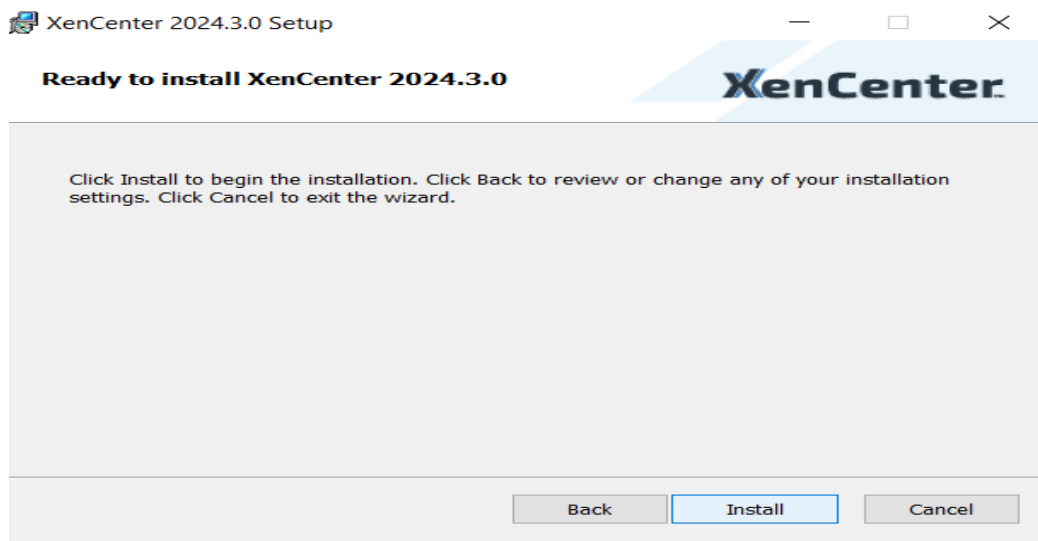


Step27: Click on Next



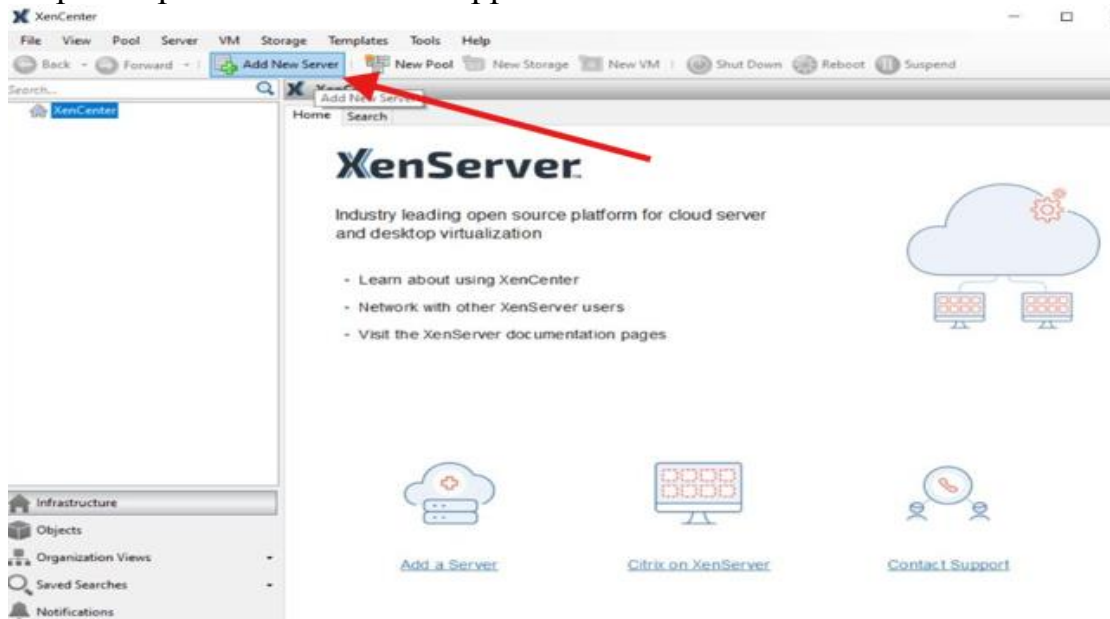


Step28: Click on Install & then Next.

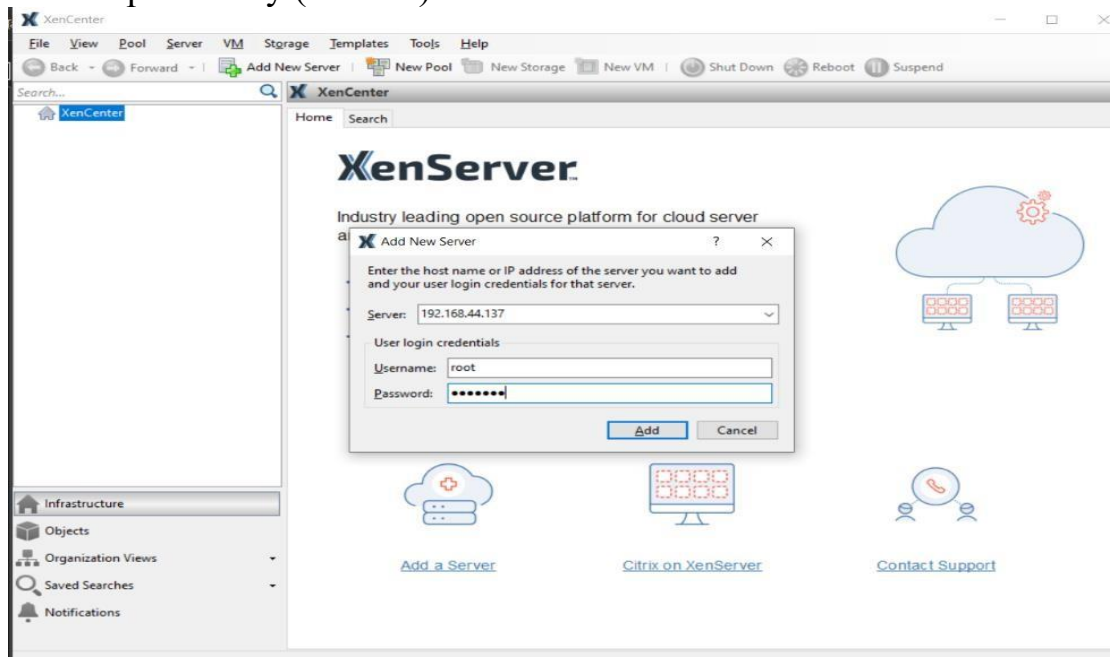




## Step29: Open the Xen Center app and Click on Add New Server

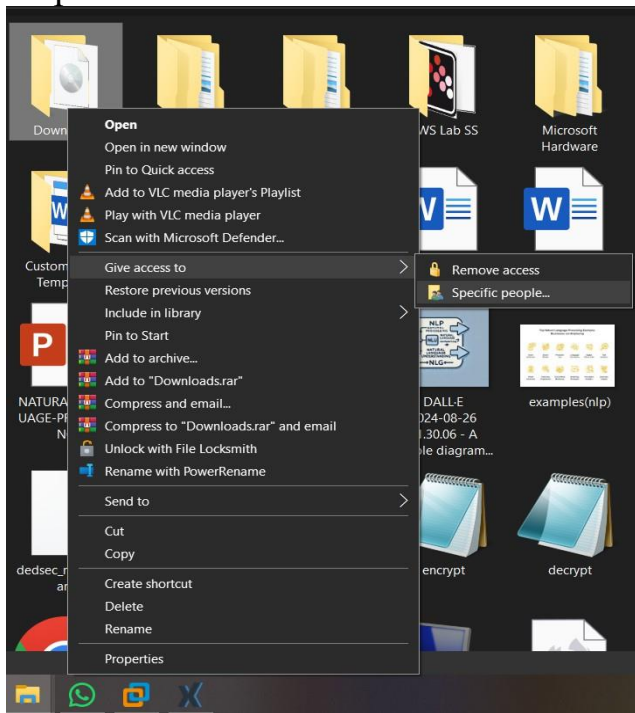


## Step30: Copy the Ip Address from the VMWare panel and put in 6-digit password which was set previously (123456).

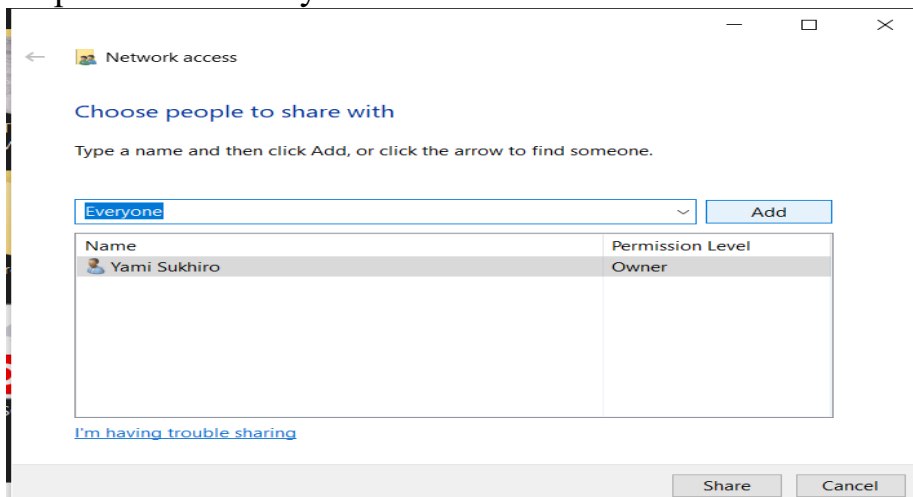




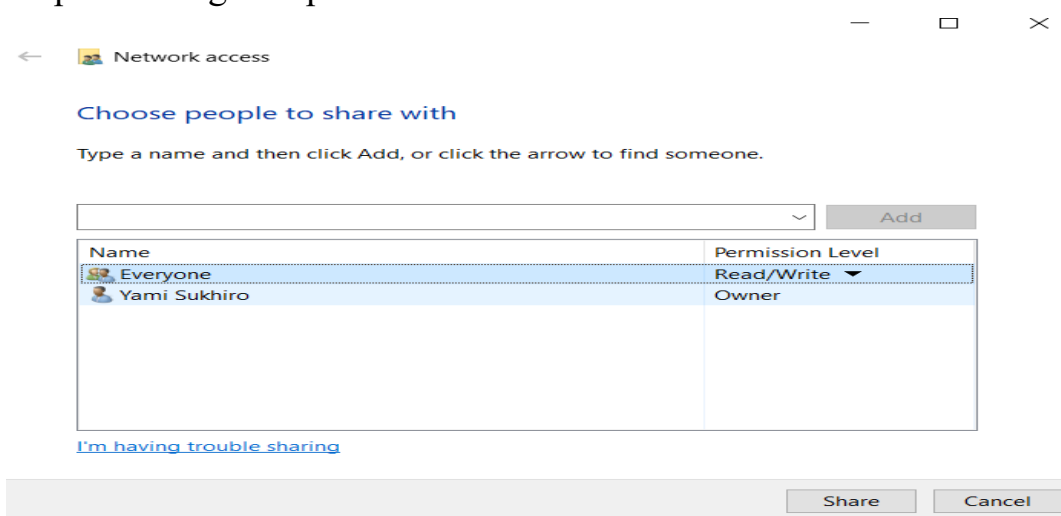
Step31: In the Base Machine Share an Iso file of Windows server 2022 over network.



Step32: Select Everyone and Click on add.

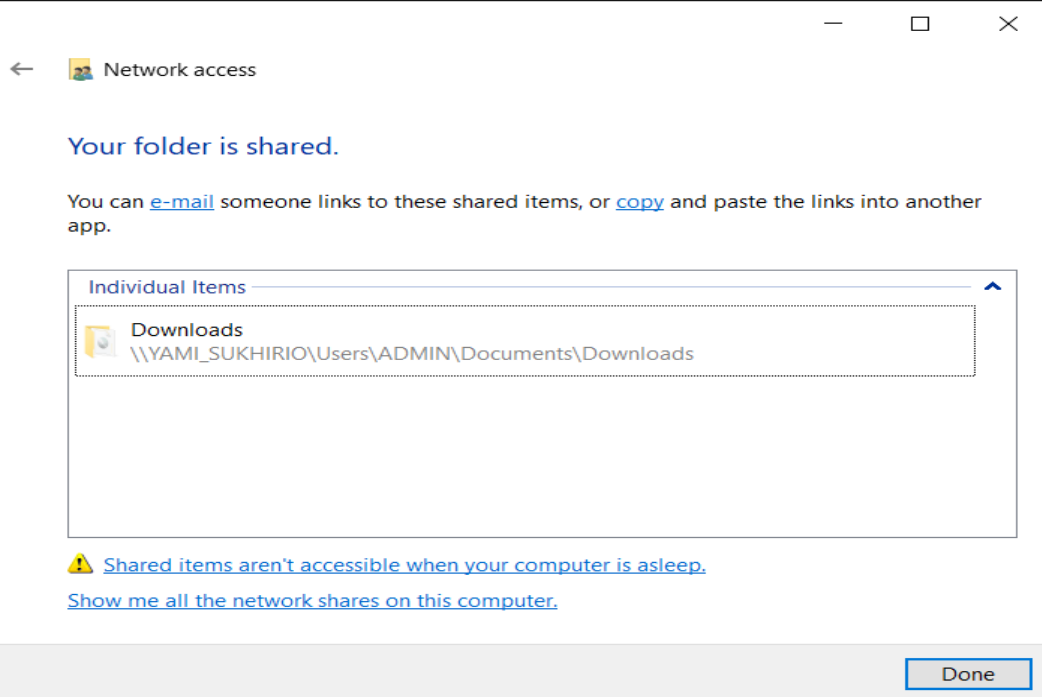


Step33: Change the permission level to Read/Write and click on Share.

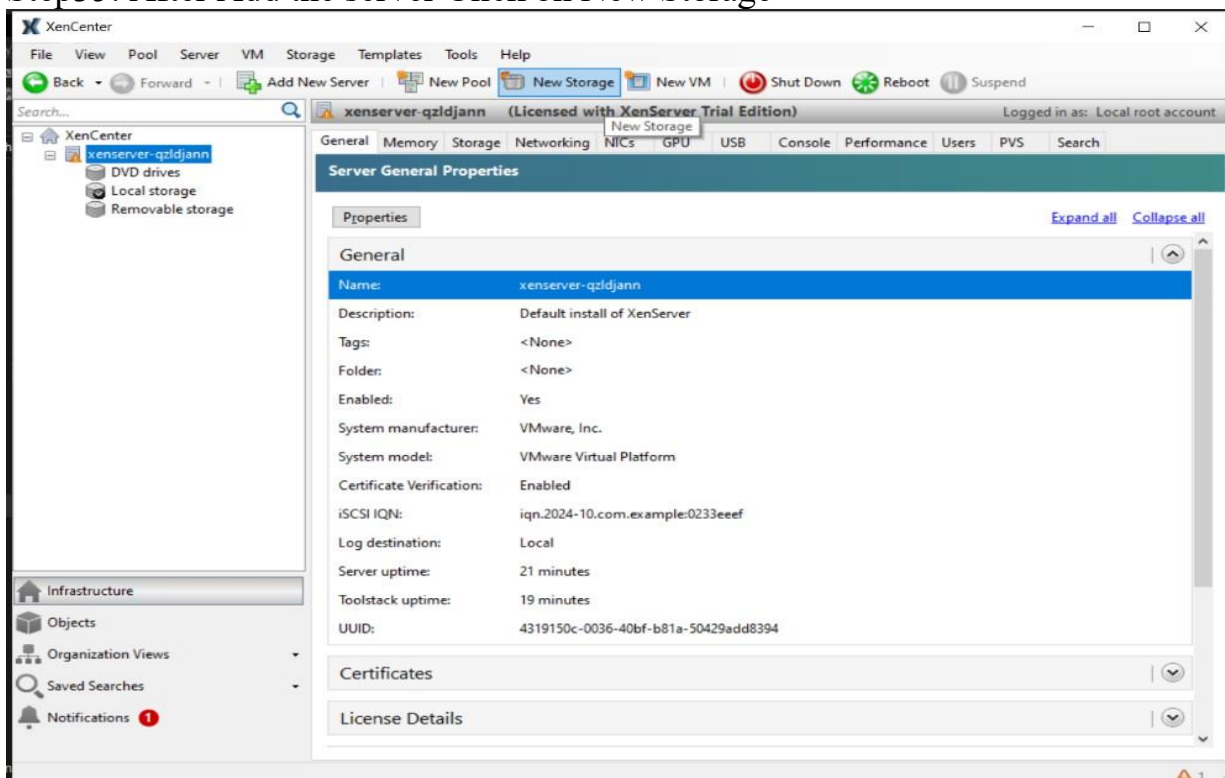




## Step34: Copy the path.

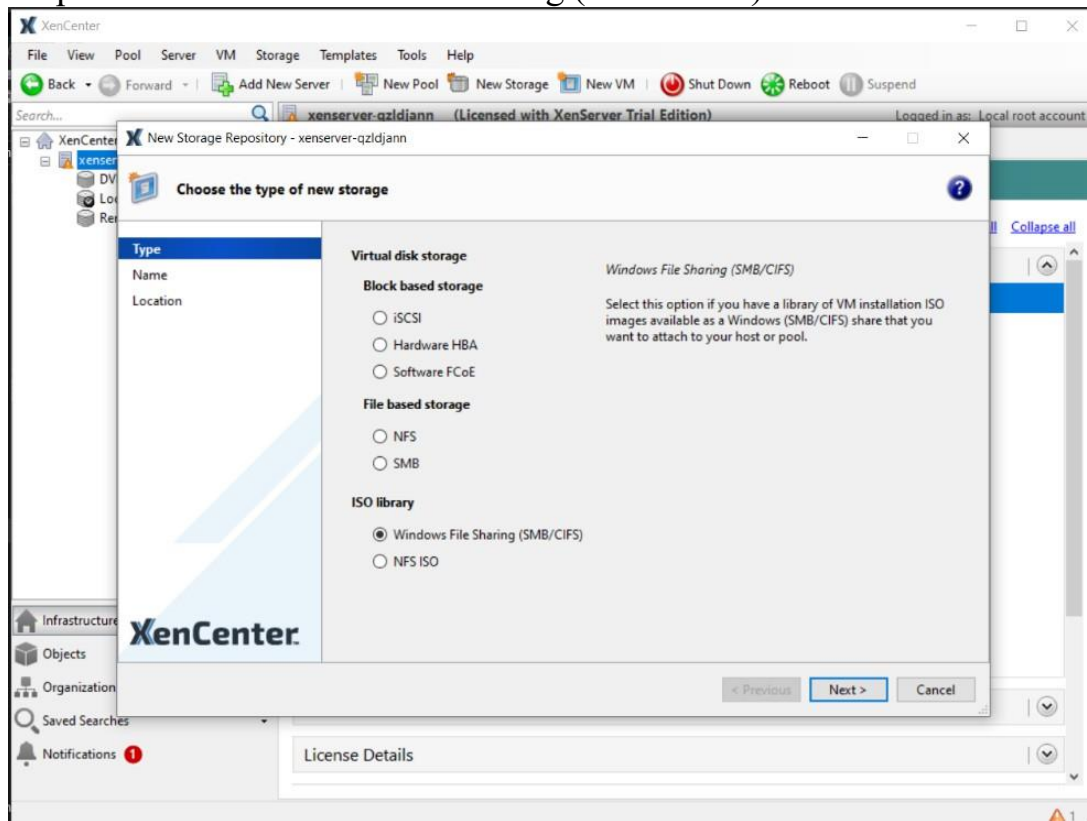


## Step35: After Add the server Click on New Storage

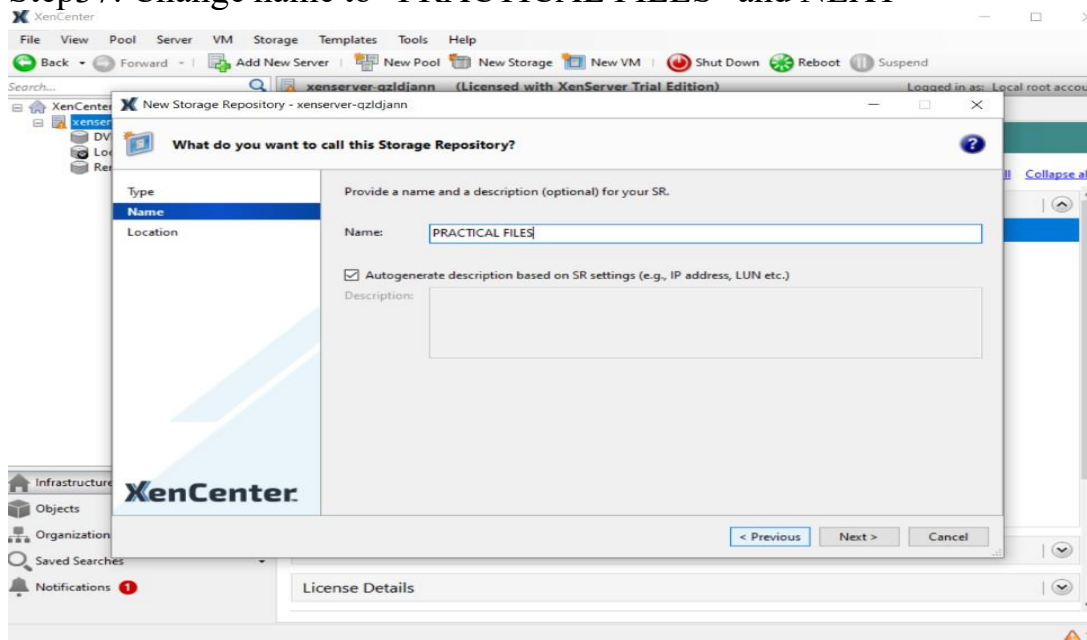




### Step36: Select Windows File Sharing (SMB/CIFS) and NEXT



### Step37: Change name to “PRACTICAL FILES” and NEXT

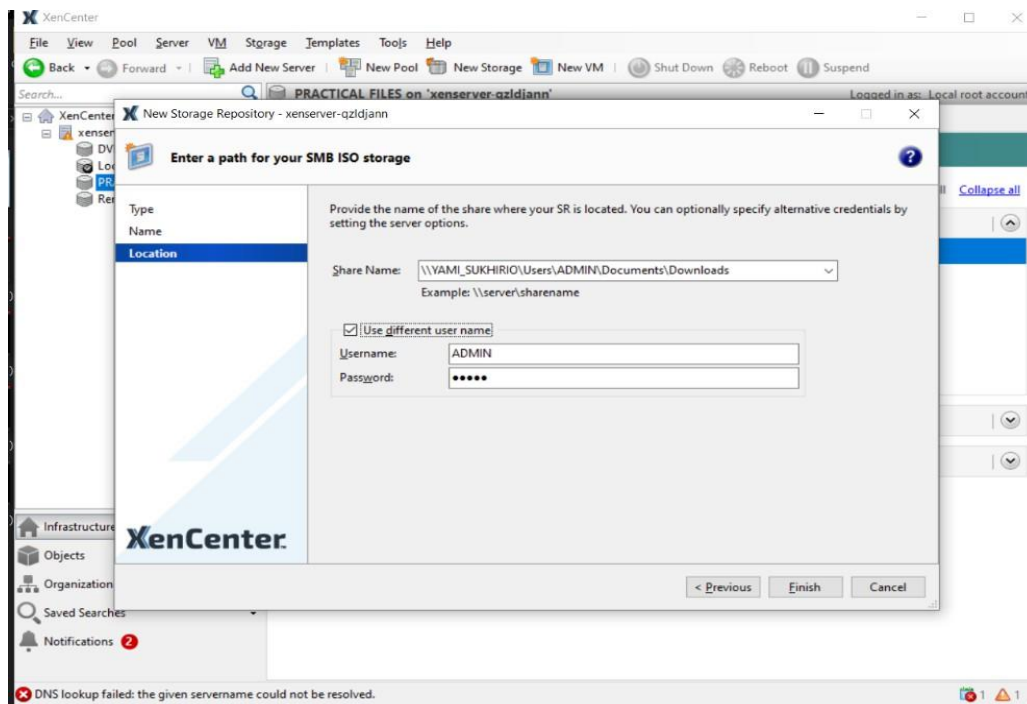




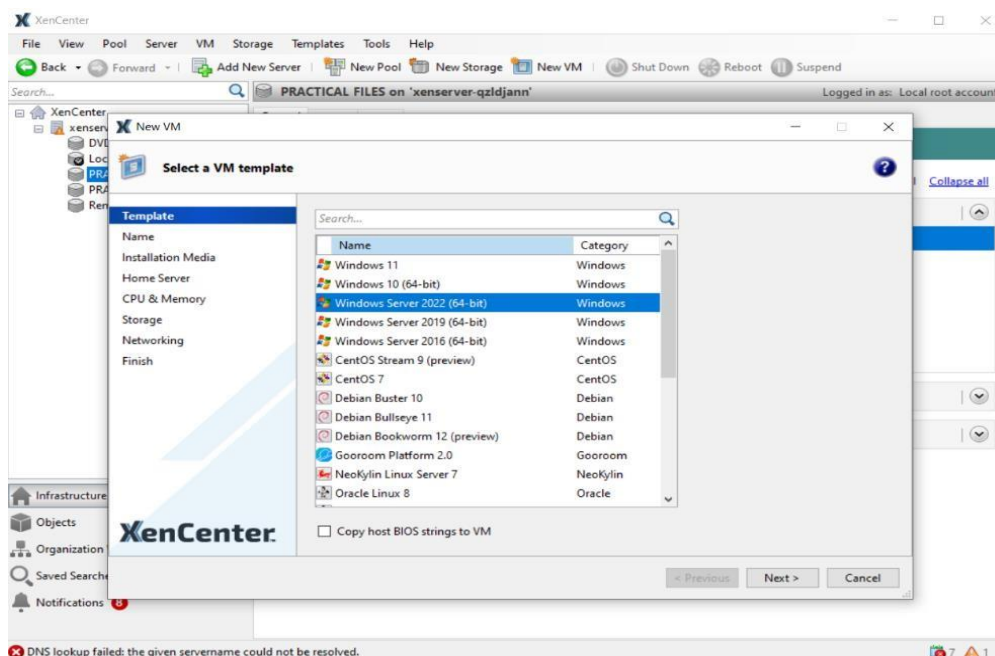
Step38: Paste the path of the file shared over the network.

(Remember file name should be written by \\Username\foldername\...)

eg: “\\Downloads\Windows\_server2022”

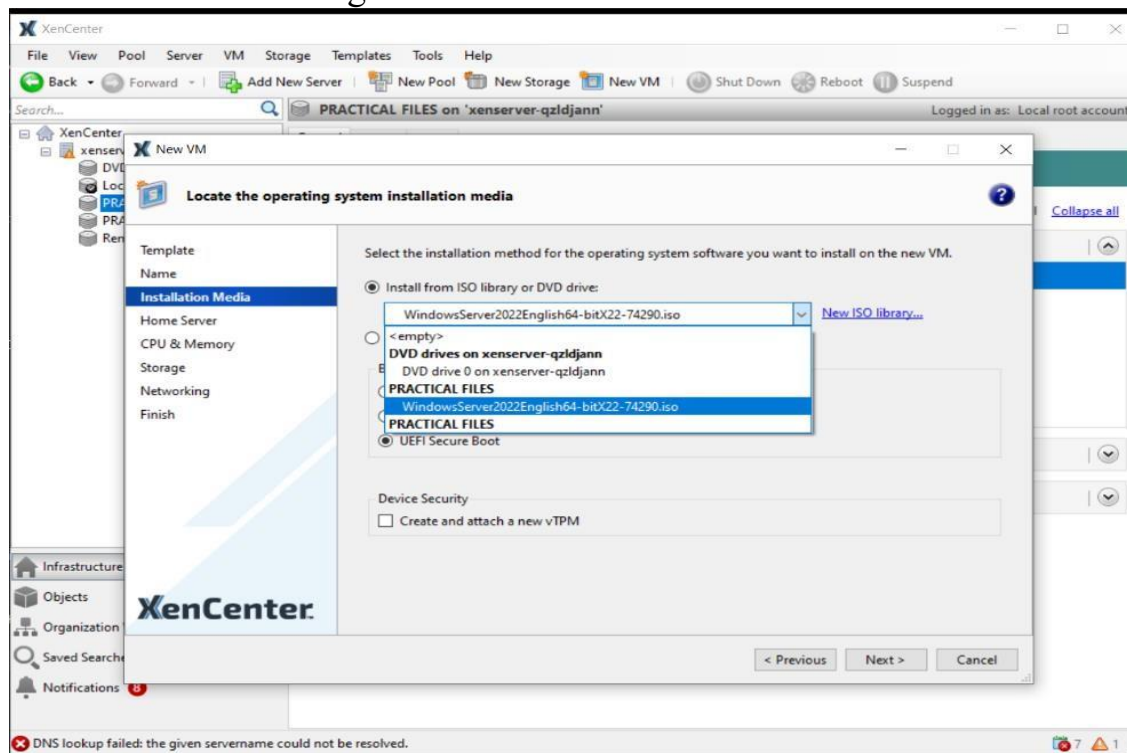


Step39: After adding a New Storage Click on New VM And Select Windows Server 2022(64-bit)

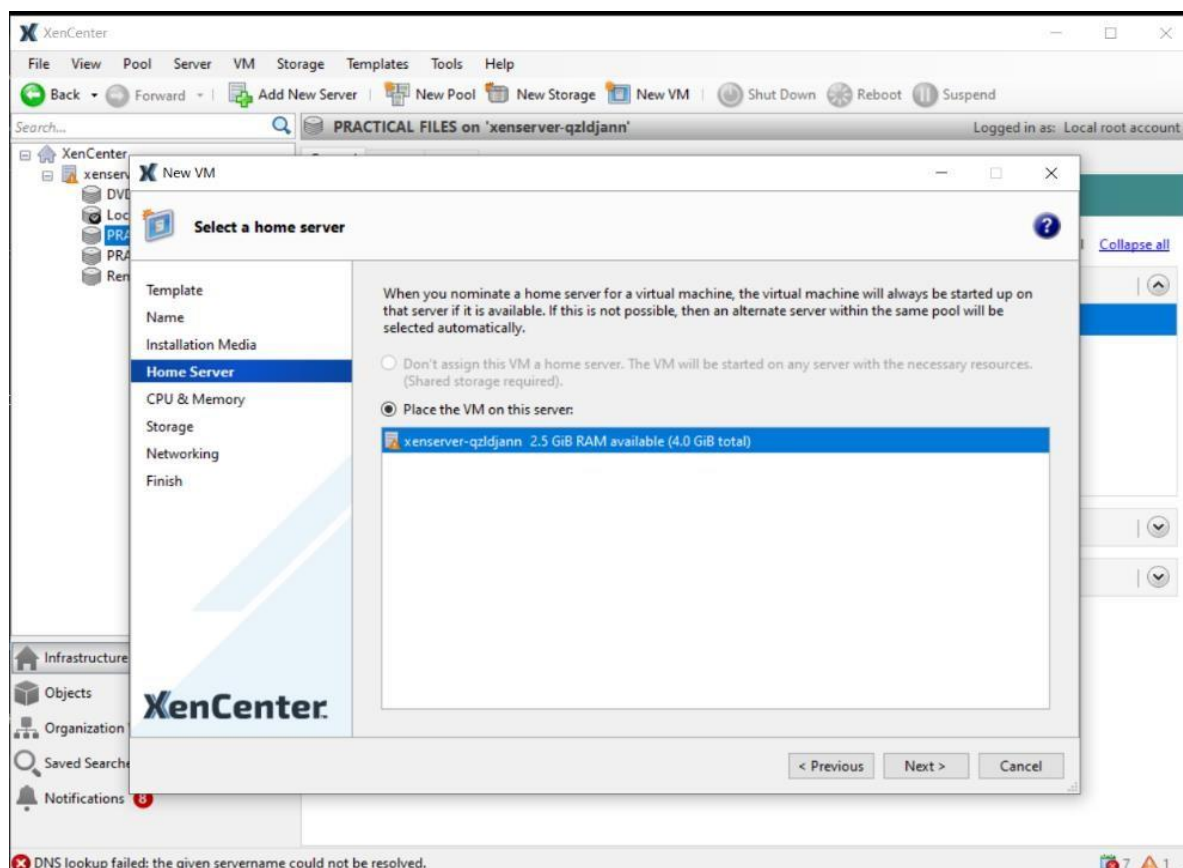




Step40: Select the ISO image which was shared over the network. -  
WindowsServer2022English64-bitX22-74290.ios

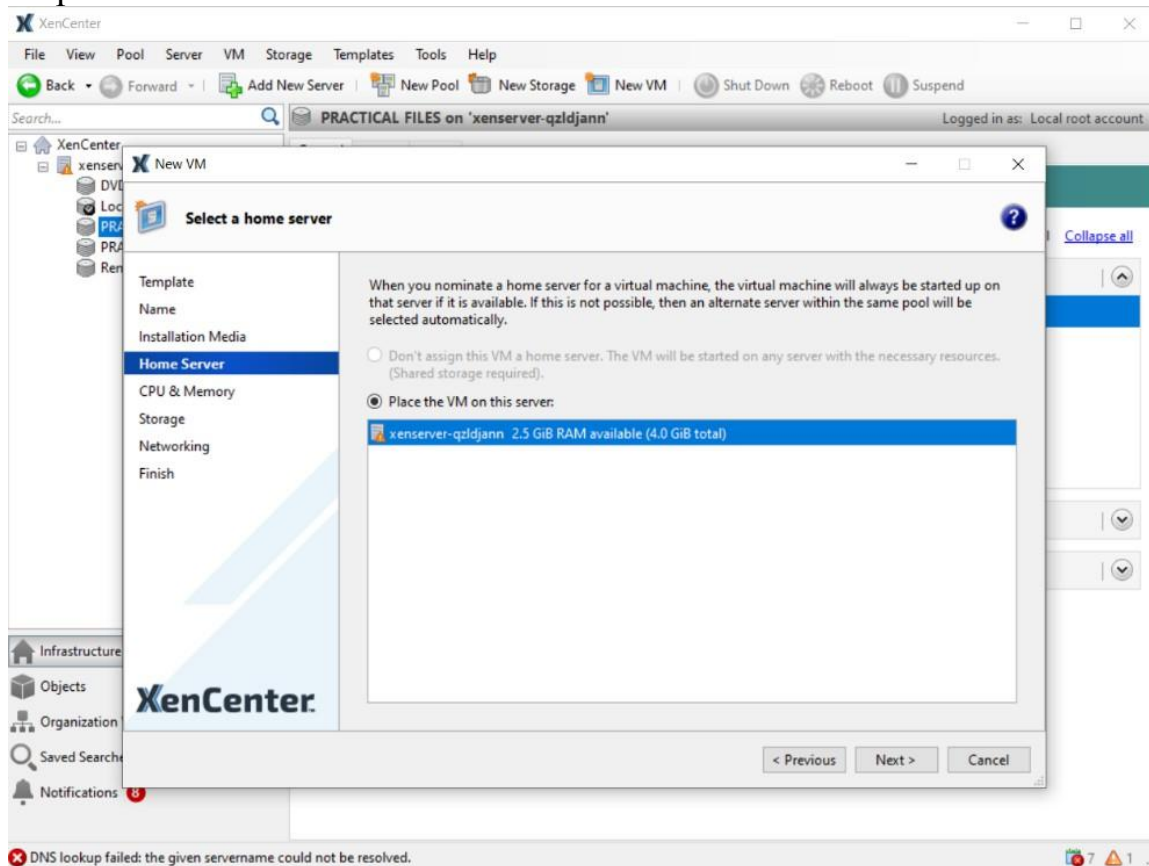


Step41: Click on Next

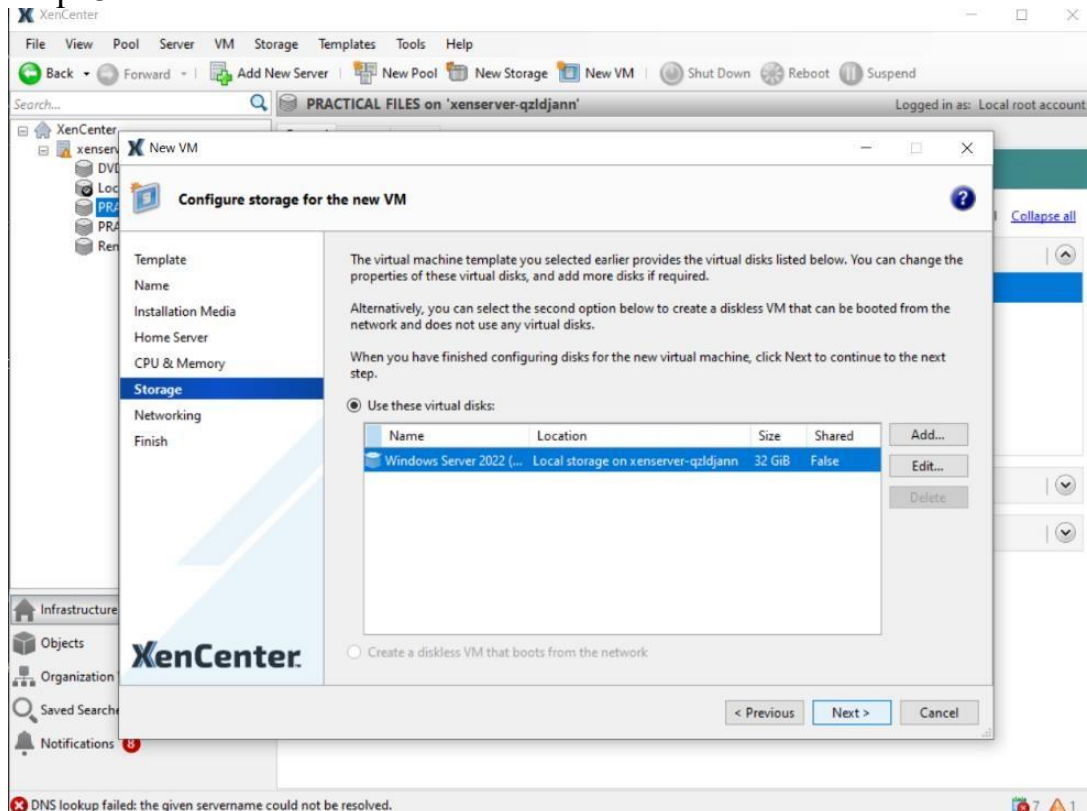




## Step42: Click on Next

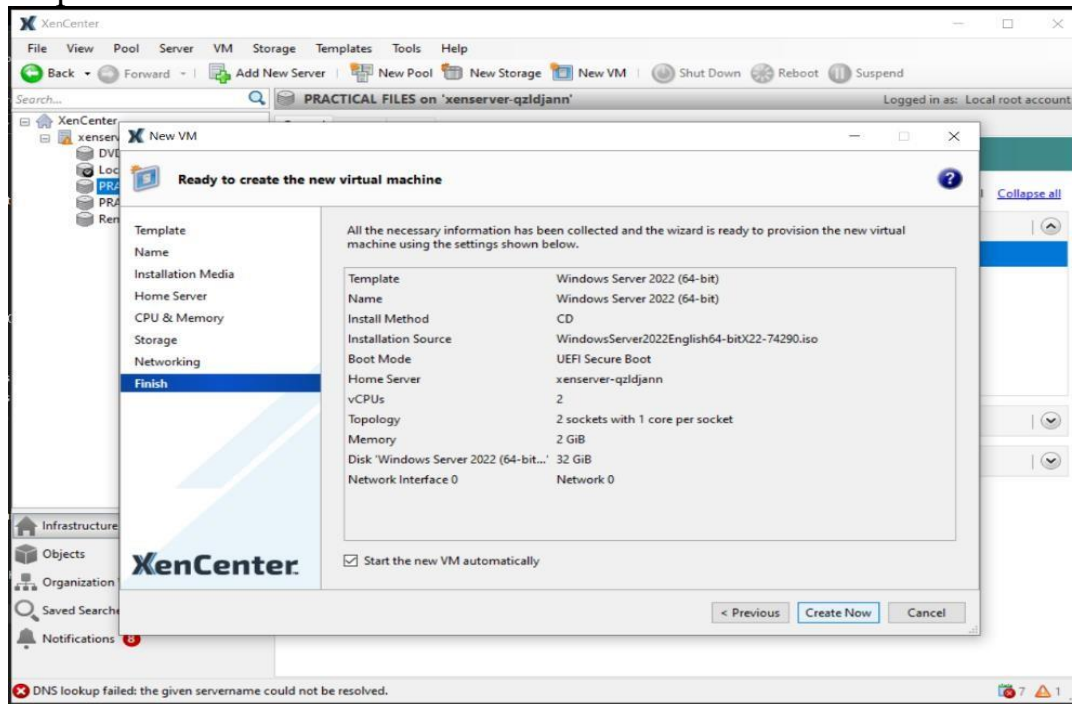


## Step43: Click on Next

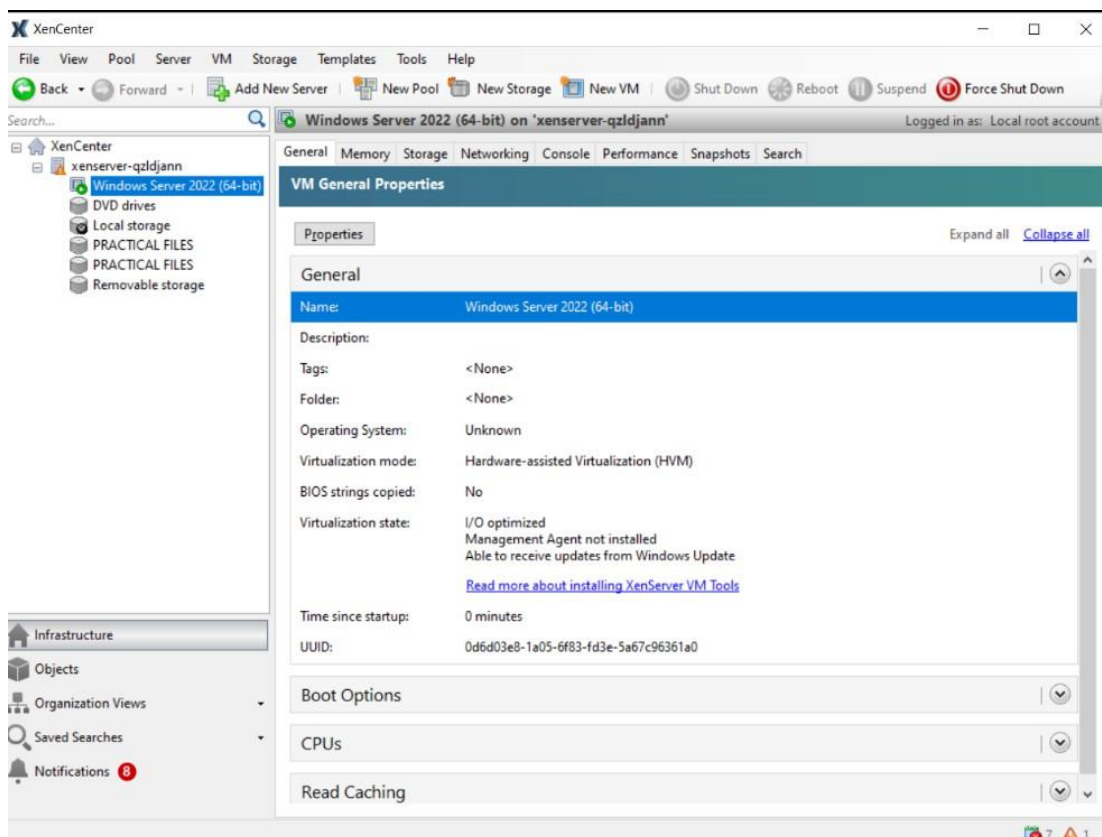




#### Step44: Click on Create Now

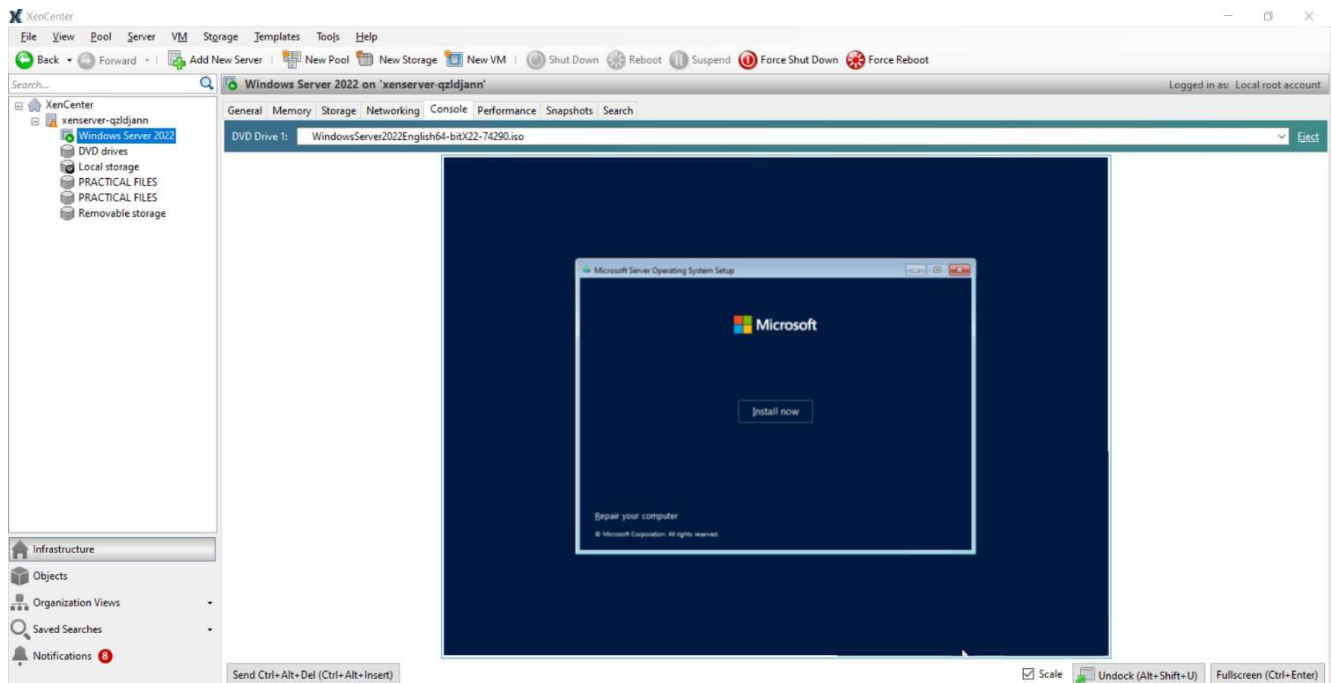


#### Step46: Click on Windows Server 2022(64-bit) & Navigate to Console tab.

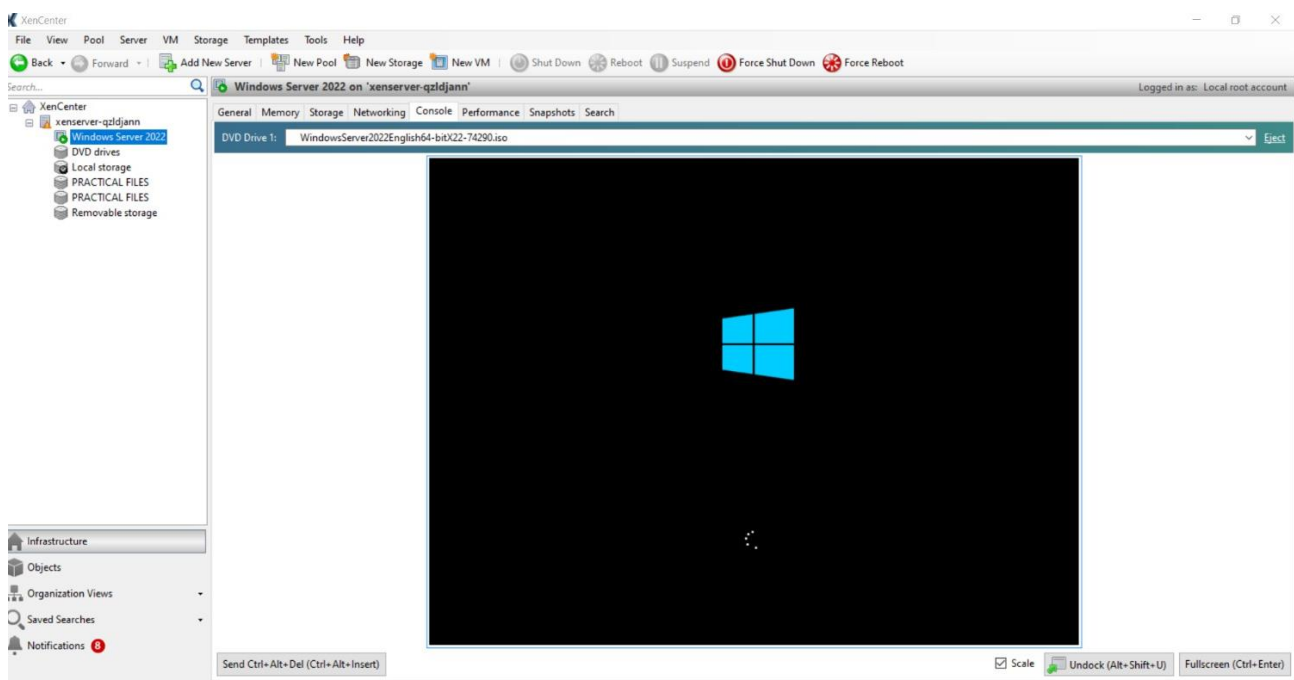




## Step47: Click on Install



## Step48: And Install Windows Server in Xen-Server





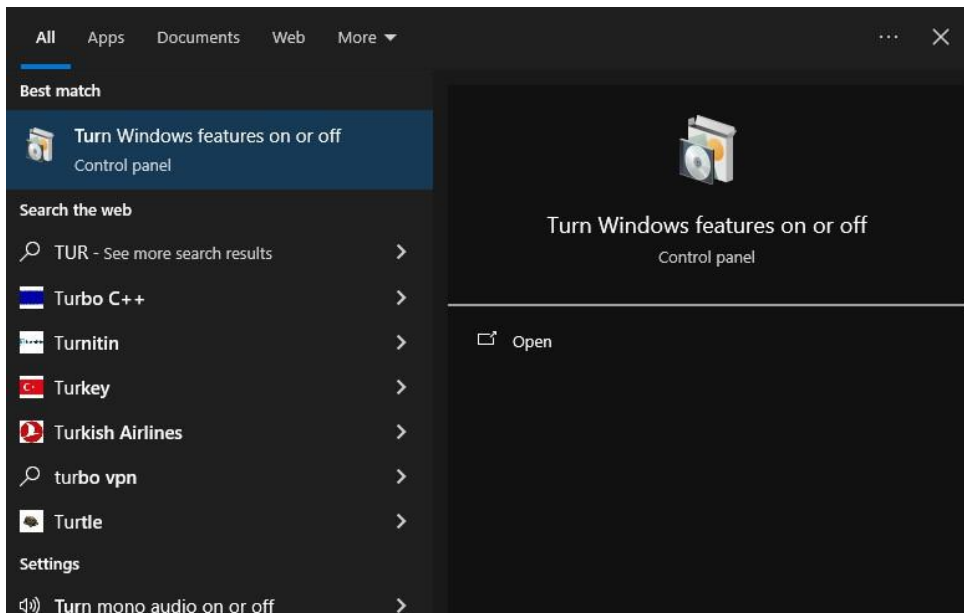
## PRACTICAL 6

**Aim: - Implementing Hypervisor**

**Requirements: - Hyper V manager**

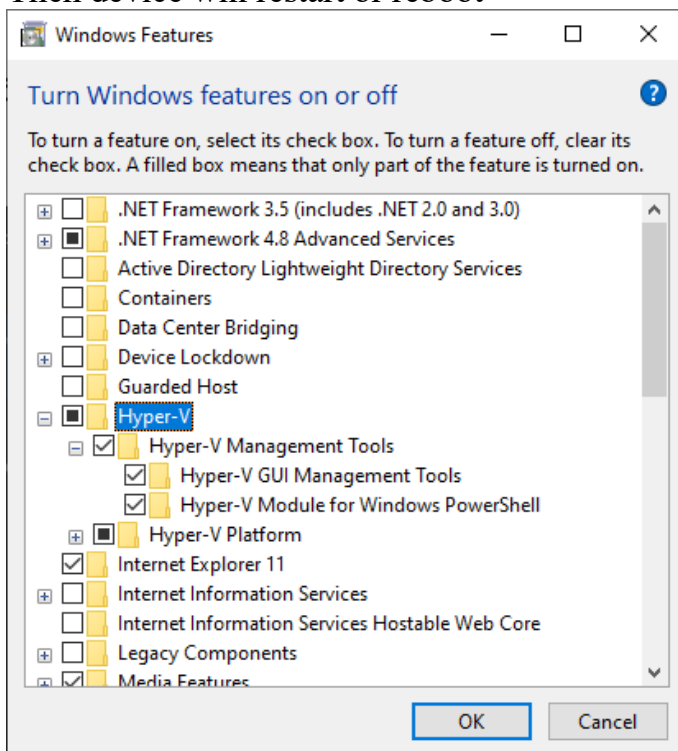
**Steps: -**

**Step1: - Search for Turn Windows feature on or off.**



**Step2: - Now check the Hyper V option → Ok.**

Then device will restart or reboot





← Windows Features

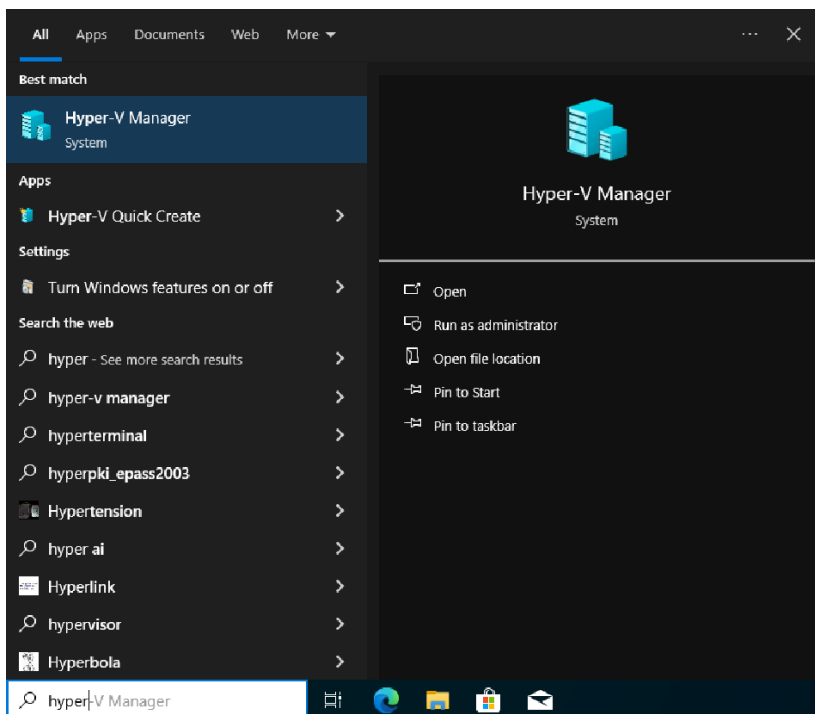
Windows completed the requested changes.

Windows needs to reboot your PC to finish installing the requested changes.

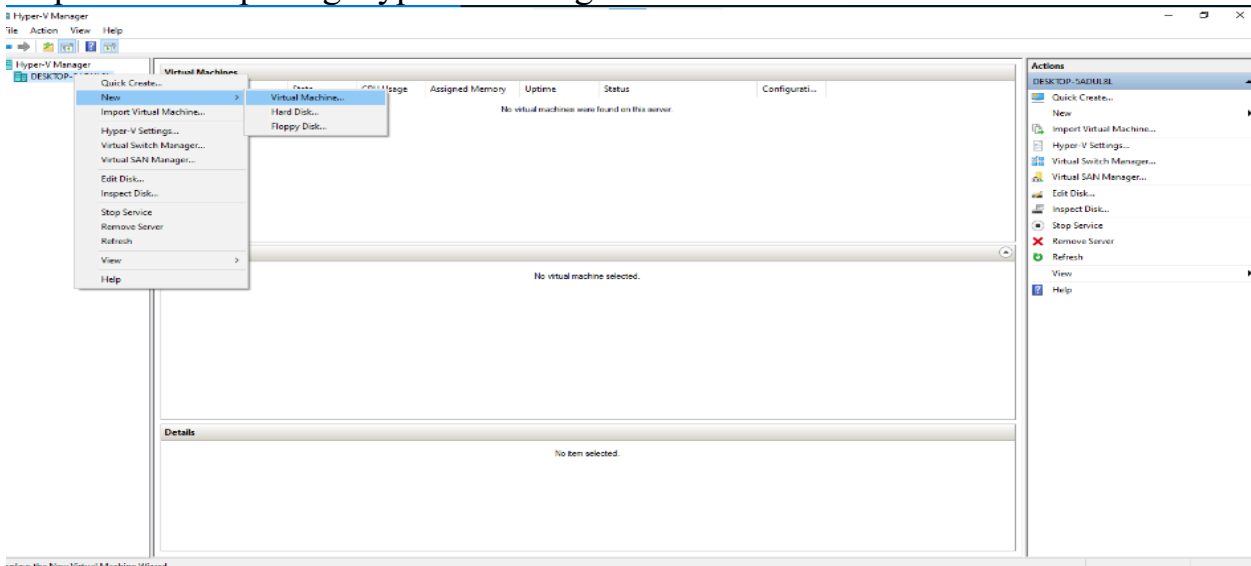
Restart now

Don't restart

Step3: - Now Open Hyper v manager



Step4: - After opening Hyper V Manager create new virtual machine.





## Step5: - Click NEXT

New Virtual Machine Wizard

**Before You Begin**

This wizard helps you create a virtual machine. You can use virtual machines in place of physical computers for a variety of uses. You can use this wizard to configure the virtual machine now, and you can change the configuration later using Hyper-V Manager.

To create a virtual machine, do one of the following:

- Click Finish to create a virtual machine that is configured with default values.
- Click Next to create a virtual machine with a custom configuration.

☐ Do not show this page again

< Previous   **Next >**   Finish   Cancel

## Step6: - Name the machine as “NEW VIRTUAL MACHINE”

New Virtual Machine Wizard

**Specify Name and Location**

Choose a name and location for this virtual machine.

The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.

Name:

You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.

☐ Store the virtual machine in a different location

Location:

**Warning:** If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.

< Previous   **Next >**   Finish   Cancel

## Step7: - Select Generation 1 and Click NEXT

New Virtual Machine Wizard

**Specify Generation**

Choose the generation of this virtual machine.

☒ **Generation 1**  
This virtual machine generation supports 32-bit and 64-bit guest operating systems and provides virtual hardware which has been available in all previous versions of Hyper-V.

☐ **Generation 2**  
This virtual machine generation provides support for newer virtualization features, has UEFI-based firmware, and requires a supported 64-bit guest operating system.

**Warning:** Once a virtual machine has been created, you cannot change its generation.

[More about virtual machine generation support](#)

< Previous   **Next >**   Finish   Cancel



## Step8: - Startup memory: 1024 MB and Click NEXT

**New Virtual Machine Wizard**

**Assign Memory**

Before You Begin  
Specify Name and Location  
Specify Generation  
**Assign Memory**  
Configure Networking  
Connect Virtual Hard Disk  
Installation Options  
Summary

Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 251658240 MB. To improve performance, specify more than the minimum amount recommended for the operating system.

Startup memory:  MB

☐ Use Dynamic Memory for this virtual machine.

**i** When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.

< Previous   **Next >**   Finish   Cancel

## Step9: - Keep the Default Setting of Configuration Networking.

**New Virtual Machine Wizard**

**Configure Networking**

Before You Begin  
Specify Name and Location  
Specify Generation  
Assign Memory  
**Configure Networking**  
Connect Virtual Hard Disk  
Installation Options  
Summary

Each new virtual machine includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected.

Connection:

< Previous   **Next >**   Finish   Cancel

## Step10: - Select the “Create a virtual hard disk” and give it a name, location and set the size to 127GB then Click NEXT

**New Virtual Machine Wizard**

**Connect Virtual Hard Disk**

Before You Begin  
Specify Name and Location  
Specify Generation  
Assign Memory  
Configure Networking  
**Connect Virtual Hard Disk**  
Installation Options  
Summary

A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties.

☒ **Create a virtual hard disk**  
Use this option to create a VHDX dynamically expanding virtual hard disk.

Name:

Location:

Size:  GB (Maximum: 64 TB)

☐ Use an existing virtual hard disk  
Use this option to attach an existing virtual hard disk, either VHD or VHDX format.

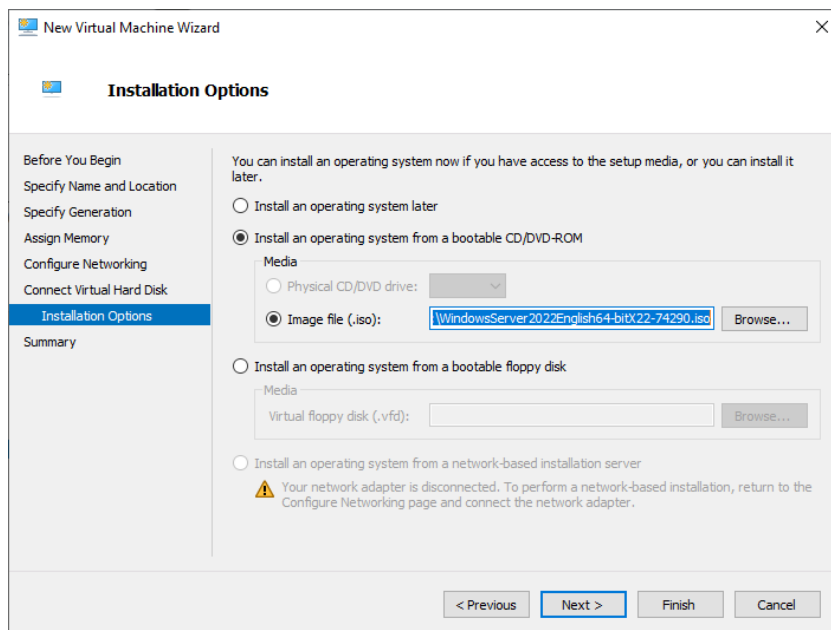
Location:

☐ Attach a virtual hard disk later  
Use this option to skip this step now and attach an existing virtual hard disk later.

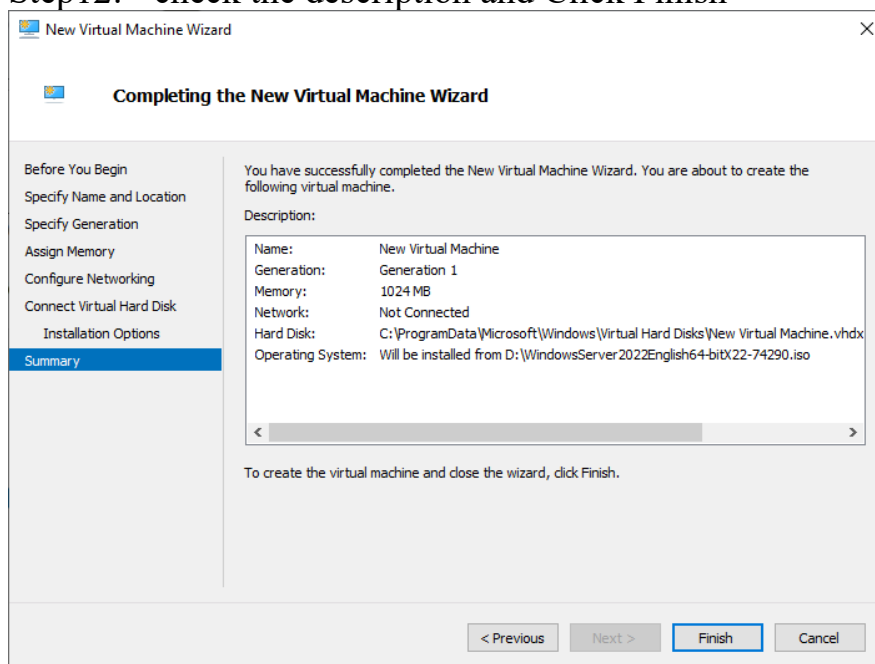
< Previous   **Next >**   Finish   Cancel



**Step11: - Now select the **Install an operating system from a bootable CD/DVD-ROM** option, in this select **Image file(.ios)** and browse the **windowserver2022.ios** file then **Click NEXT****

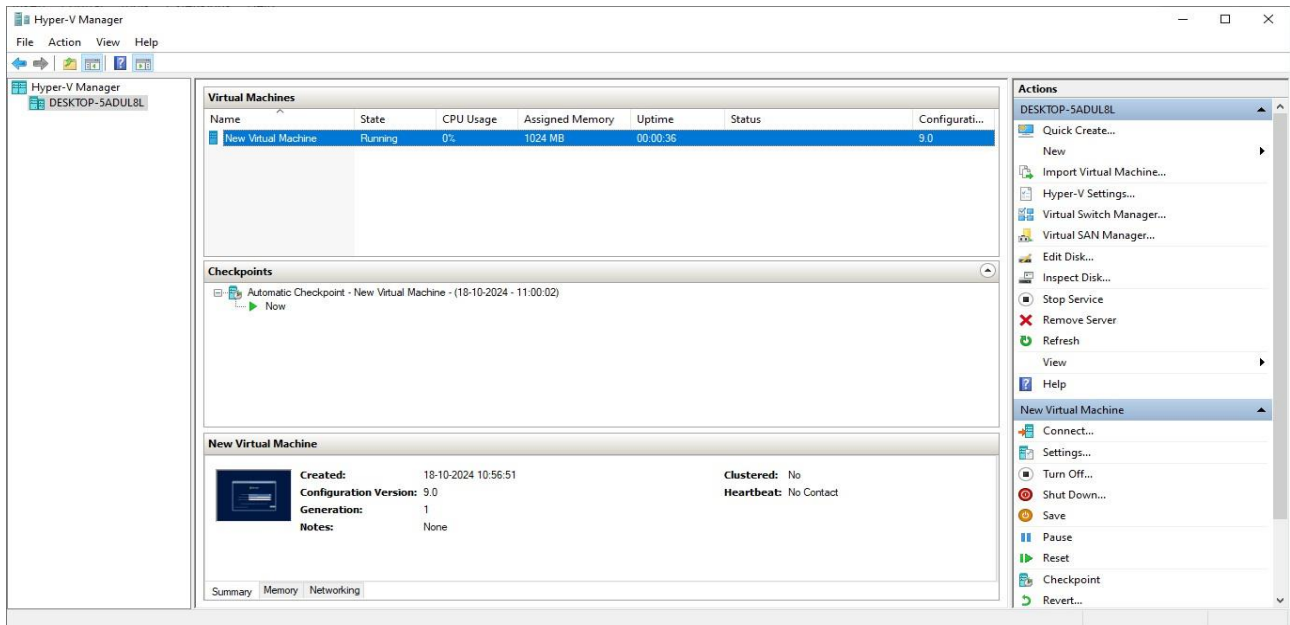


**Step12: - check the description and Click Finish**





## Step13: - power on the virtual machine





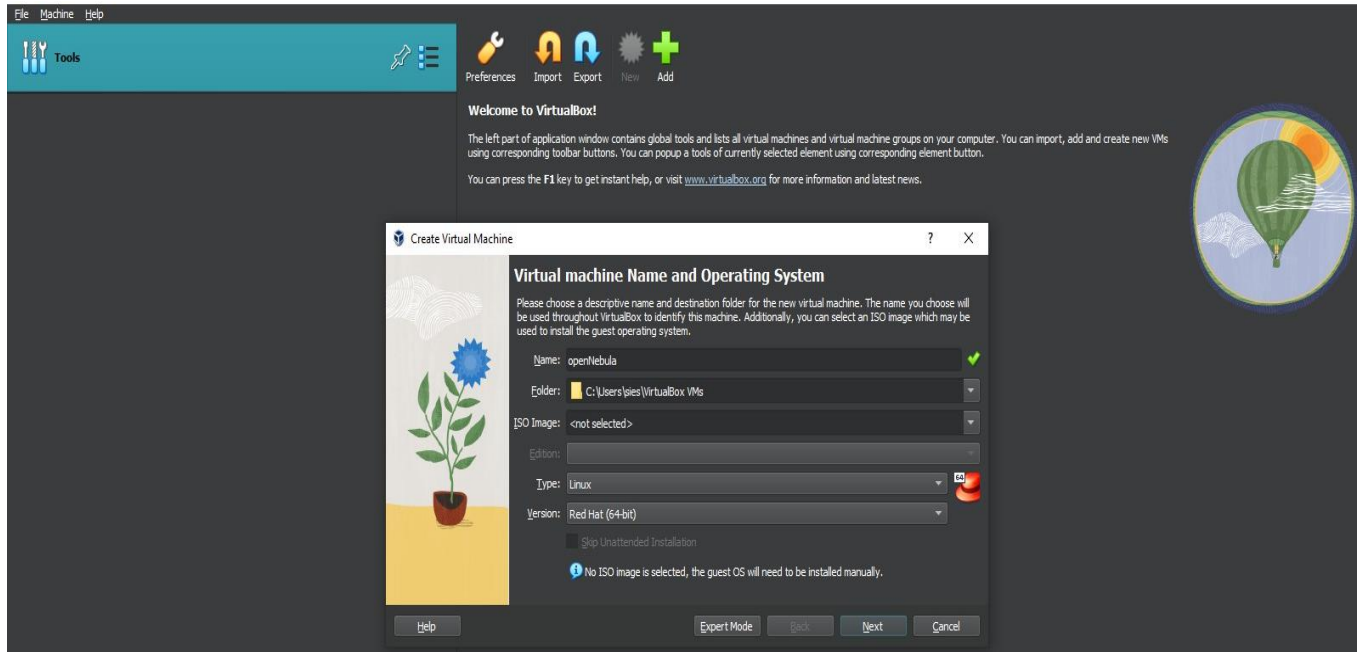
## PRACTICAL 7

**Aim - Implementing open Nebula.**

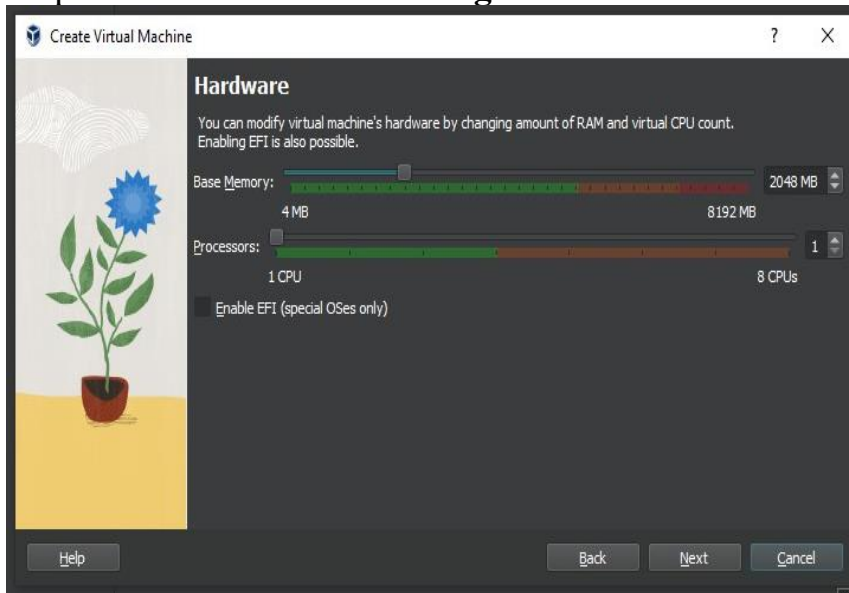
**Requirements: - oracle vm virtual box, open nebula sandbox**

**Steps: -**

**Step1: - Open oracle Vm VirtualBox → Click on New → Give name, Type - Linux, Version - Red Hat(64-bit) → Next.**



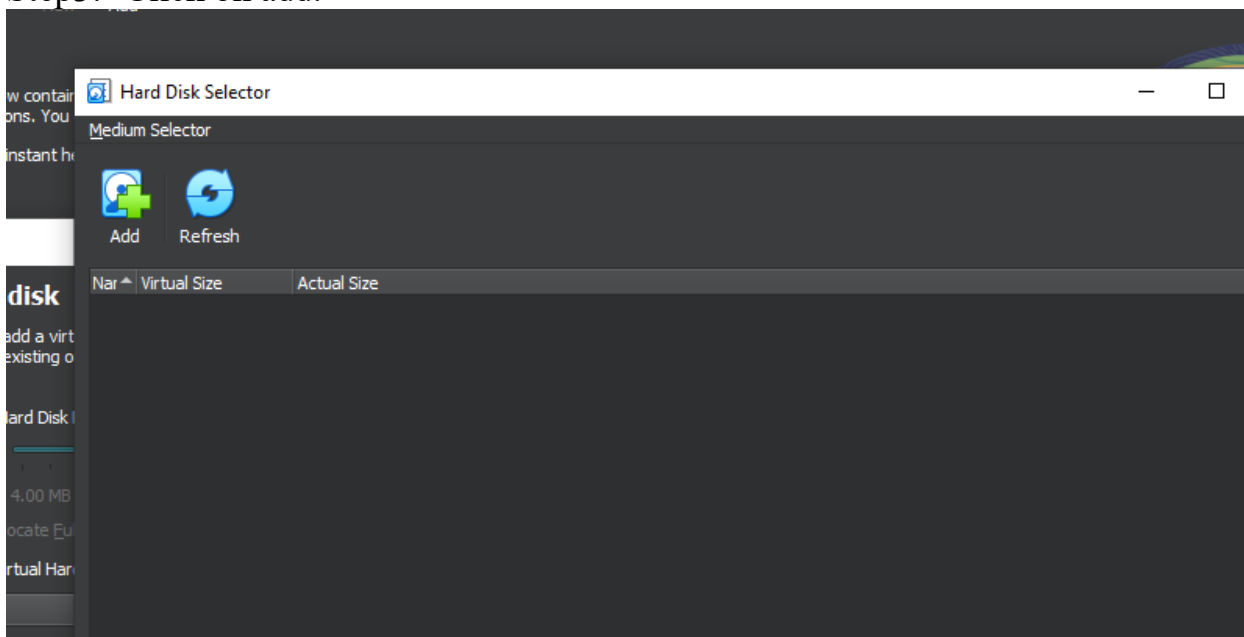
**Step2: - Click on a “use existing virtual hard disk file”**



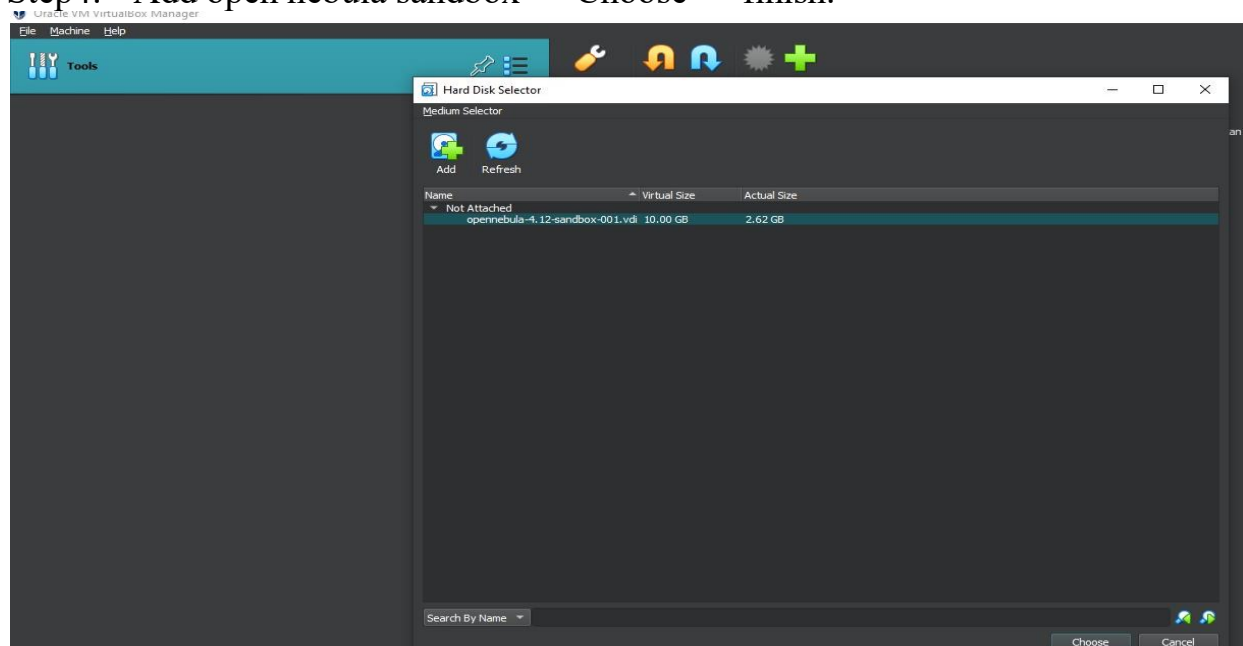




Step3: -Click on add.

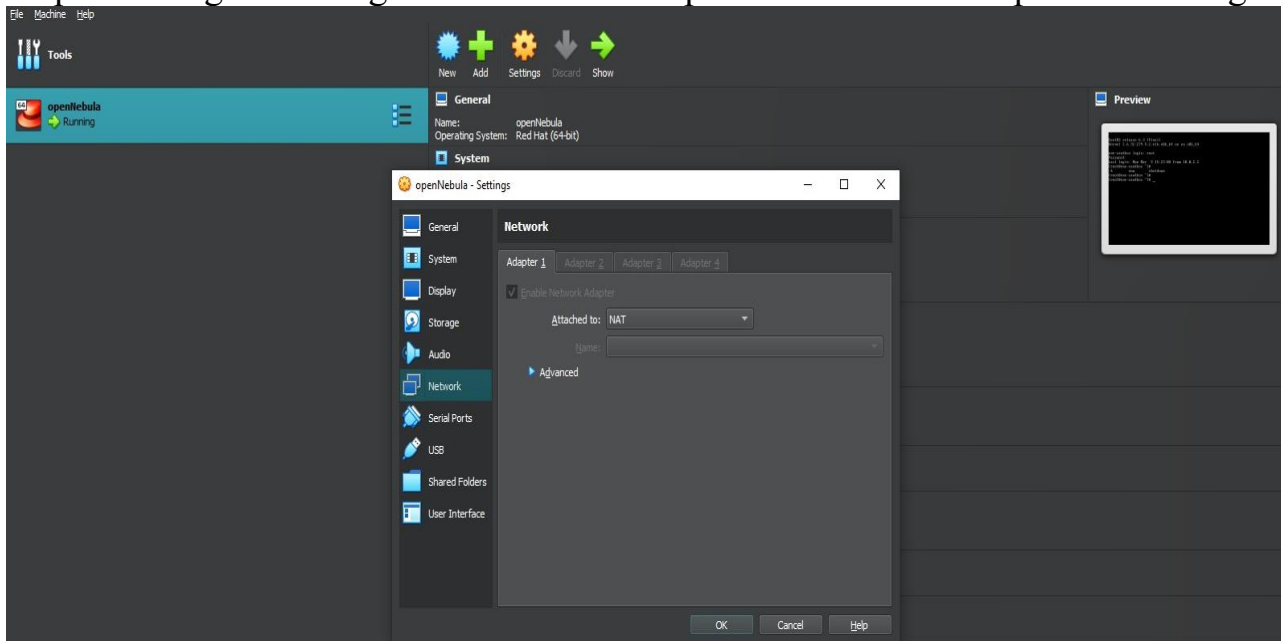


Step4: - Add open nebula sandbox → Choose → finish.



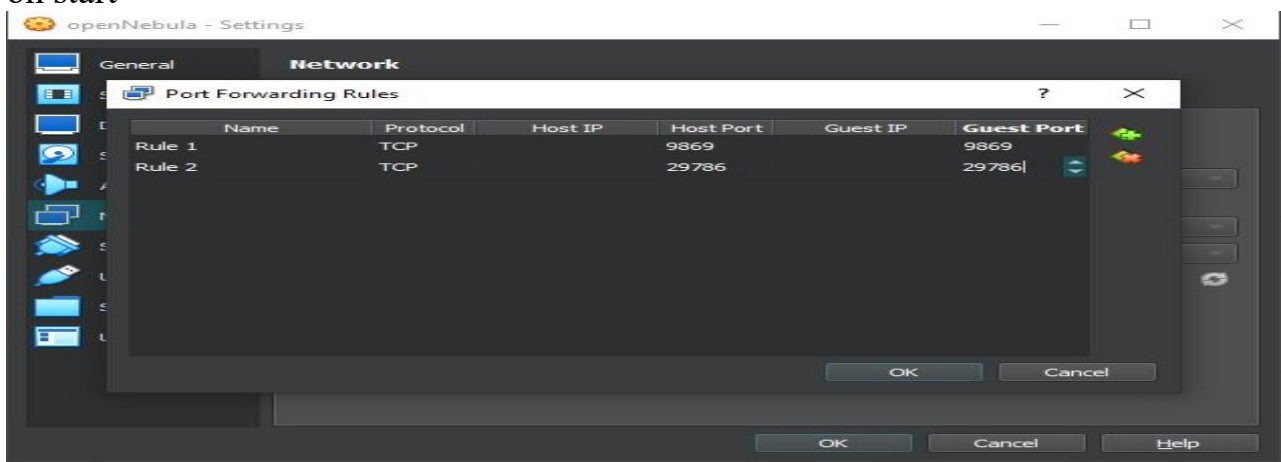


Step5: -Now go to settings → Network → adapter1 → Advanced → port forwarding.

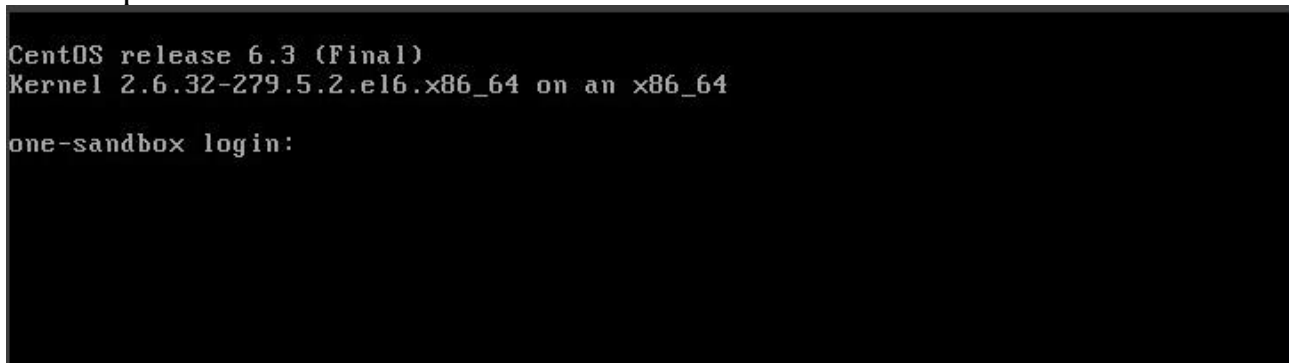


Step6: -Now add host port and guest port number then add one more.  
**(Remember the port numbers)**

Step7: - Click Ok → ok → click on start

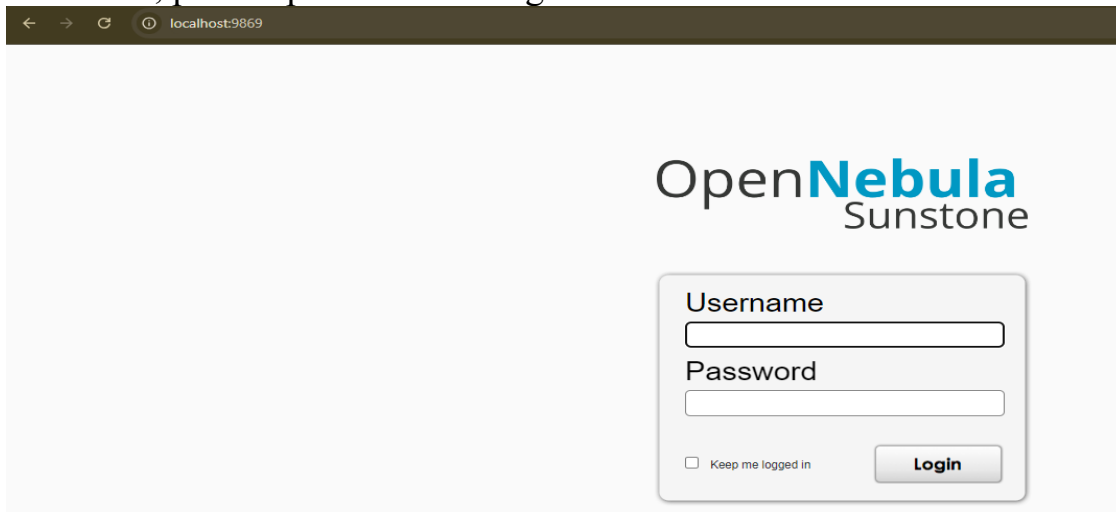


Step8: - Login - root.  
 Pwd - opennebula

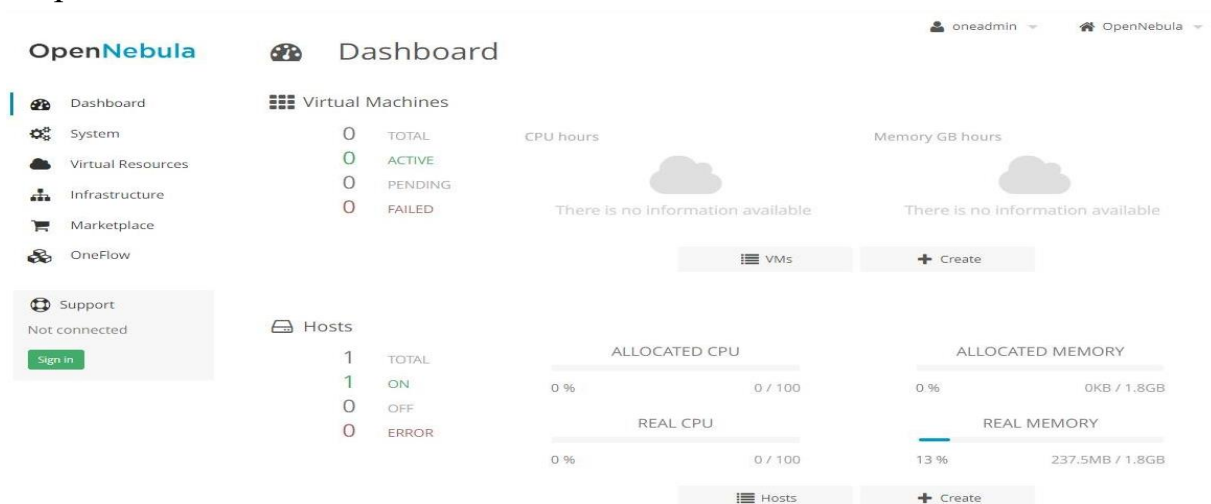




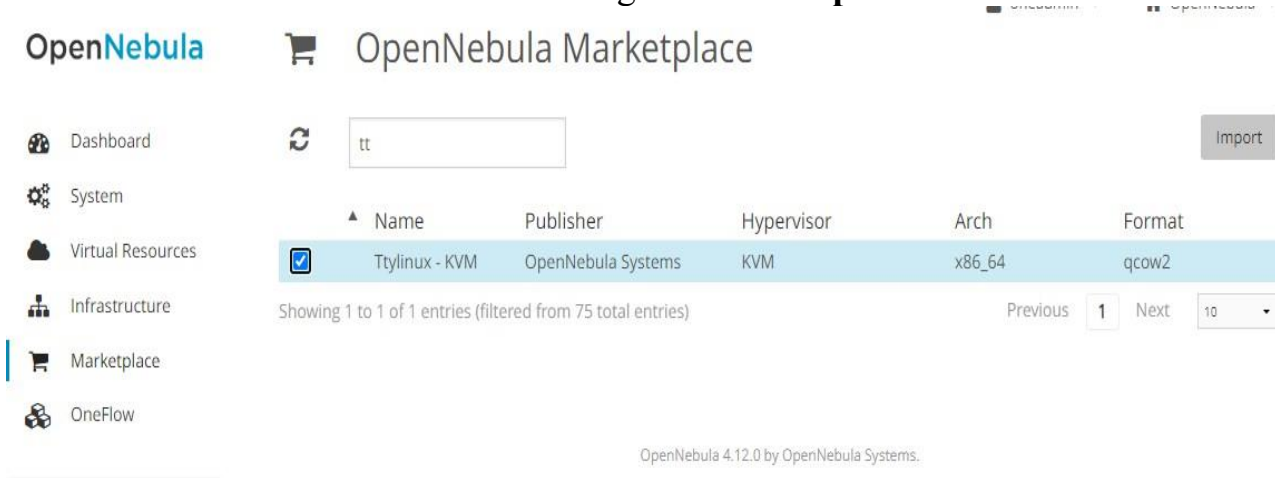
Step9: -Now minimize and open browser(chrome) → localhost:9869 → username - oneadmin, pwd - opennebula → login.



Step10: -Now u can see this interface.

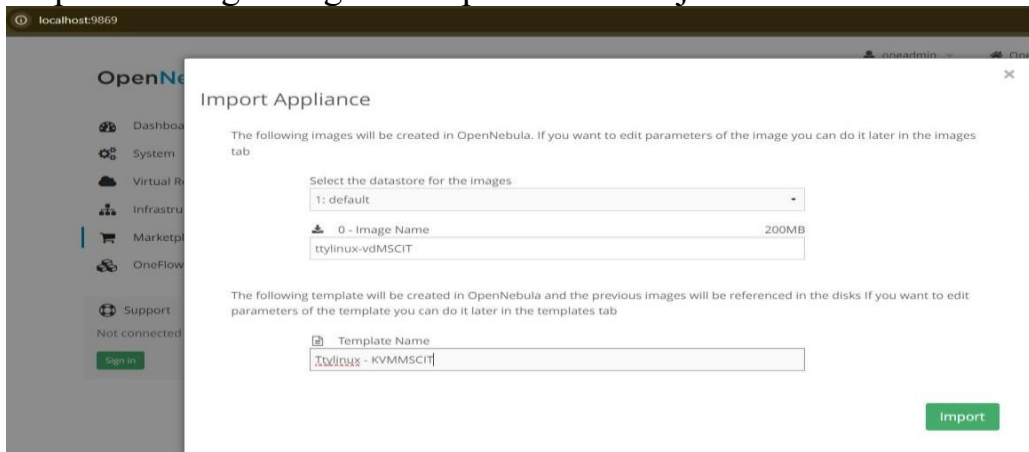


Step10: -Click Marketplace → search “tty” → TtyLinux KVM → Click on checkbox and then refresh → once the status is “running” → click **import**.

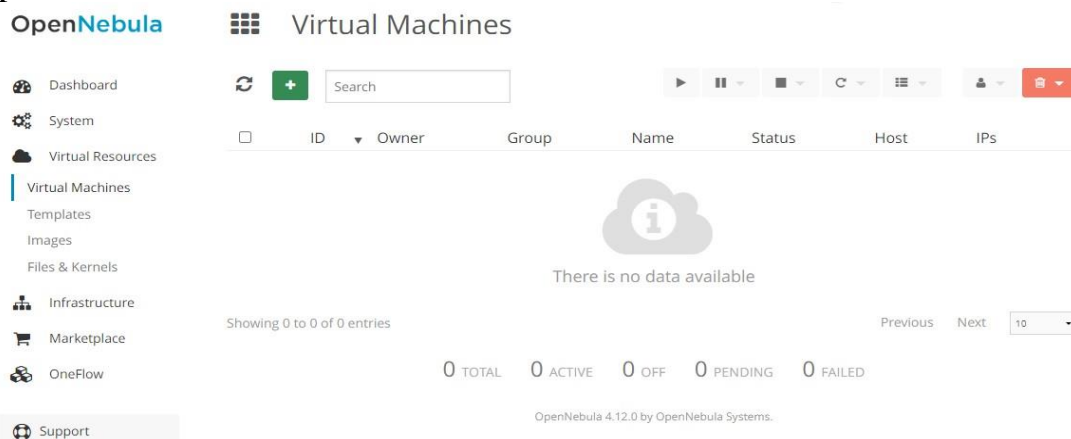




Step11: -Change Image & template name → just add **MSCIT** at the end → import.



Step12: -Click Virtual Resources → Virtual Machines → Click on “+” button.



Step13: -Click on oneadmin → import.

Create Virtual Machine

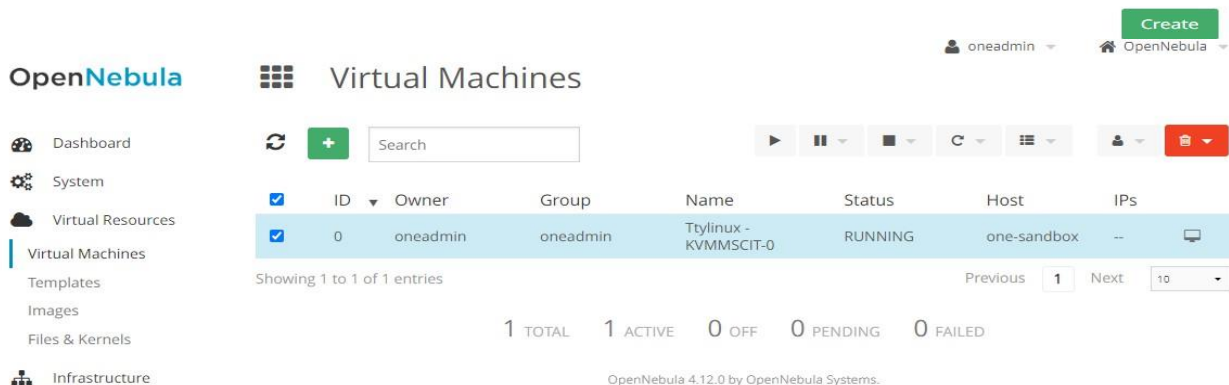
Step 1: Specify a name and the number of instances

VM Name:  Number of instances:  ☐ Hold

Step 2: Select a template

ID	Owner	Group	Name	Registration time
1	oneadmin	oneadmin	Ttylinux - KVMMSCT	11:12:54 25/09/2024
0	oneadmin	oneadmin	ttylinux	19:55:40 28/04/2014

You selected the following template: **Ttylinux - KVMMSCT**





## PRACTICAL 8

### Aim - Implementing Amazon Web Service AWS

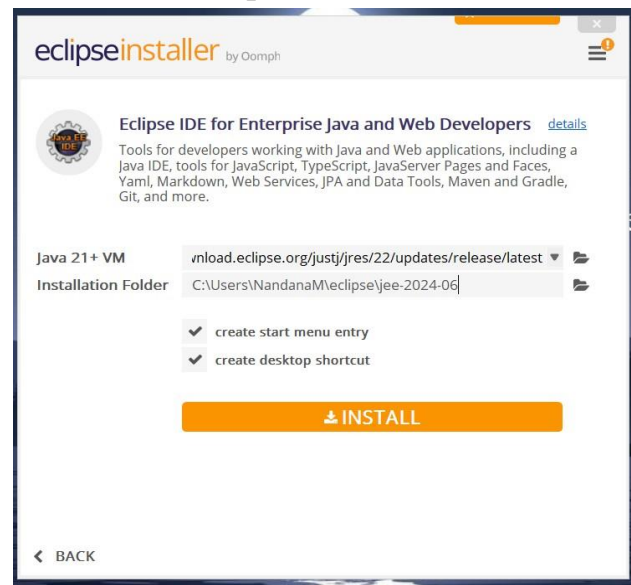
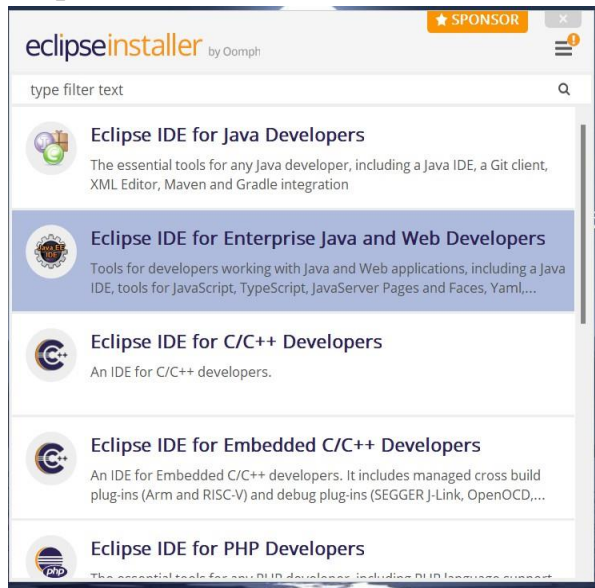
**Requirements: - Eclipse installer, tomcat Apache 10.1 v**

**Steps: -**

**Step1: -**Install tomcat Apache in your pc. install 10.1 version and then execute it Install eclipse from its official website.

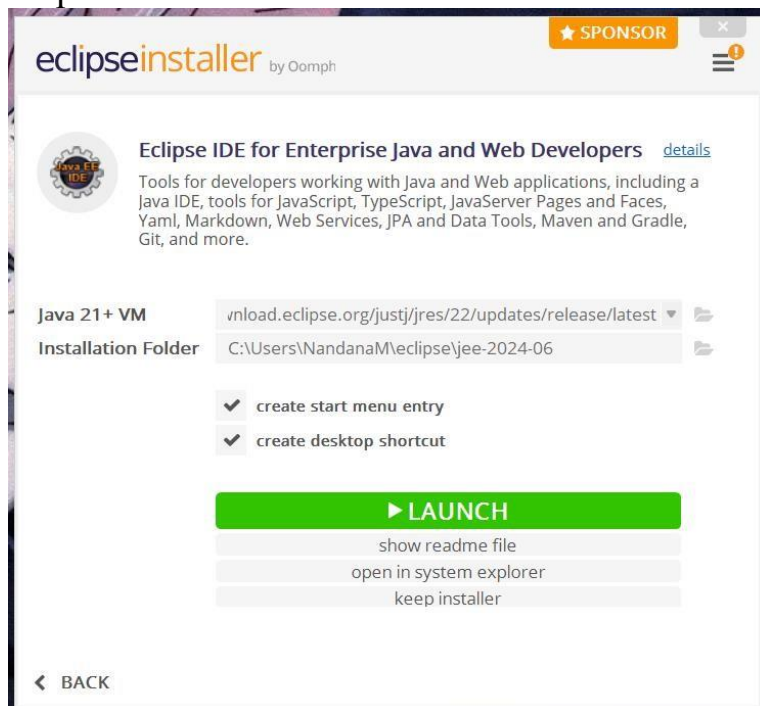
**Step2: -**Click on

**Step3: -** Click on Install



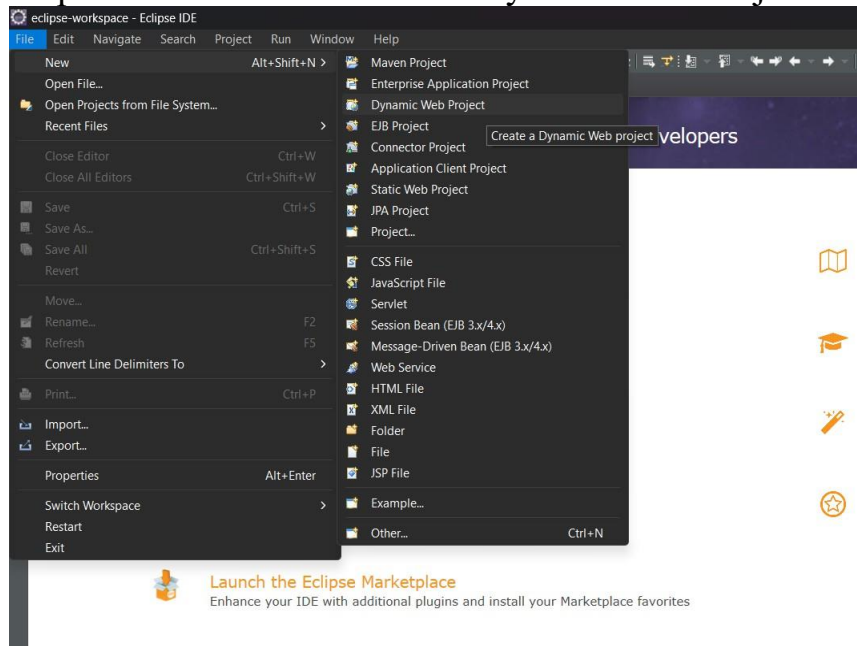
Wait until the installation is completed.

**Step4: -** Click on Launch

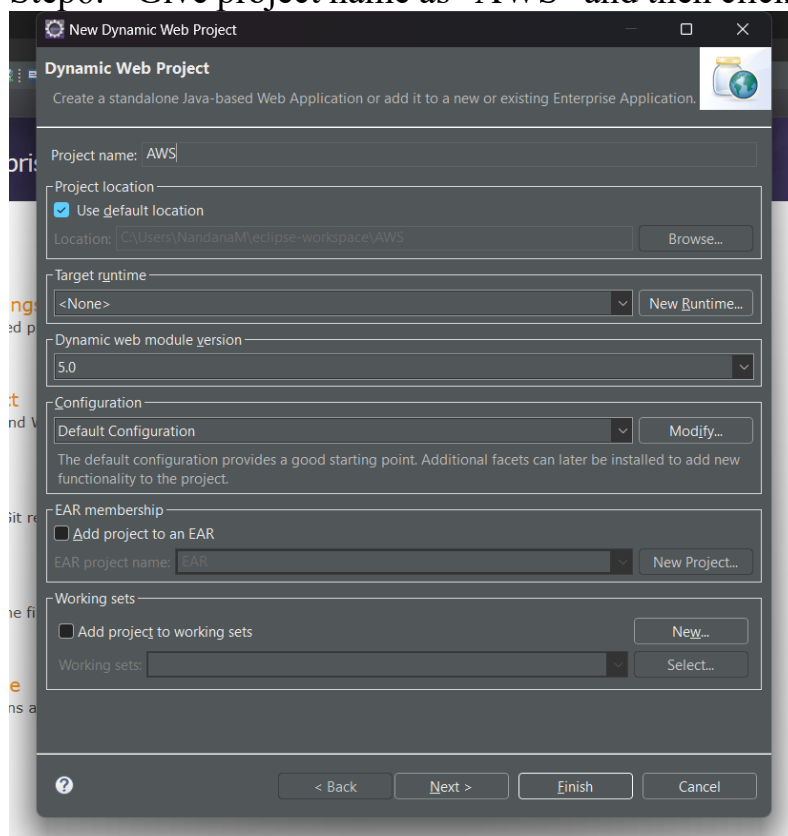




## Step5: - Click on File > New > Dynamic Web Project

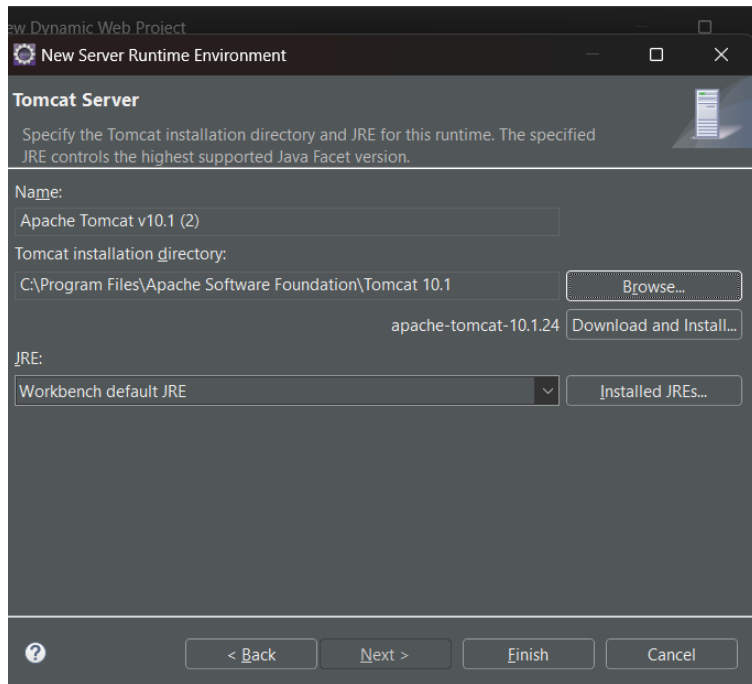


## Step6: - Give project name as “AWS” and then click on “Next”

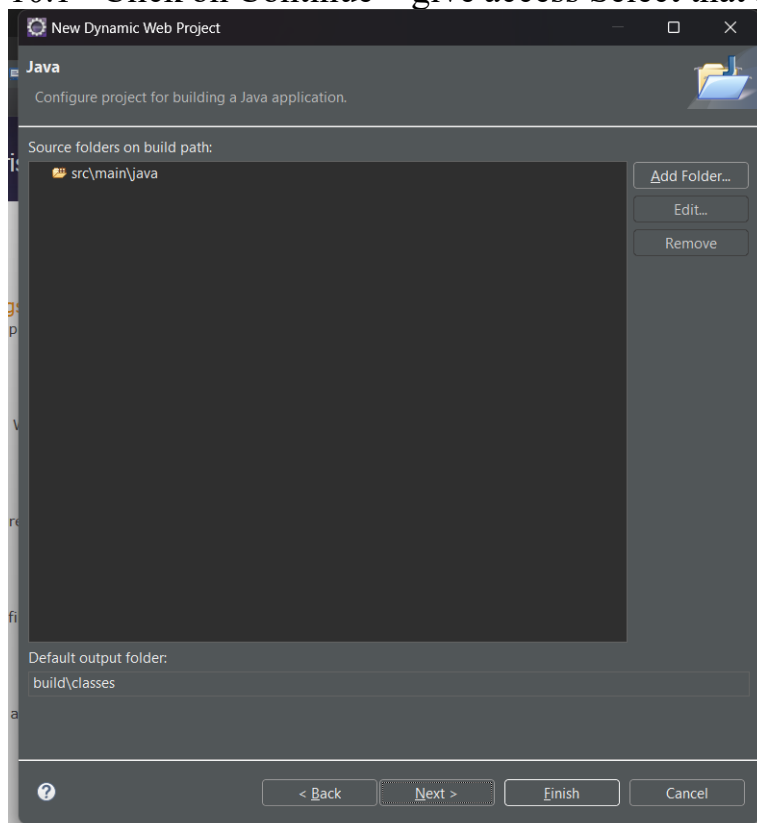




Step7: - Click on Target Runtime > New Runtime > Apache > Apache tomcat v10.1 > Next.

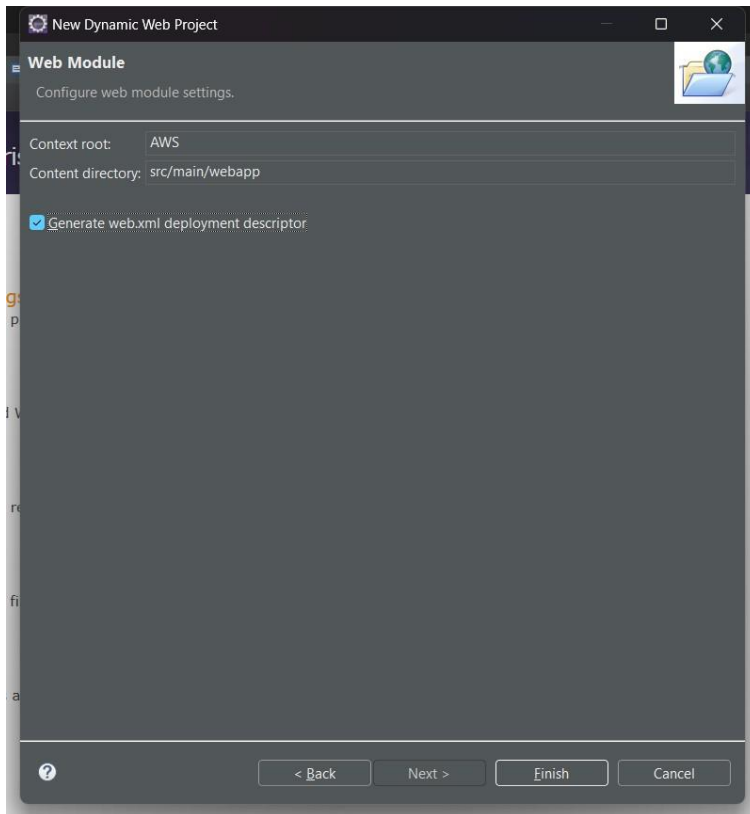


Step8: - Click Browse > C drive > program files > Apache Software foundation > Tomcat 10.1 > Click on Continue > give access Select that and then click “Next”

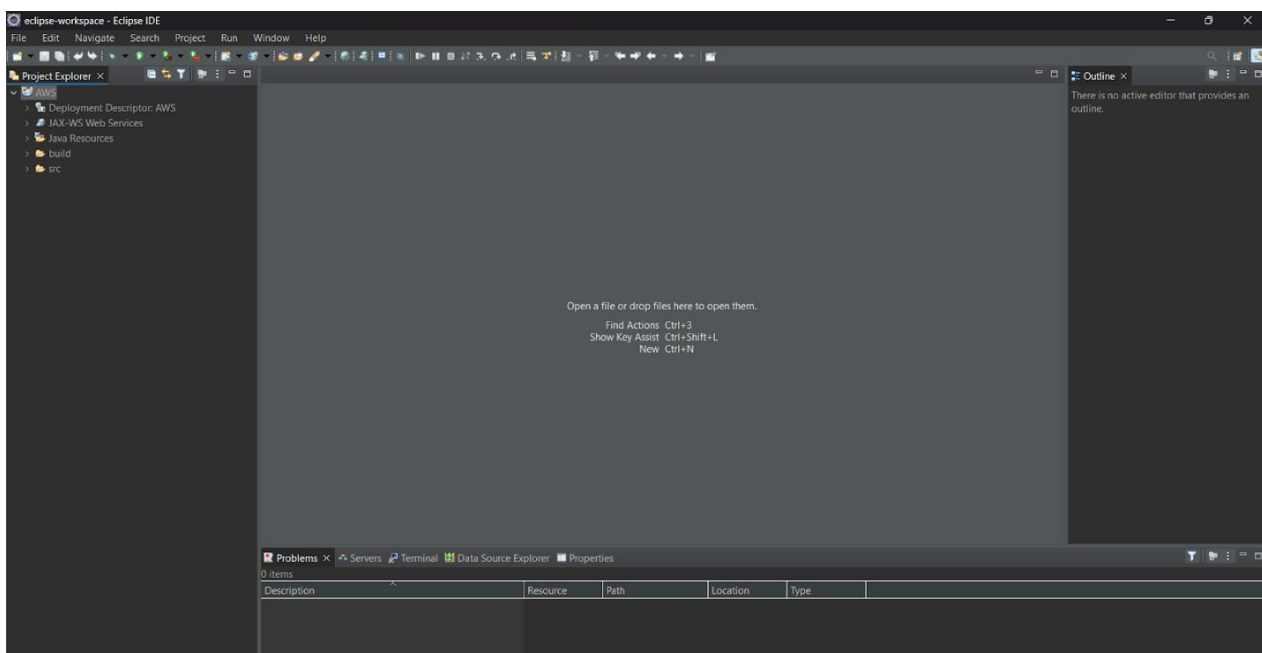




Step9: - Make sure u tick the checkbox and then click “Finish”



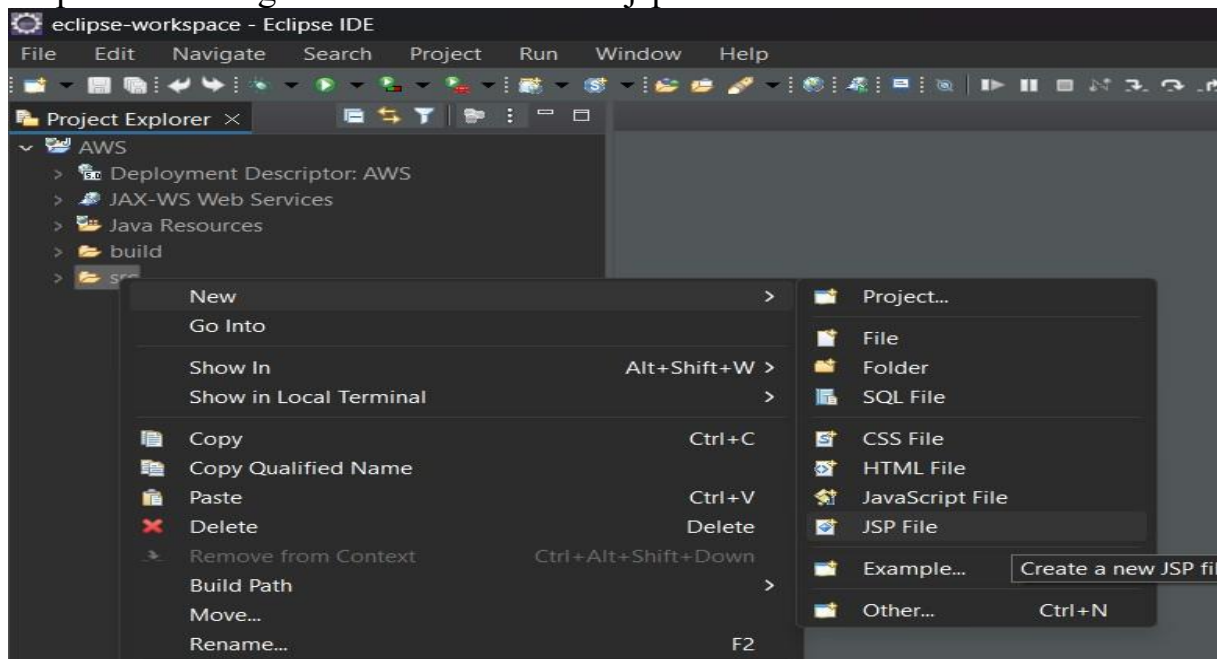
Step10: - You will be navigated to this page.



If u do not see “project explorer” which is on the left-hand-side ...then click on “windows > show view > project explorer



Step11: - Now right click on src > new > jsp file.



Step12: - Create two jsp files ...one as newfile.jsp and the other as fibonacci.jsp

Step13: - To create jsp file Click on jsp file and then name your jsp file if you want then to click next and then finish.

Step14: - Write the code.

```

NewFile.jsp × Fibonacci.jsp × Tomcat v10.1 Server at localhost
1 <%@ page language="java" contentType="text/html; charset=UTF-8"
2   pageEncoding="UTF-8"%>
3 <!DOCTYPE html>
4 <html>
5 <head>
6 <meta charset="UTF-8">
7 <title>Insert title here</title>
8 </head>
9 <body>
10 <form action="Fibonacci.jsp">
11   Enter a value for n: <input type="text" name="val">
12   <input type="submit" value="Submit">
13 </form>
14 </body>
15 </html>
  
```

```

NewFile.jsp × Fibonacci.jsp × Tomcat v10.1 Server at localhost
1 <%@ page language="java" contentType="text/html; charset=UTF-8"
2   pageEncoding="UTF-8"%>
3 <!DOCTYPE html>
4 <html>
5 <head>
6 <meta charset="UTF-8">
7 <title>Insert title here</title>
8 </head>
9 <body>
10 <!--
11   int n;
12   String str;
13
14   int fibo(int n) {
15     if(n<2)
16       return n;
17     else
18       return fibo(n-1) + fibo(n-2);
19   }
20 %>
21 <b>Fibonacci series: </b><br>
22 <%
23   str = request.getParameter("val");
24   n = Integer.parseInt(str);
25
26   for(int i=0; i<=n; i++) {
27     out.print(fibo(i) + " ");
28   }
29 %>
30 </body>
31 </html>
  
```

Step15: - Now run the code and check the Output.

Enter a value for n:

**Fibonacci series:**  
0 1 1 2 3 5