

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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FMSC2425170

For the Academic Year

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SIES College of Arts, Science and Commerce (Empowered Autonomous), Sion
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Department of Information Technology

CERTIFICATE

This is to certify that Mr. Kushte Shripad Shashikant, of MSc [Information Technology] Semester - I, Seat No. FMSC2425170 has successfully completed the practical's for the subject of Cloud Computing as a partial fulfilment of the degree M.Sc.(I.T.) during the academic year 2024-25.

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Date:

INDEX

Sr. No.	Practical's	Page No.
1	Implementing Failover Cluster on Windows	1
2	Implement VMware ESXi Server with VSphere Client	24
3	Implementing Google App Engine	43
4	Implementing IaaS using Eucalyptus	48
5	Manage XenServer with XenCenter	66
6	Implementing Hypervisor	89
7	Implementing OpenNebula	94
8	Implementing Amazon Web Service	102

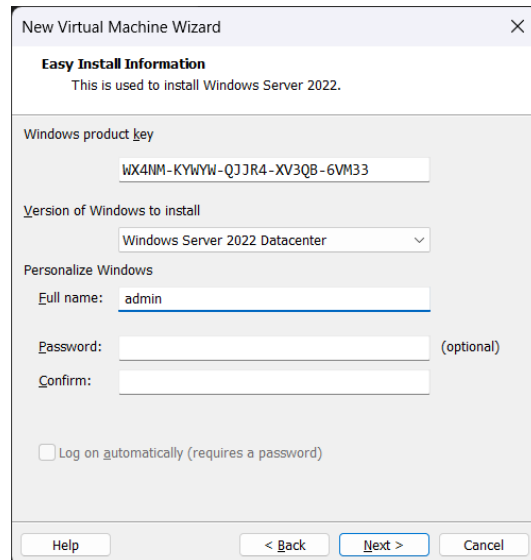
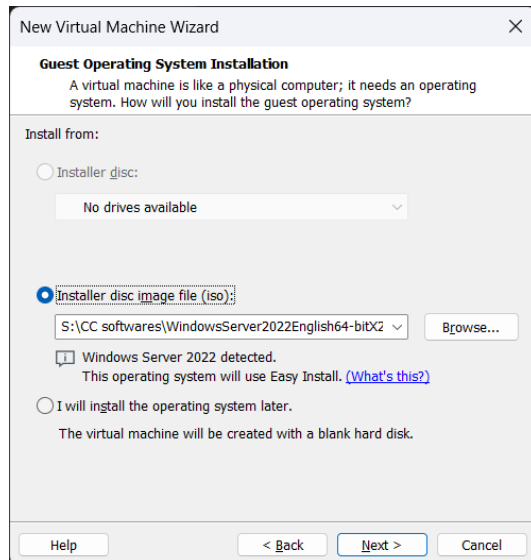
PRACTICAL 1

Aim :- Implementing Failover Cluster on Windows

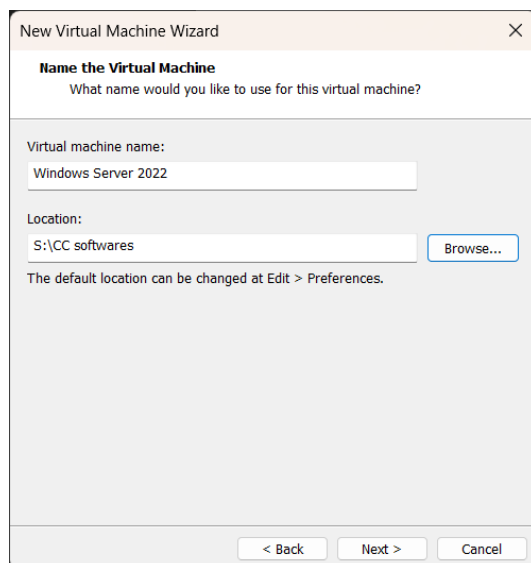
File used:- Windows Server 2022.iso file

Steps:-

Create a new VM



Give a Name → Next



Keep default storage capacity → split virtual disk into multiple files

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):

Recommended size for Windows Server 2022: 60 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.

Click on Customize Hardware

New Virtual Machine Wizard

Ready to Create Virtual Machine
Click Finish to create the virtual machine and start installing Windows Server 2022 and then VMware Tools.

The virtual machine will be created with the following settings:

Name:	FailoverCluster
Location:	S:\CC softwares
Version:	Workstation 17.5.x
Operating System:	Windows Server 2022
Hard Disk:	60 GB, Split
Memory:	2048 MB
Network Adapter:	NAT
Other Devices:	2 CPU cores, CD/DVD, USB Controller

☒ Power on this virtual machine after creation

Set Memory to 1GB → Network Adapter → Custom specific Virtual network

Hardware

Device	Summary
Memory	1 GB
Processors	2
New CD/DVD (DATA)	Using file S:\CC softwares\...
Network Adapter	Custom (VMnet1)
USB Controller	Present
Sound Card	Auto detect
Display	Auto detect

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: MB

☒ Maximum recommended memory (Memory swapping may occur beyond this size.)
☐ Recommended memory
☐ Guest OS recommended minimum

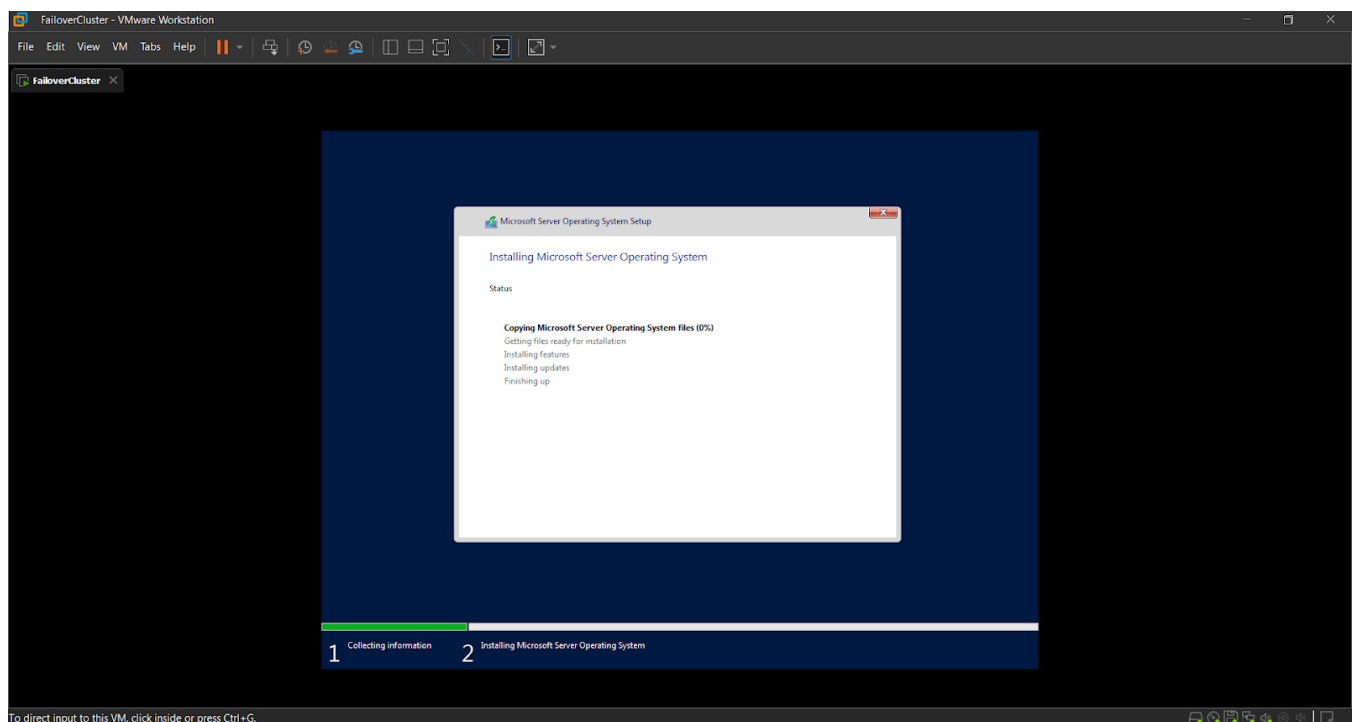
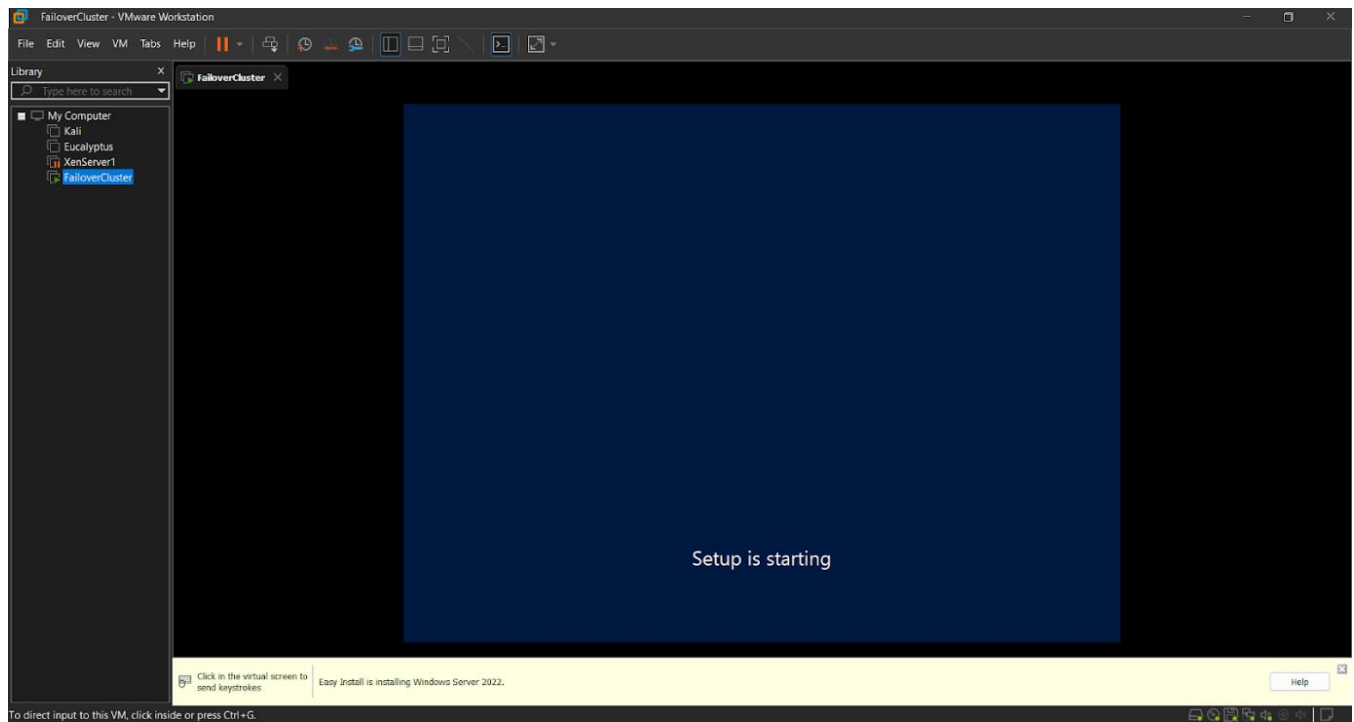
Hardware

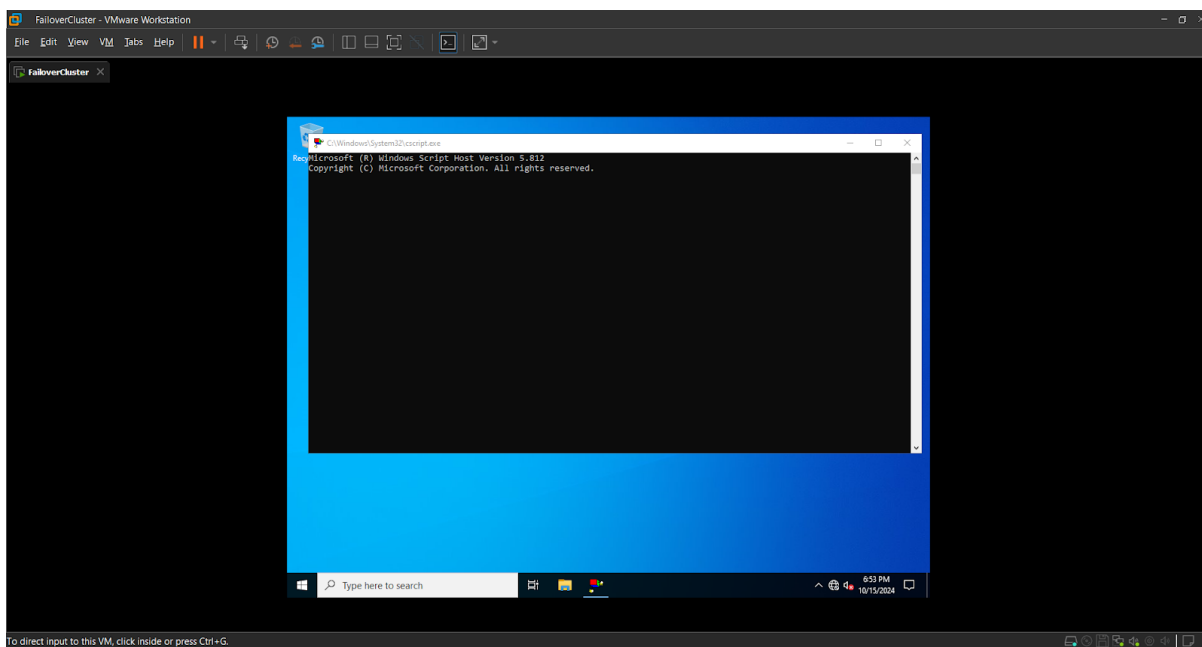
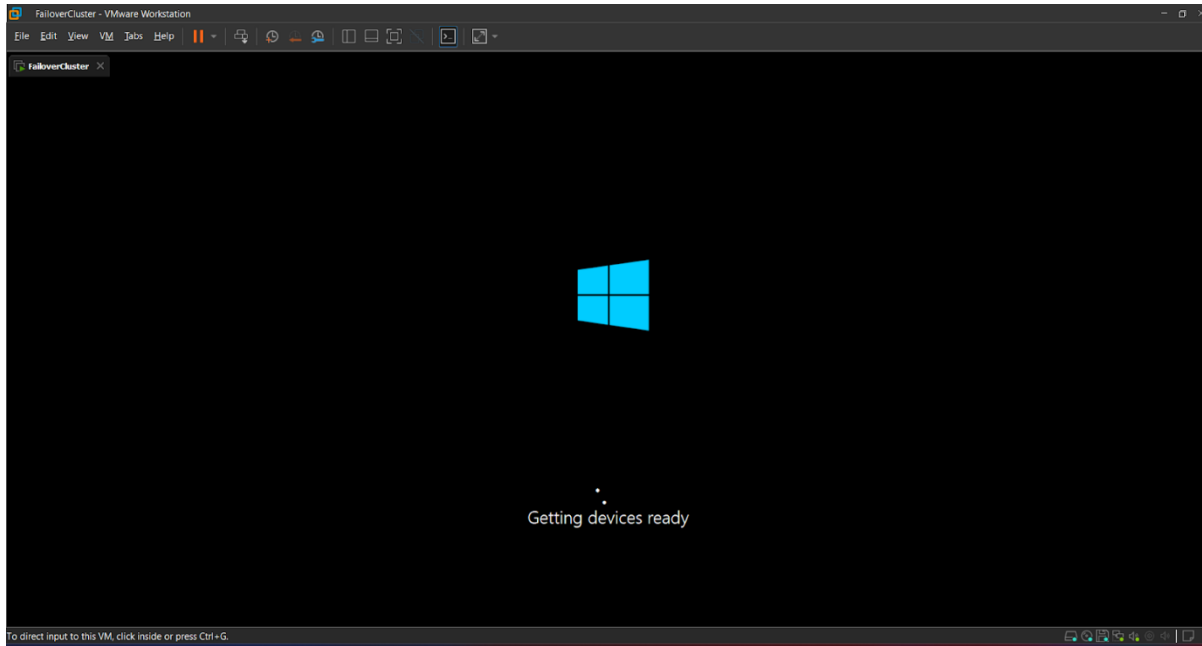
Device	Summary
Memory	1 GB
Processors	2
New CD/DVD (DATA)	Using file S:\CC softwares\...
Network Adapter	NAT
USB Controller	Present
Sound Card	Auto detect
Display	Auto detect

Device status
☐ Connected
☒ Connect at power on

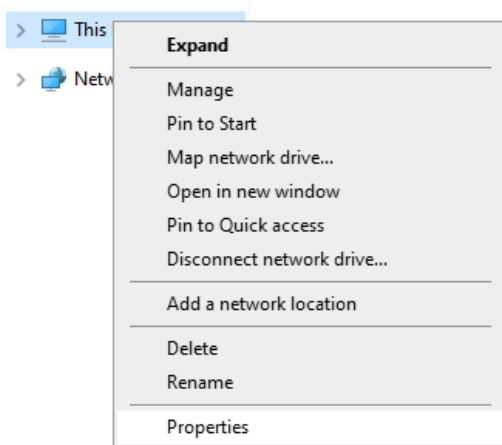
Network connection
☐ Bridged: Connected directly to the physical network
☐ Replicate physical network connection state
☐ NAT: Used to share the host's IP address
☐ Host-only: A private network shared with the host
☒ Custom: Specific virtual network
 VMnet1 (Host-only)

Now Power on the virtual machine





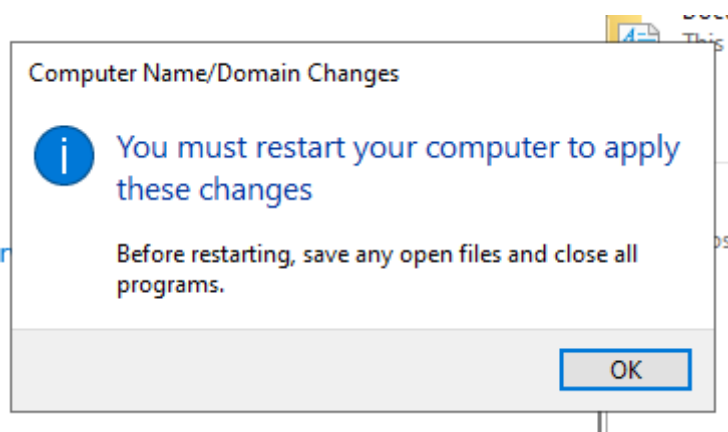
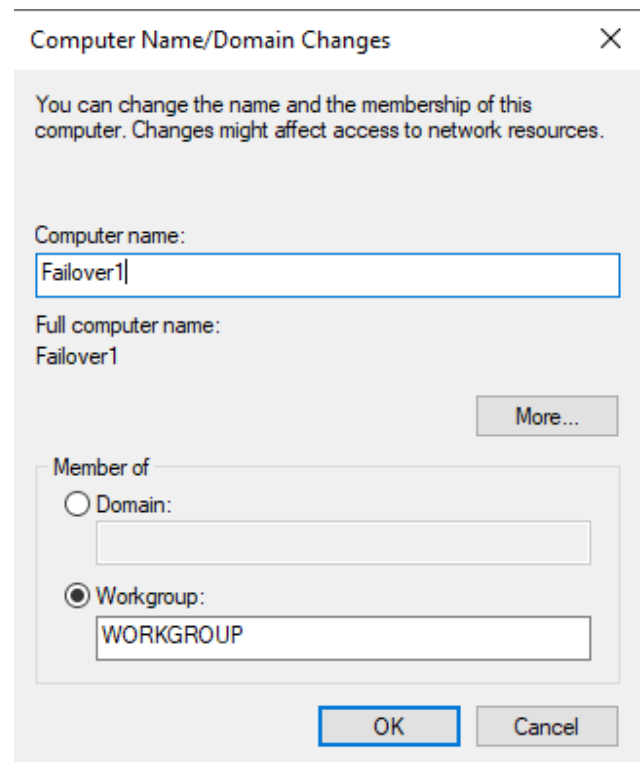
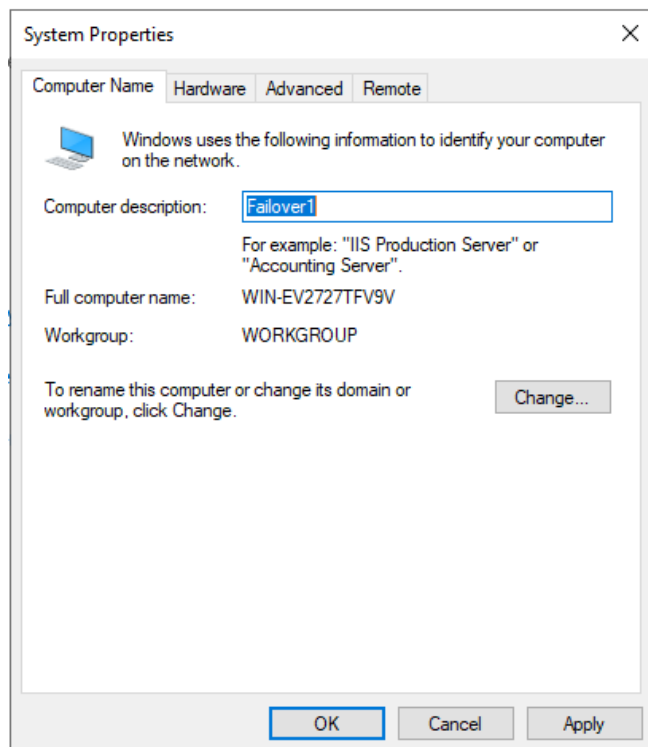
Ctrl + E → This Pc → Right Click → Properties



Related settings

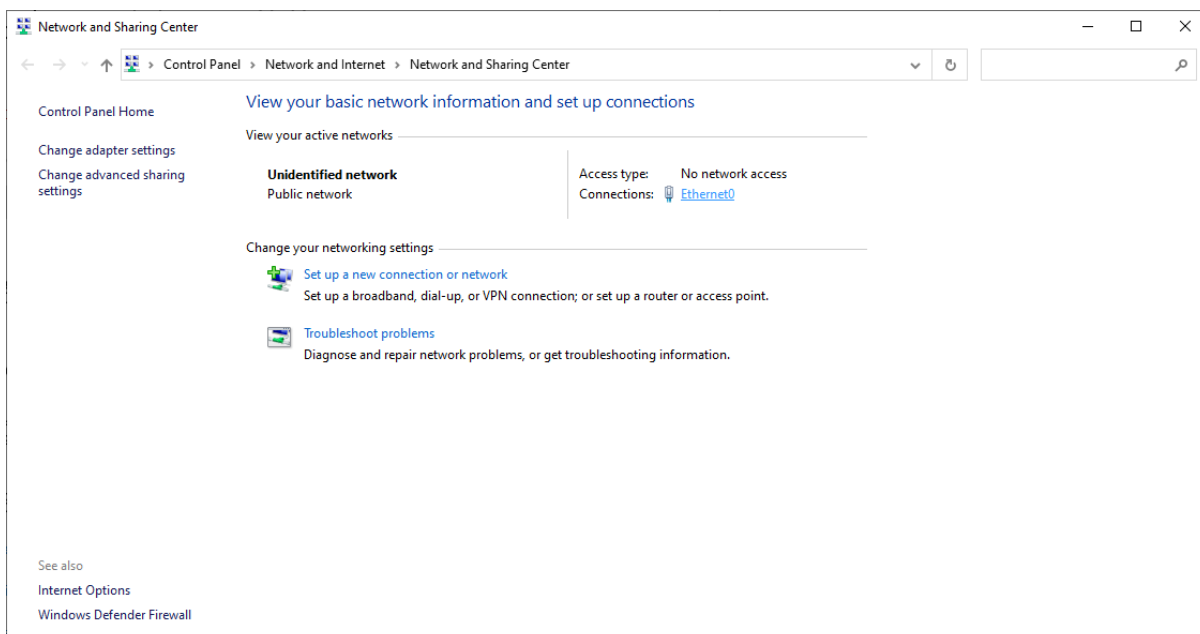
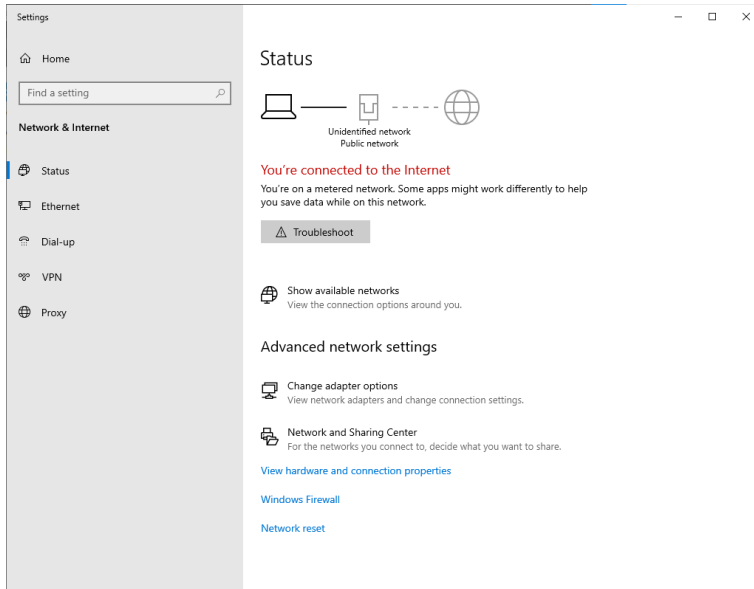
[Device Manager](#)[Remote desktop](#)[System protection](#)[Advanced system settings](#)[Rename this PC \(advanced\)](#)[Graphics settings](#)

Click on Rename this Pc (advanced) → give a name → Click on change → Ok

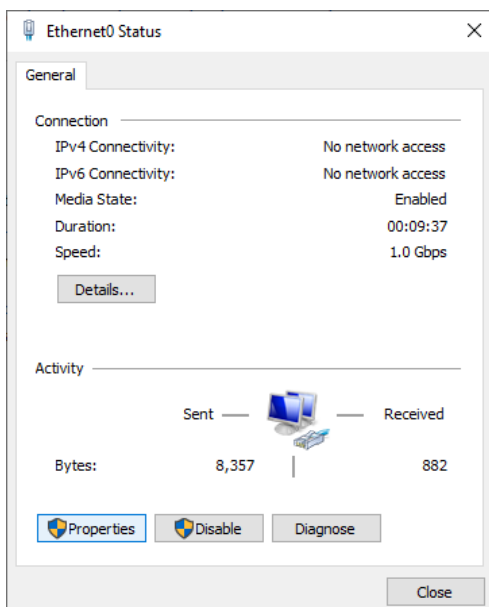


After restart

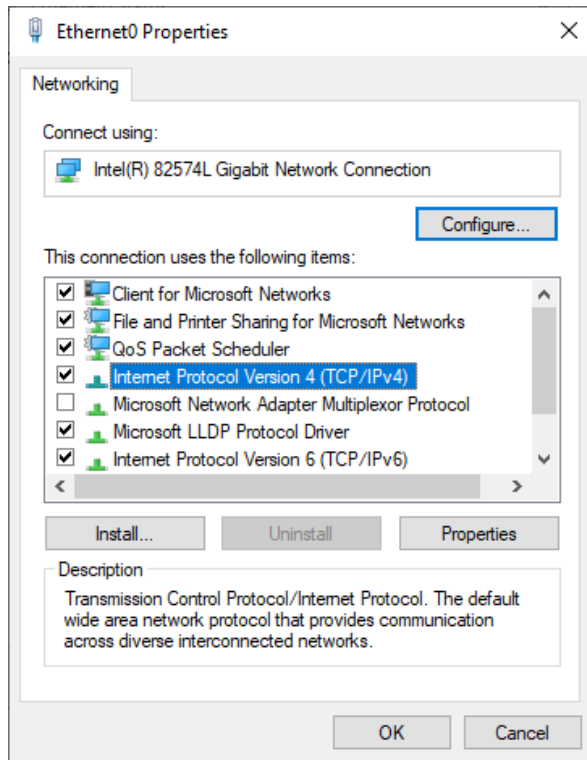
Go to setting → network and sharing centre → Click on Internet()



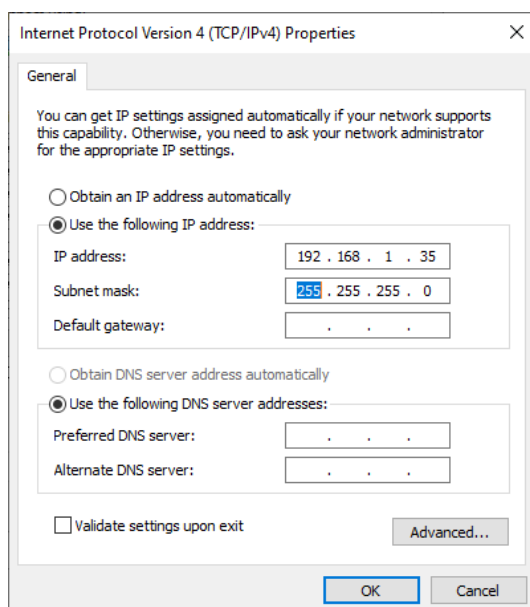
Click on properties →



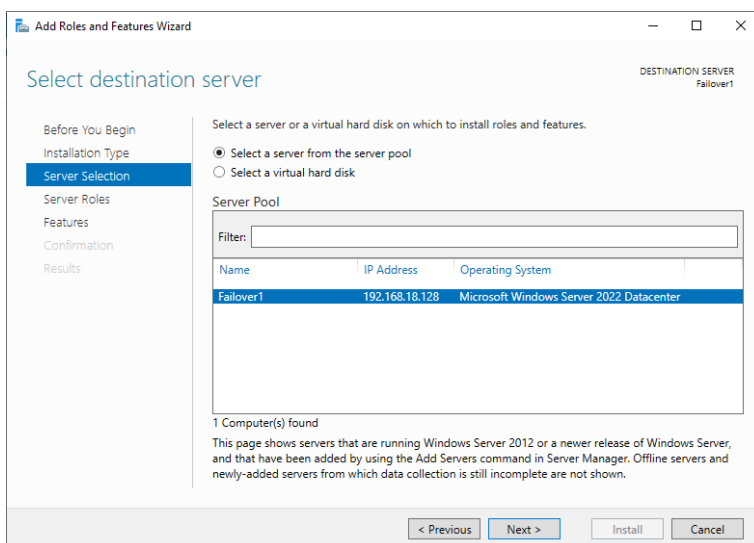
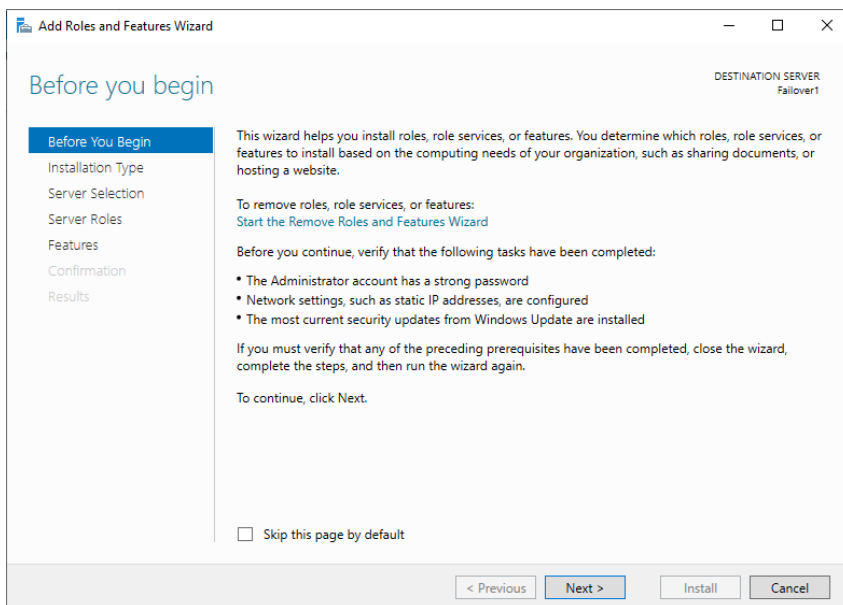
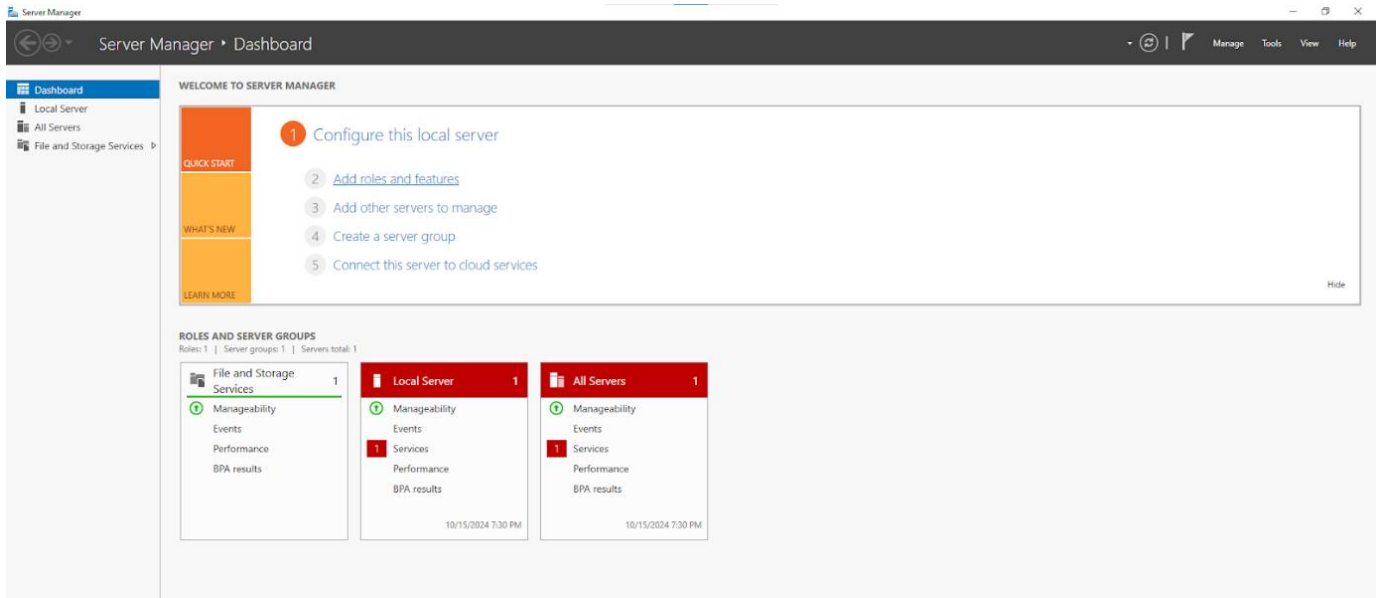
Click internet protocol version 4



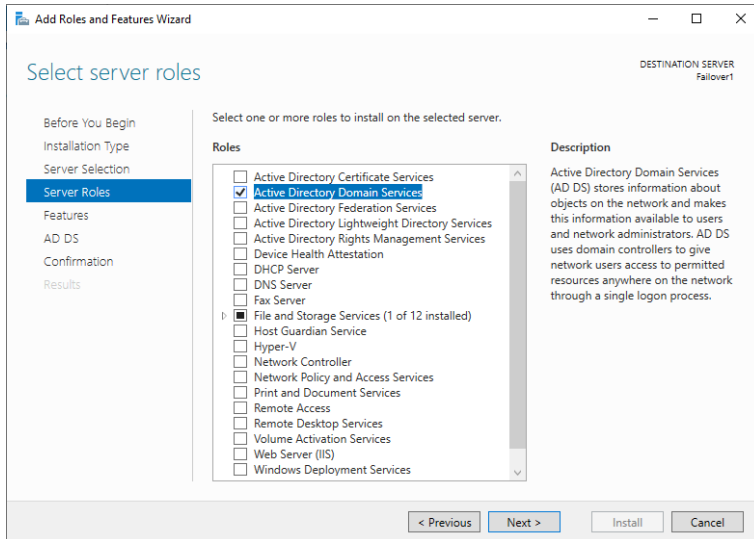
Now add ip address 192.168.1.35 , subnet mask



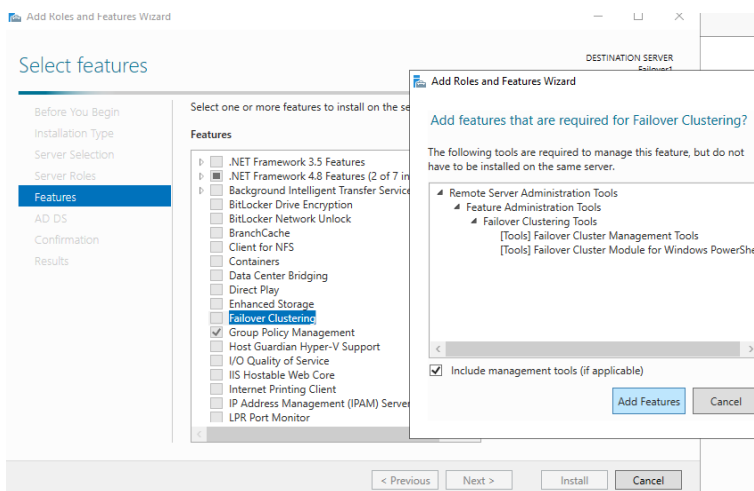
Now click on server manager → Add roles and features



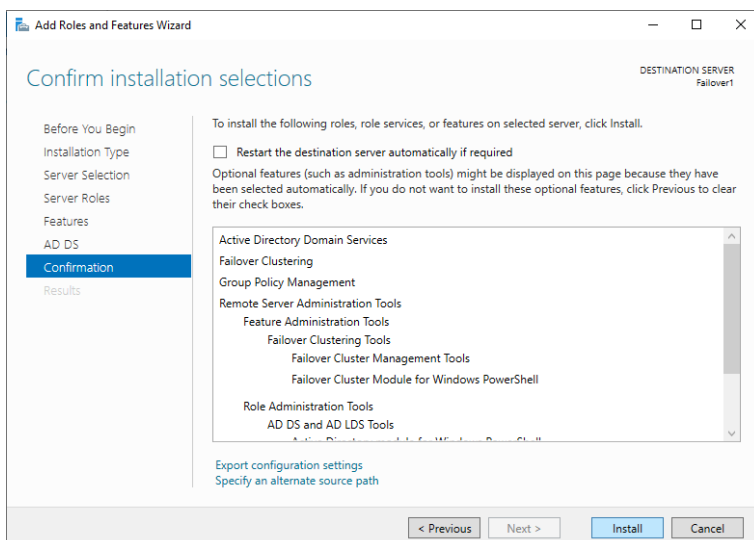
Check the Active Directory Domain Services → Add feature → next



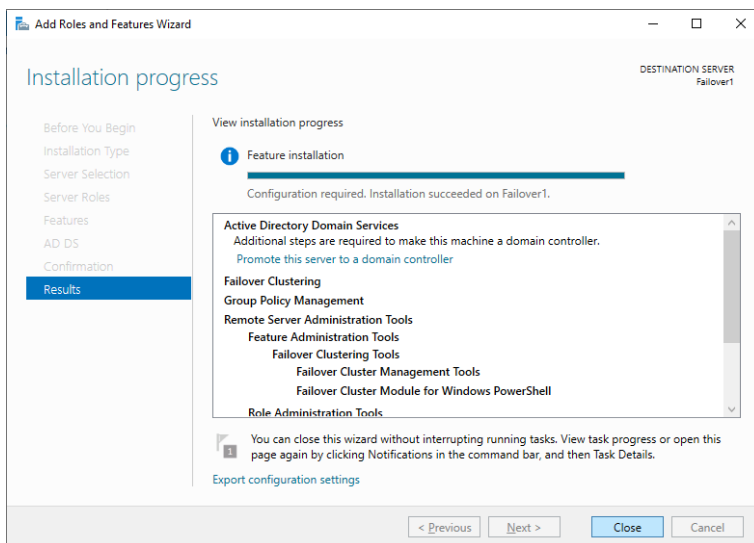
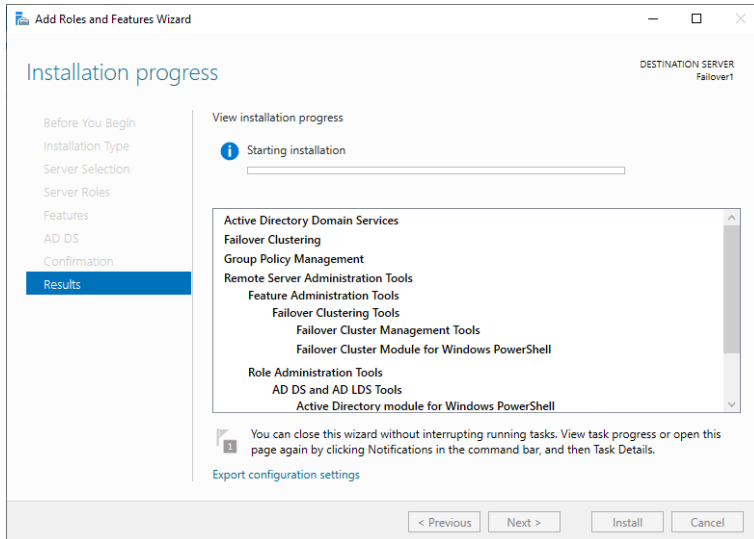
Click on failover cluster → add feature → Next



Click on install

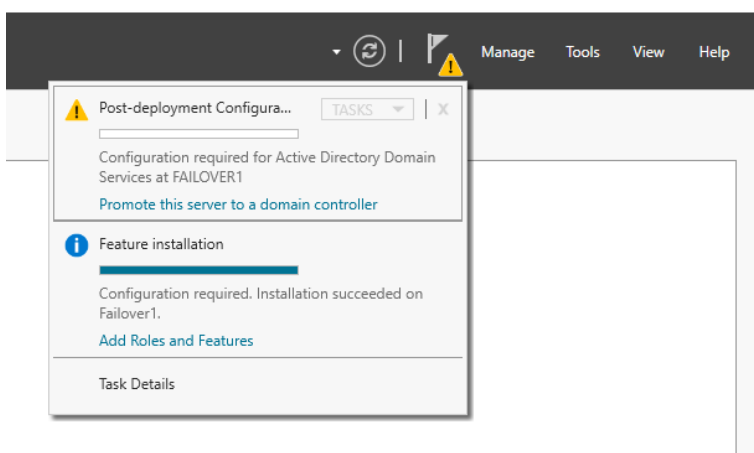


Installation started



After installation click on close

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



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

Active Directory Domain Services Configuration Wizard

Deployment Configuration

TARGET SERVER
Failover1

Deployment Configuration

Select the deployment operation

- ☐ Add a domain controller to an existing domain
- ☐ Add a new domain to an existing forest
- ☒ Add a new forest

Specify the domain information for this operation

Root domain name:

[More about deployment configurations](#)

< Previous Next > Install Cancel

Give password : root@2108 → next

Active Directory Domain Services Configuration Wizard

Domain Controller Options

TARGET SERVER
Failover1

Deployment Configuration

Domain Controller Options

Select functional level of the new forest and root domain

Forest functional level:

Domain functional level:

Specify domain controller capabilities

- ☒ Domain Name System (DNS) server
- ☒ Global Catalog (GC)
- ☐ Read only domain controller (RODC)

Type the Directory Services Restore Mode (DSRM) password

Password:

Confirm password:

[More about domain controller options](#)

< Previous Next > Install Cancel

Click on next

Active Directory Domain Services Configuration Wizard

DNS Options

TARGET SERVER
Failover1

Deployment Configuration

Domain Controller Options

DNS Options

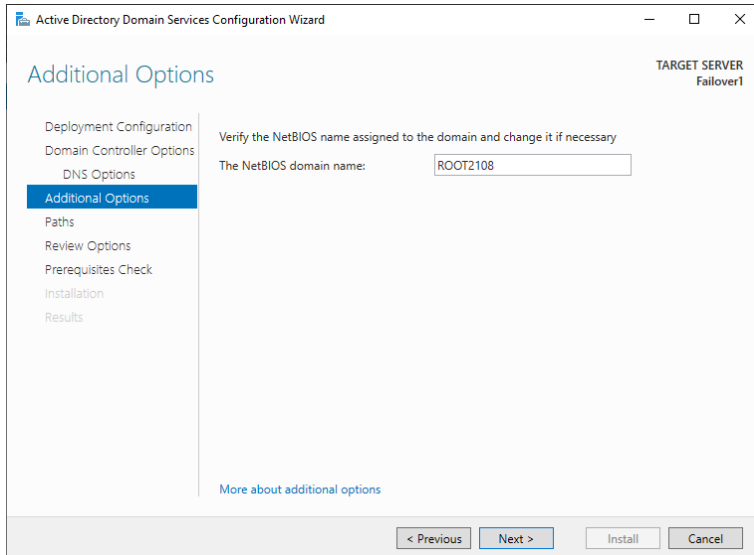
Specify DNS delegation options

- ☐ Create DNS delegation

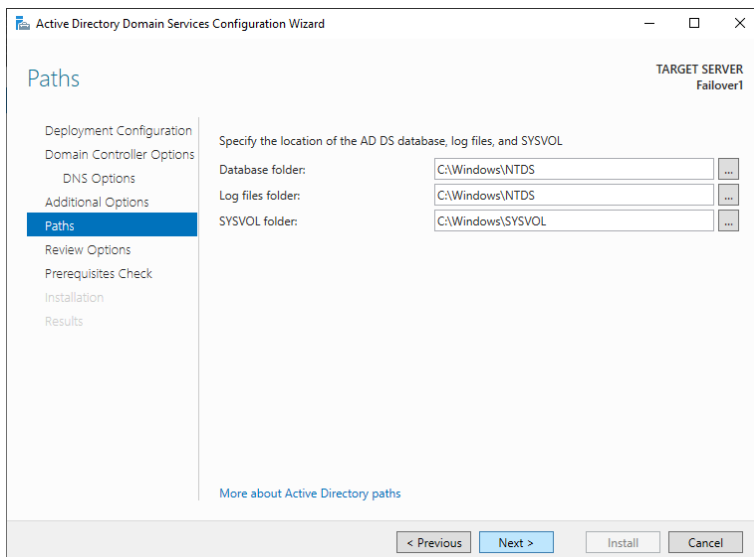
[More about DNS delegation](#)

< Previous Next > Install Cancel

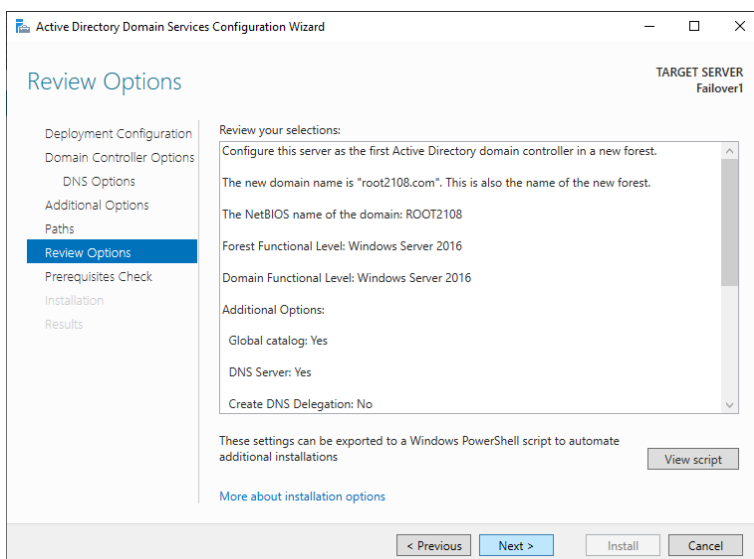
Don't do anything .. it comes automatically → next



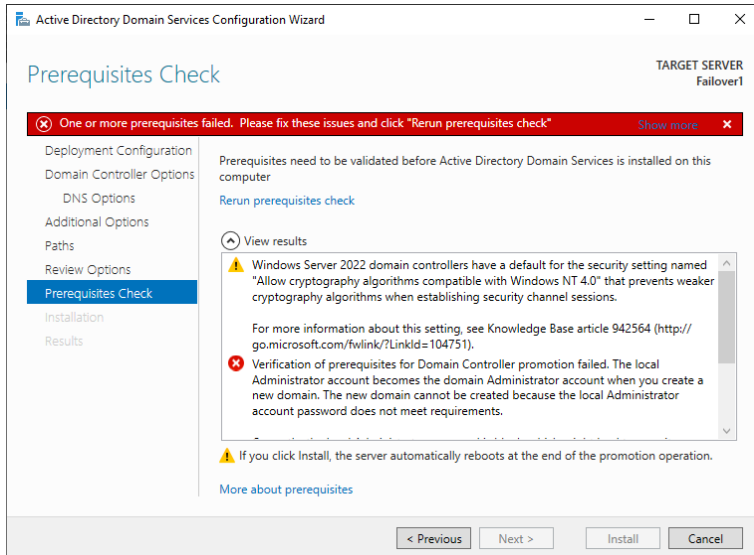
Click on Next



Click on next



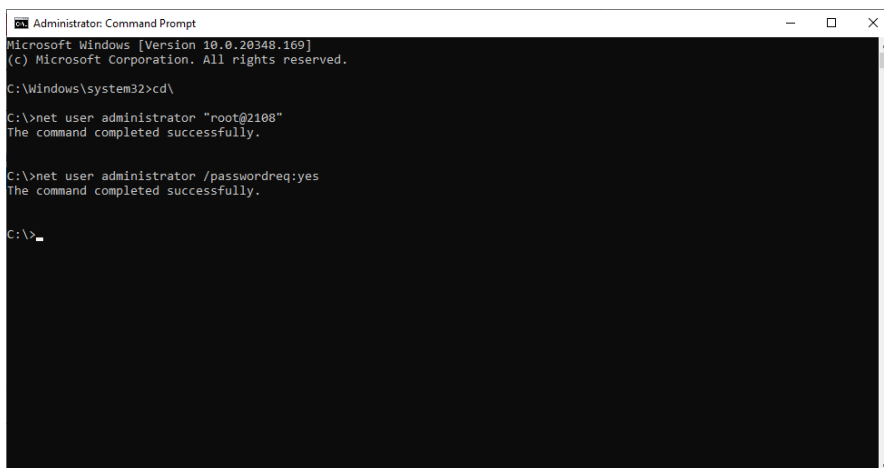
Now it will give u an error



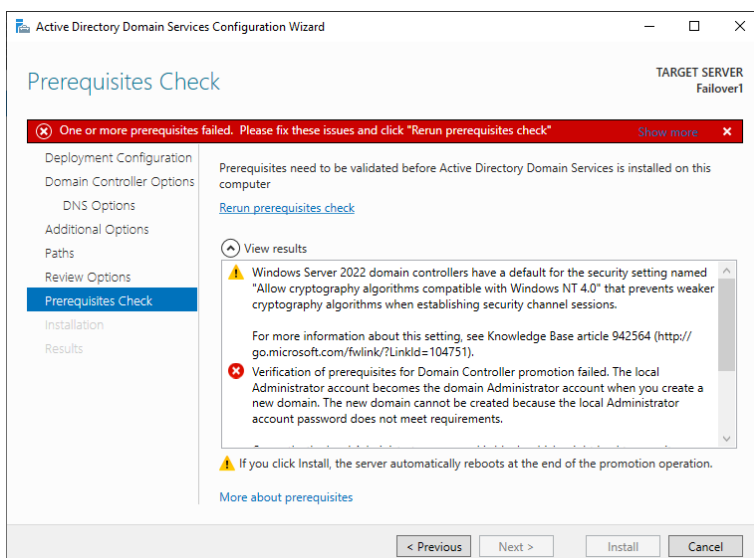
Open cmd → run as administrator → Now type the following commands:-

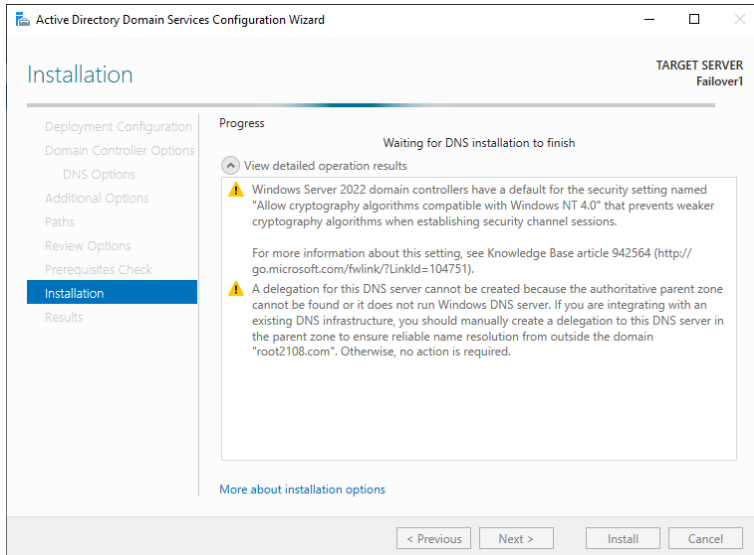
- cd\
- net user administrator "root@2108"
- net user administrator /passwordreq:yes

root@2108 – this is the password u set before

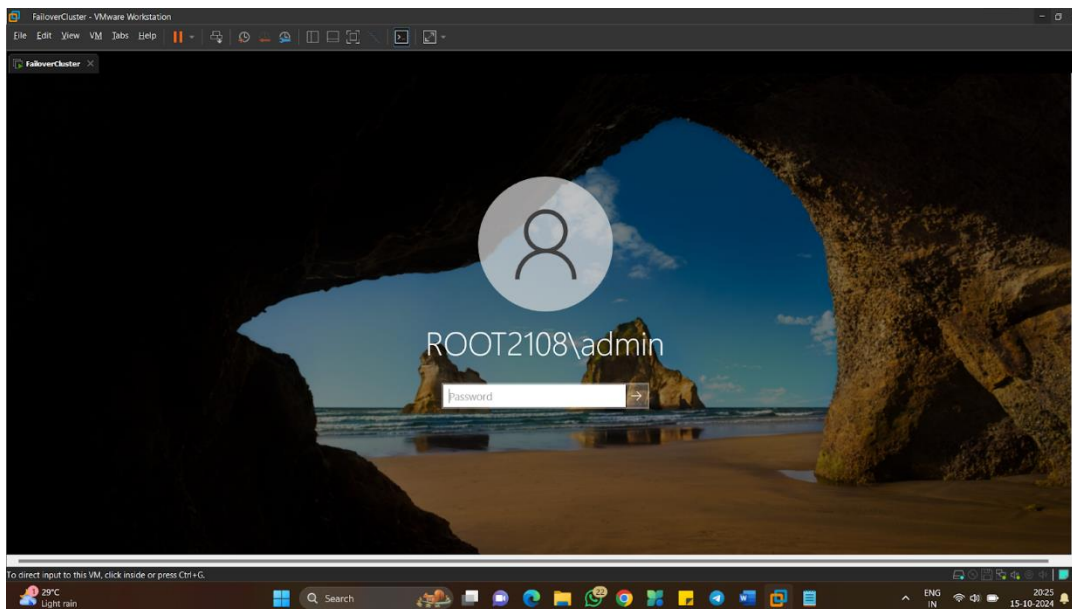


Now click on rerun prerequisites check → install



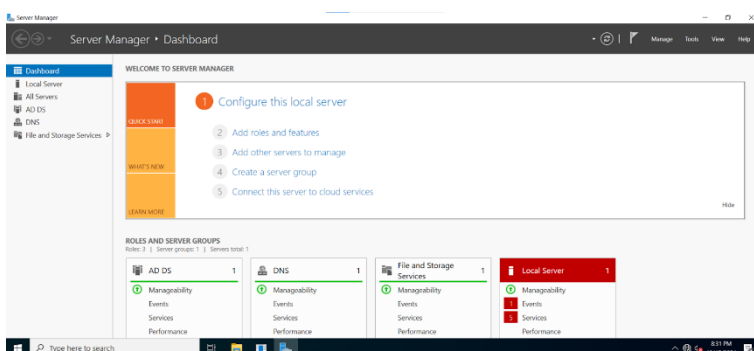


After this the PC will restart

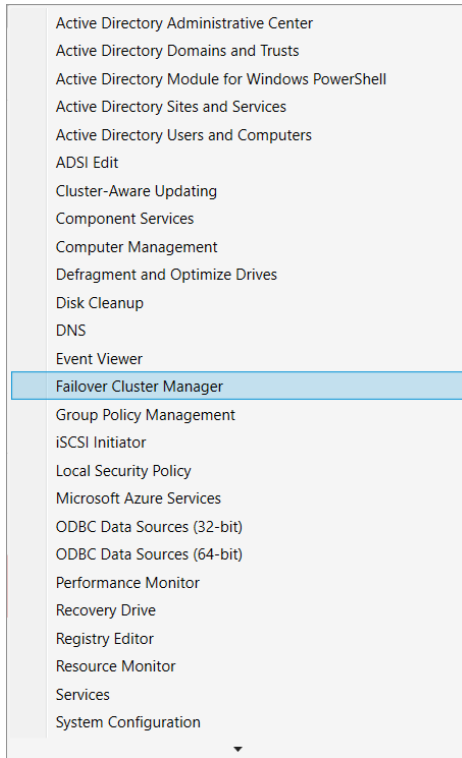


Now enter the password

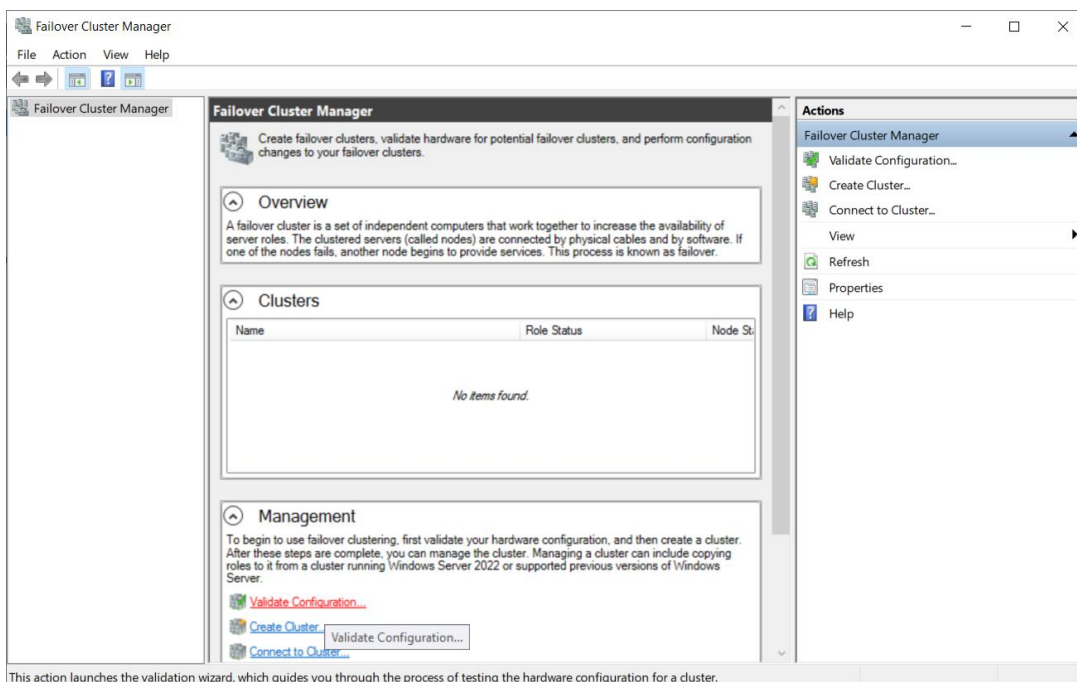
Click on tools



Now click on tools ☐ failover cluster manager



Failover Cluster manager opens → Click on validate configuration



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

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:

Computers

Object Types...

From this location:

root2108.com

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

Now run all test

Validate a Configuration Wizard

Testing Options

Before You Begin

Select Servers or a Cluster

Testing Options

Confirmation

Validating

Summary

Choose between running all tests or running selected tests.

The tests examine the Cluster Configuration, Hyper-V Configuration, Inventory, Network, Storage, and System Configuration.

Microsoft supports a cluster solution only if the complete configuration (servers, network, and storage) can pass all tests in this wizard. In addition, all hardware components in the cluster solution must be "Certified for Windows Server 2022."

☒ Run all tests (recommended)

☐ Run only tests I select

[More about cluster validation tests](#)

< Previous Next > Cancel

Now click on next

Validate a Configuration Wizard

Validating

Before You Begin

Select Servers or a Cluster

Testing Options

Confirmation

Validating

Summary

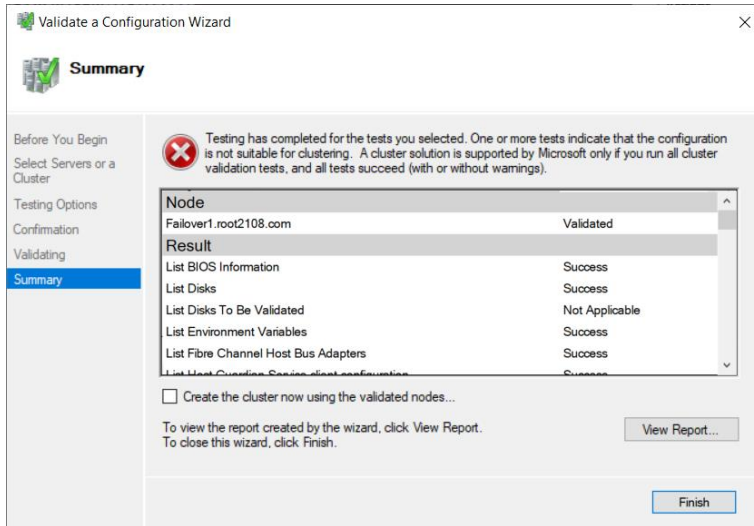
The following validation tests are running. Depending on the test selection, this may take a significant amount of time.

Progress	Test	Result
100%	List iSCSI Host Bus Adapters	The test passed.
100%	List SAS Host Bus Adapters	The test passed.
100%	List BIOS Information	The test passed.
100%	List Environment Variables	The test passed.
100%	List Host Guardian Service client configuration	The test passed.
100%	List Memory Information	The test passed.
100%	List Operating System Information	The test passed.
0%	List Plug and Play Devices	Test is currently running.

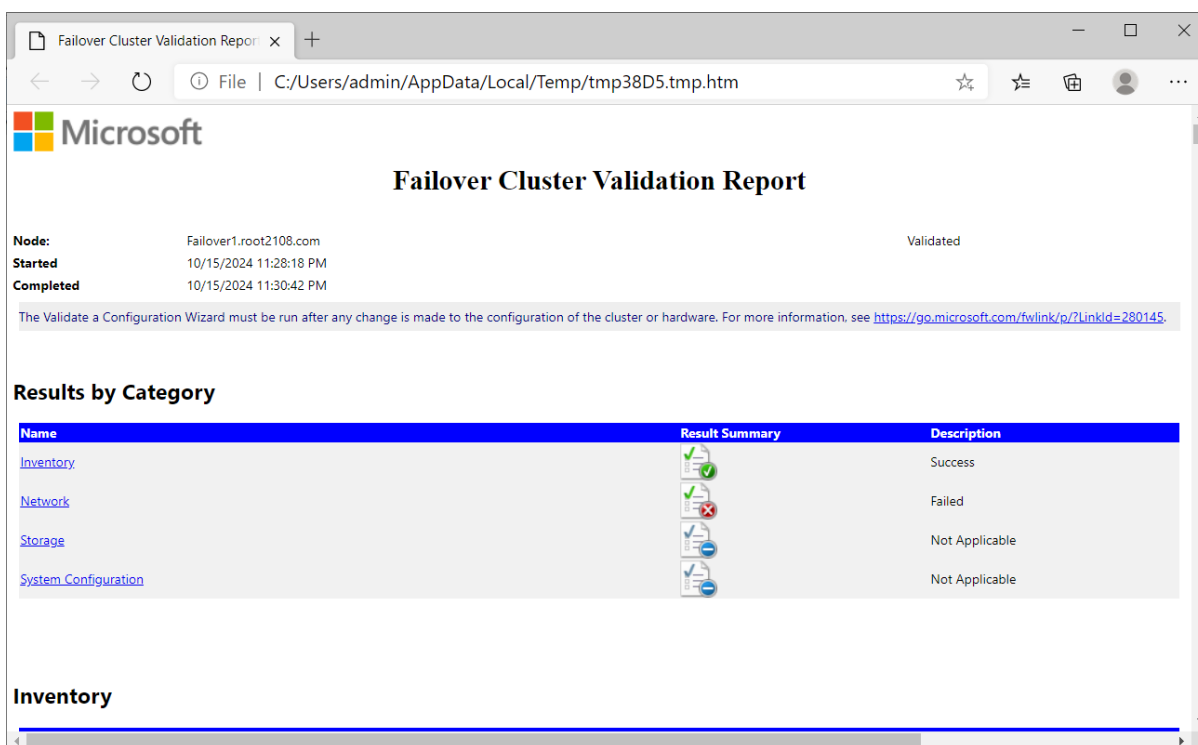
Test is currently running.

Cancel

Now click on view report



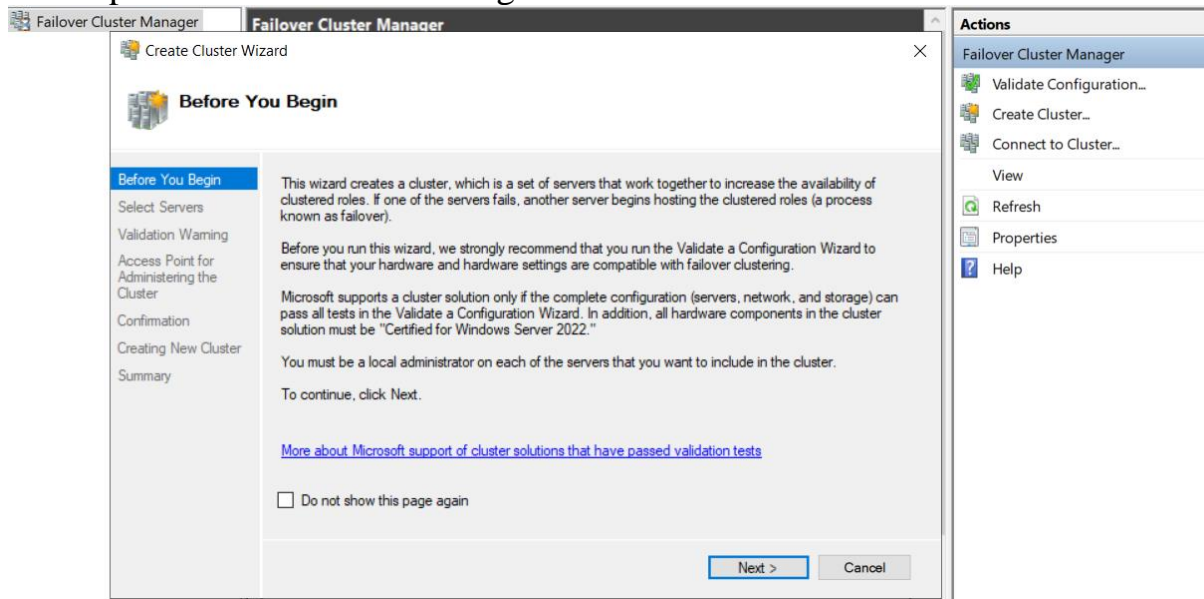
Then it will display the following page



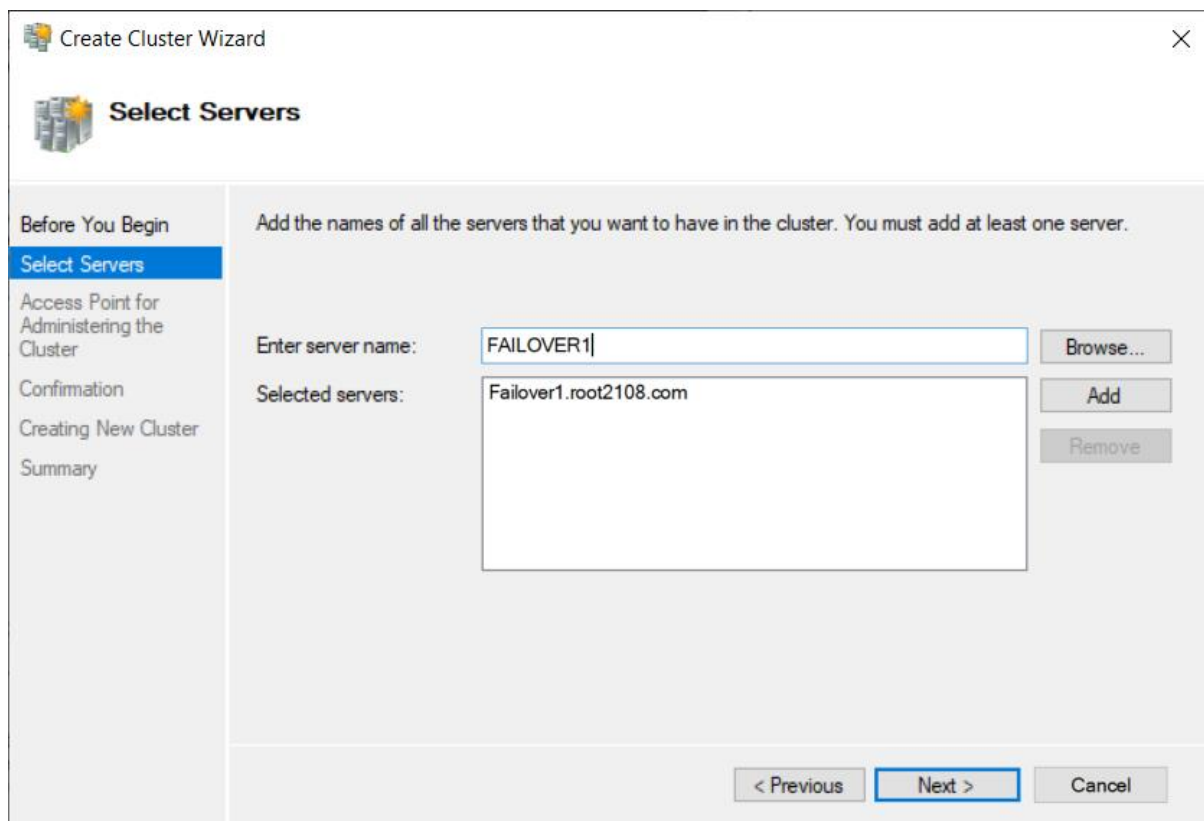
After viewing the report click on finish

Creating Cluster

Now open failover cluster manager → Create Cluster → next



Click on browse → Advanced → Find now → 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. 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

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

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

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

Create Cluster Wizard

Summary

Before You Begin

Select Servers

Access Point for Administering the Cluster

Confirmation

Creating New Cluster

Summary

You have successfully completed the Create Cluster Wizard.

Node
Failover1.root2108.com
Cluster
ROOT_123
Quorum
Node Majority
IP Address
192.168.1.24

To view the report created by the wizard, click View Report.
To close this wizard, click Finish.

View Report...

Finish

Create Cluster

File | C:/Users/admin/AppData/Local/Temp/tmpC6CC.tmp.htm

Create Cluster

Cluster:	ROOT_123
Node:	Failover1.root2108.com
Quorum:	Node Majority
IP Address:	192.168.1.24
Cluster registration:	DNS and Active Directory Domain Services
Started	10/15/2024 11:52:49 PM
Completed	10/15/2024 11:53:09 PM

Beginning to configure the cluster ROOT_123.

Initializing Cluster ROOT_123.

Validating cluster state on node Failover1.root2108.com.

Searching the domain for computer object 'ROOT_123'.

Find a suitable domain controller for node Failover1.root2108.com.

Check whether the computer object ROOT_123 for node Failover1.root2108.com exists in the domain. Domain controller \\Failover1.root2108.com.

Computer object for ROOT_123 does not exist in the domain.

Find a suitable domain controller for node Failover1.root2108.com.

Bind to domain controller \\Failover1.root2108.com.

Check whether the computer object Failover1.root2108.com for node Failover1.root2108.com exists in the domain. Domain controller \\Failover1.root2108.com.

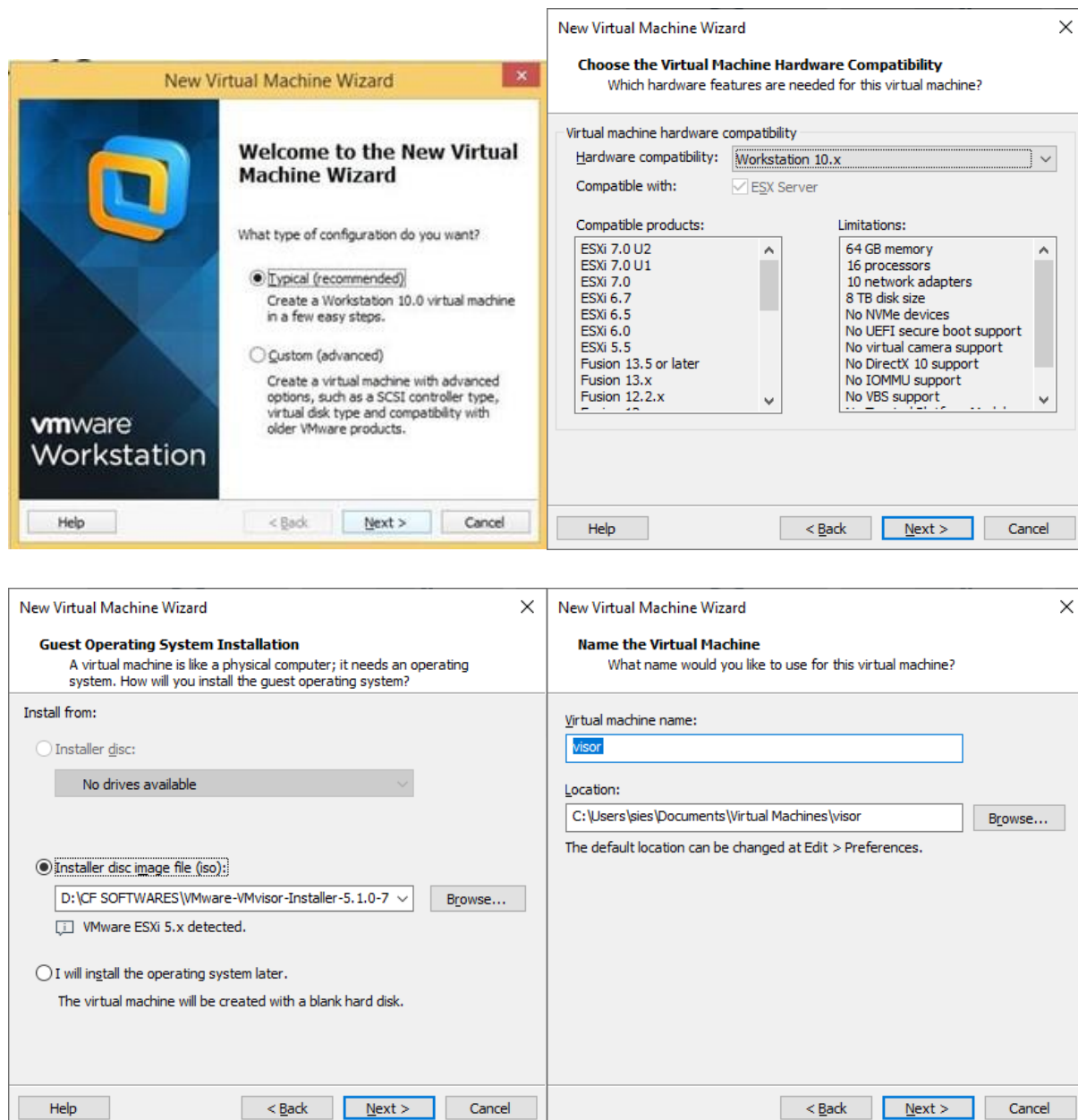
PRACTICAL 2

Aim :- Implement VMware ESXi Server with VSphere Client

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

Step:-

Create a new VM



<p>New Virtual Machine Wizard X</p> <p>Processor Configuration Specify the number of processors for this virtual machine.</p> <p>Processors</p> <p>Number of processors: <input type="text" value="2"/></p> <p>Number of cores per processor: <input type="text" value="1"/></p> <p>Total processor cores: 2</p> <p>Help < Back Next > Cancel</p>	<p>New Virtual Machine Wizard X</p> <p>Memory for the Virtual Machine How much memory would you like to use for this virtual machine?</p> <p>Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.</p> <p>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 -</p> <p>Memory for this virtual machine: <input type="text" value="4096"/> MB</p> <p>Maximum recommended memory: 6.0 GB</p> <p>Recommended memory: 4 GB</p> <p>Guest OS recommended minimum: 4 GB</p> <p>Help < Back Next > Cancel</p>
<p>New Virtual Machine Wizard X</p> <p>Network Type 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 < Back Next > Cancel</p>	<p>New Virtual Machine Wizard X</p> <p>Select I/O Controller Types 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 < Back Next > Cancel</p>
<p>New Virtual Machine Wizard X</p> <p>Select a Disk Type 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>NVMe disks are not supported by VMware ESXi 5.x.</p> <p>Help < Back Next > Cancel</p>	<p>New Virtual Machine Wizard X</p> <p>Select a Disk 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 < Back Next > Cancel</p>

New Virtual Machine Wizard

Specify Disk Capacity

How large do you want this disk to be?

Maximum disk size (GB):

Recommended size for VMware ESXi 5.x: 40 GB

☐ 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.

☒ 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

New Virtual Machine Wizard

Specify Disk File

Where would you like to store the disk file?

Disk file

One 100 GB disk file will be created using this file name.

Browse...

Help

< Back

Next >

Cancel

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...

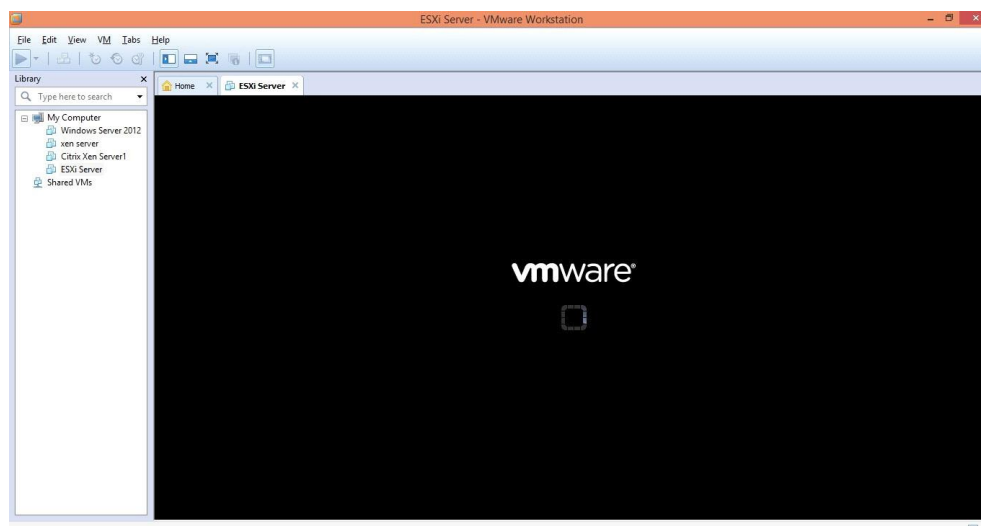
☒ Power on this virtual machine after creation

< Back

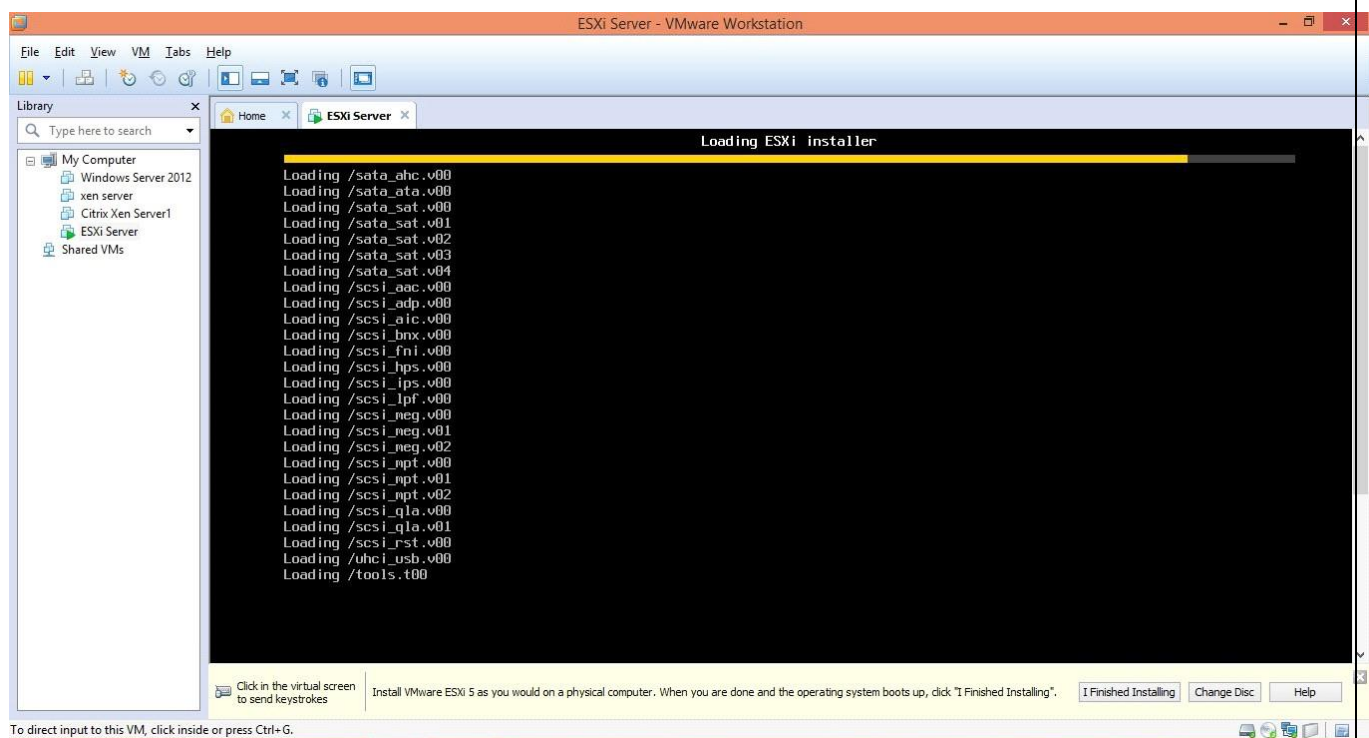
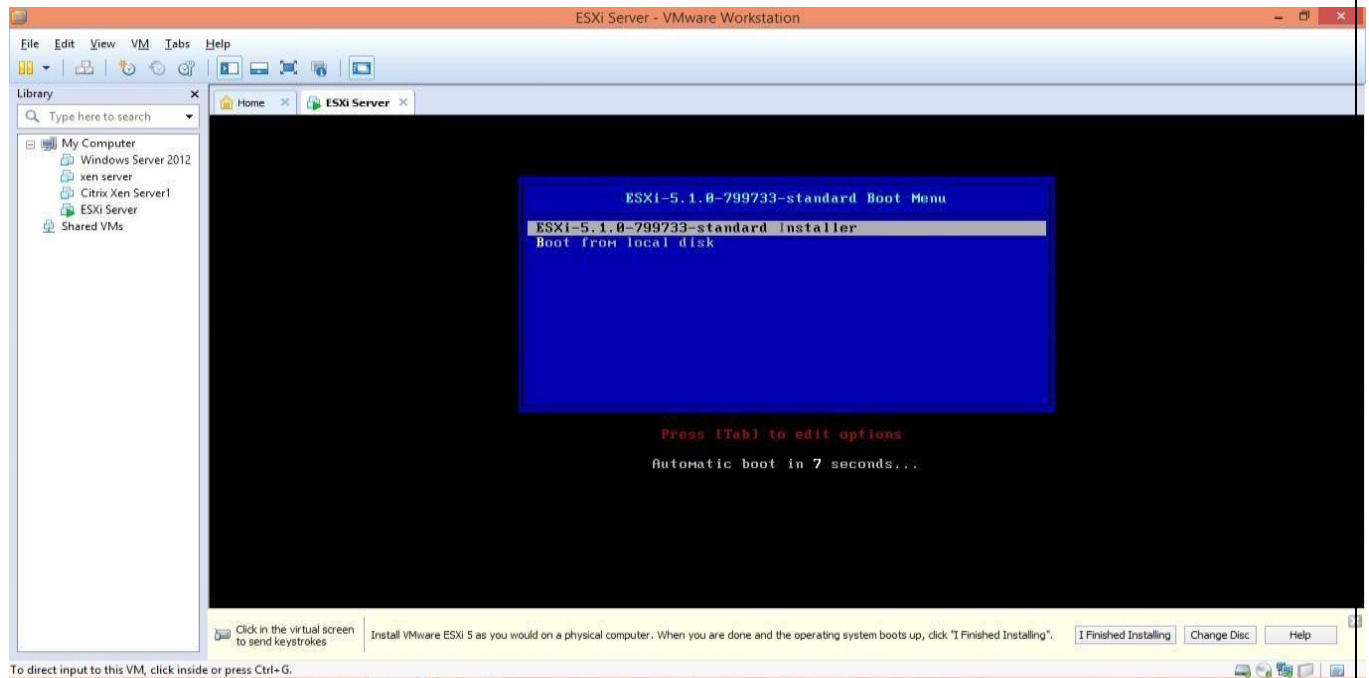
Finish

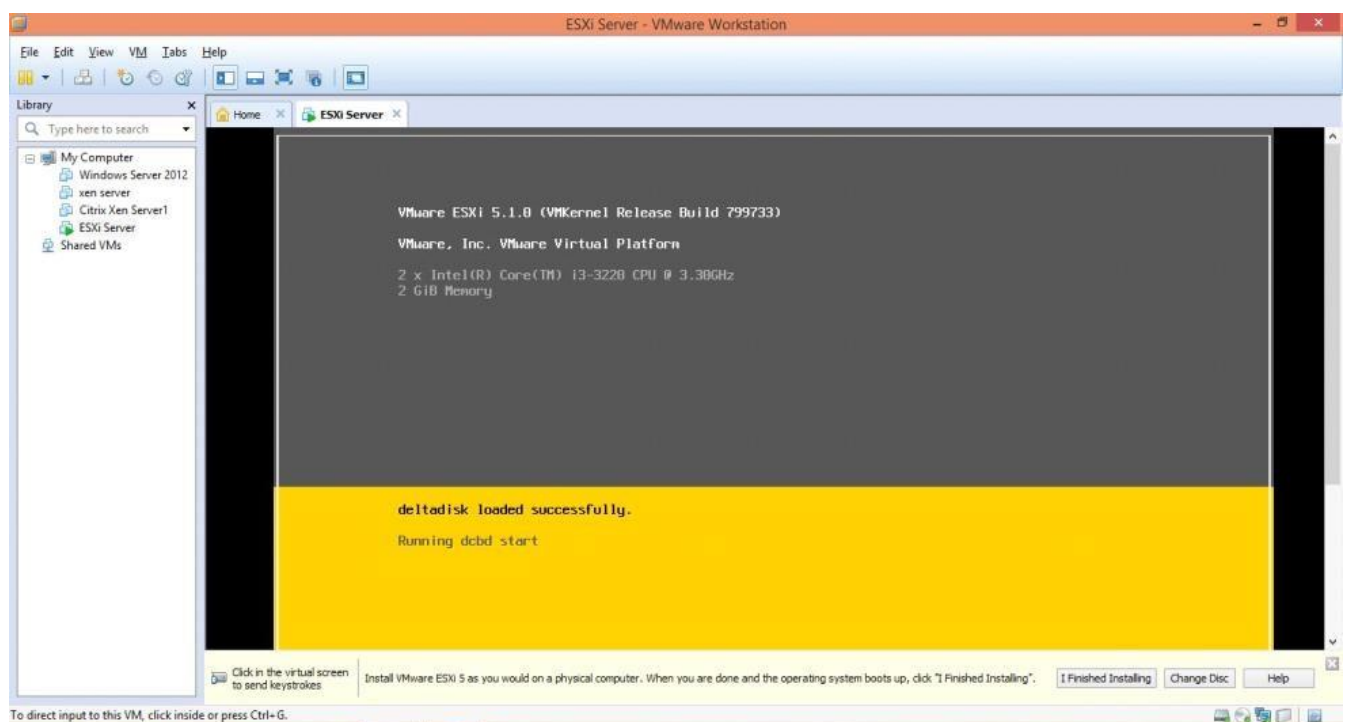
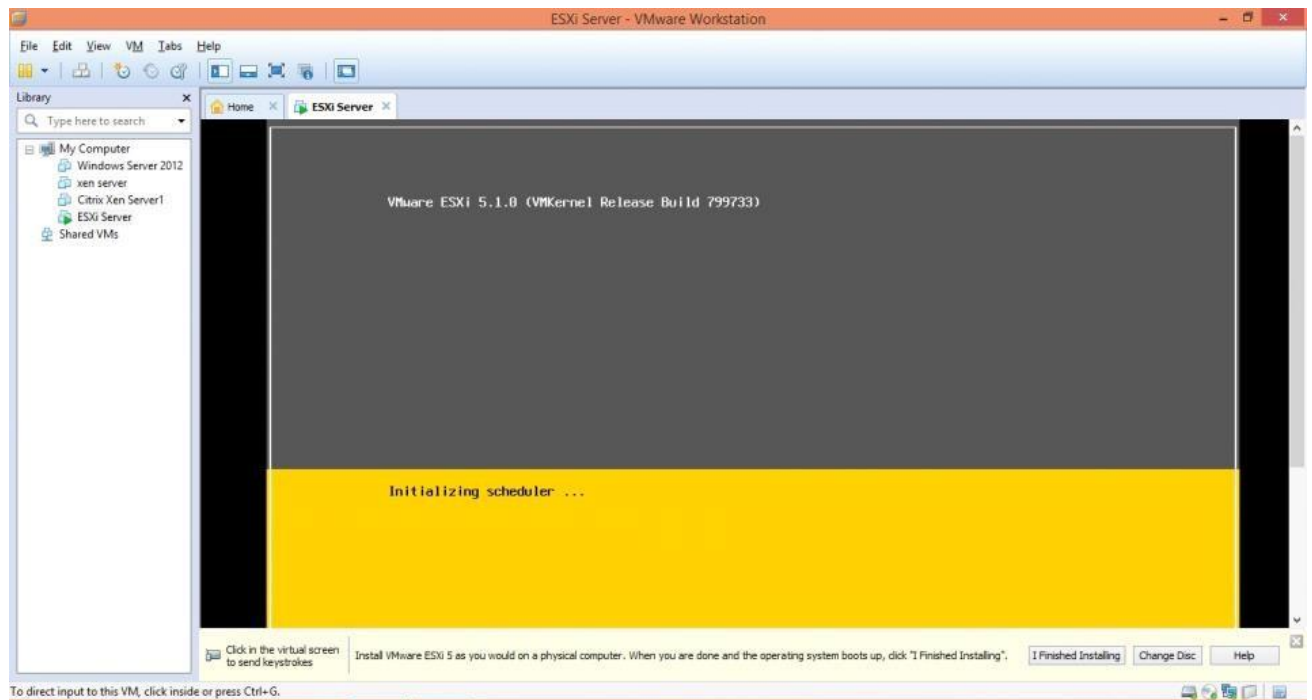
Cancel

At the final window click on “Finish” button.

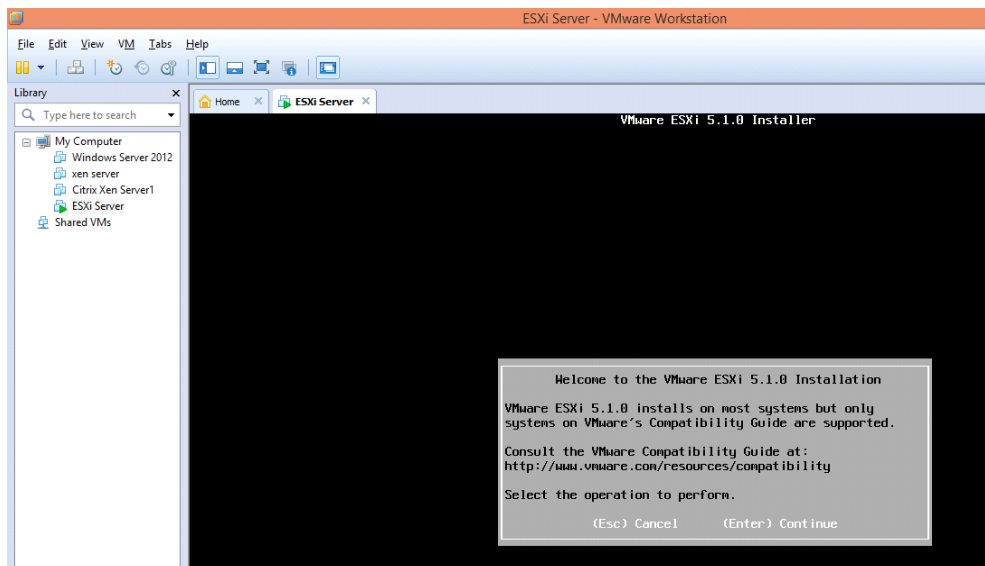


Creation of Virtual Machine is in progress...

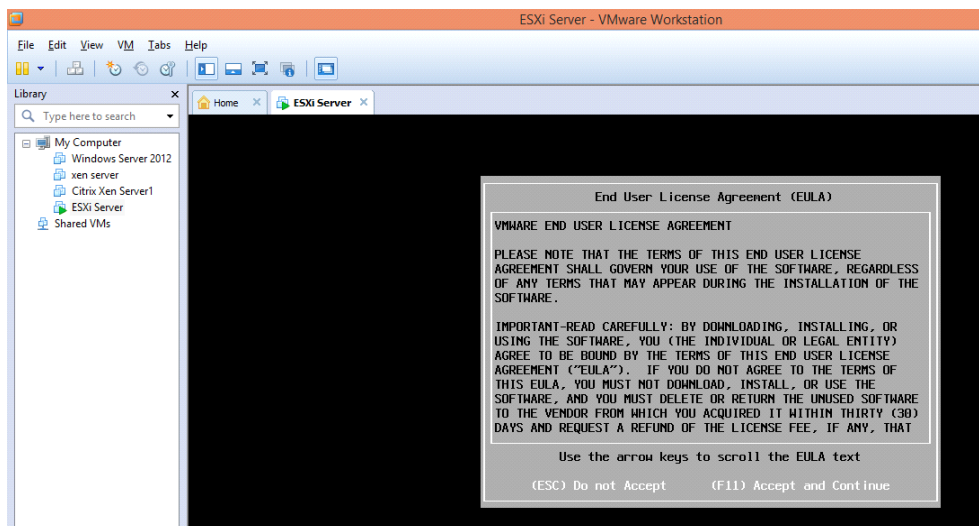




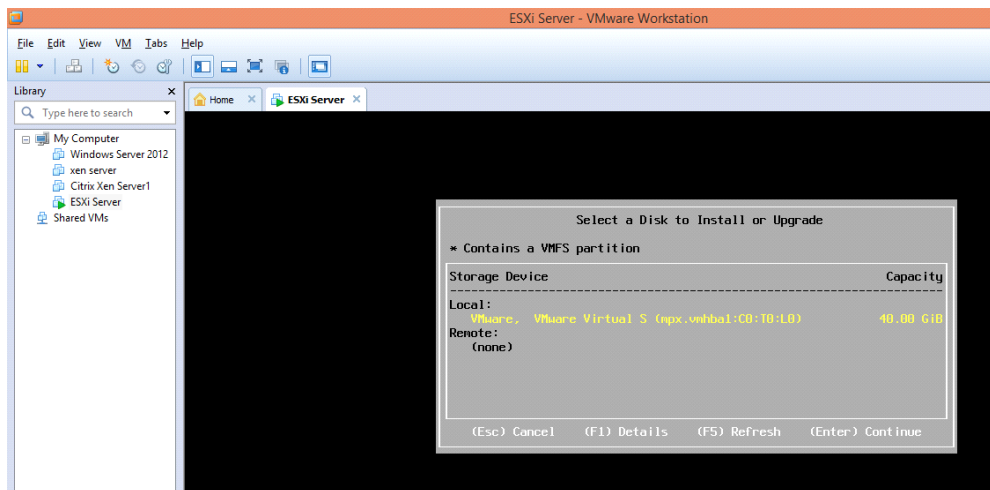
In the following screen click on Continue or press Enter key.



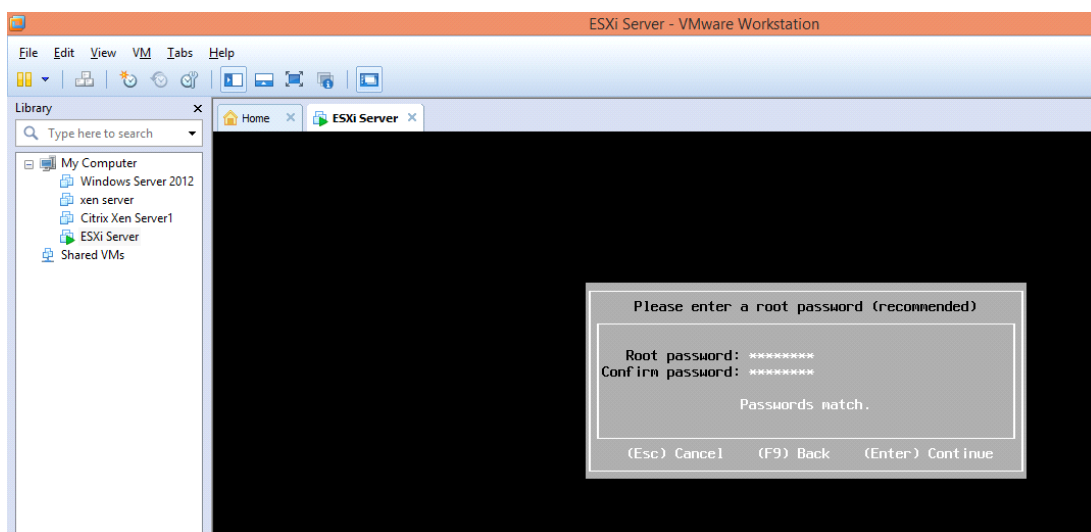
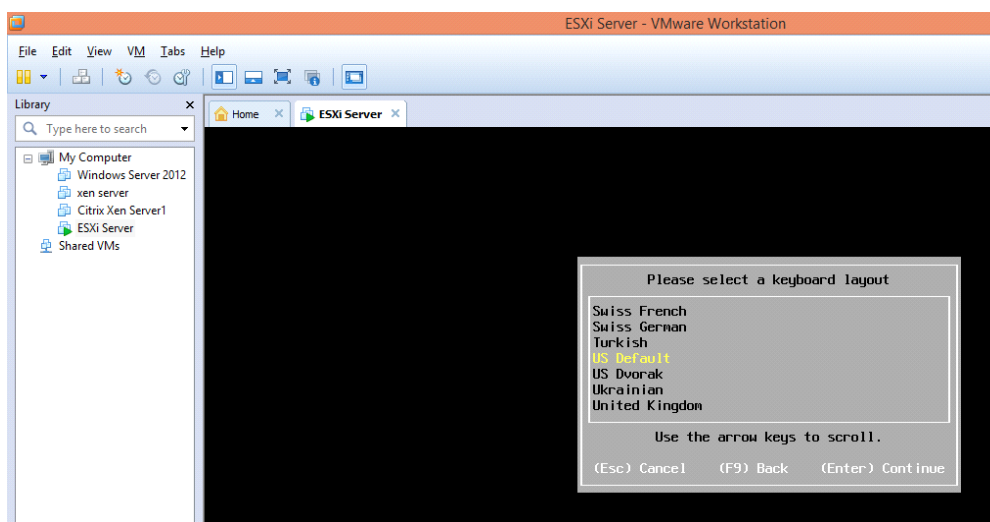
For License Agreement click on “Accept and Continue” or press F11 key.



For Installation press Enter key.

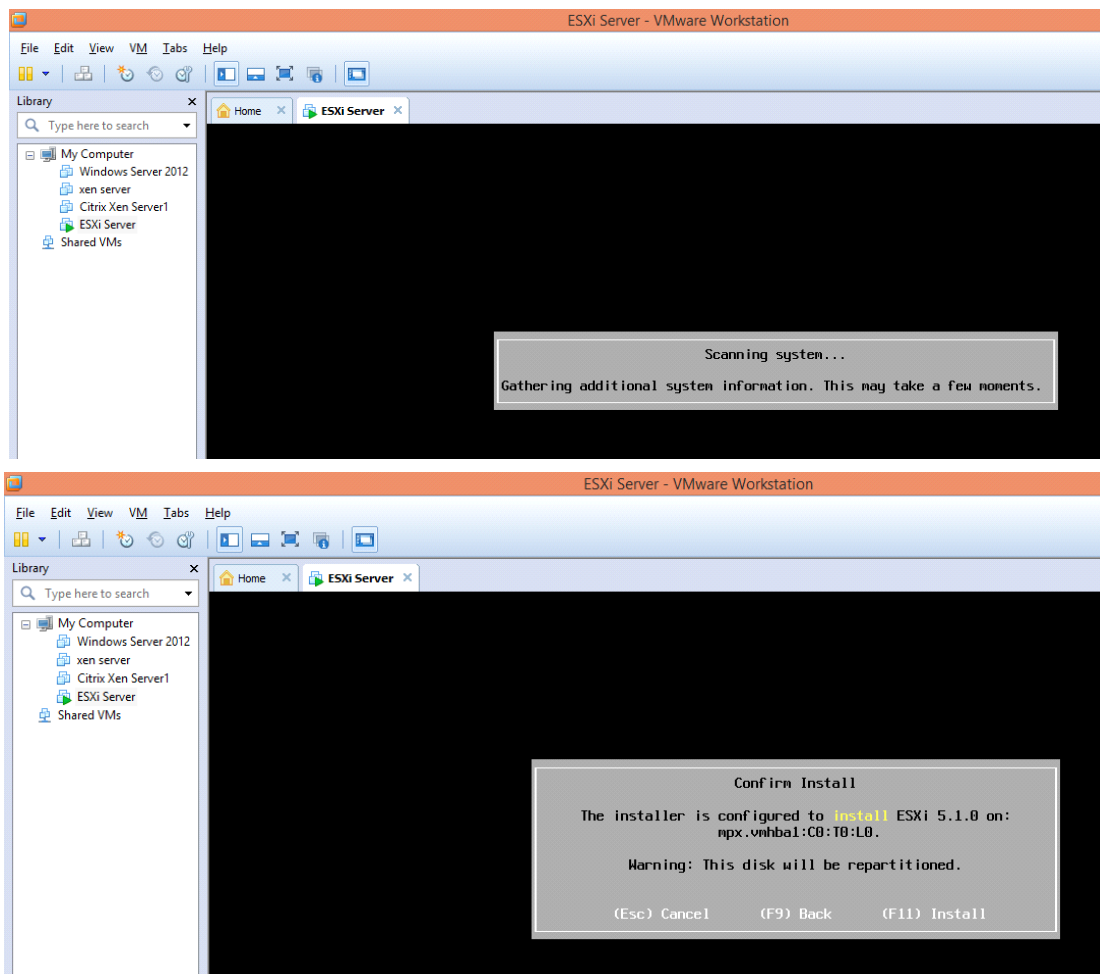


Keep the default settings for keyboard settings and press Enter key.



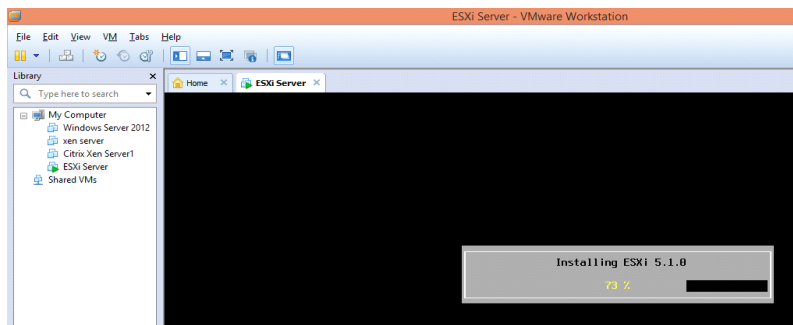
Enter the root and confirmation password and click on Continue or press Enter key.

The Installation is in progress...

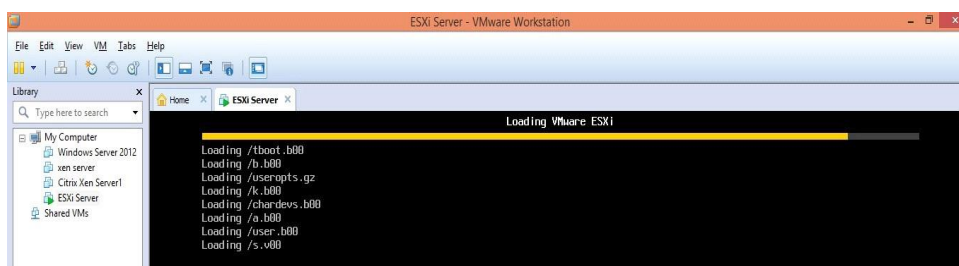
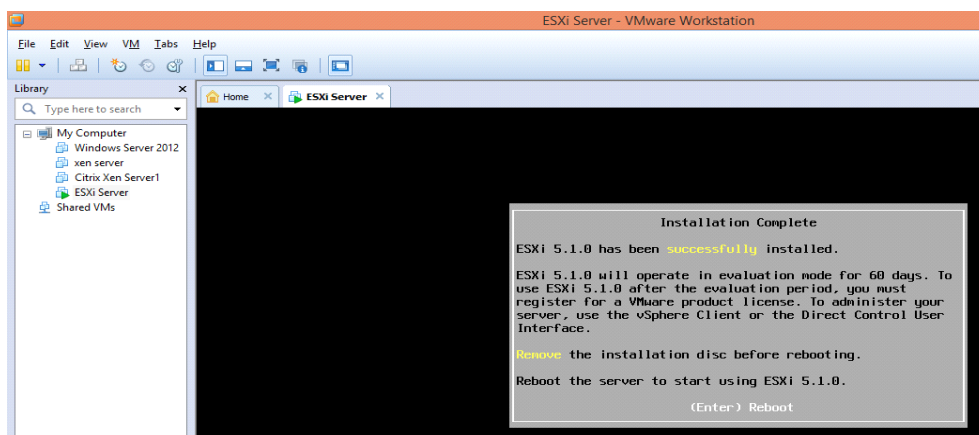
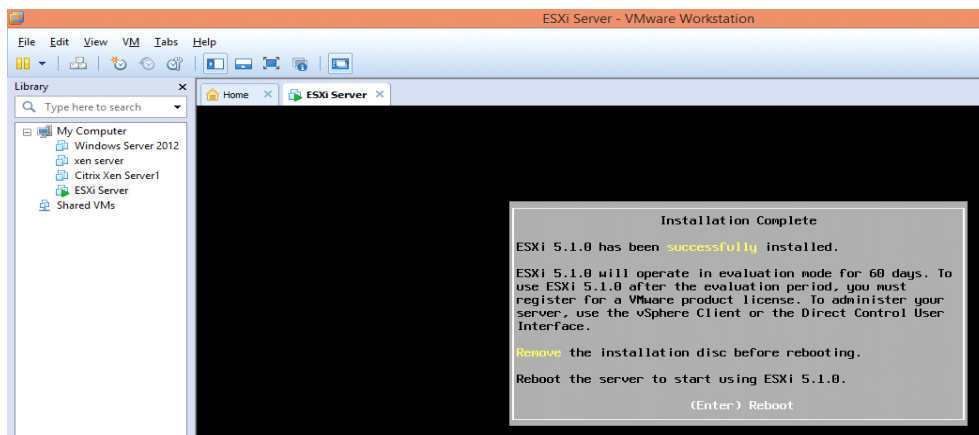


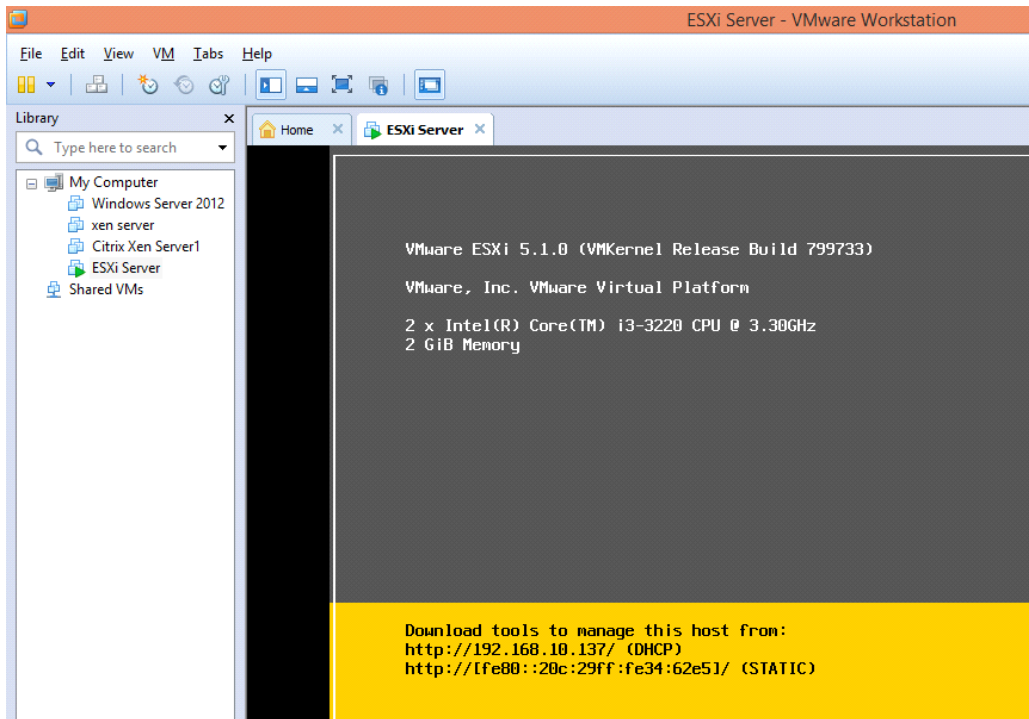
Press

F11 key to Install. Installing ESXi 5.1.0...



Press Enter key to Reboot.

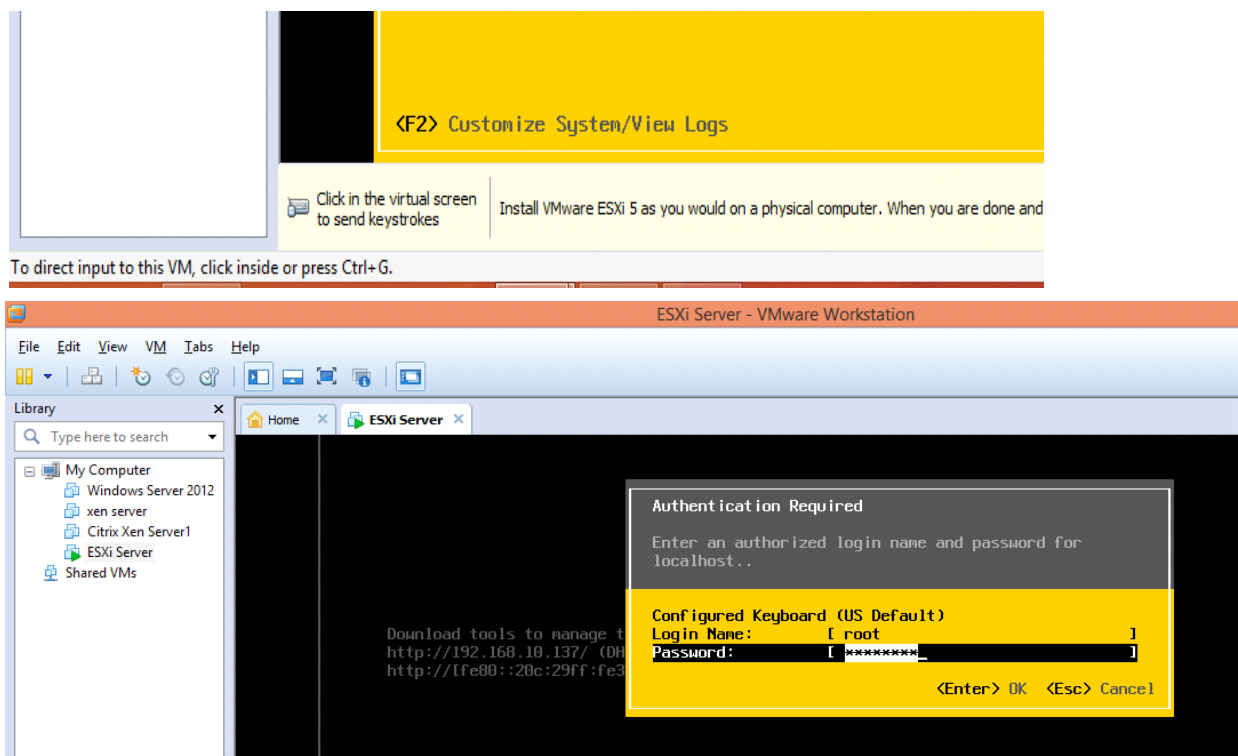




Note the

DHCP IP Address. Here it is-192.168.10.137

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

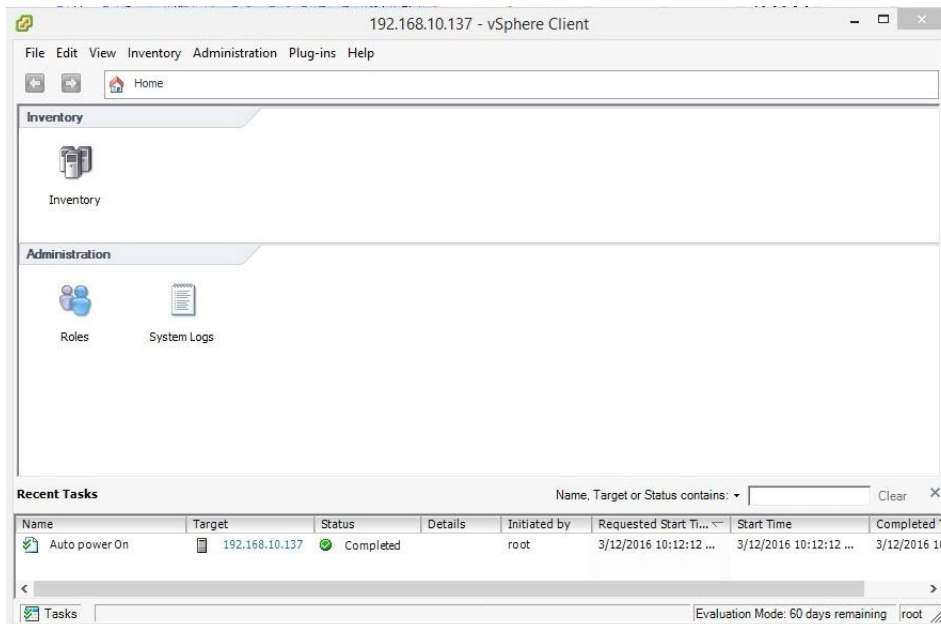


Enter the username as root and the root password (which was used earlier).

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

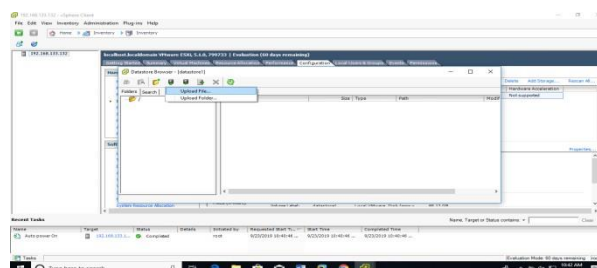
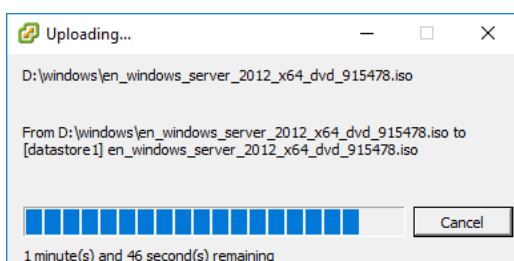
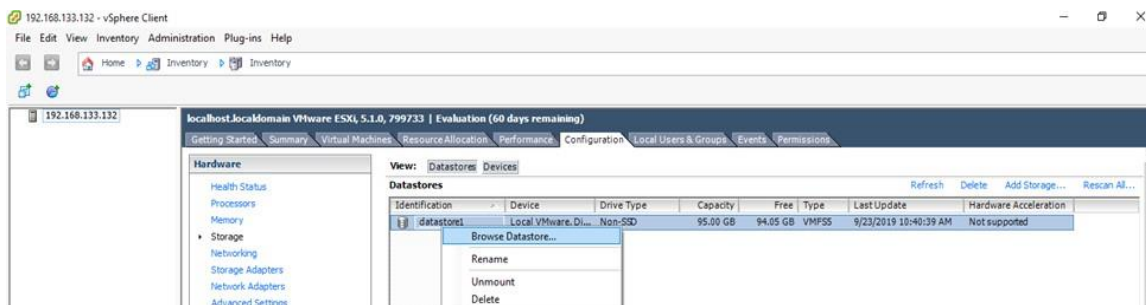


Click on the Ignore for the Security Warning.



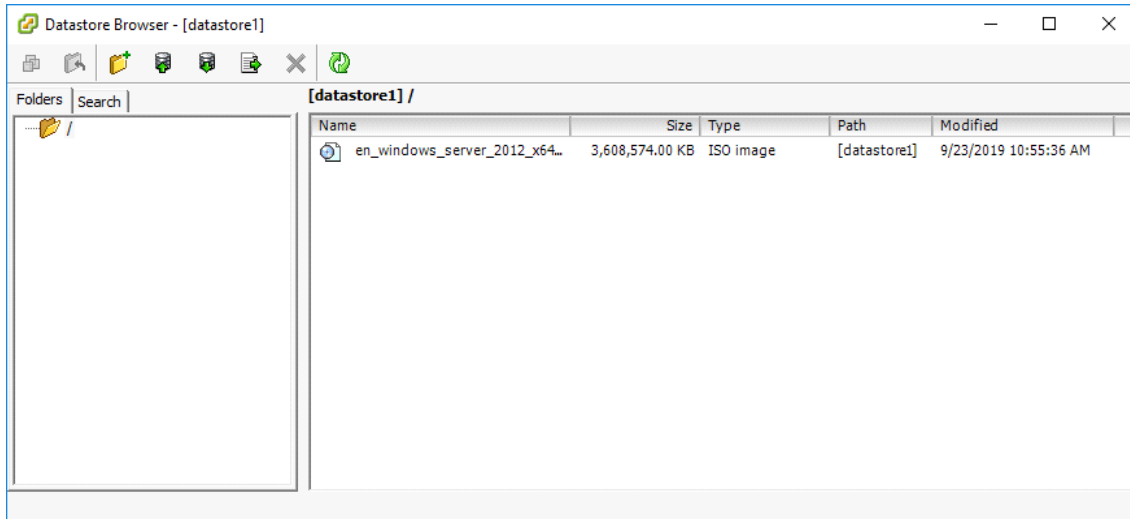
After login the VMware vSphere Client looks like the following image. At the bottom of this screen the connectivity of VMware vSphere Client where the target IP address is the ESXi Server's DHCP IP address. Click on the Inventory.

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

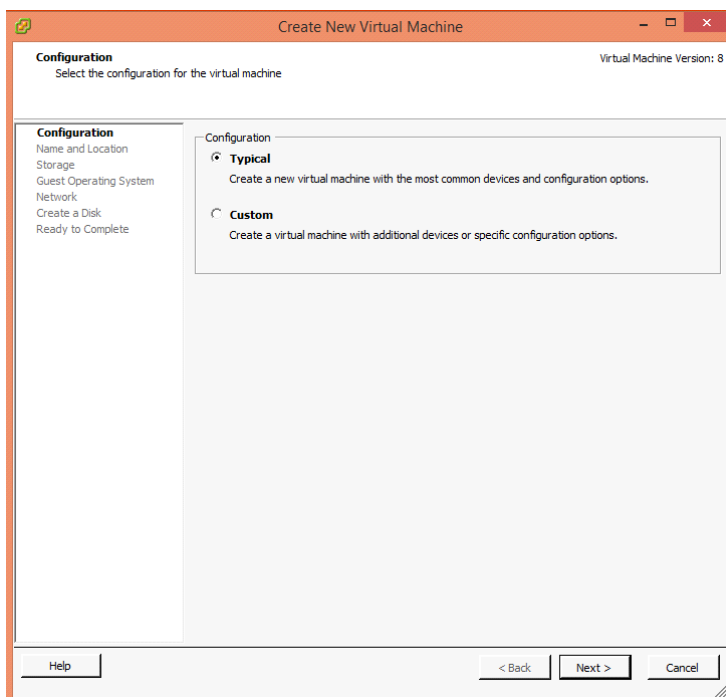
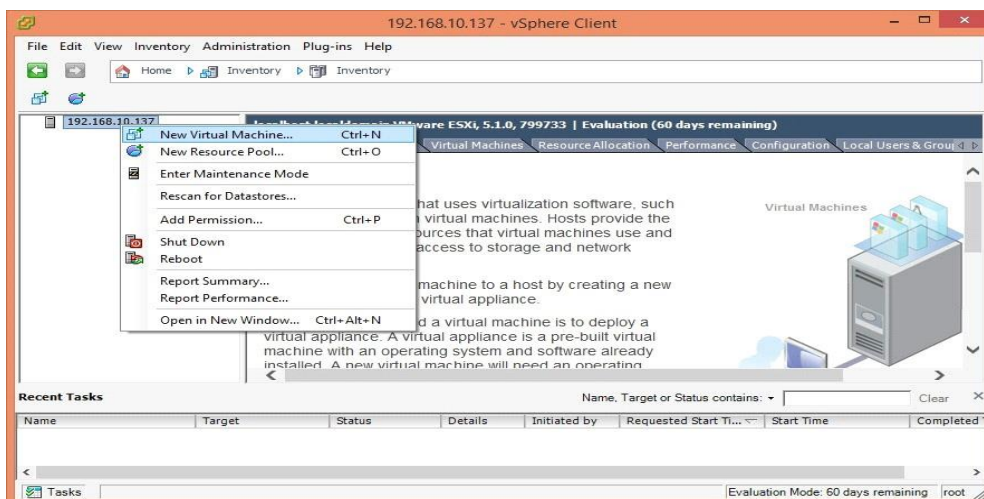


In the Datastore Browser – [datastore1] window click on Upload files to this datastore tool and select “Upload File...” option

Upload the “Microsoft Windows Server 2012”.

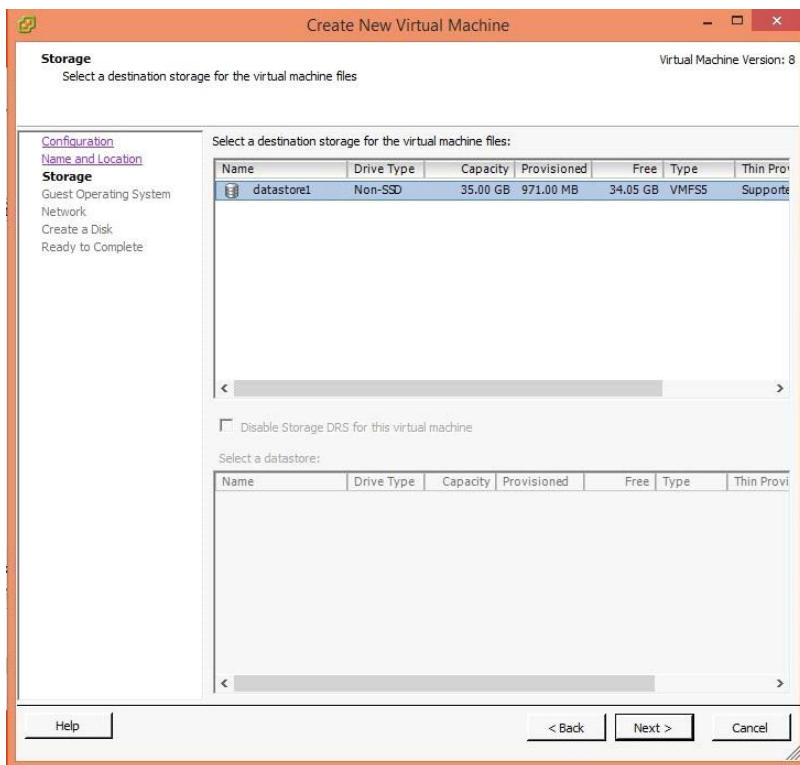
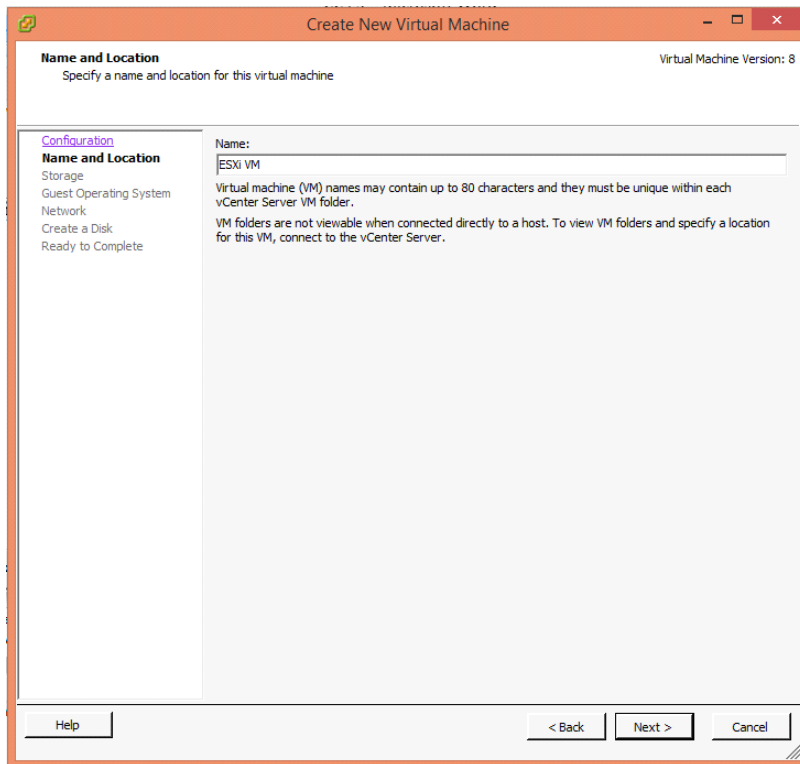


It shows the IP Address (192.168.10.137) listed on the left pane. Right click on the IP address and select the option “New Virtual Machine...”.



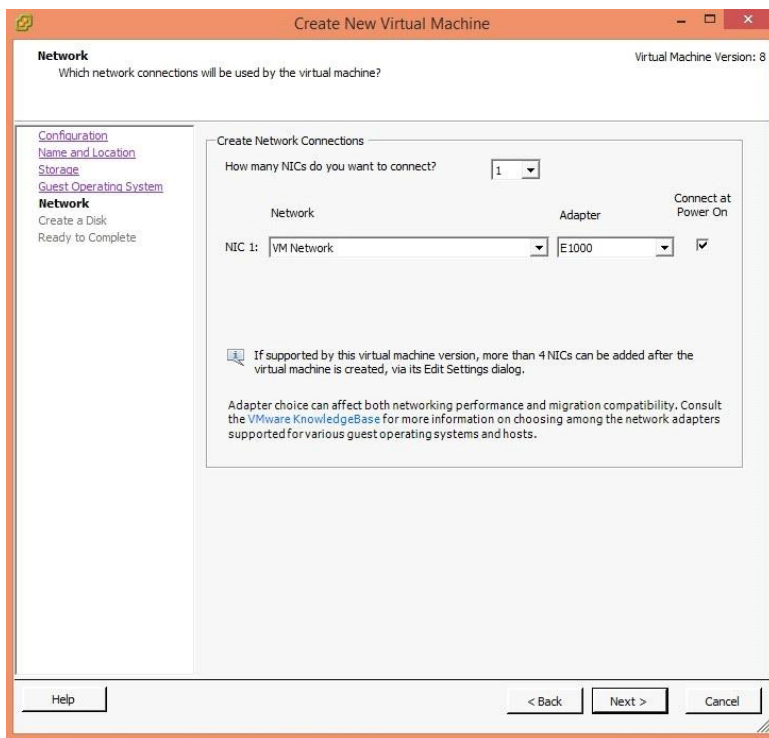
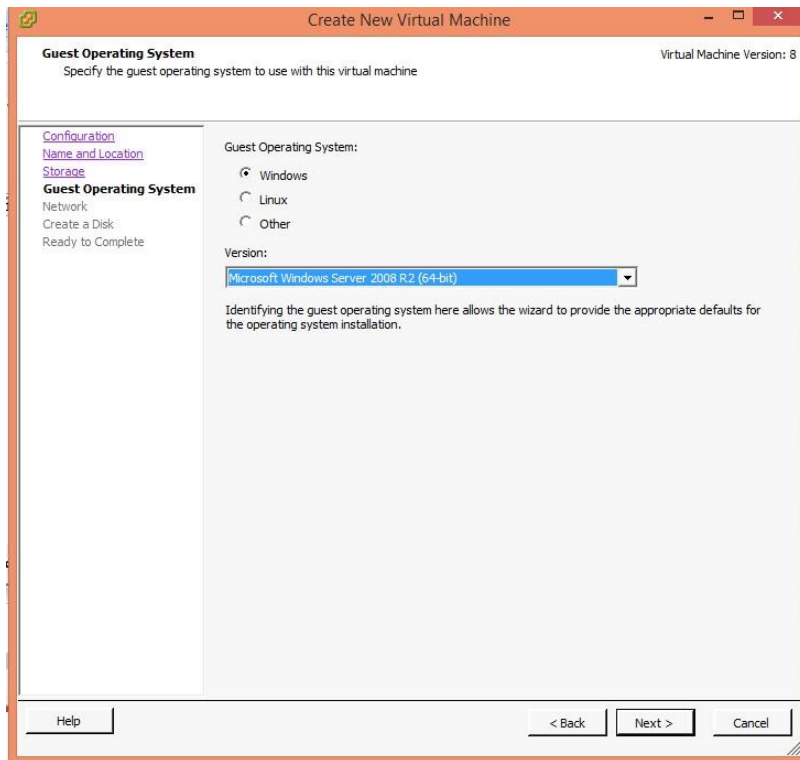
In the Create New Virtual Machine window select the Typical option and click on “Next”.

Give a name to the Virtual Machine. Here it is given as ESXi VM. Click on the “Next button.



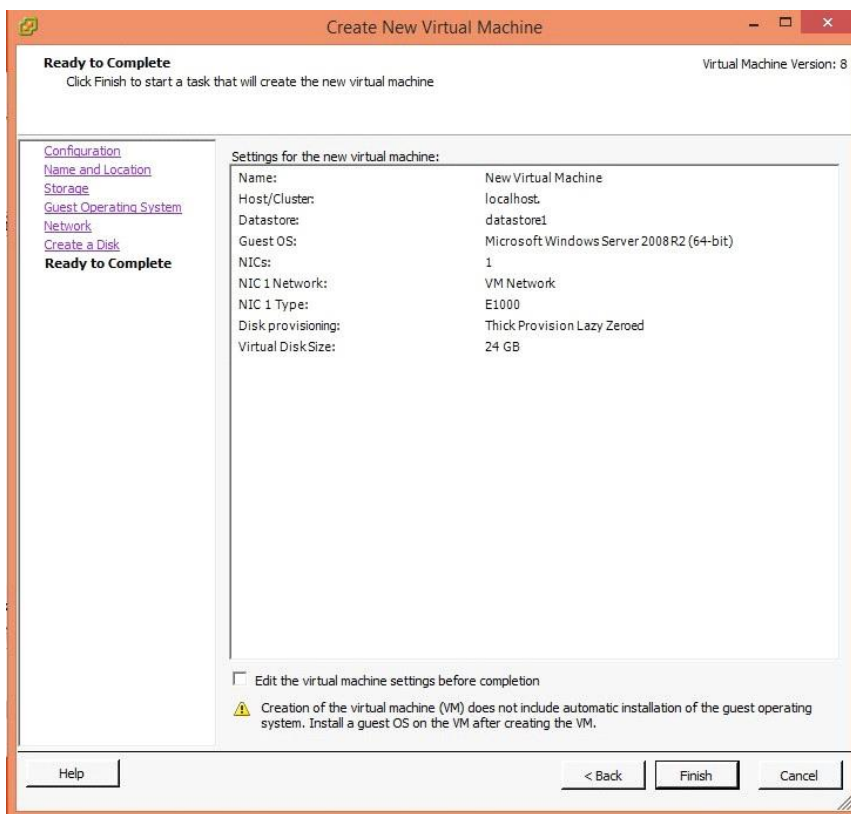
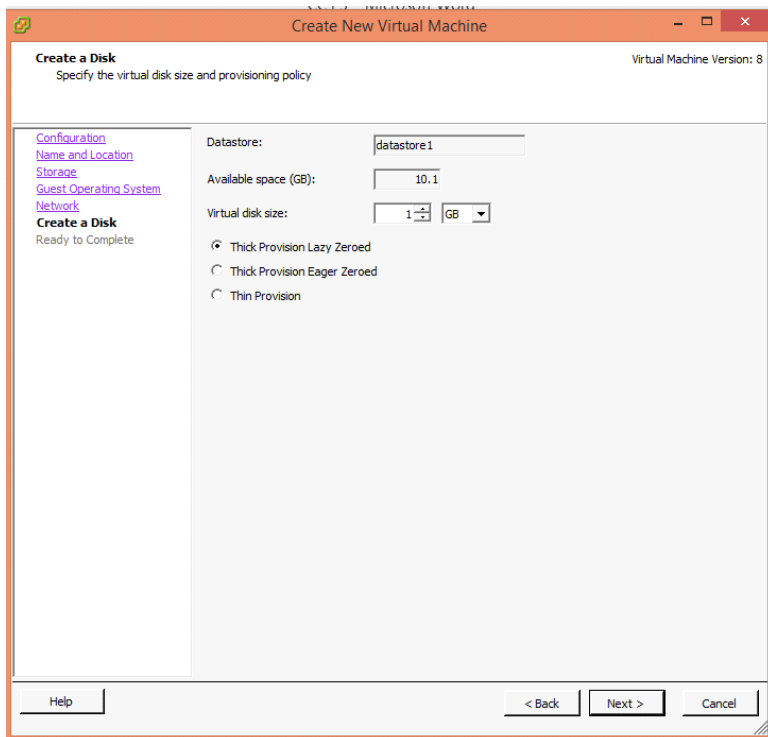
In the next screen keep the settings default for Storage and click on “Next”.

Select the Guest OS as Windows and Version as “Microsoft Windows Server 2008 R2 (32- bit)”.



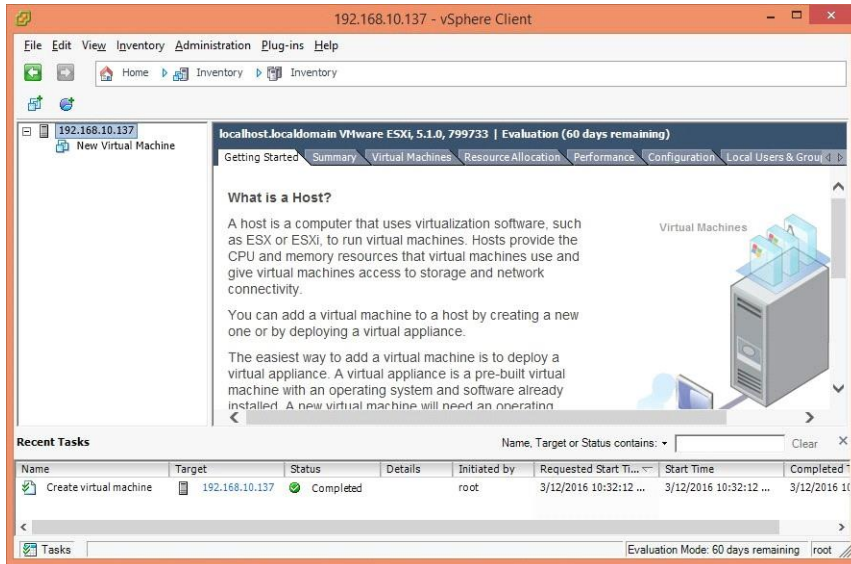
Leave the Network settings default and click on “Next”.

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.

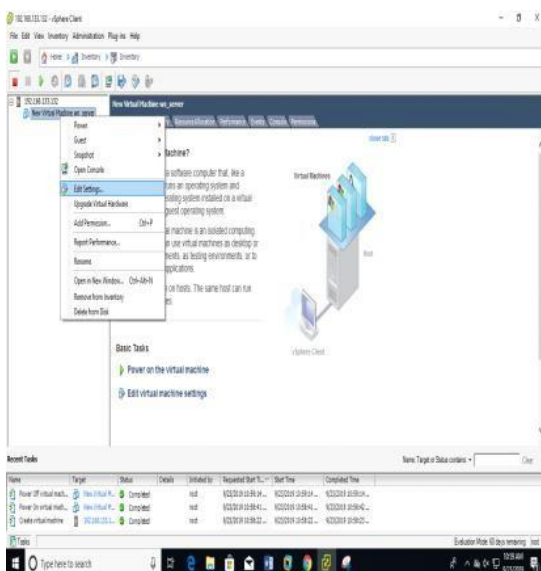


At the final screen click on “Finish” button.

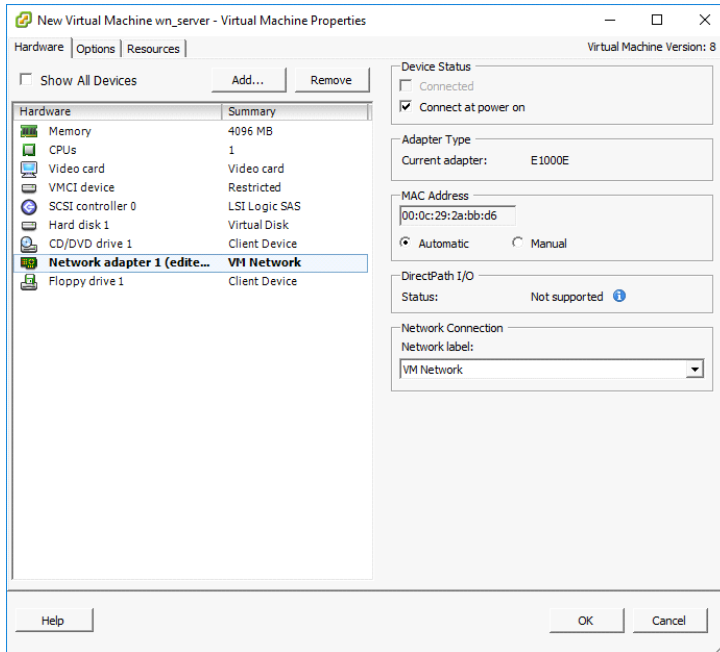
The new created Virtual Machine is listed under the IP Address.



Right click on virtual machine Edit settings Network adapter.

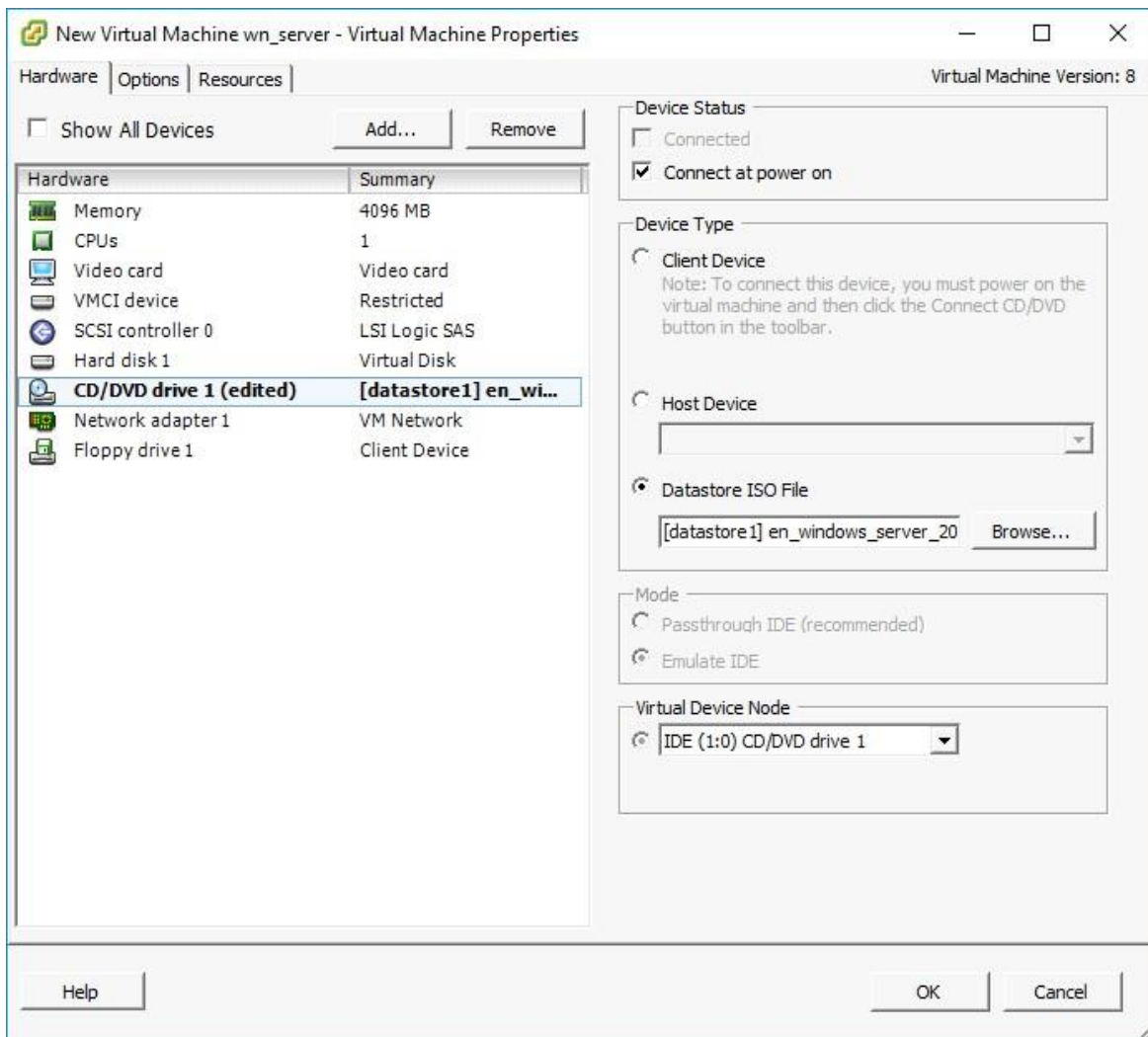


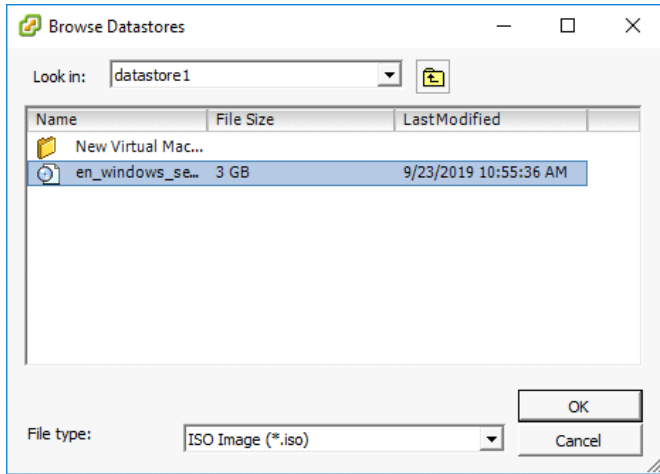
Right click on virtual machine Edit settings Network adapter "Check on Connect at power on".



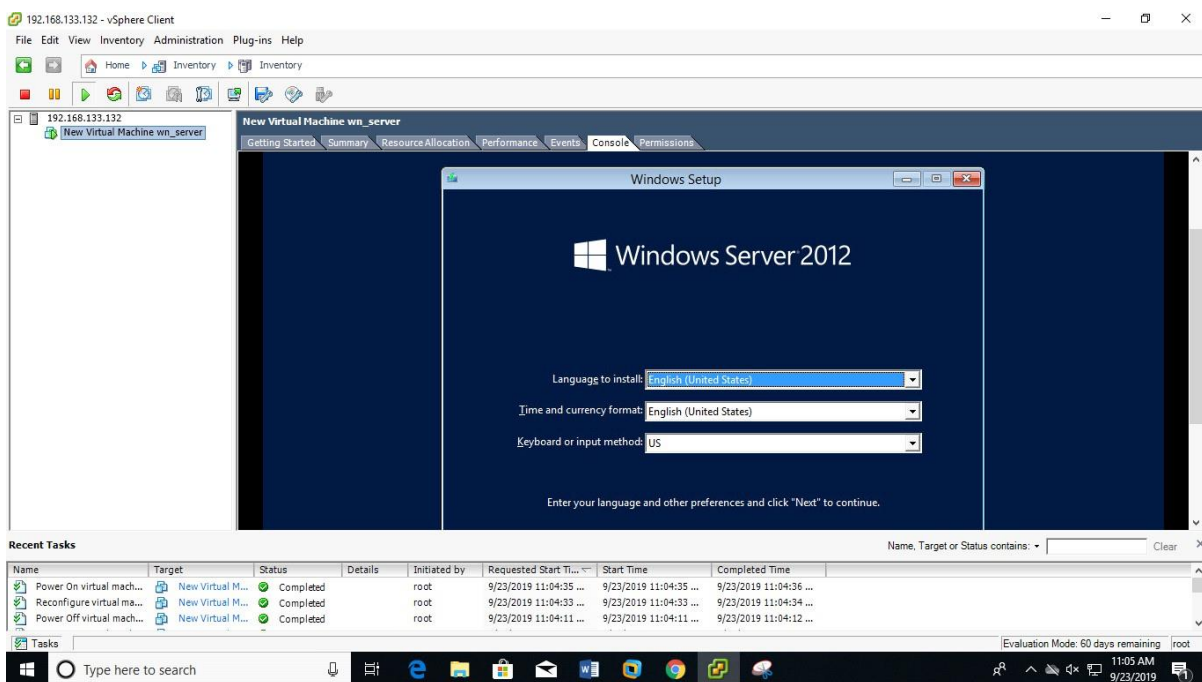
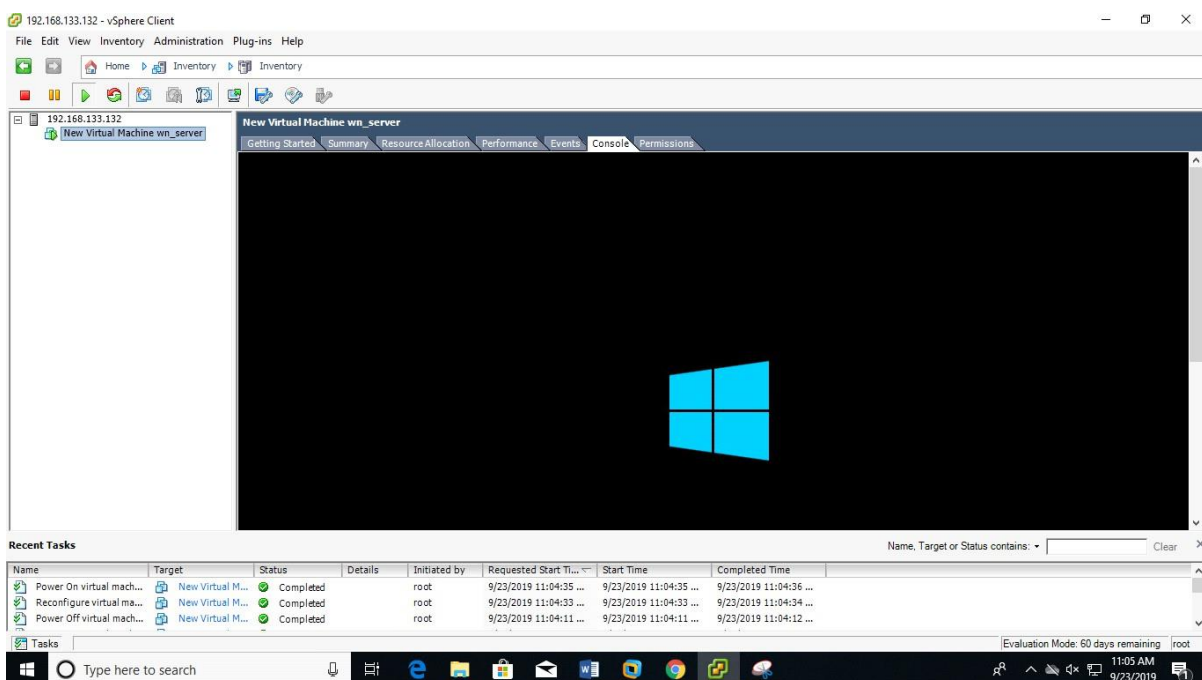
Right click on virtual machine Edit settings CD/DVD Drive Check on Datastore ISO file and browse the iso

”Check on Connect at power on”.





Power on VM



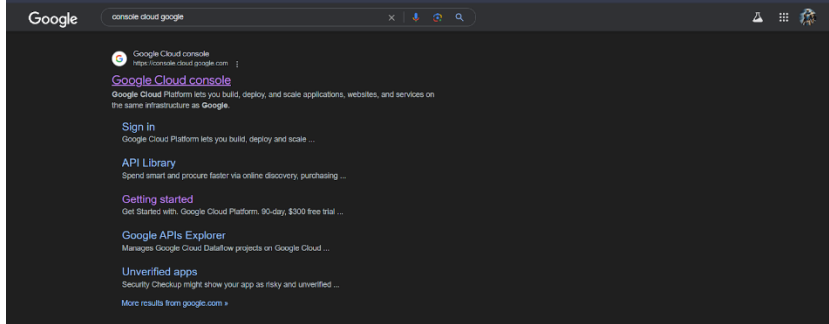
PRACTICAL 3

Aim:- Implementing Google App Engine

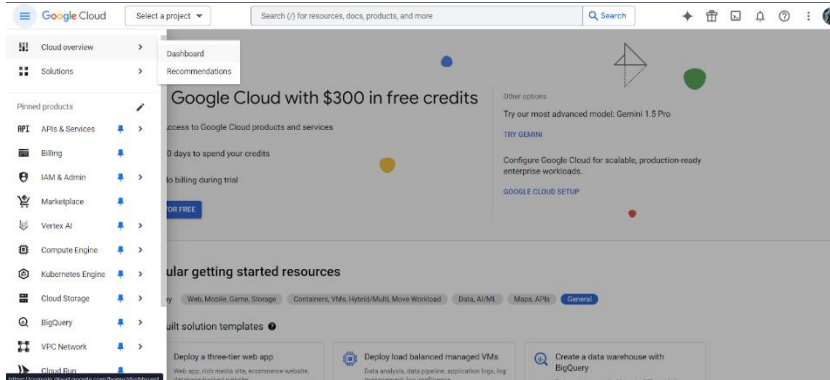
Software:- Google cloud console

Steps:-

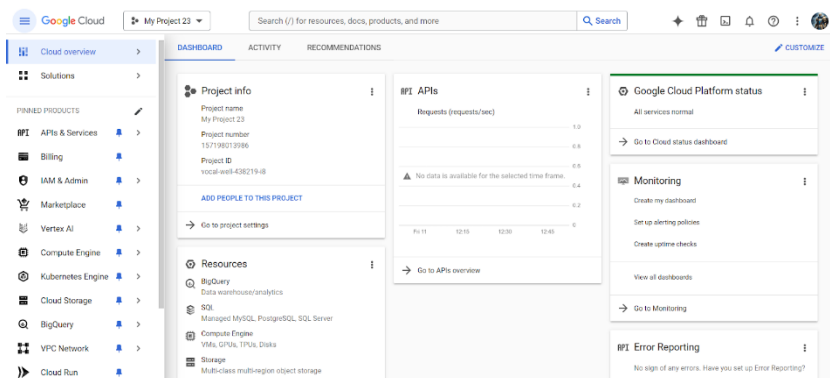
Go to any browser search “console cloud google”



Now click on cloud overview → dashboard



Now u can see this interface



Now click on My project 23

The screenshot shows the Google Cloud console dashboard for 'My Project 23'. The left sidebar contains navigation links: 'Cloud overview', 'Solutions', 'PINNED PRODUCTS', and 'APIs & Services'. The main content area has tabs for 'DASHBOARD' and 'ACTIVITY'. Under 'DASHBOARD', there is a 'Project info' section showing the project name 'My Project 23' and the project number.

Now create a project by clicking on new project

The 'Select a project' dialog is shown. It includes a search bar labeled 'Search projects and folders' and a 'NEW PROJECT' button. Below the search bar, there are tabs for 'RECENT', 'STARRED', and 'ALL'. A table lists recent projects:

Name	ID
My Project 23	vocal-well-438219-i8

CANCEL

Project name *

Project ID: gae1-438219. It cannot be changed later. [EDIT](#)

Location * [BROWSE](#)

Parent organization or folder

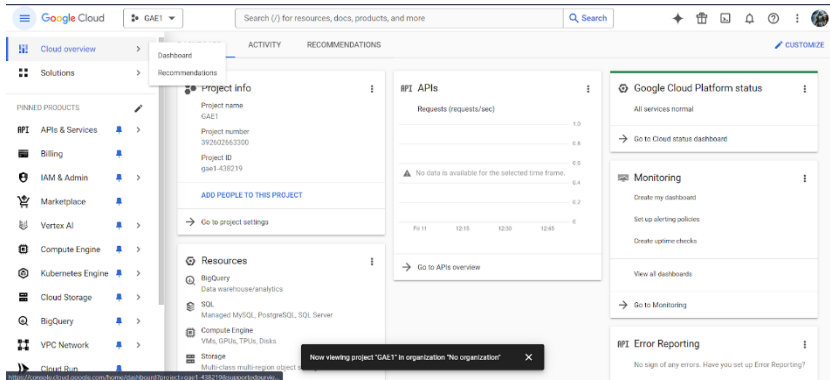
[CREATE](#) [CANCEL](#)

Now click on project that you created

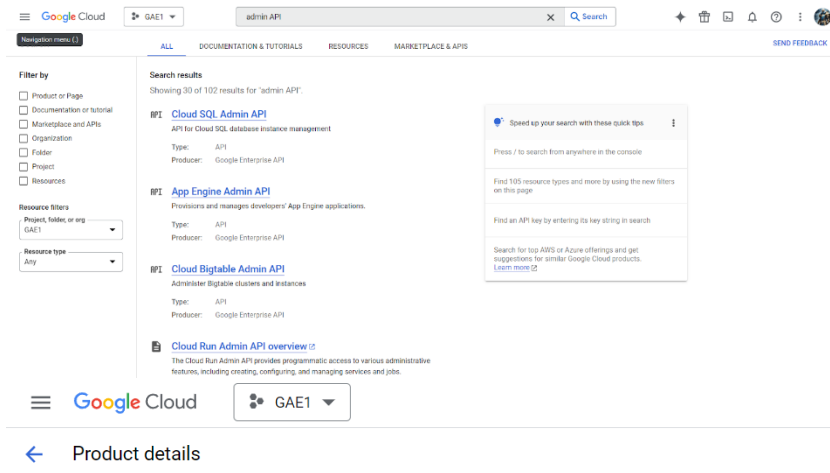
The screenshot shows the Google Cloud console with a notifications panel open. The panel lists three notifications, all indicating successful project creation:

- Create Project: GAE1 (Just now) - [SELECT PROJECT](#)
- Create Project: My Project 23 (3 minutes ago) - [SELECT PROJECT](#)
- Create Project: My Project 23 (15 minutes ago) - [SELECT PROJECT](#)

At the bottom of the notifications panel is a link to [SEE ALL ACTIVITIES](#).



Now search “Admin API”



App Engine Admin API

[Google Enterprise API](#)

Provisions and manages developers' App Engine applications.

ENABLE

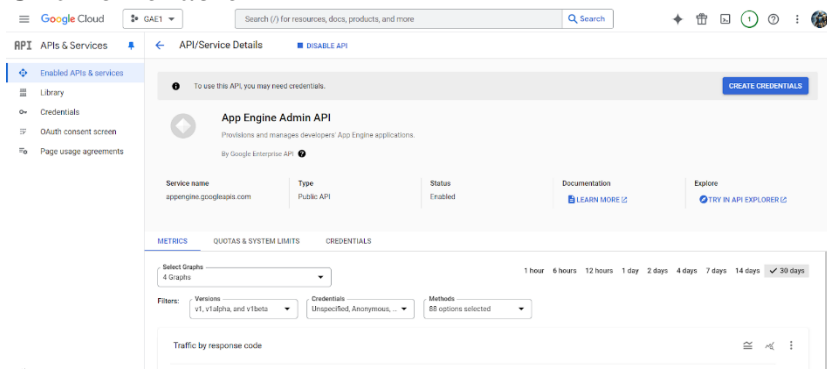
TRY THIS API [↗](#)

OVERVIEW

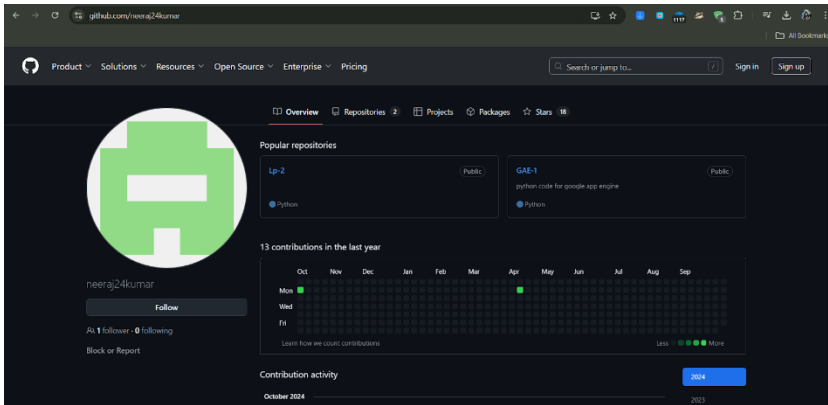
DOCUMENTATION

RELATED PRODUCTS

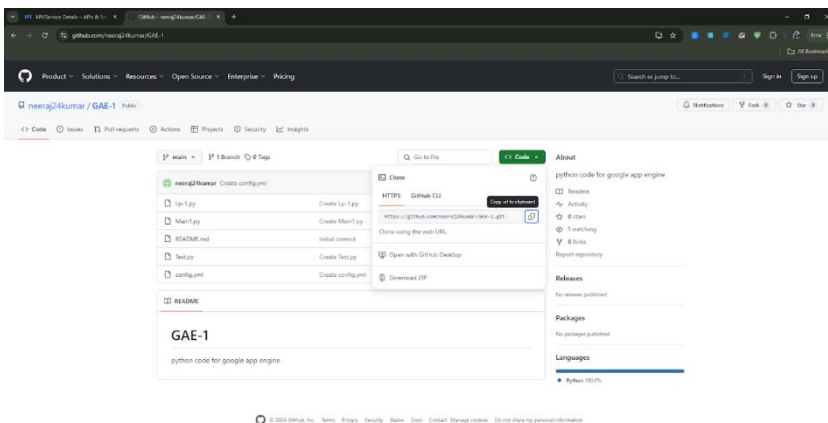
Click on enable



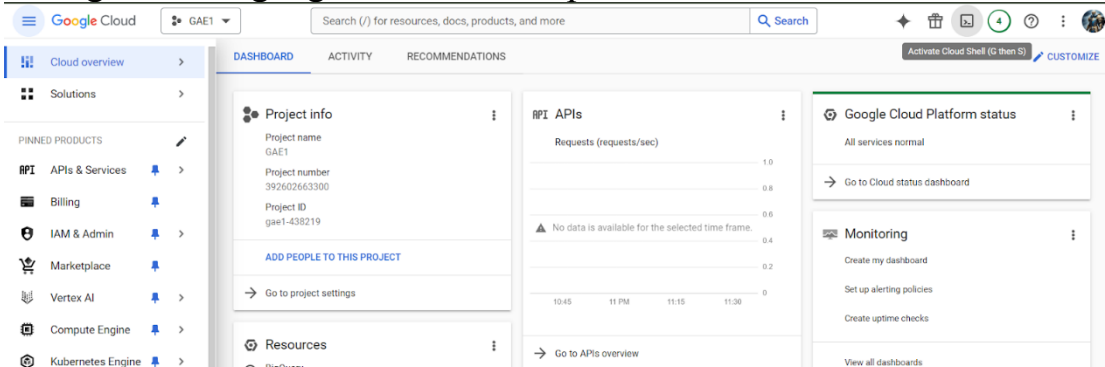
Now open chrome and type neeraj24kumar in GitHub
<https://github.com/neeraj24kumar>



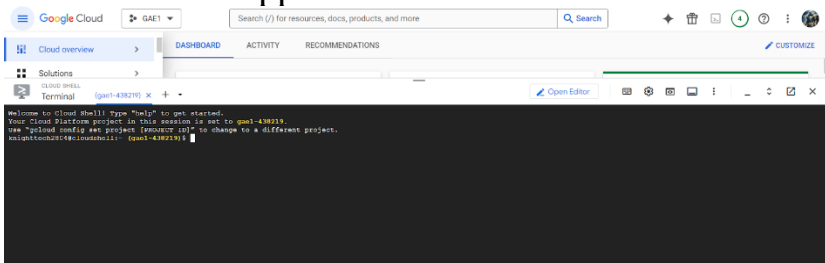
Now click on GAE1 and then copy the link → <https://github.com/neeraj24kumar/GAE-1.git>



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



A terminal will appear from bottom



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 is been executed successfully.

Now to remove all the above read folder and file do the following steps:-

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

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
```

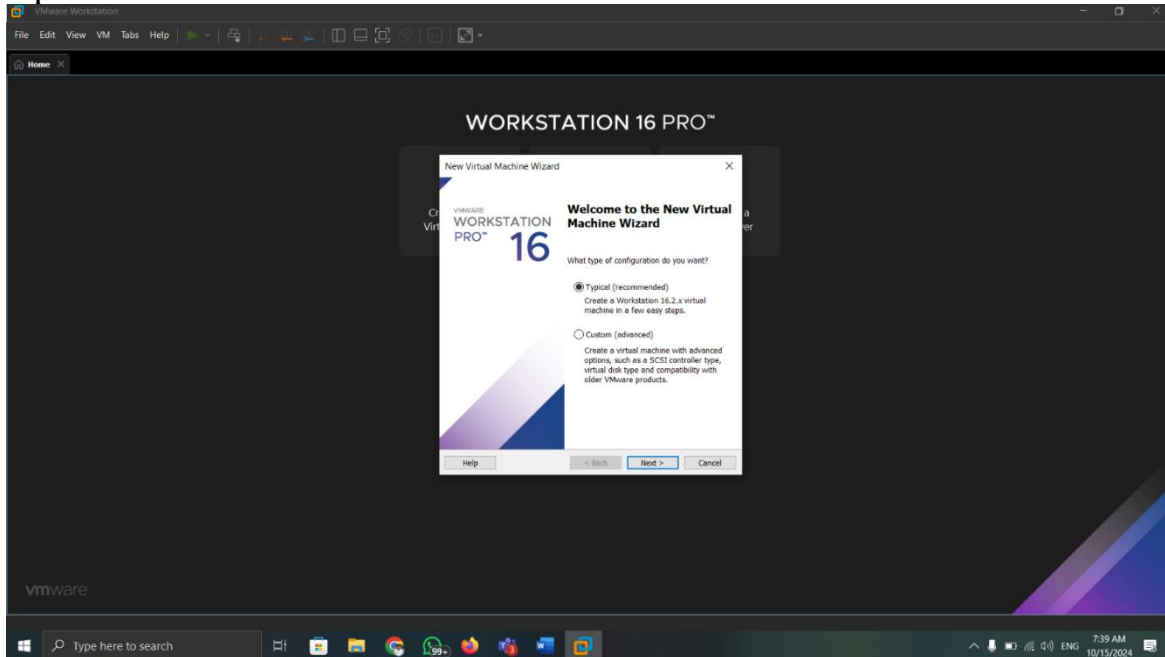
PRACTICAL 4

Aim :-Implementing IaaS using Eucalyptus

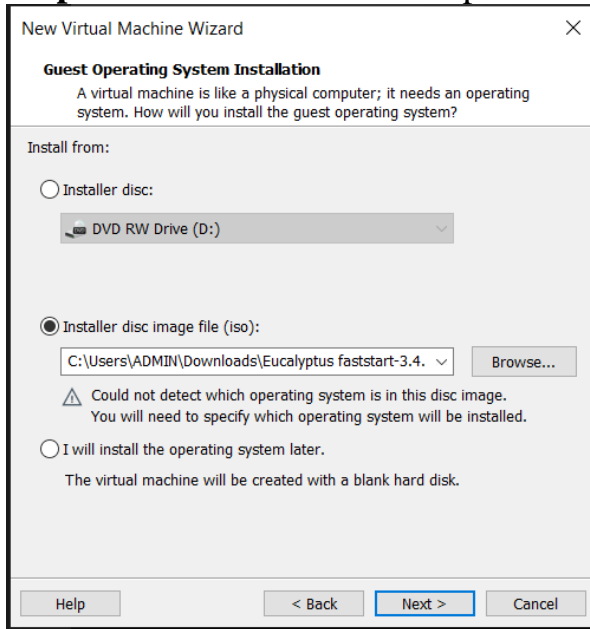
Requirements:- VMware Workstation 17x , Eucalyptus faststart 3.4.1.iso file

Steps:-

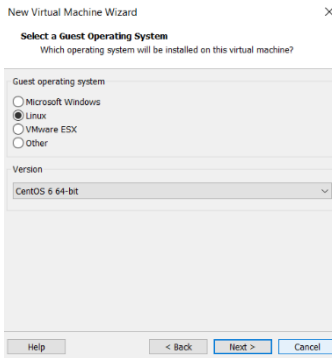
Open VMware workstation click on next



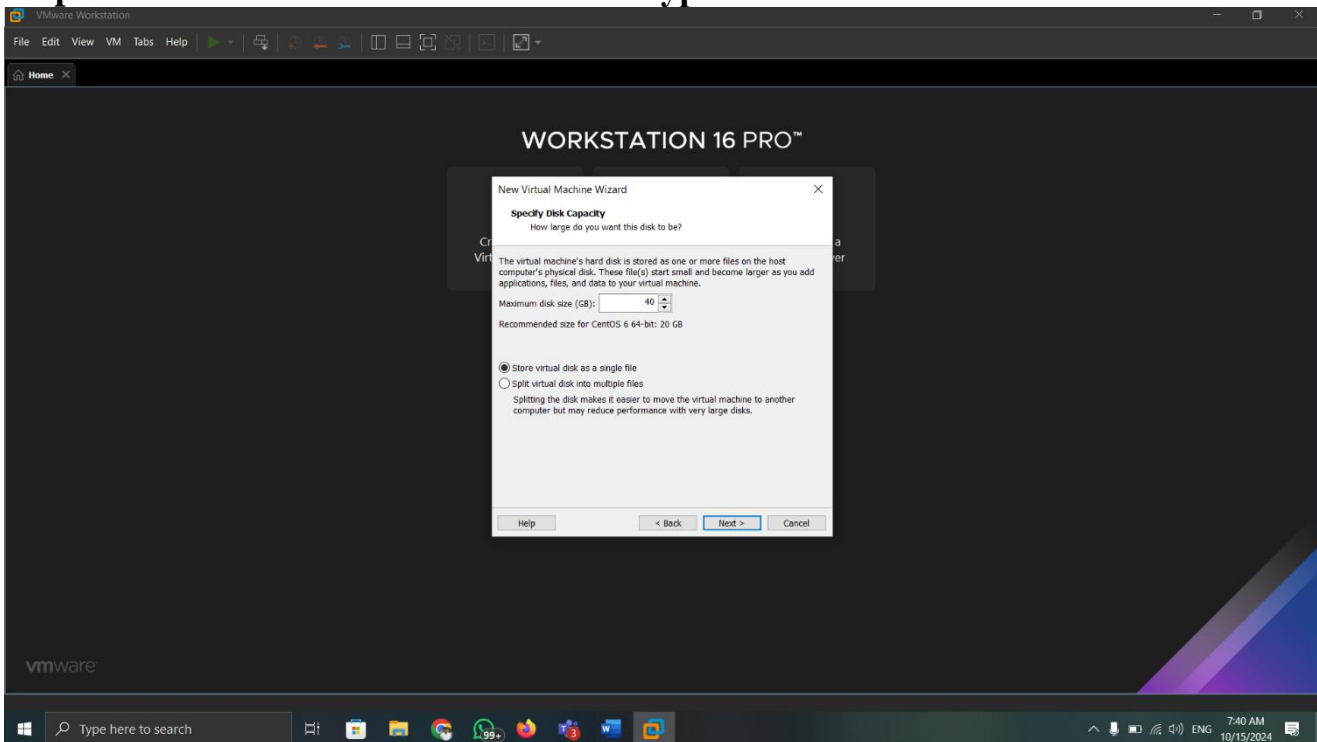
Step1:-Click on Browse and upload the Eucalyptusfaststsr-3.4.1



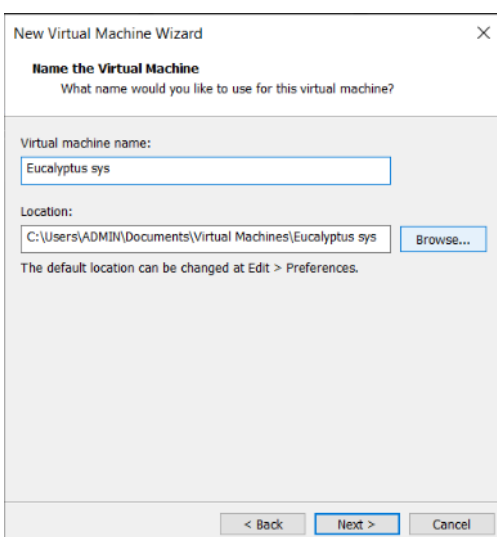
Step2: Click on Linux and version is CentOS 6 64-bit



Step3: Name for virtual machine as “Eucalyptus”

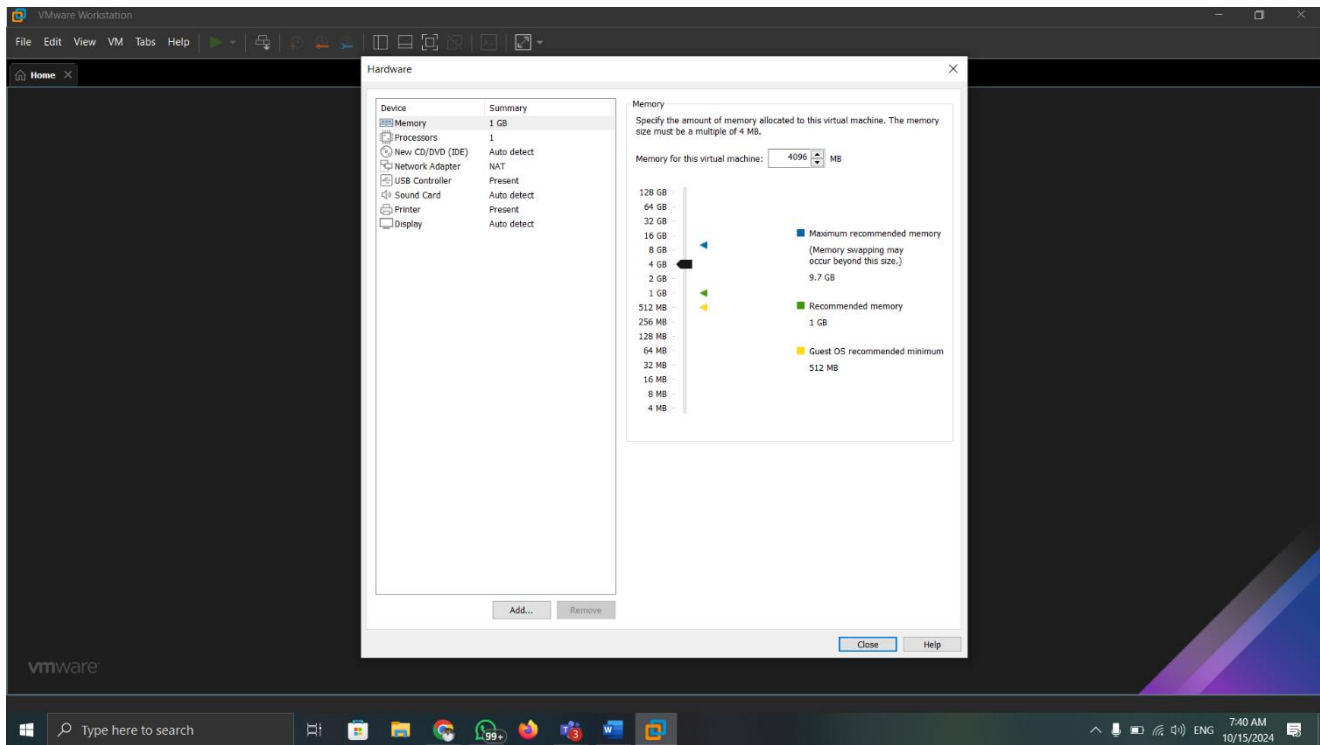


Step4: Manual disk :40.0

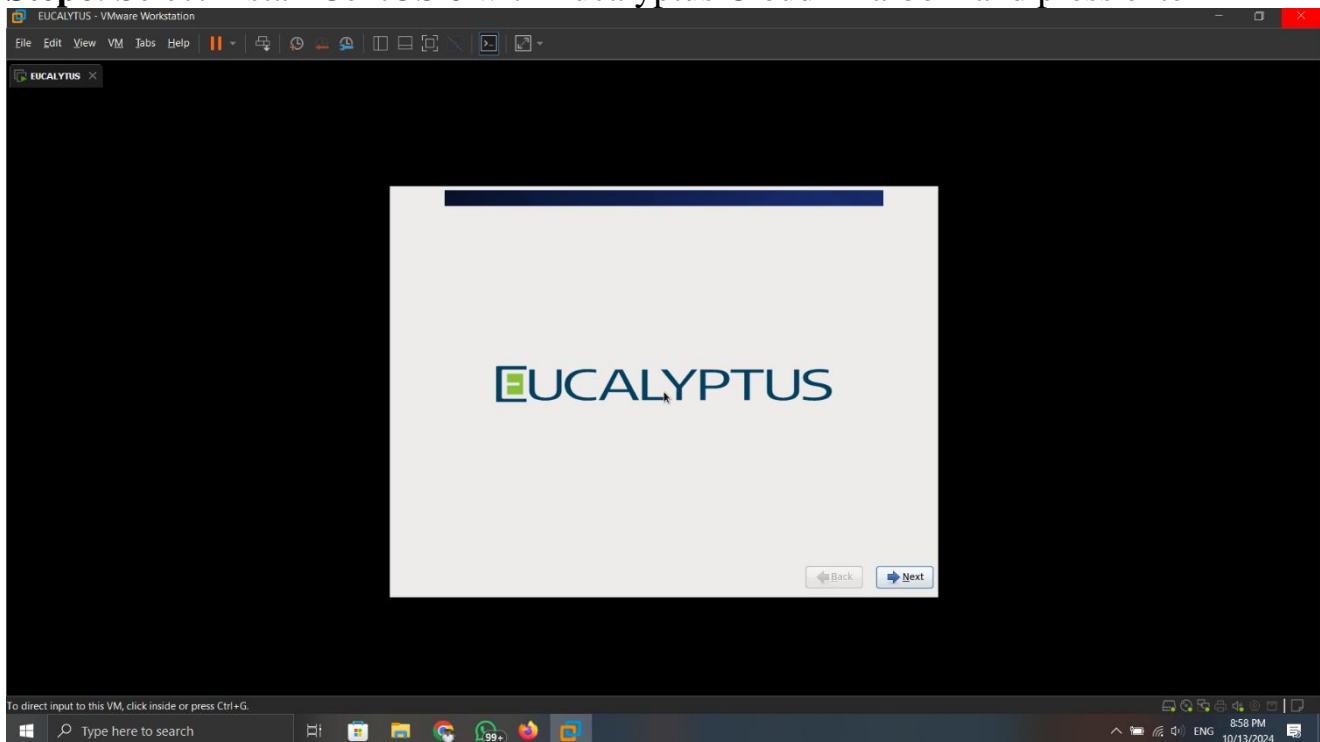


Step5: Click on Custom Hardware & Give the memory storage as 4GB and then click on next & also Change the number of cores per processor as 2 and select virtualize intel VT-x/EPT and then in Network Adapters select bridge network connection and close

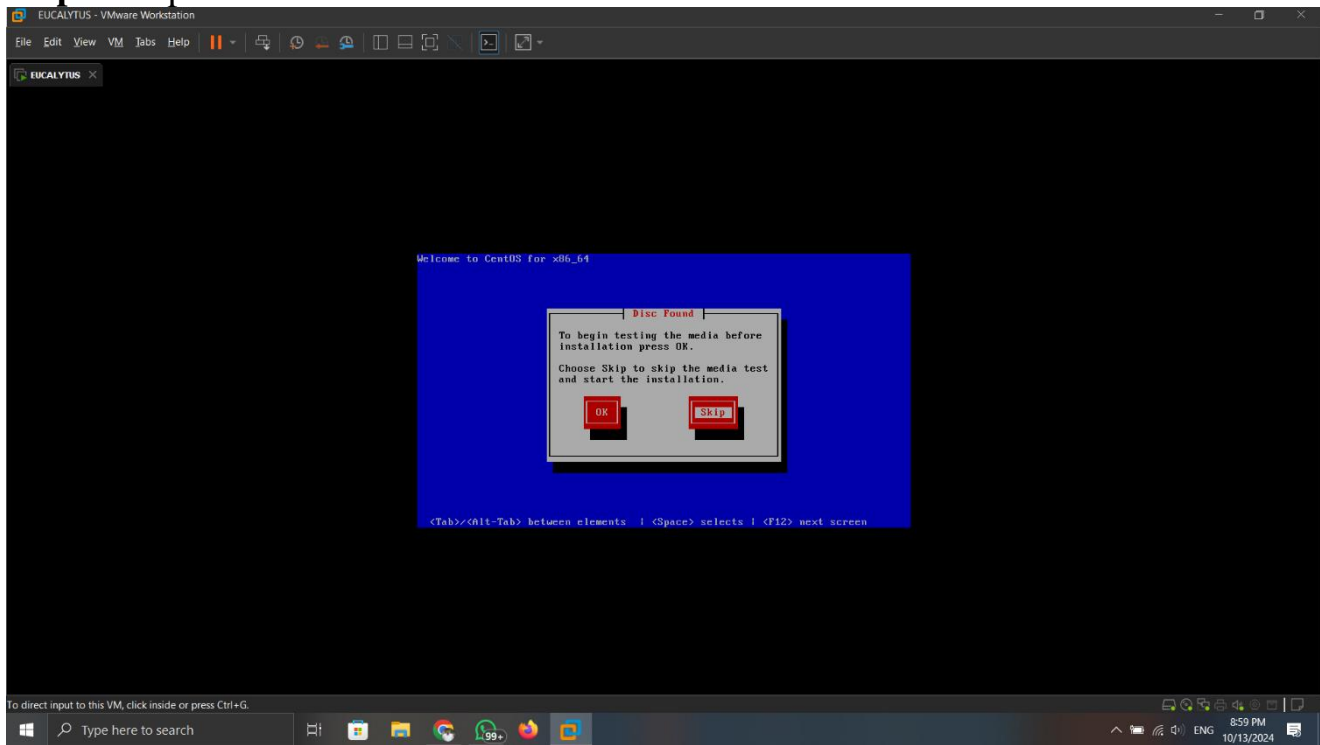
and start the vm.



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

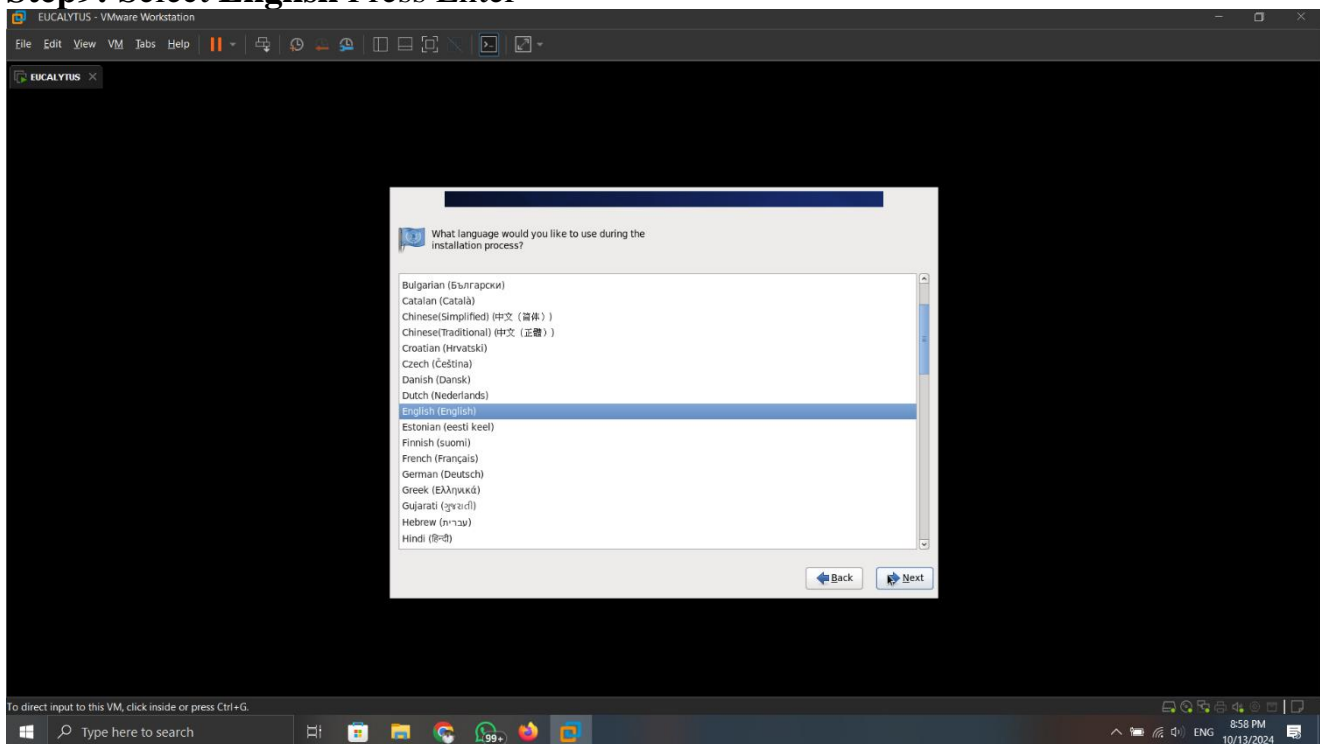


Step7: Skip and then OK

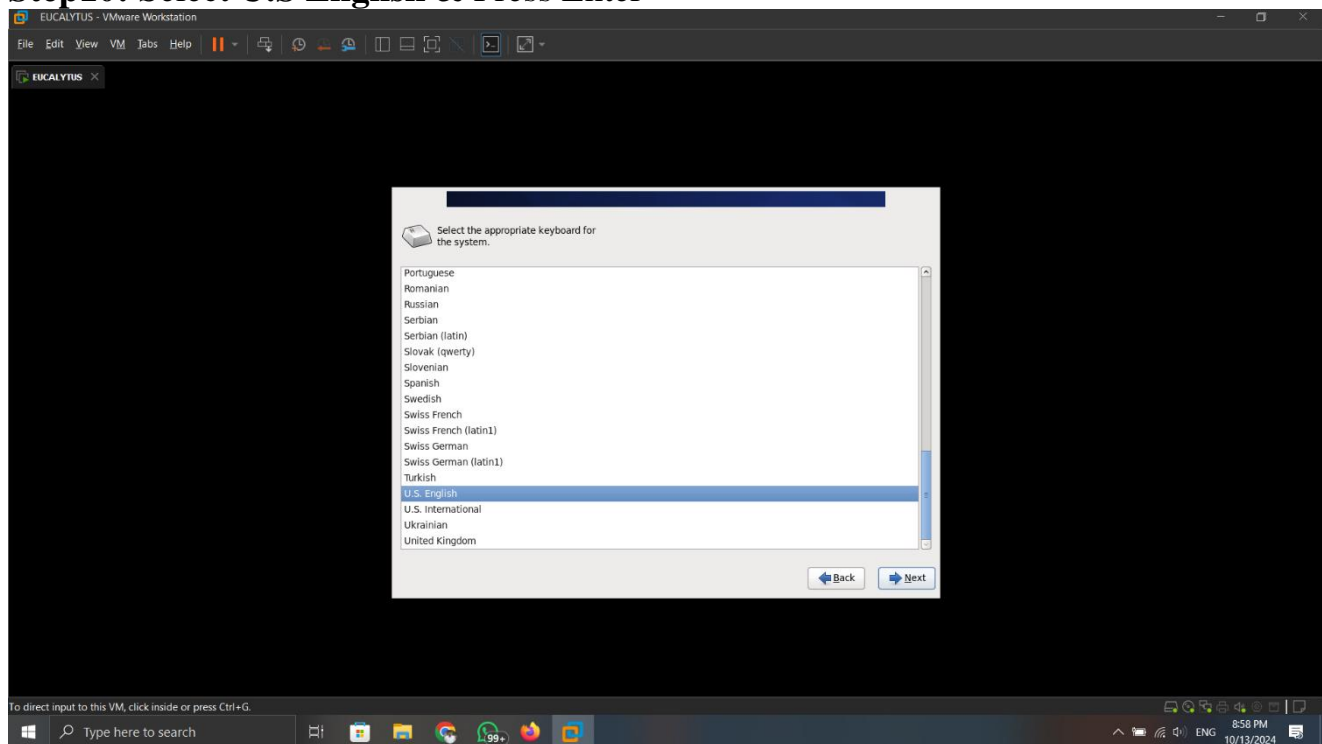


Step8: When the installation screen pops up Click on Next

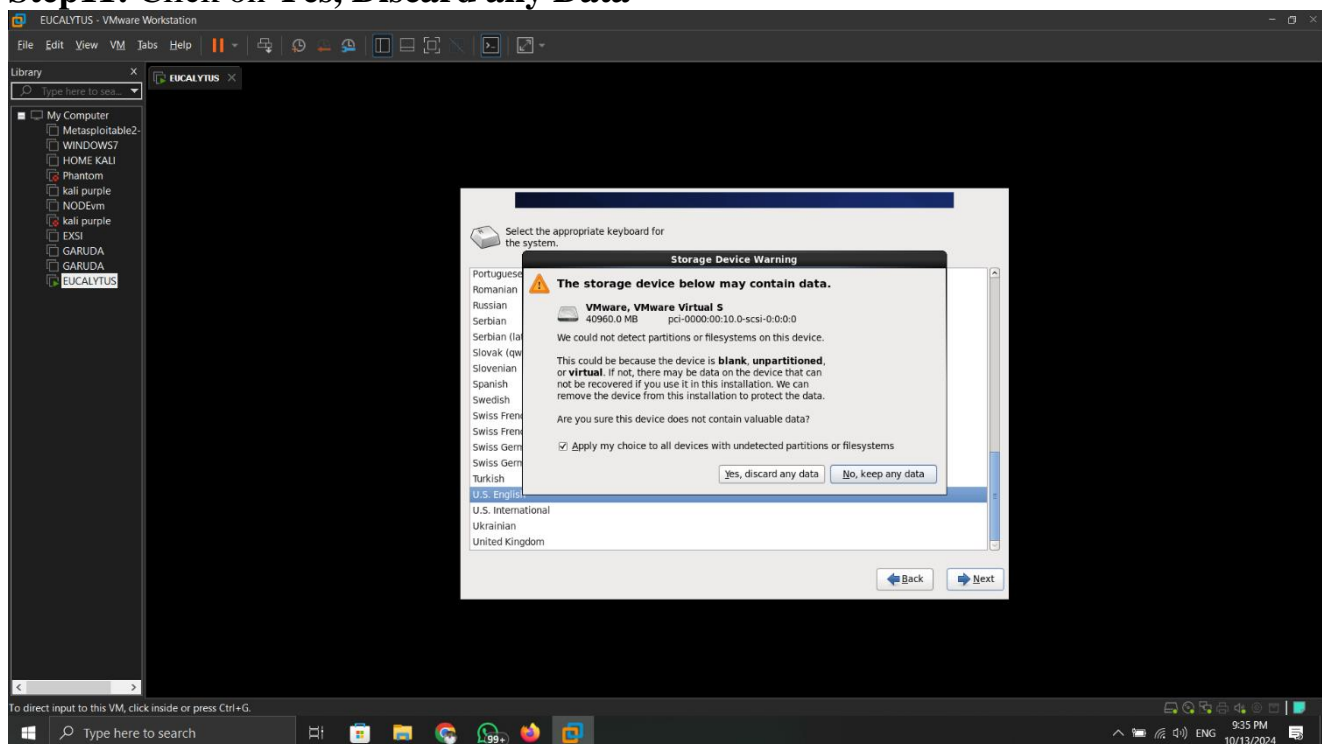
Step9: Select English Press Enter



Step10: Select U.S English & Press Enter

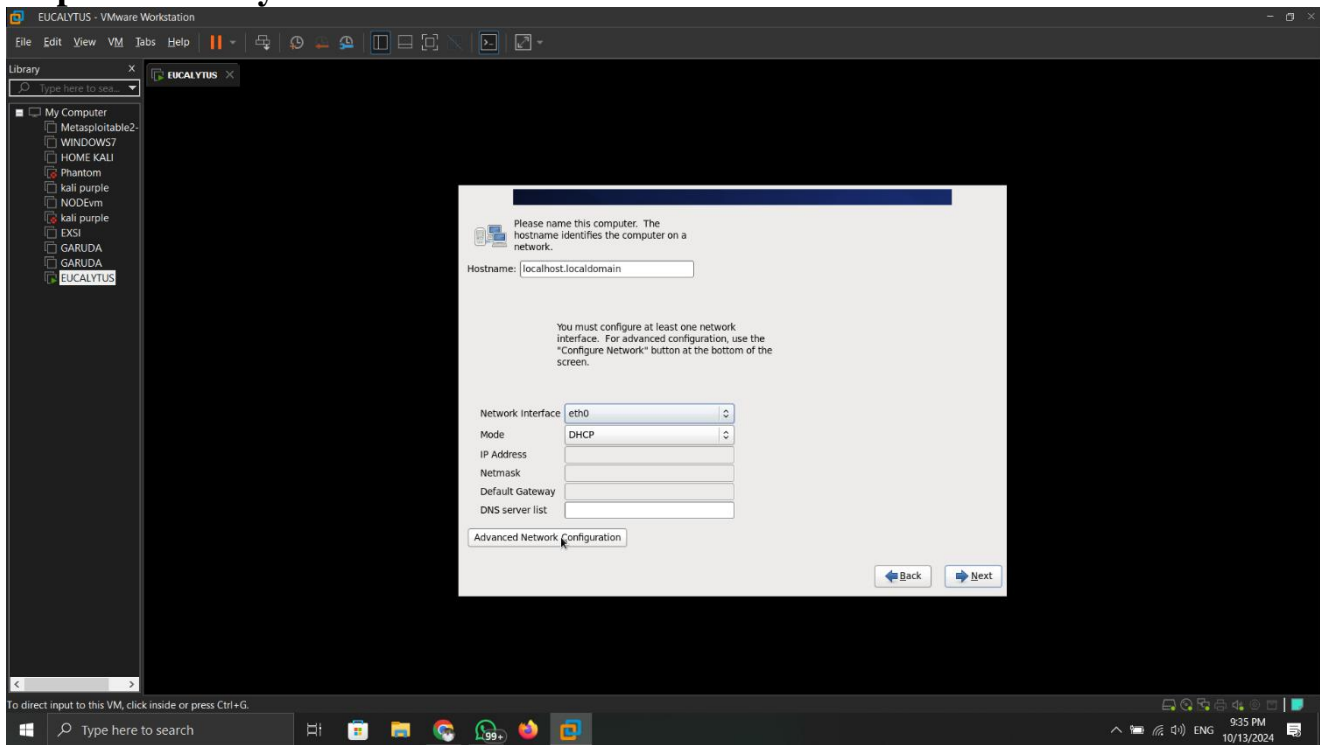


Step11: Click on Yes, Discard any Data

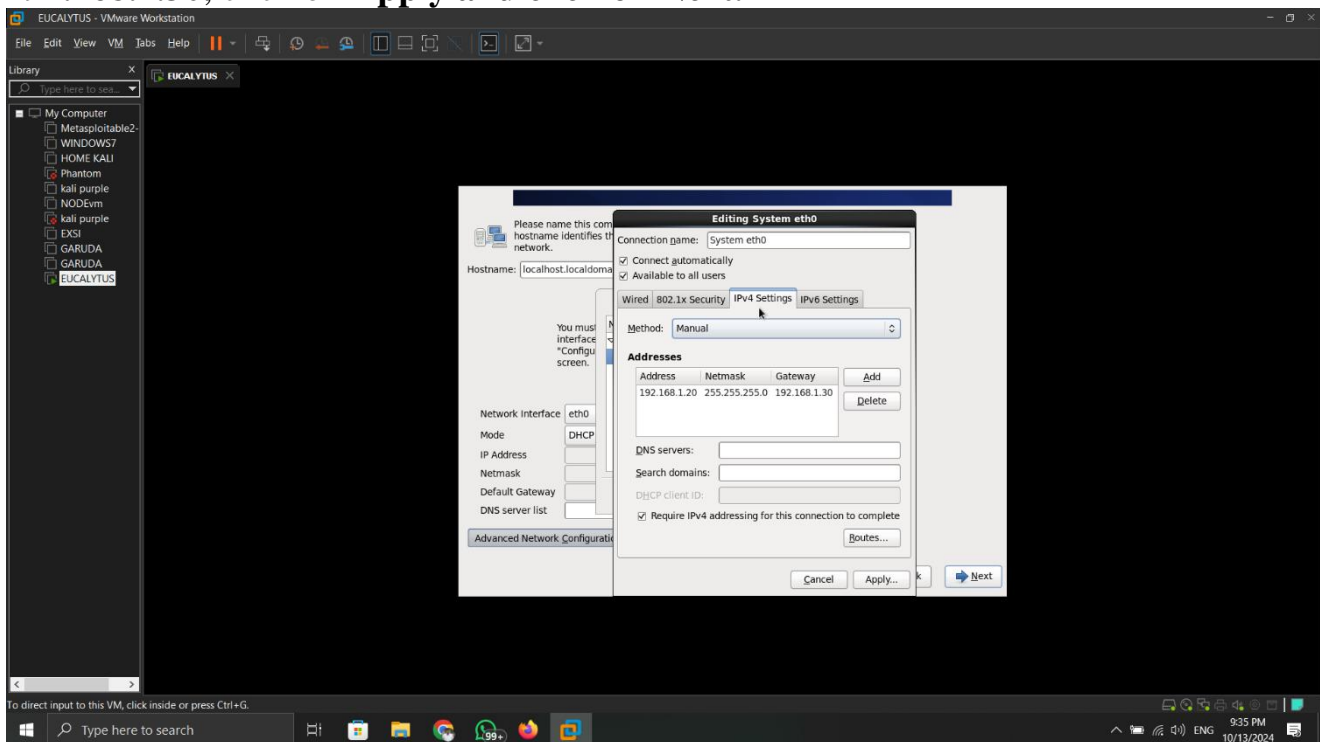


Step12: Click on Advance Network Configuration

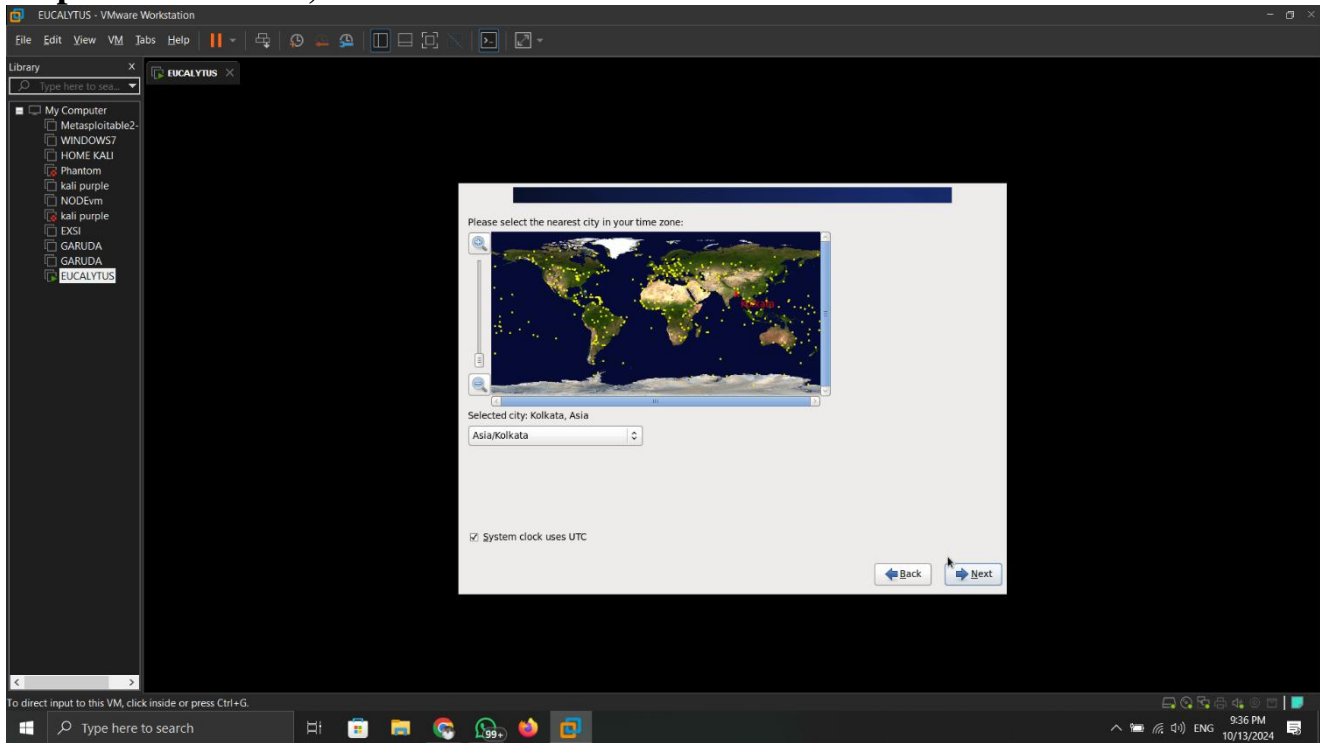
Step13: Select System eth0 and click on Edit



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.

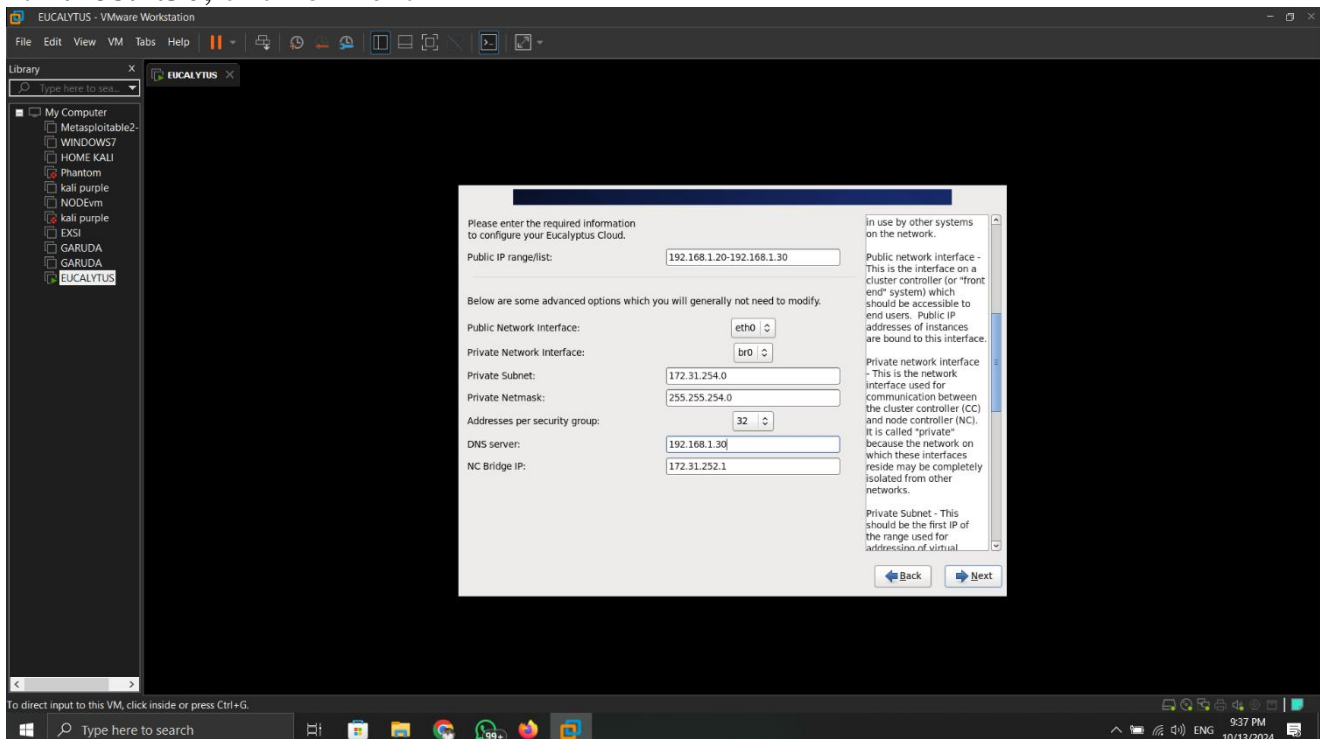


Step15: Select Asia, Kolkata and then next

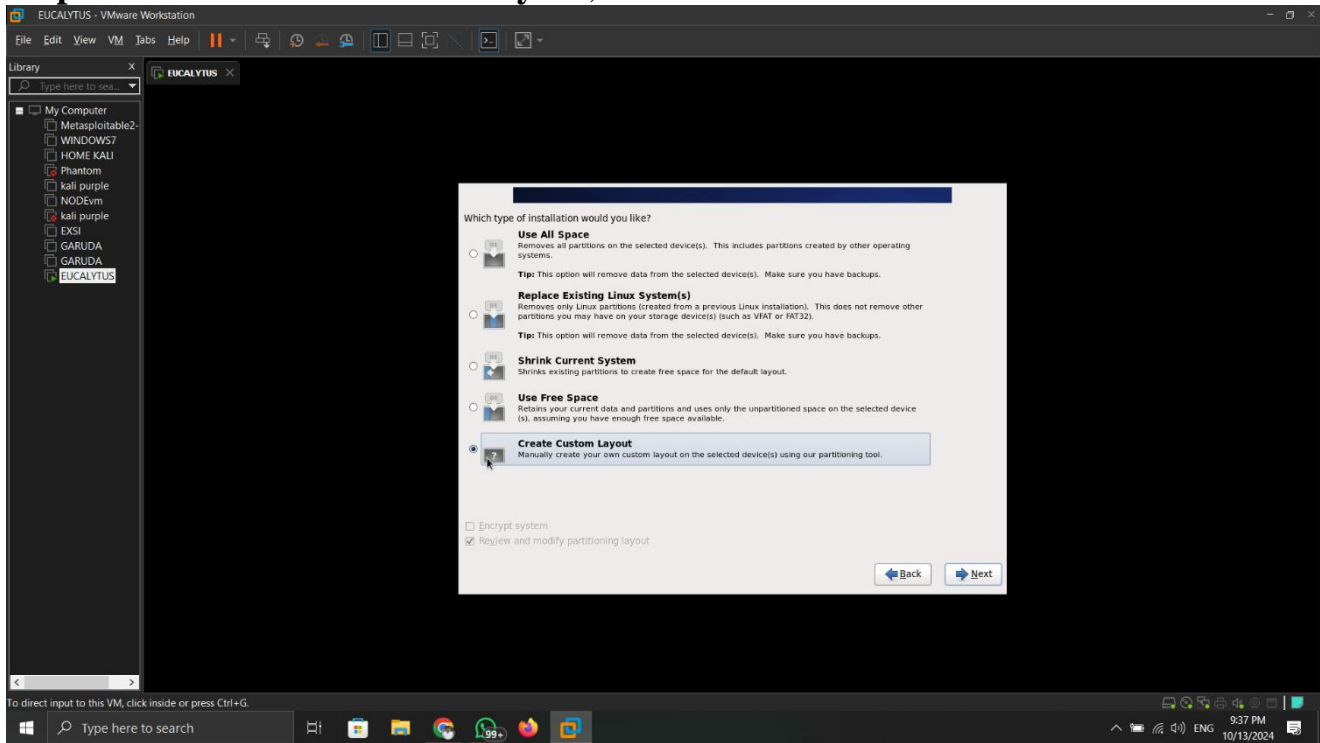


Step16: Create password and next

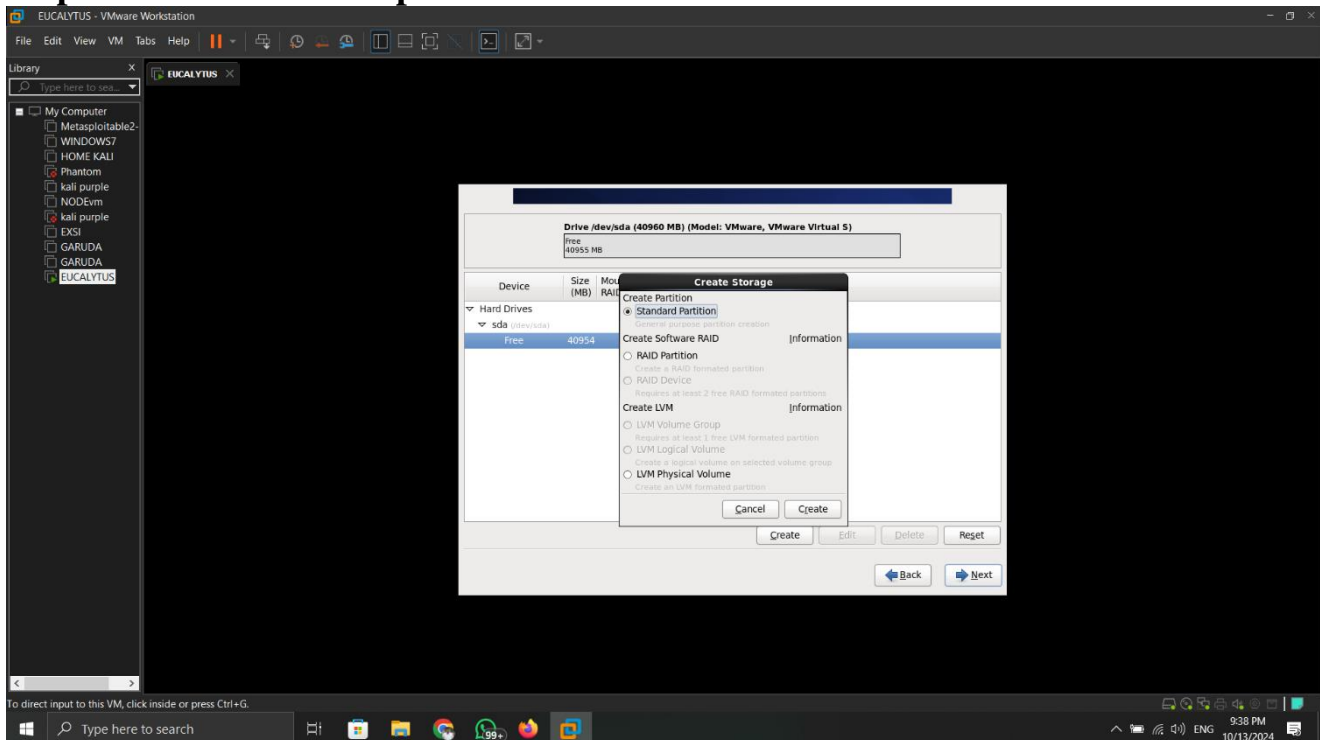
Step17: Place *public IP range* 192.168.1.20-192.168.1.30 and *DNS server* as 192.168.1.30, click on next



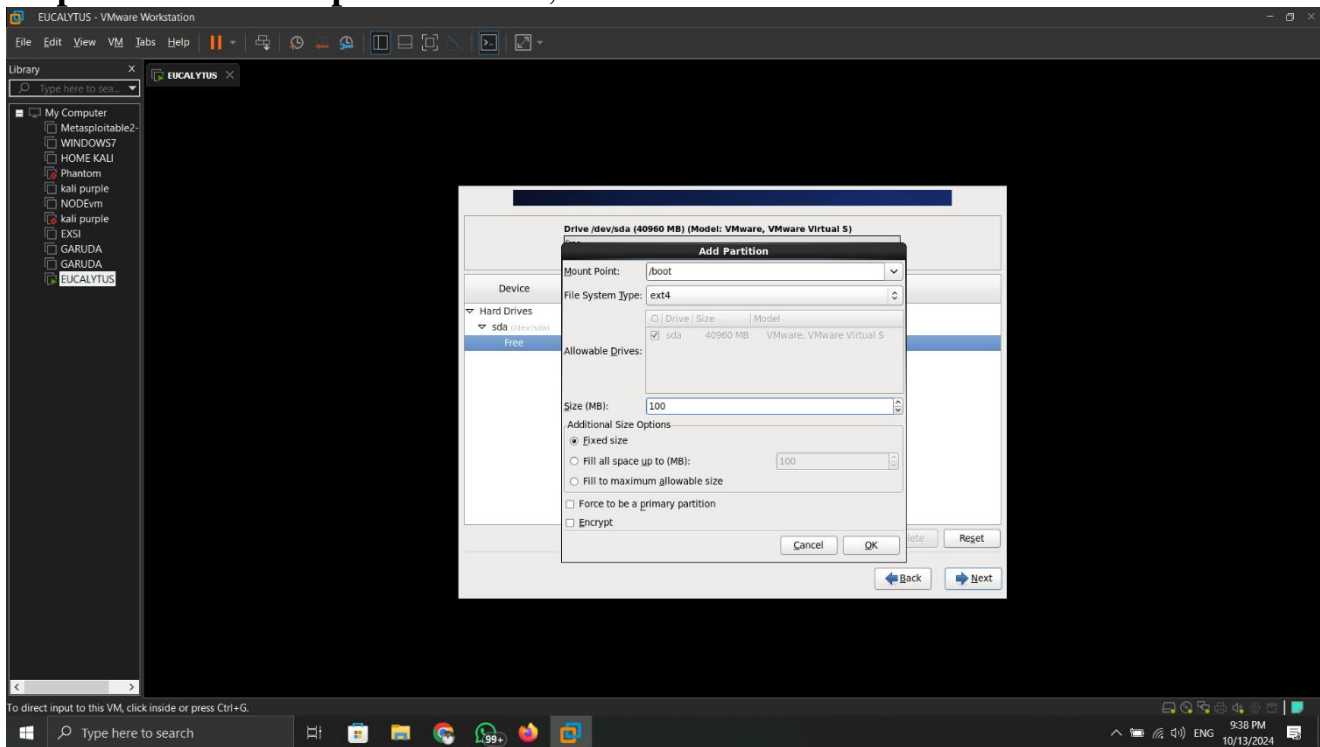
Step18: Select Create Custom layout, click on Next.



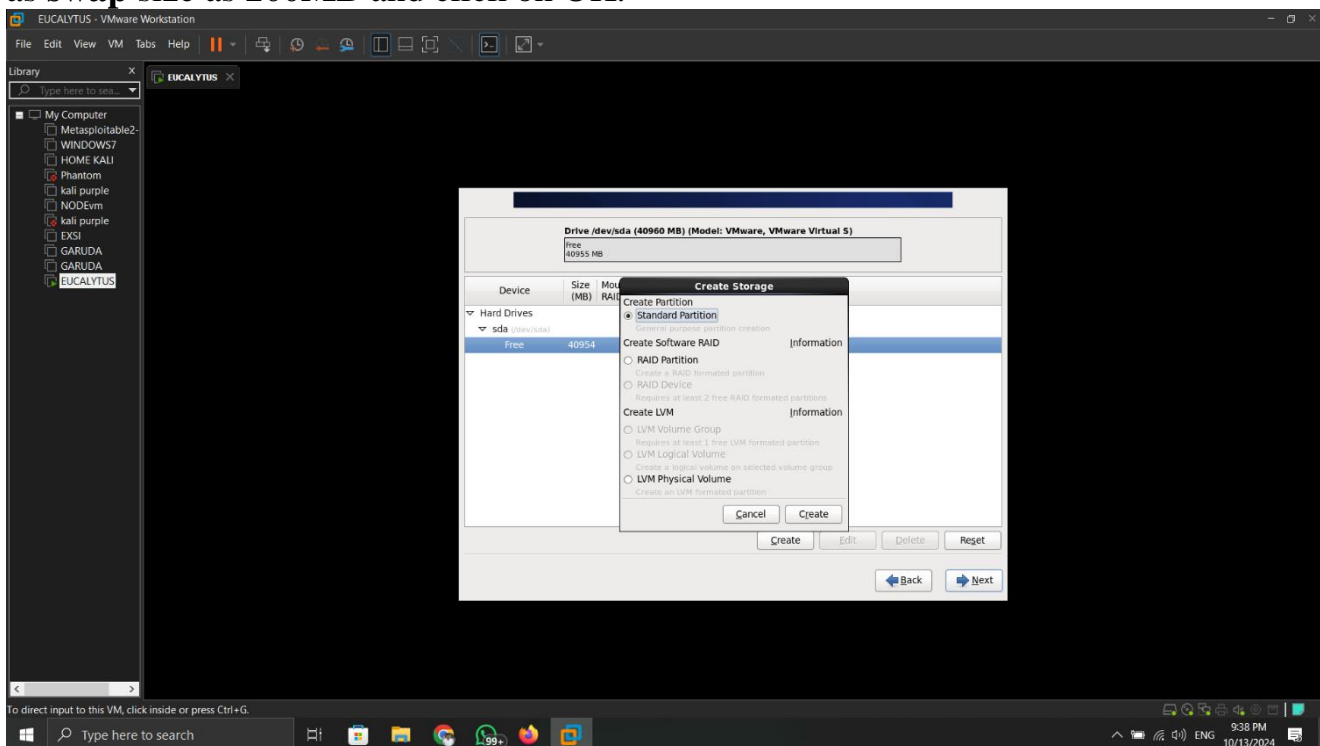
Step19: Select Standard partition and click on Create

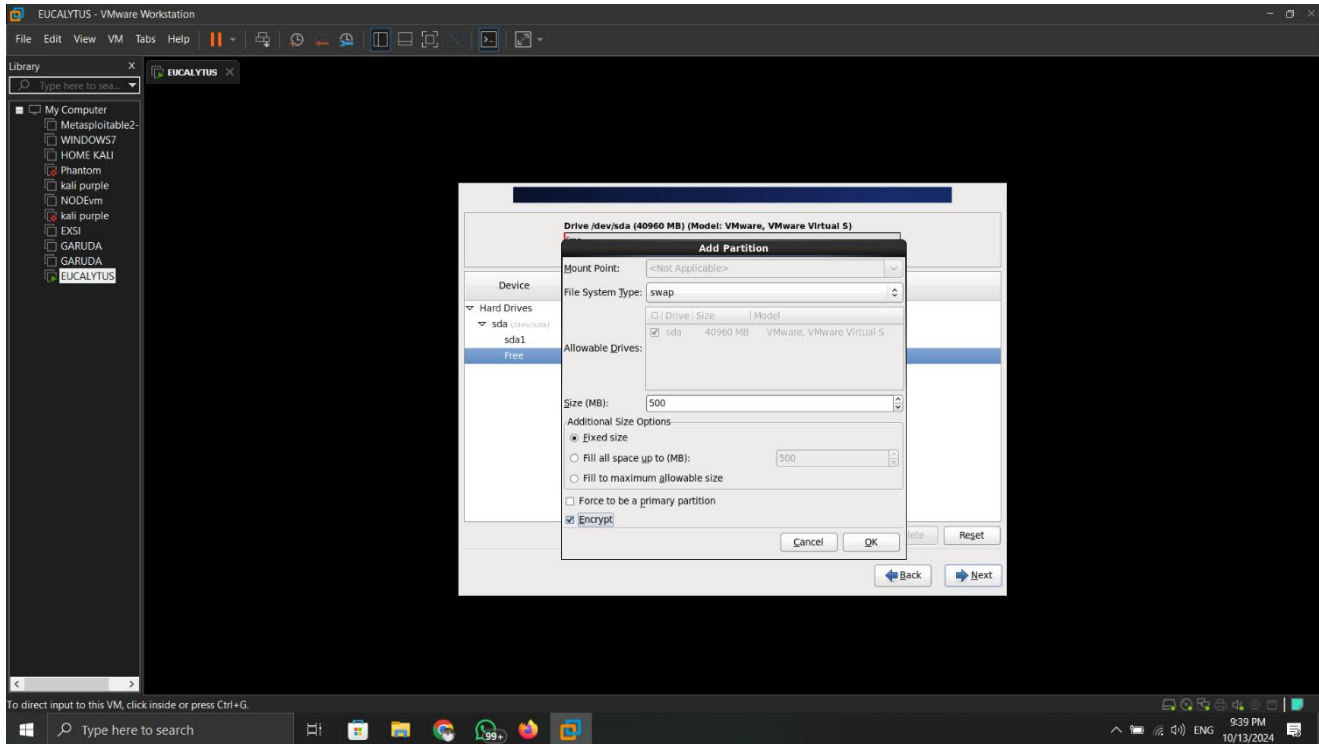


Step20: Give mount point as /boot, size as 100MB and click on OK.

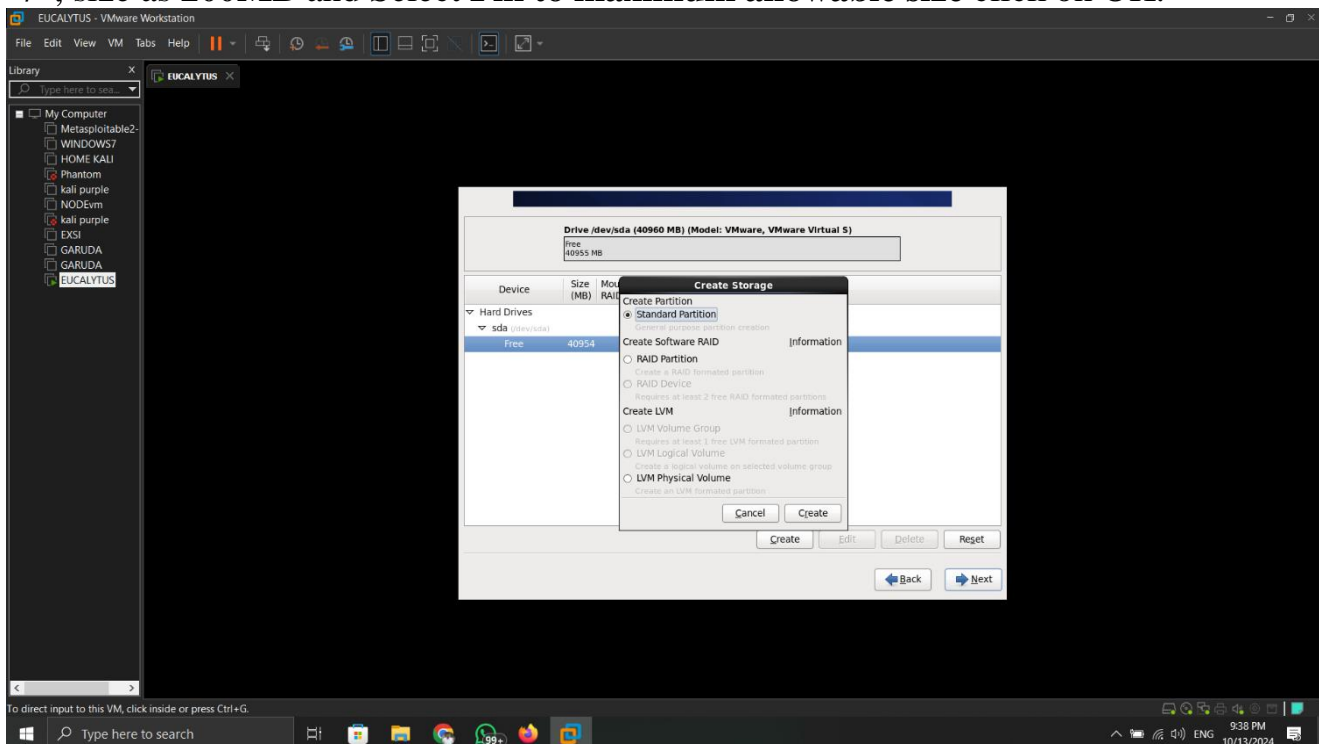


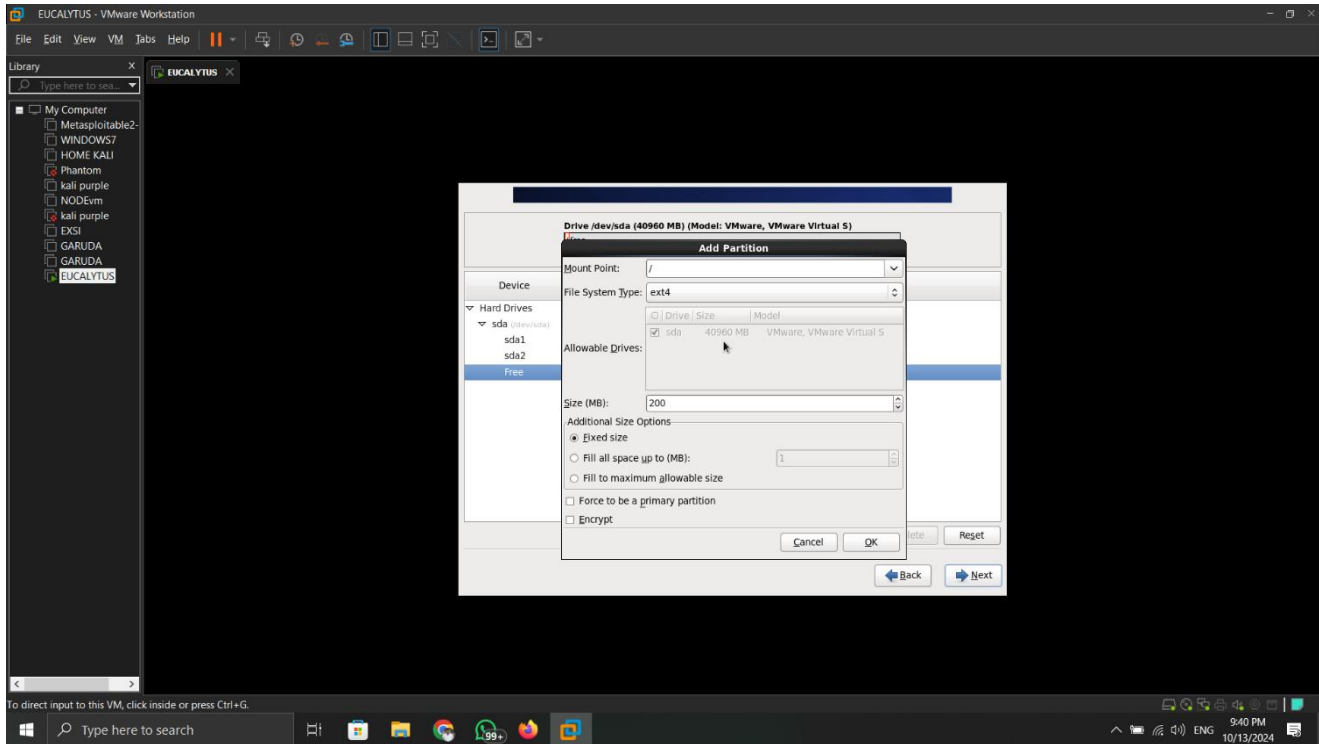
Step21: Again, Select Standard partition and click on Create & Select File System Type as swap size as 200MB and click on OK.





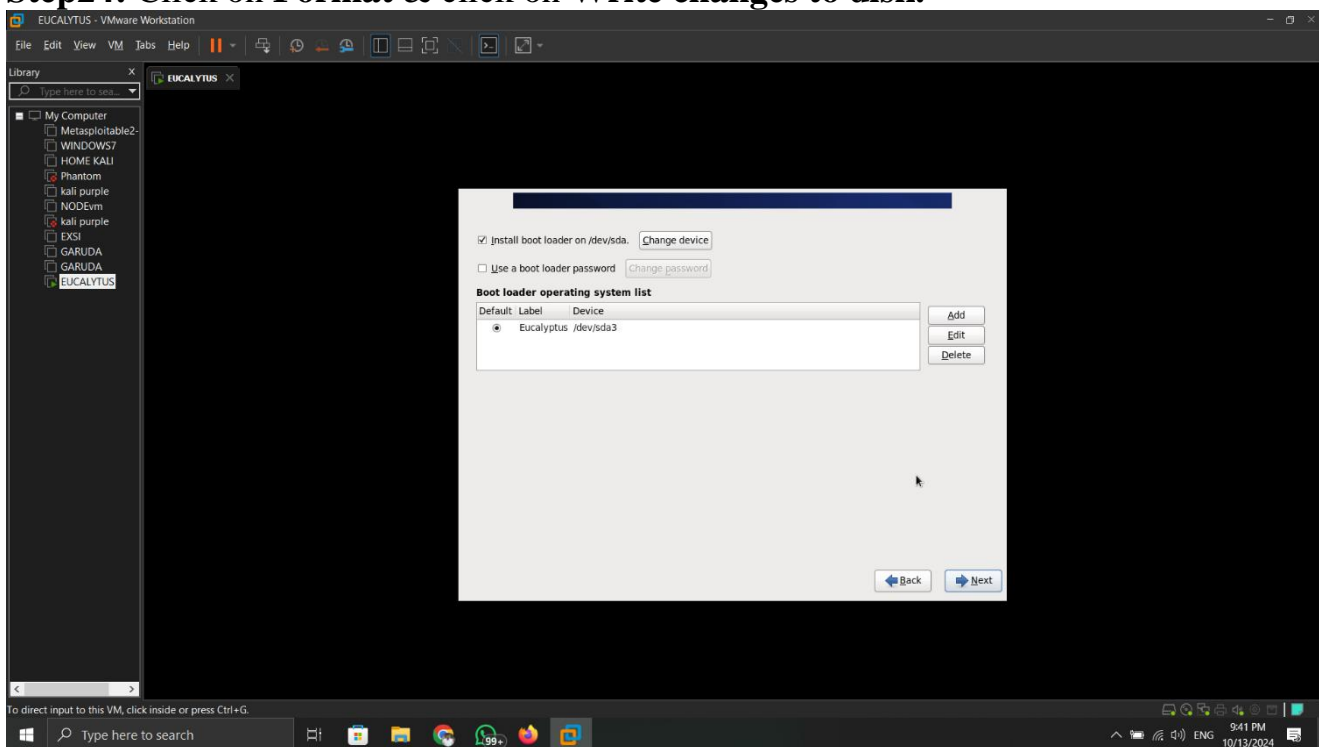
Step22: Again, Select Standard partition and click on Create & Give mount point as “/”, size as 200MB and Select Fill to maximum allowable size click on OK.



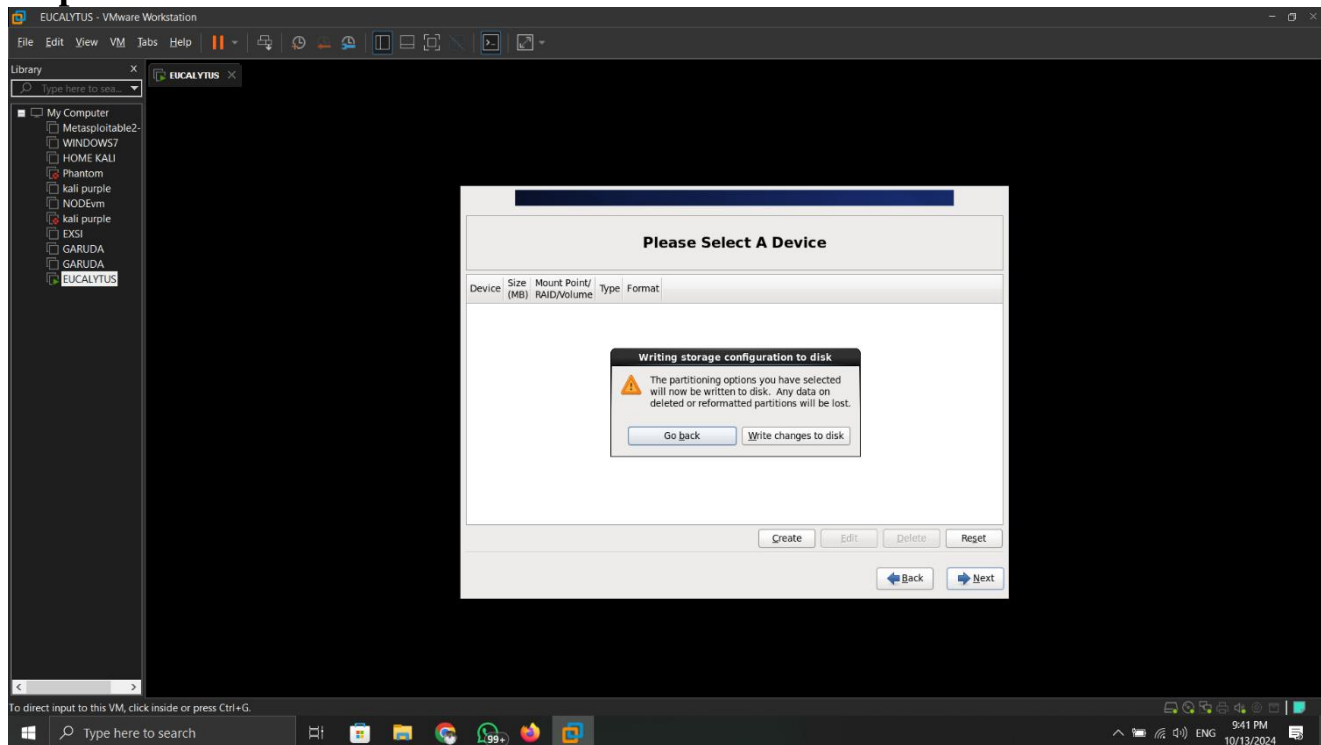


Step23: Click on Next

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

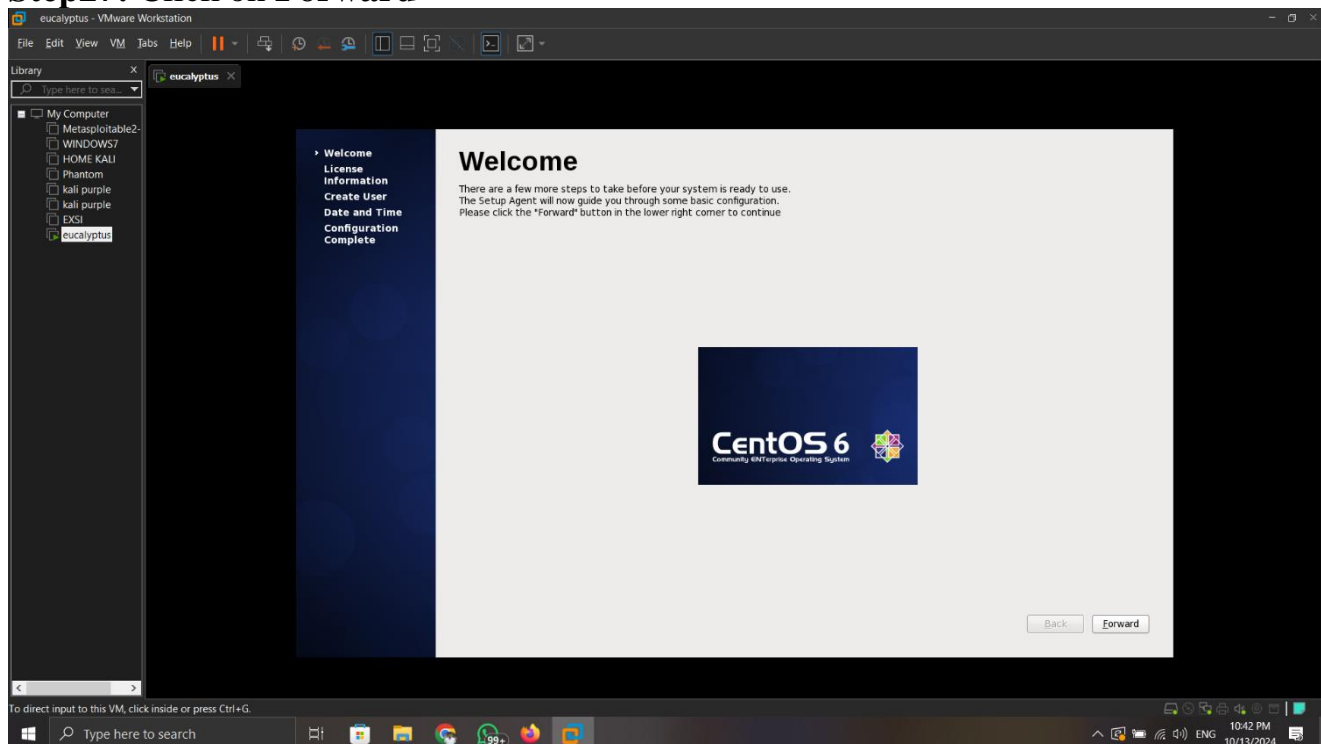


Step25: Click on Next and Finish

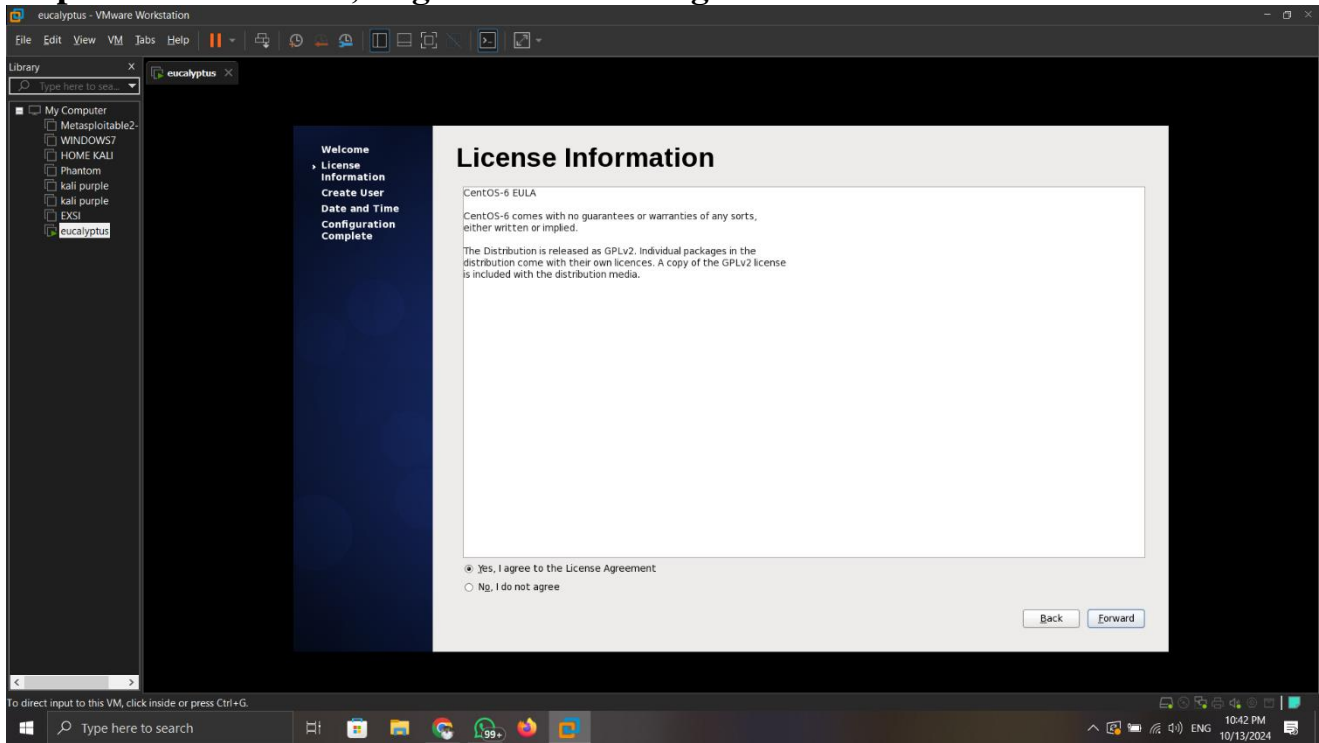


Step26: Click on Reboot

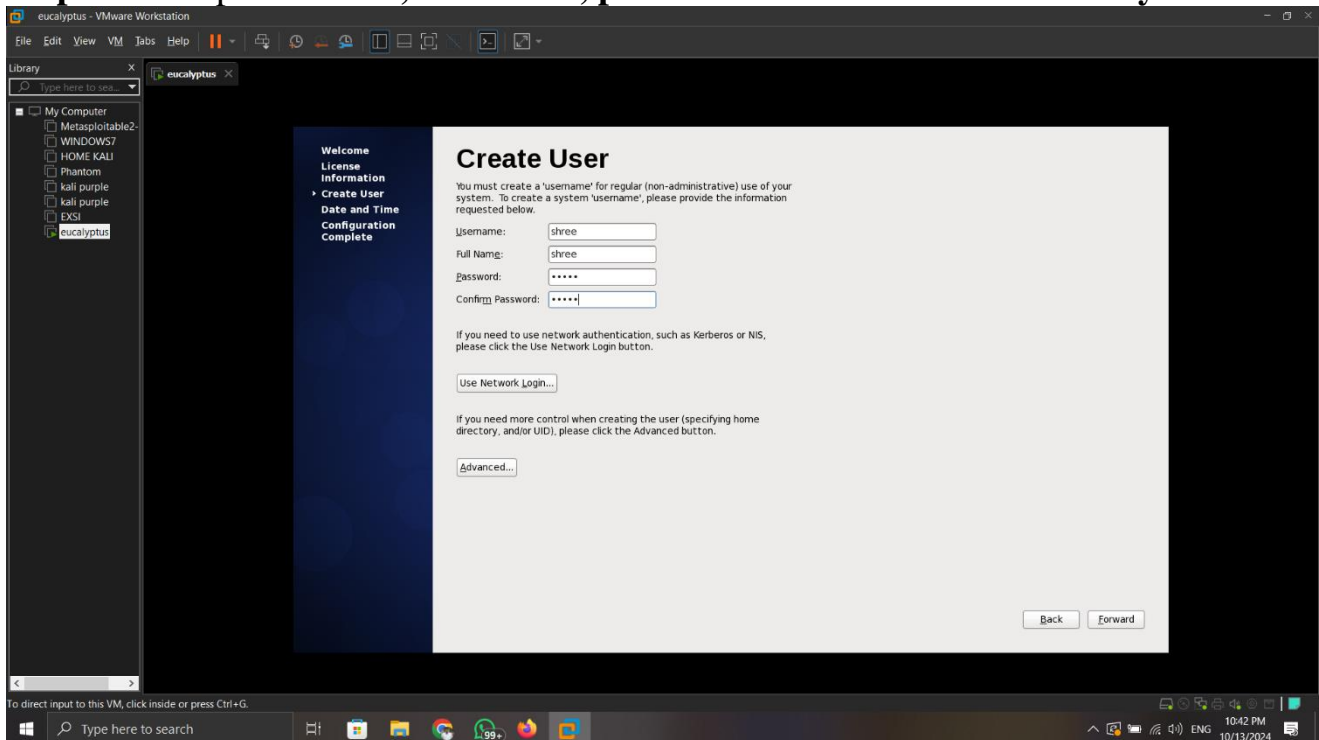
Step27: Click on Forward



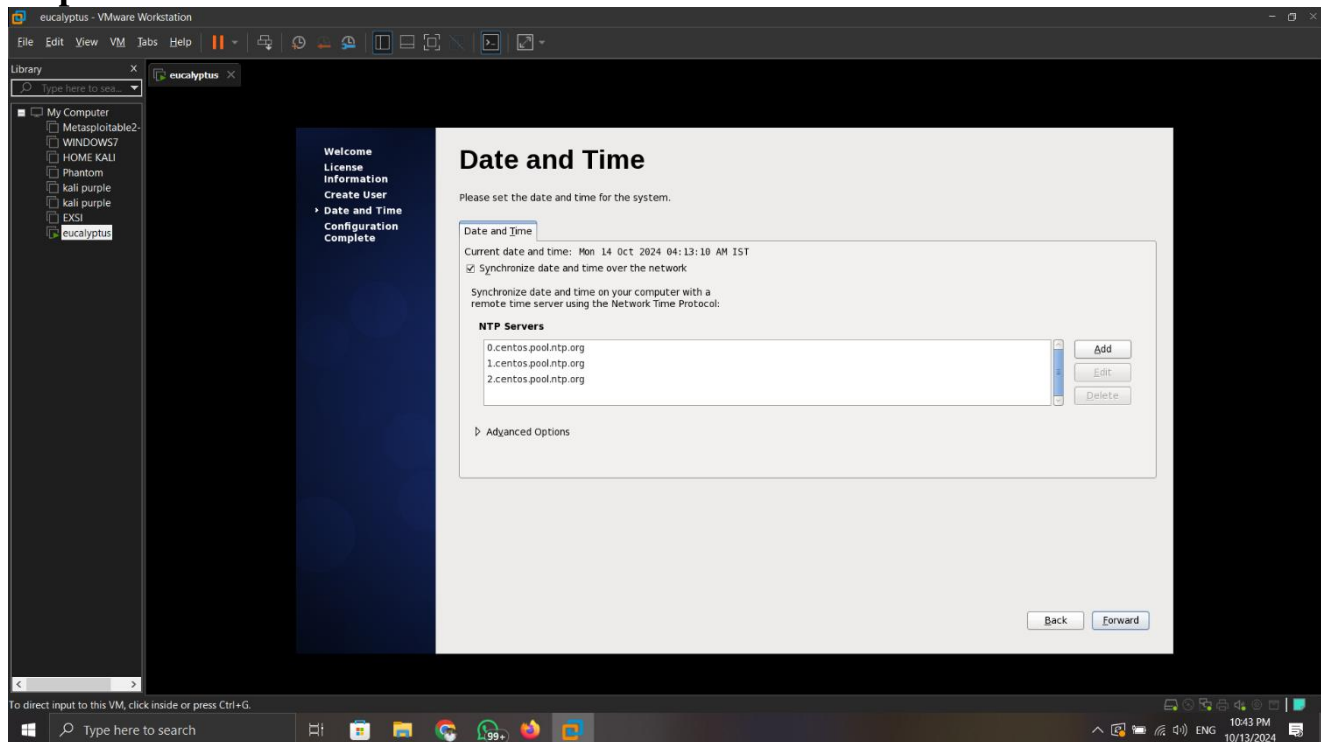
Step28: Click on “Yes, I agree the license Agreement and Forward



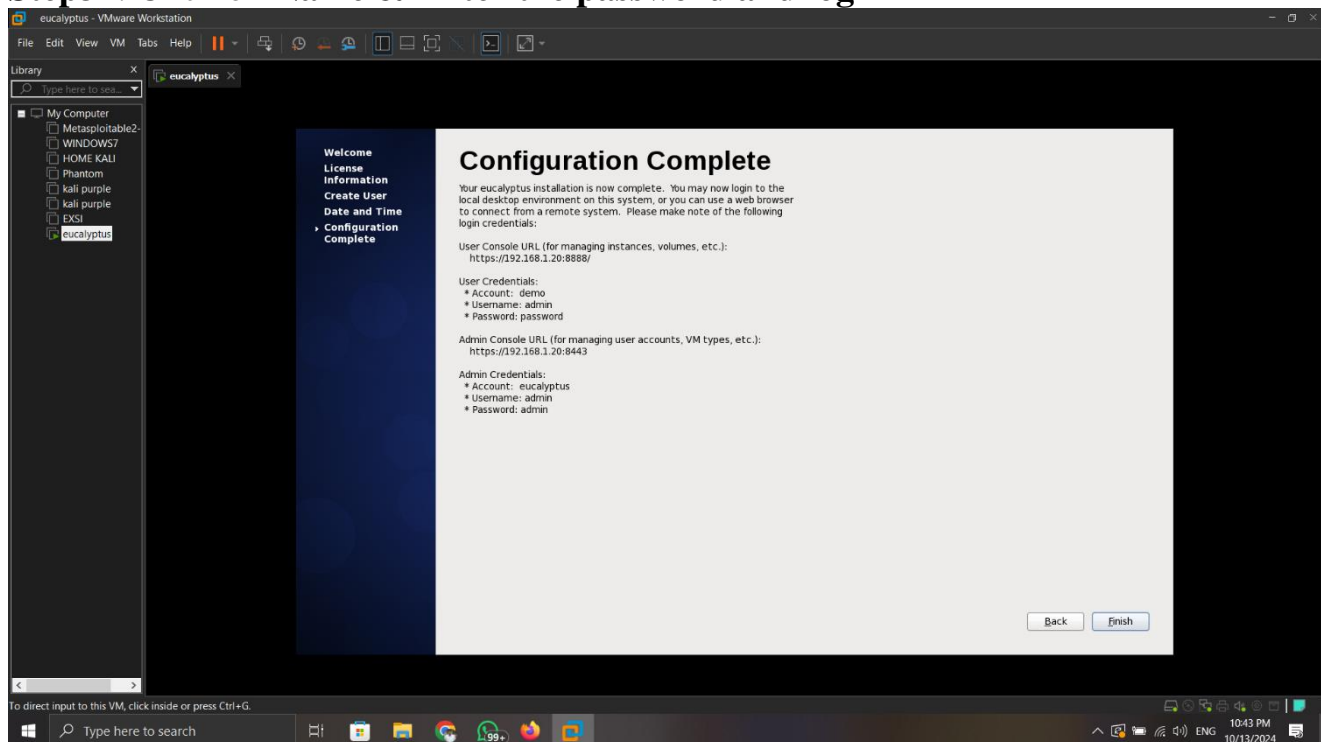
Step29: Fill up username, Full name, password & confirm Password of your choice



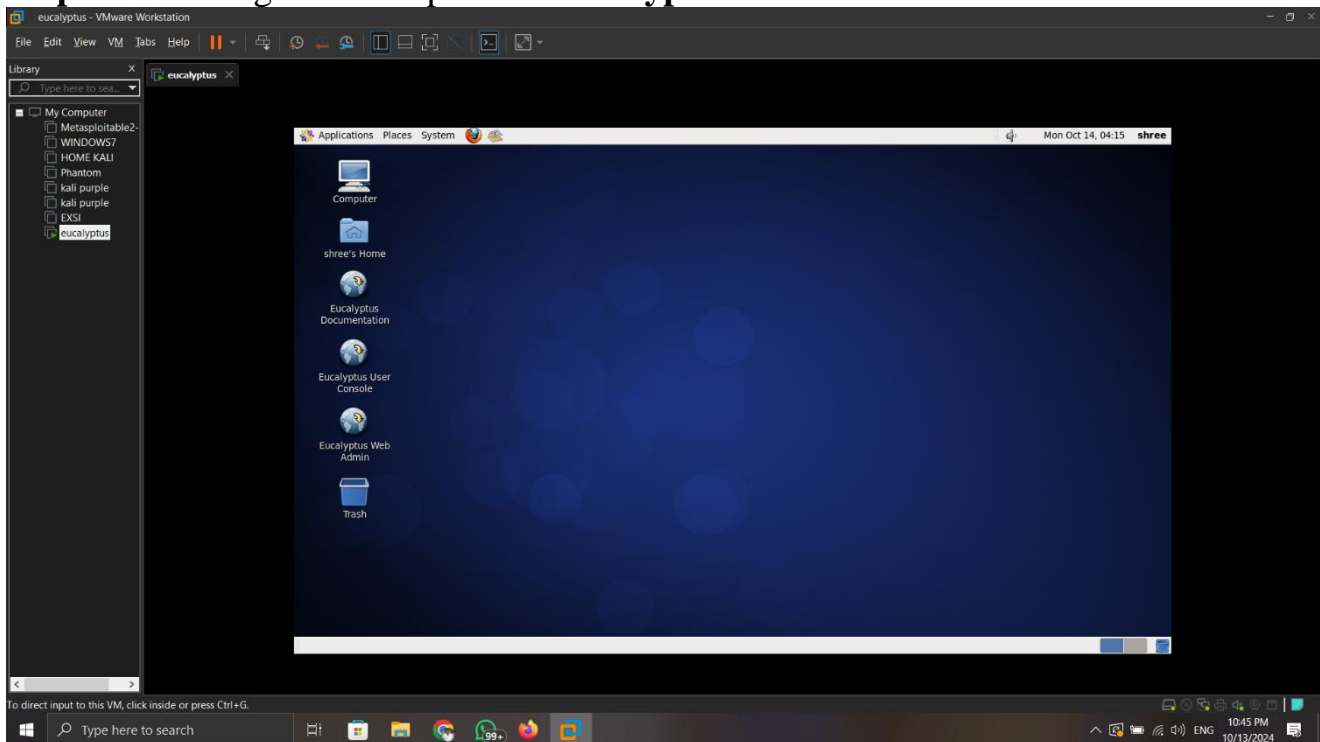
Step30: Click Forward & Finish



Step31: Click on Name & Enter the password and login

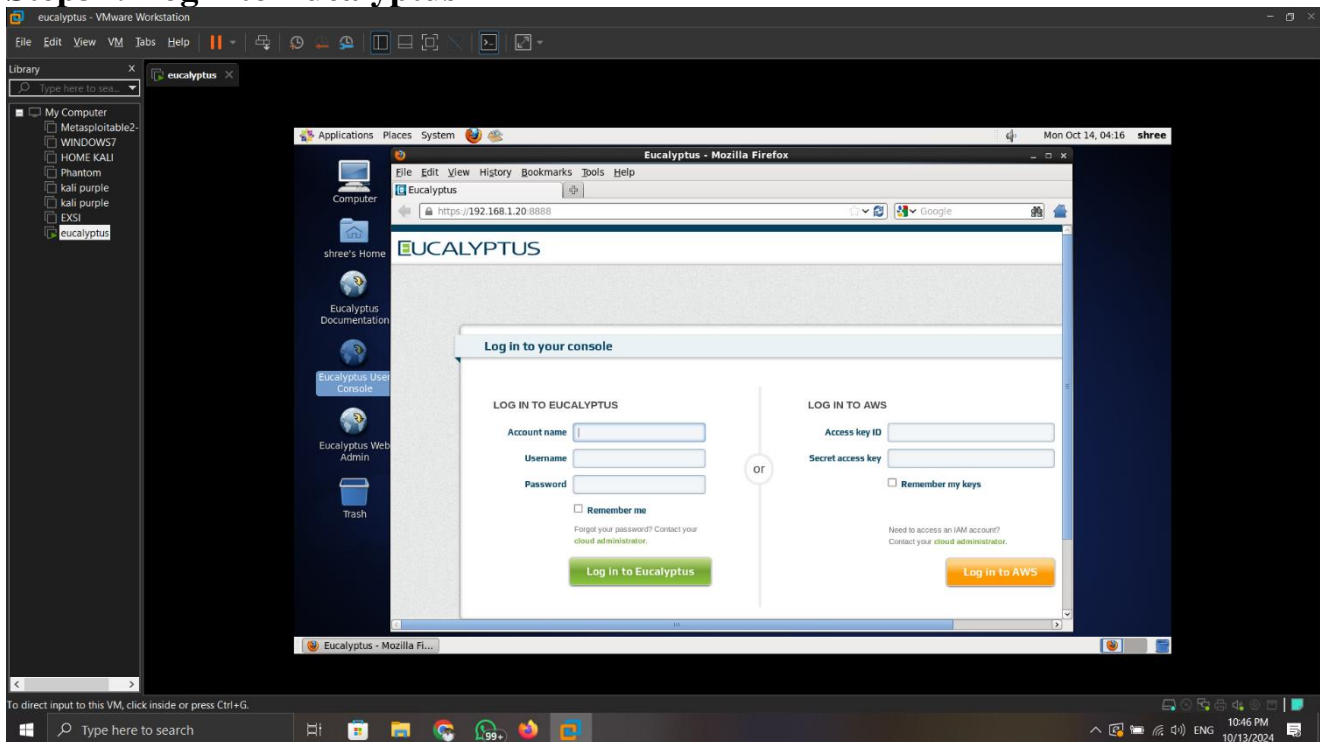


Step32: After login it will open this **Eucalyptus User Console**

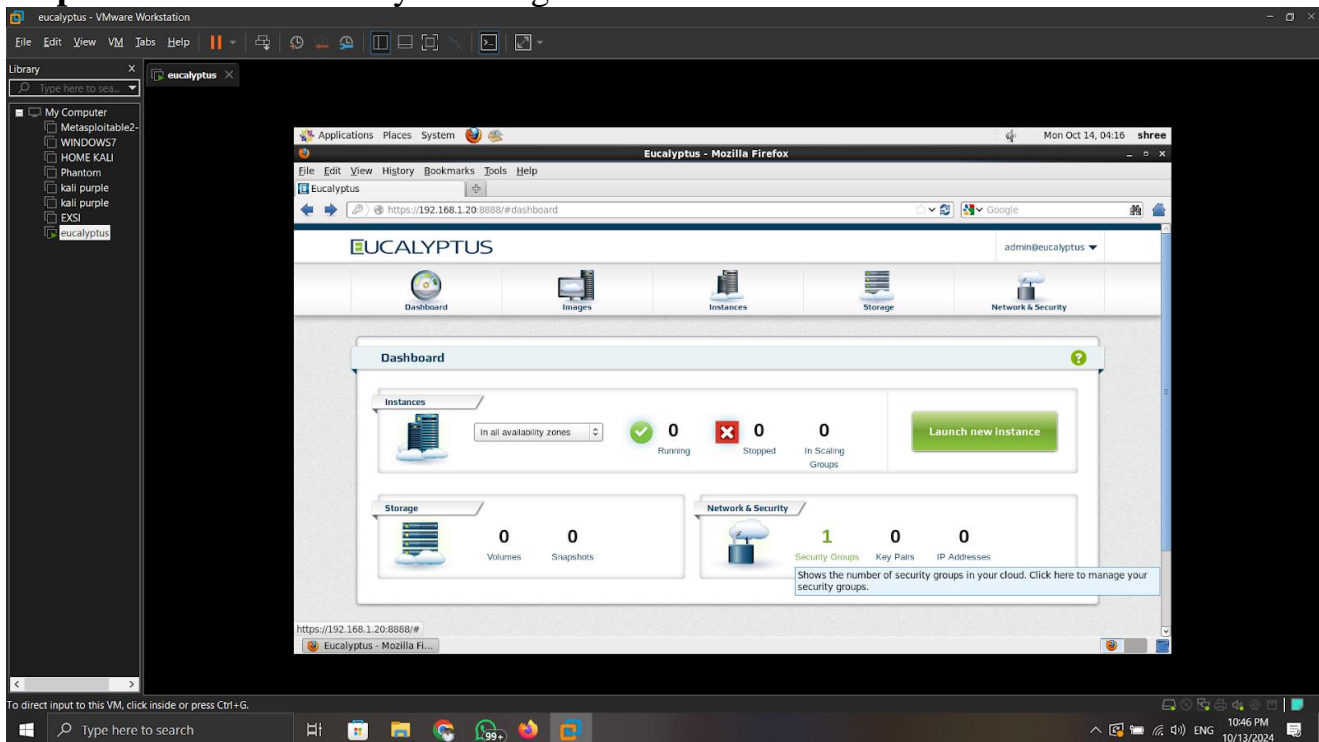


Step33: Now First Click on **Understand the risk** and then add exception

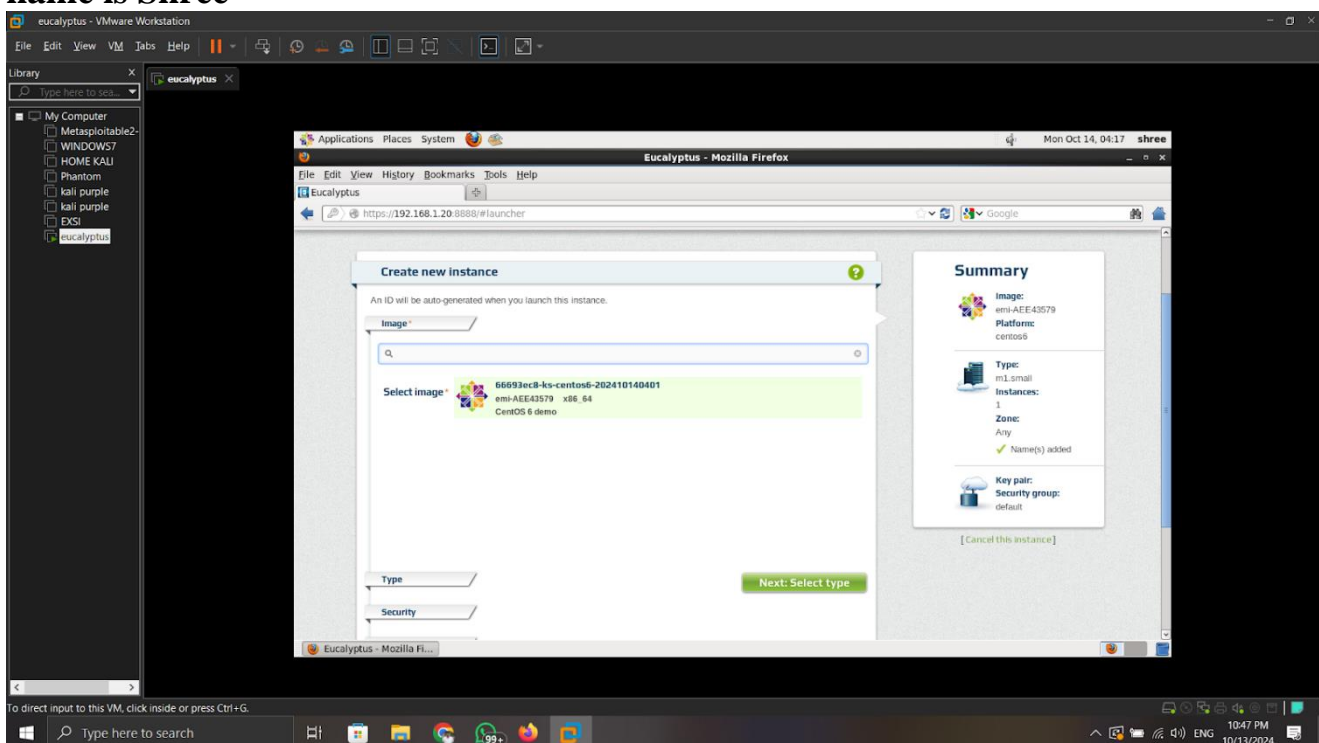
Step34: Login to Eucalyptus

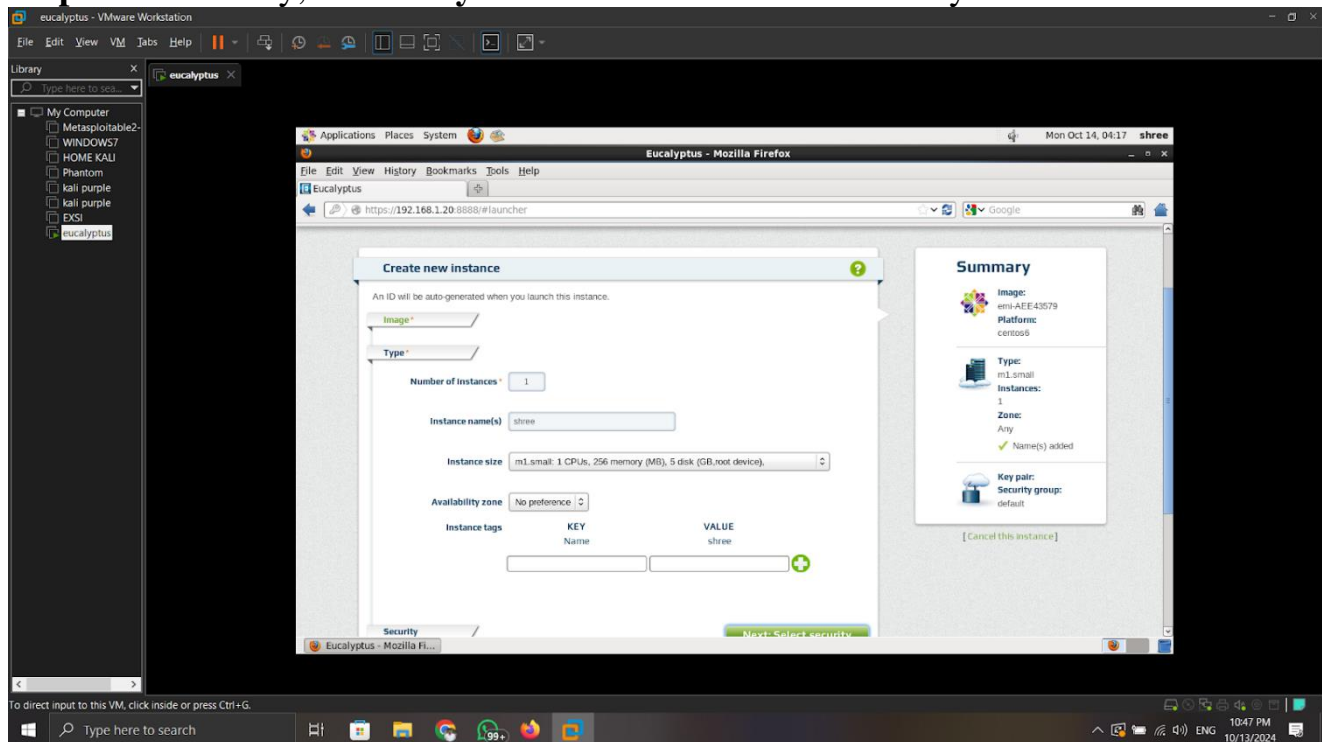


Step35: Create instance by Clicking on “Launch new Instance”

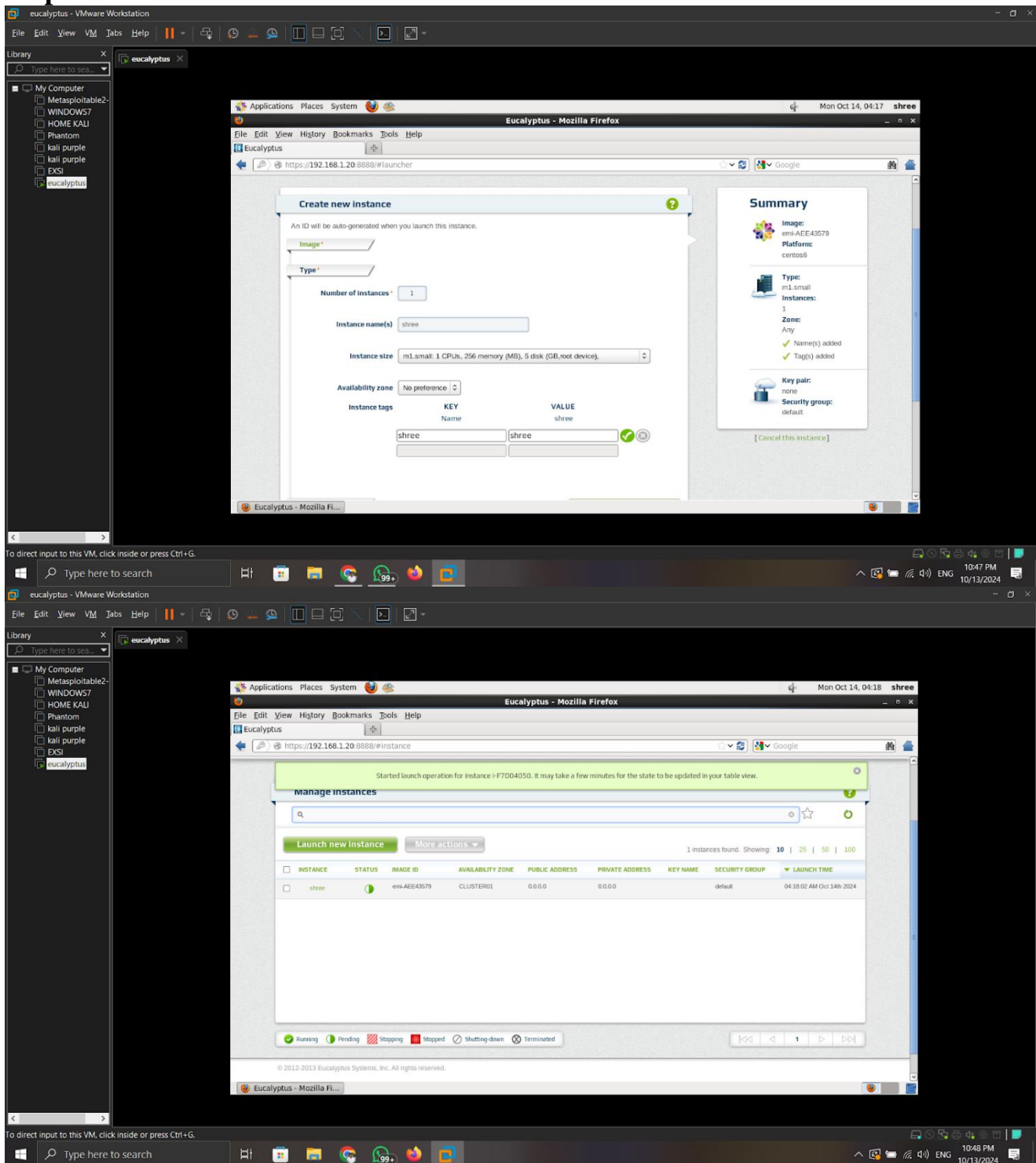


Step36: Click on Next: Select Type and give the instance name as Eucalyptus and key name is Shree



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

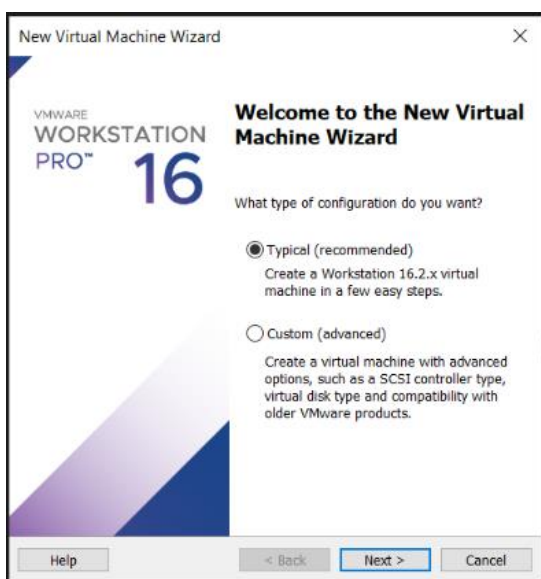
3.Xen Server 8

Steps:

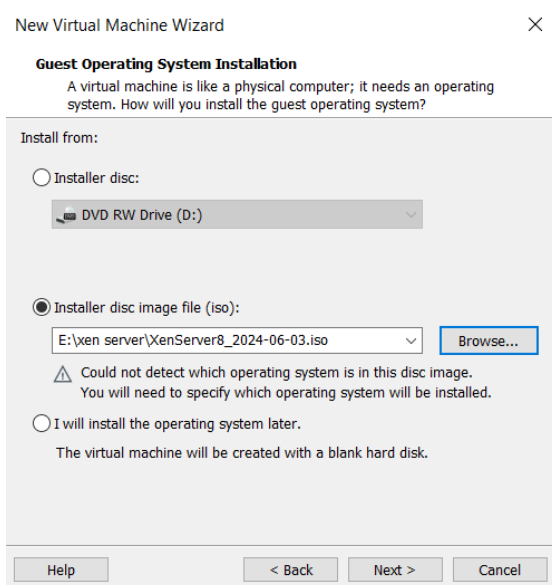
Step1:- Create a new Virtual Machine in VMware Workstation

File → New Virtual Machine

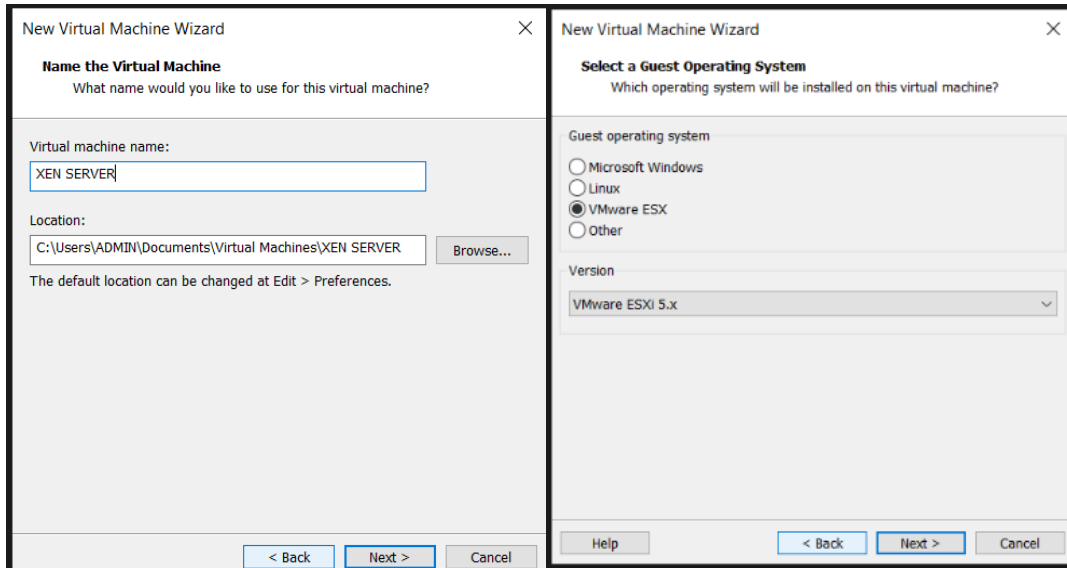
Step2: Select Typical (recommended) and click on “Next” button.



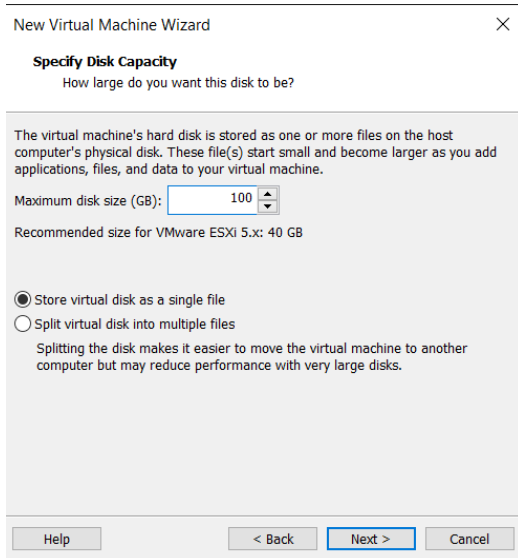
Step3: Select the iso file click on the Browse & select “XenServer-8.2.0- install-cd” file. Then click on the “Next” button.



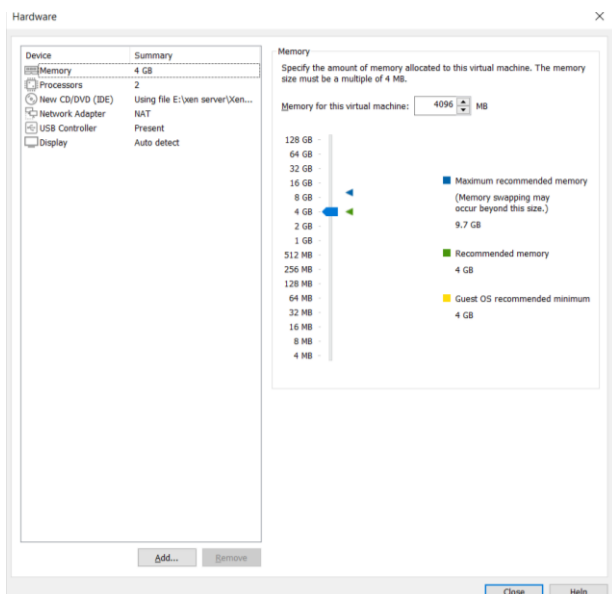
Step4: Select Guest OS as “VMware ESXi” and Version as “VMware ESXi 5”. Give a name to the Virtual Machine as Xen Server



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

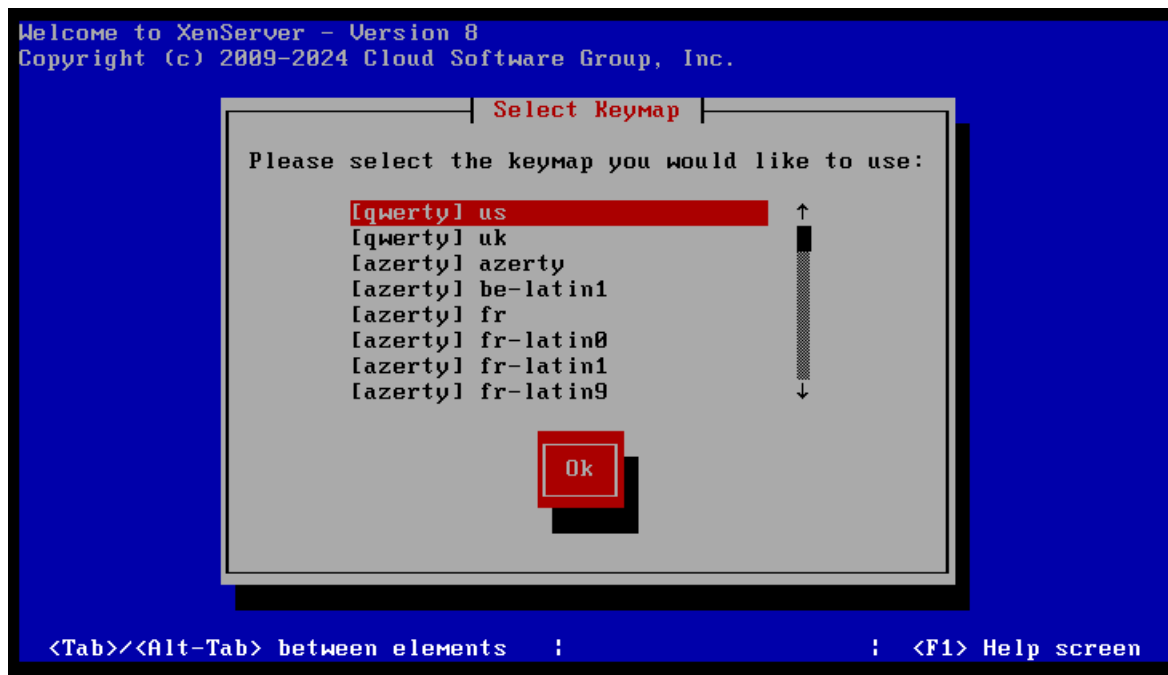


Step6: At the Hardware window select Memory size as 2GB, Close and Click on “Finish”



Step7: Power ON the Xen Server

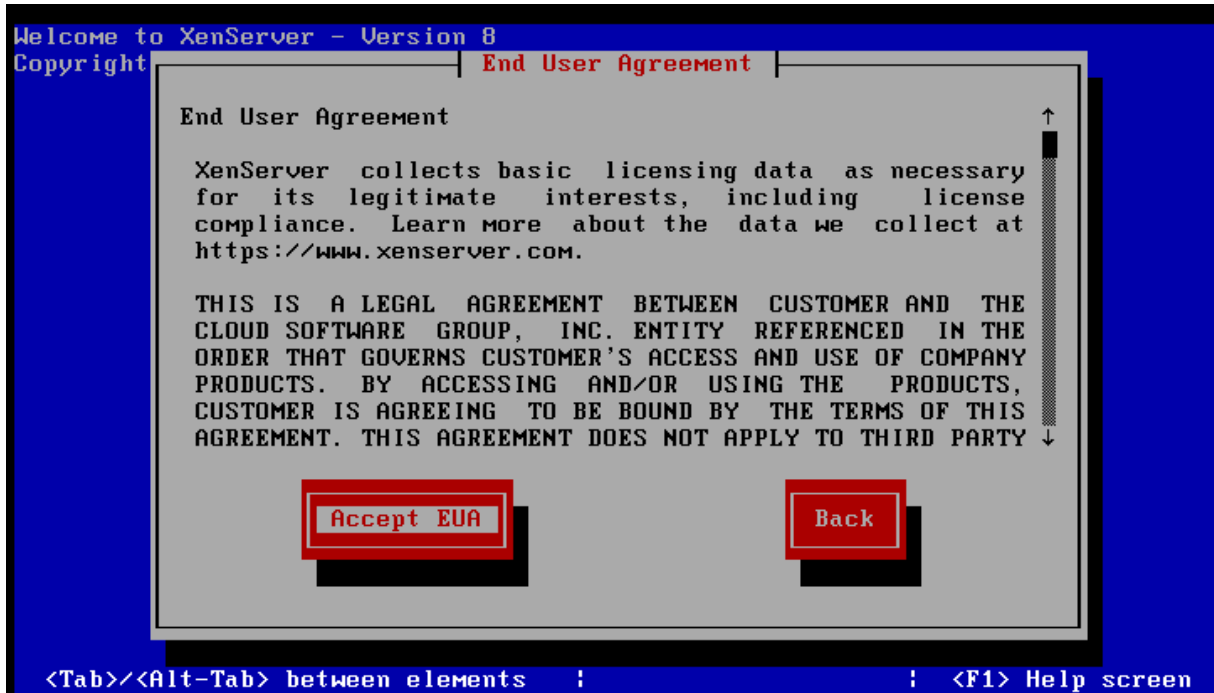
Step8: Select Keymap as [qwerty] us and press Enter.



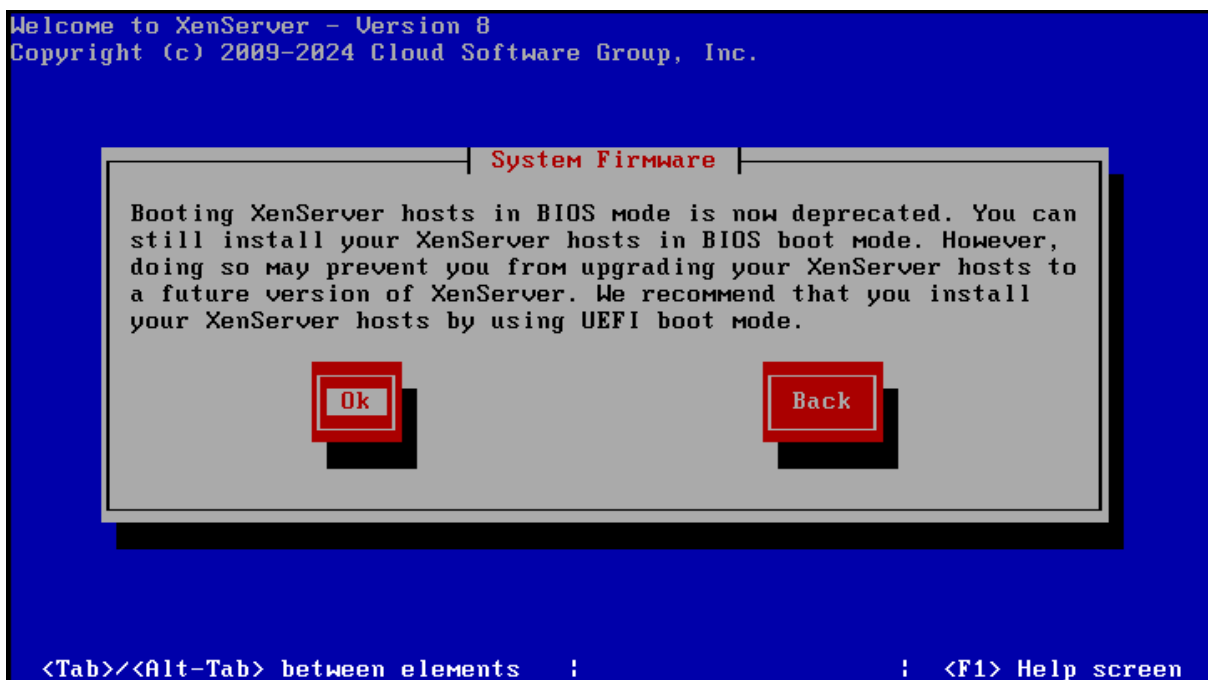
Step9: In the Welcome to XenServer Setup screen press Enter to choose Ok.



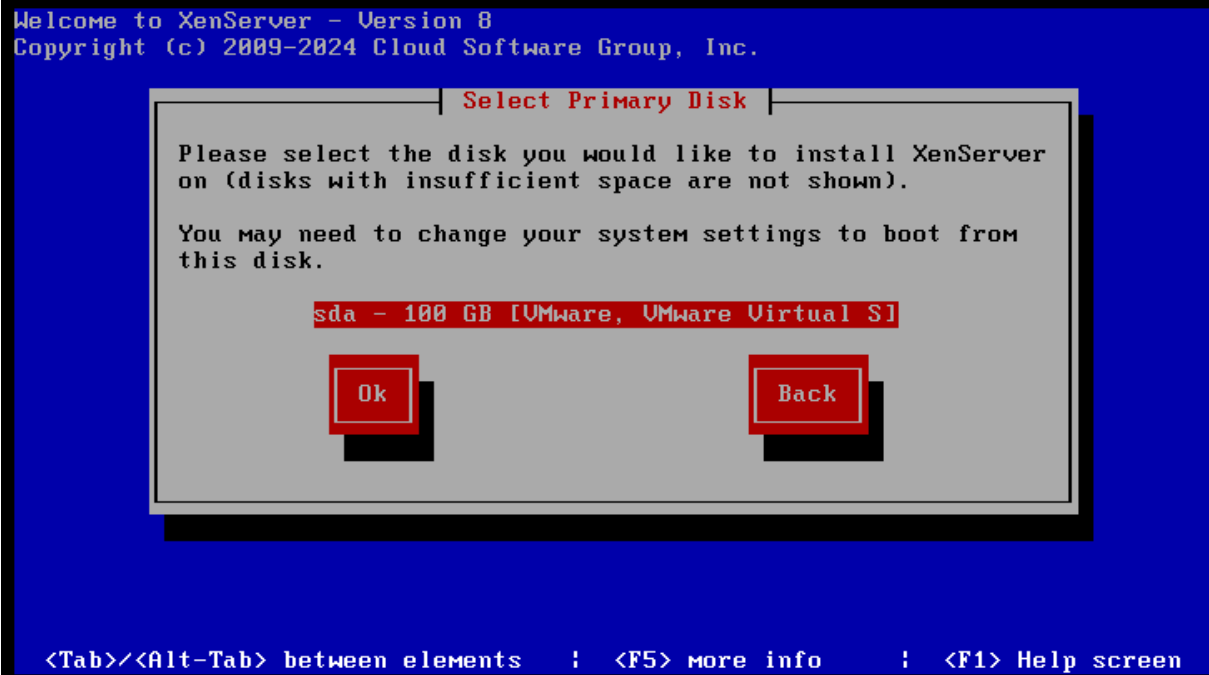
Step10: In End User Agreement Select Accept EUA



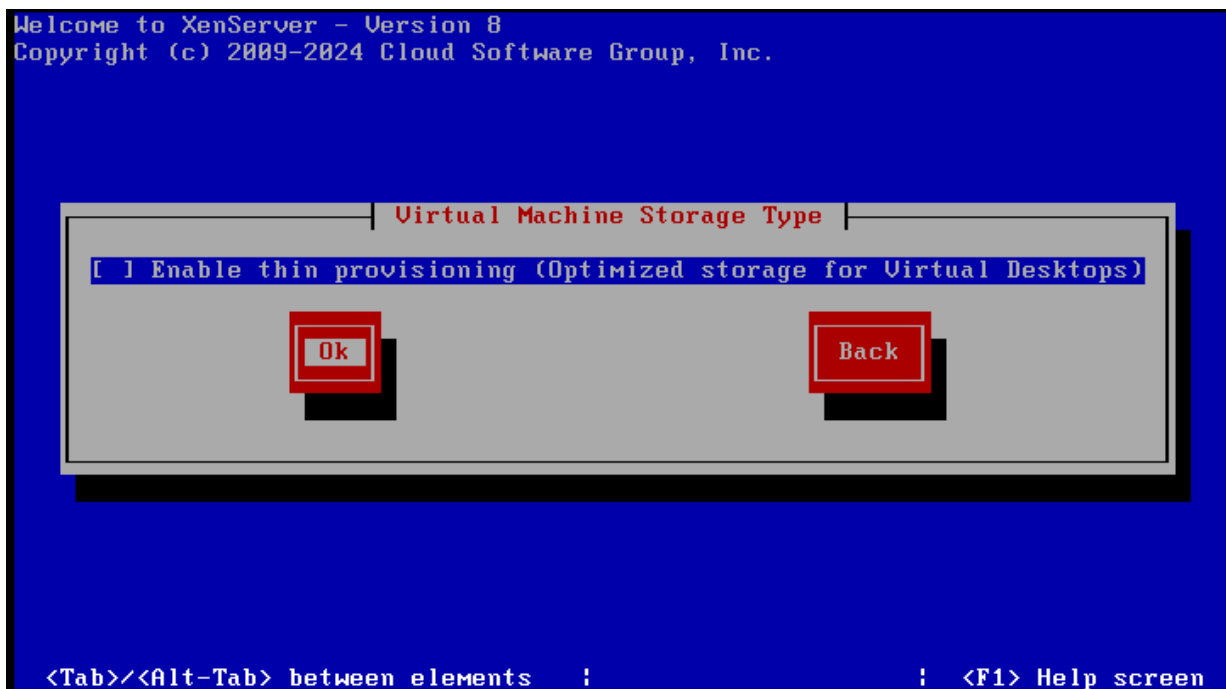
Step11:In system Firmware Select OK



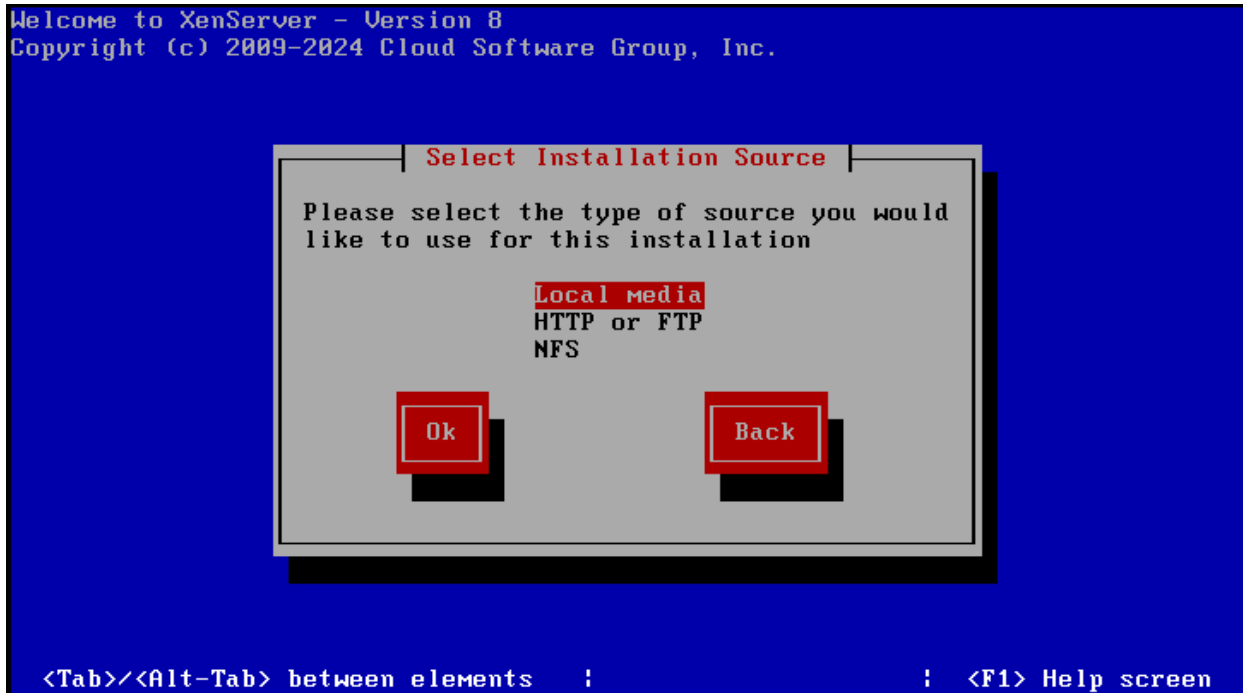
Step12:Select Primary Disk and press OK



Step13: In Virtual Machine Storage Type Select and press OK



Step14: Select Installation Source as Local Media



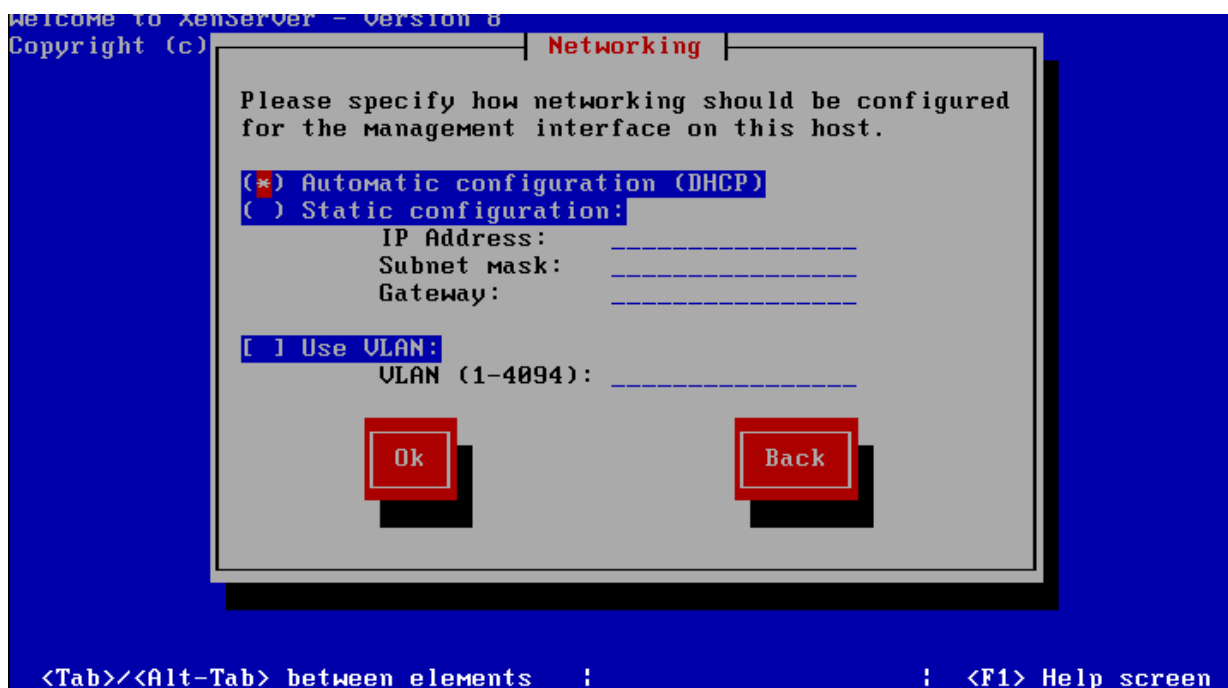
Step15: Choose skip verification and click on ok



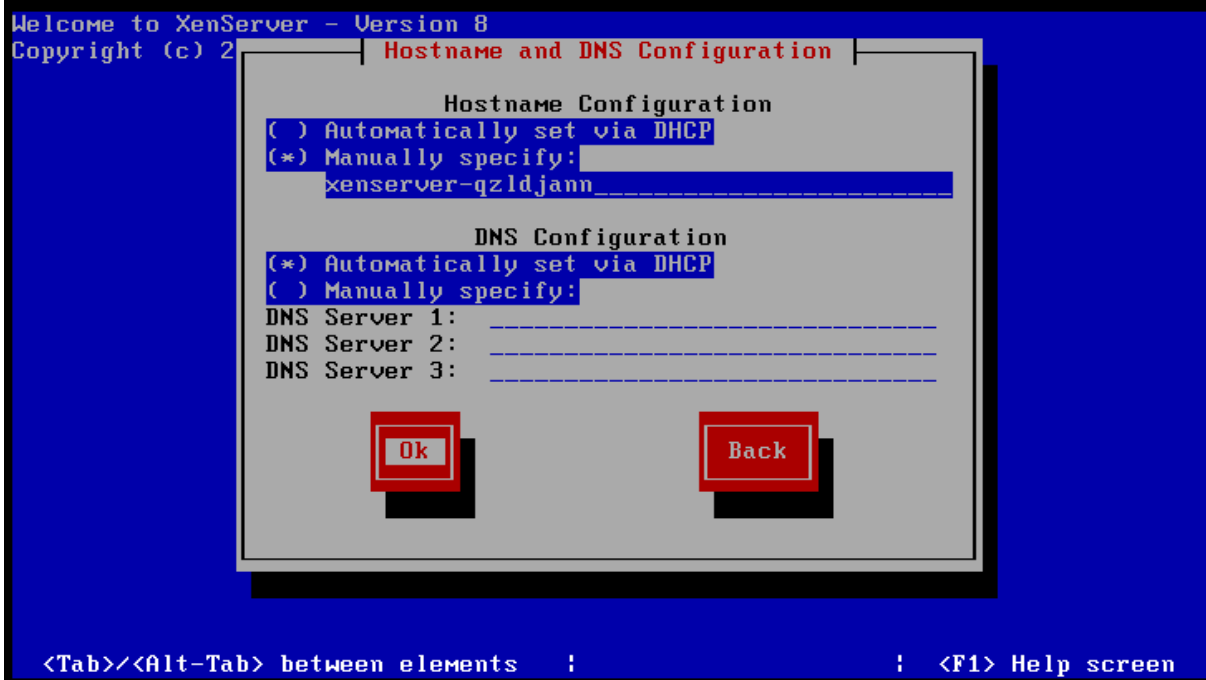
Step16: Set a 6 digit password and click OK



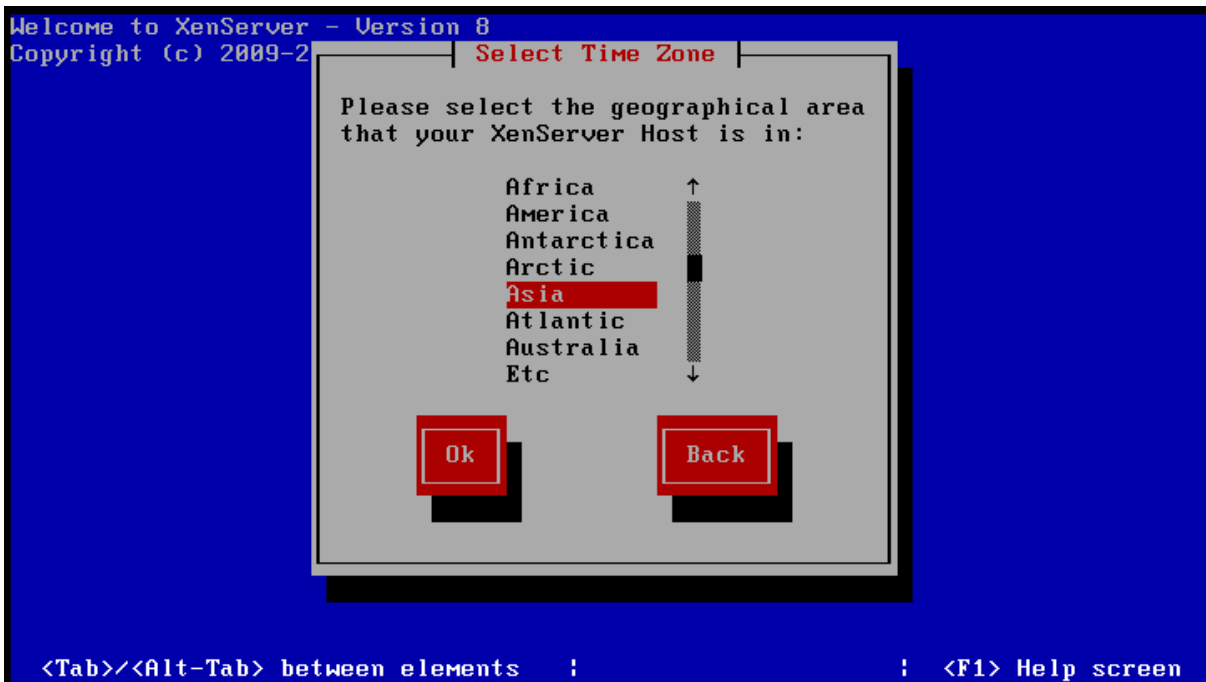
Step17: Keep the setting default and navigate to OK Button



Step18: Keep the setting default and navigate to OK Button



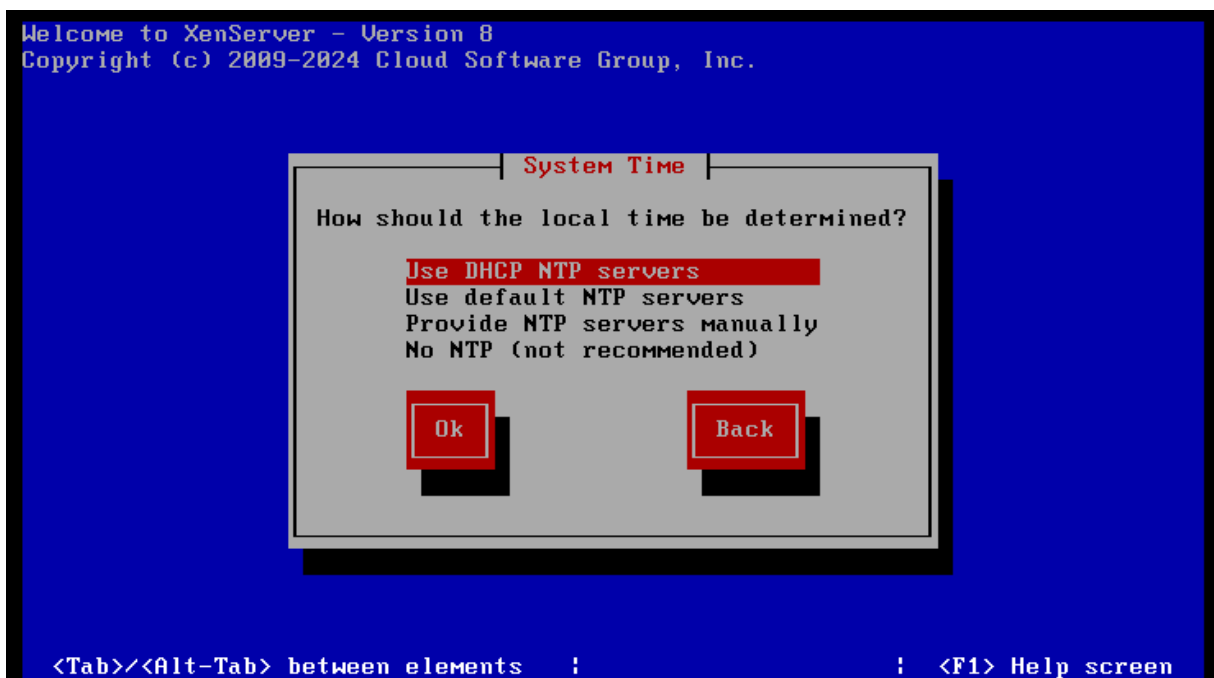
Step19: In the dropdown find Asia and press Enter



Step20: In the dropdown find Kolkata and press Enter



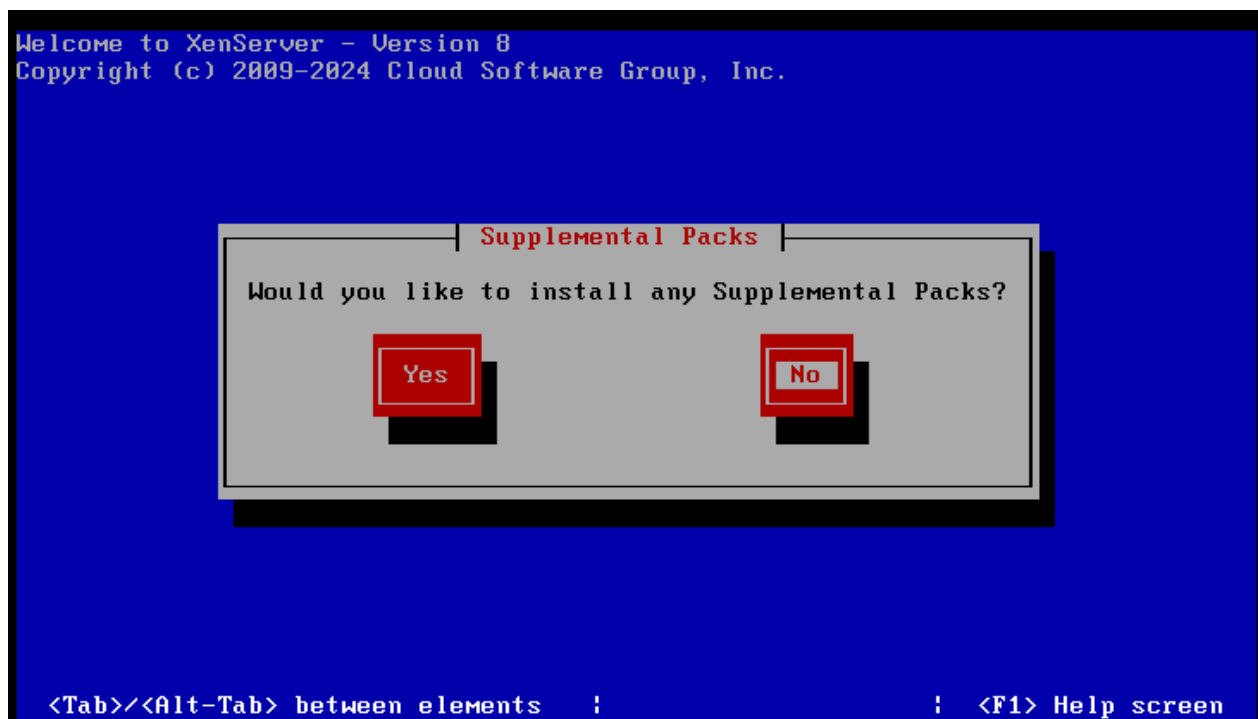
Step21: Keep the setting default & click on OK



Step22: Click on Install XenServer.



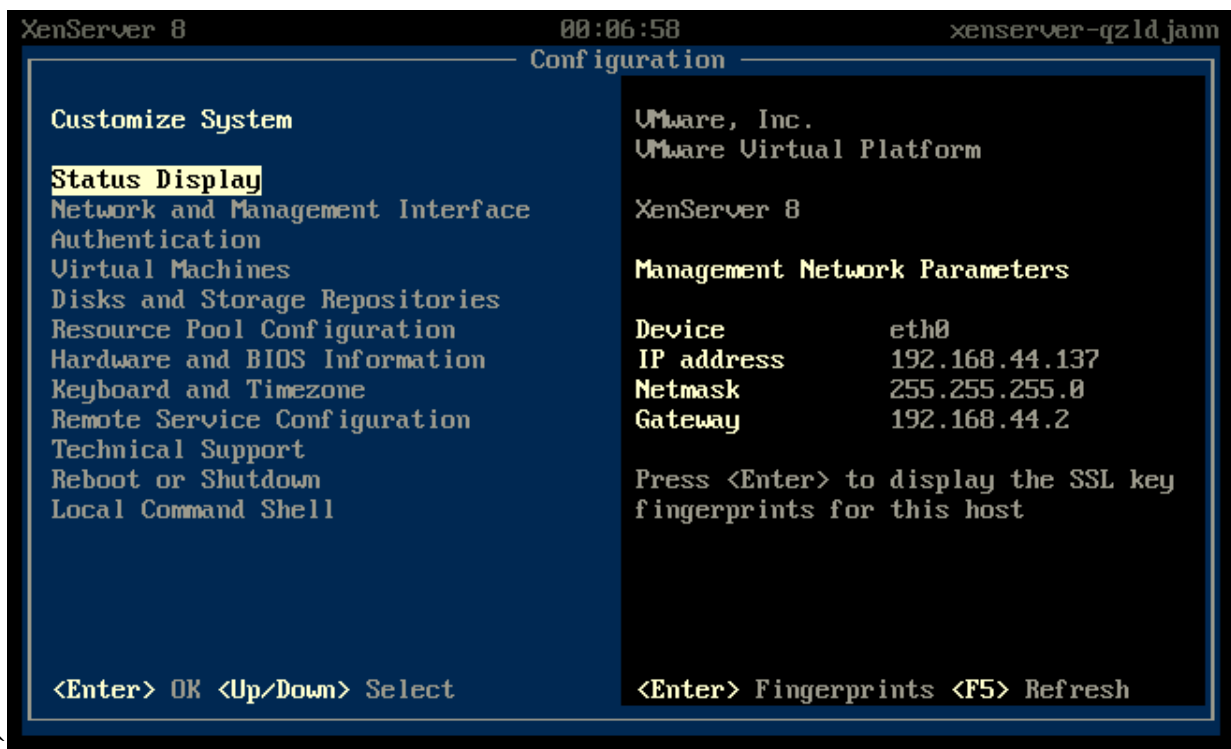
Step23: Select No and the vm will reboot



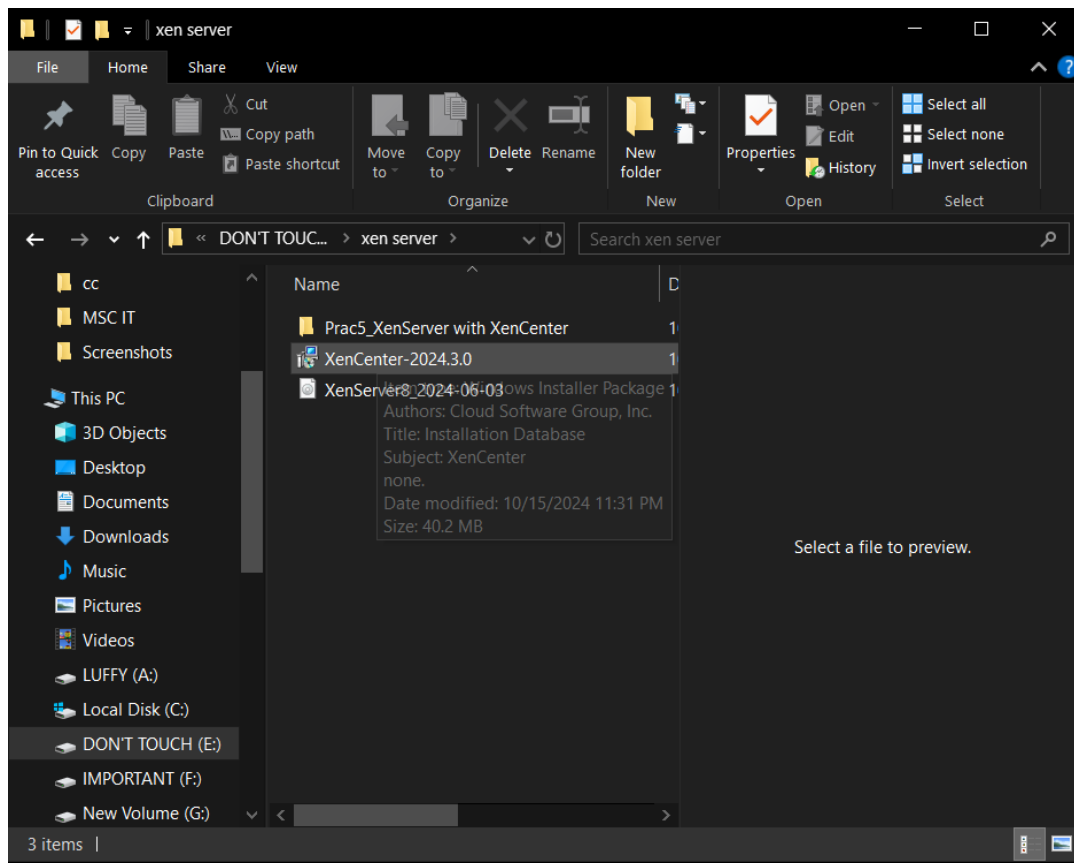
Step24: Press Enter



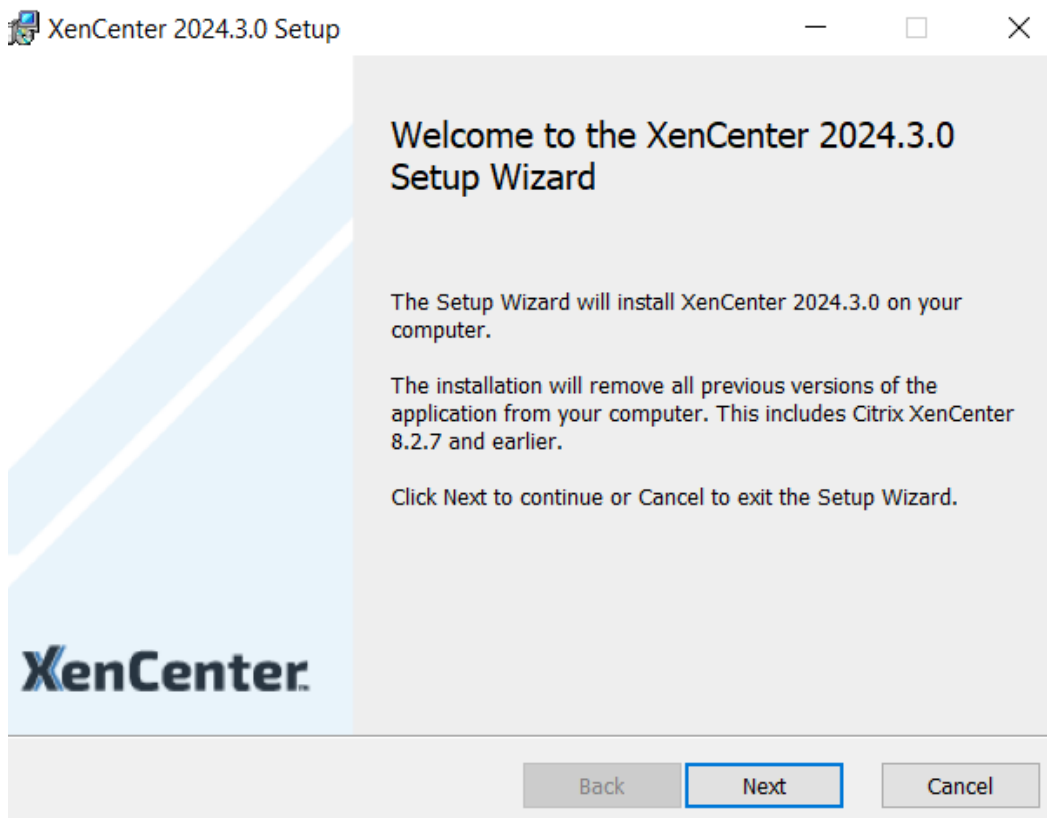
Step25: A panel will appear with bunch of information



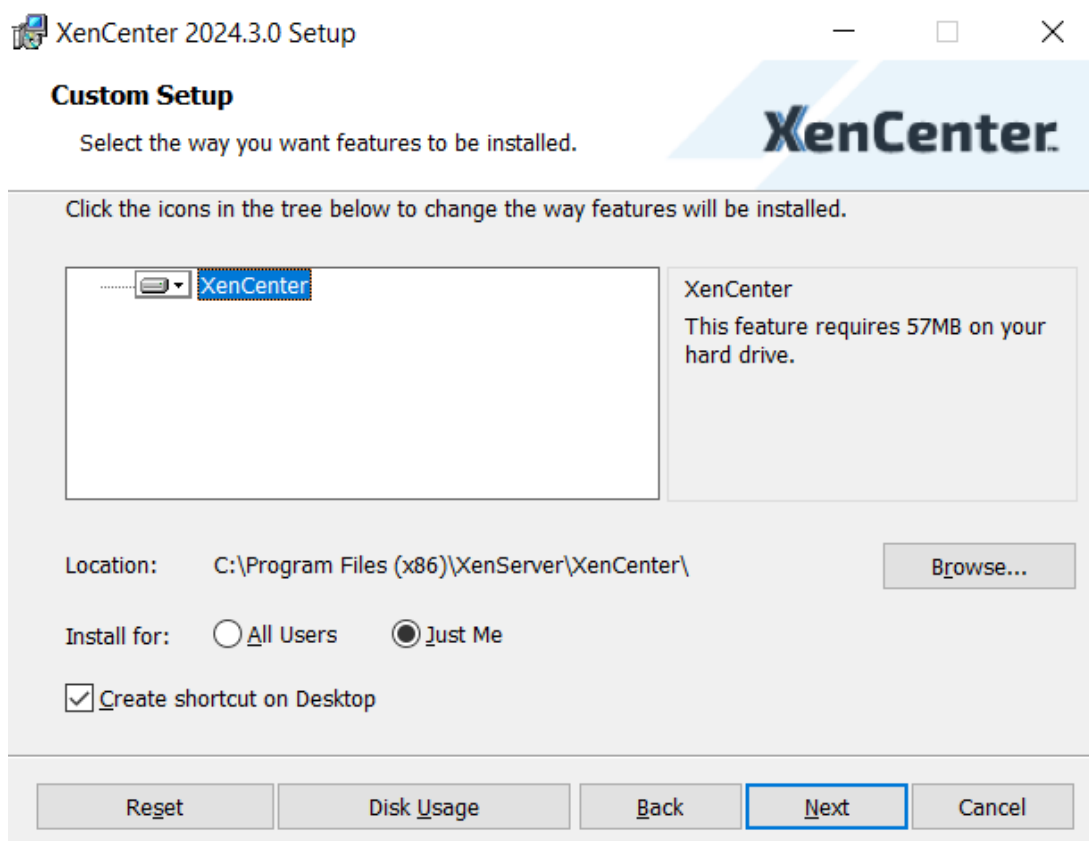
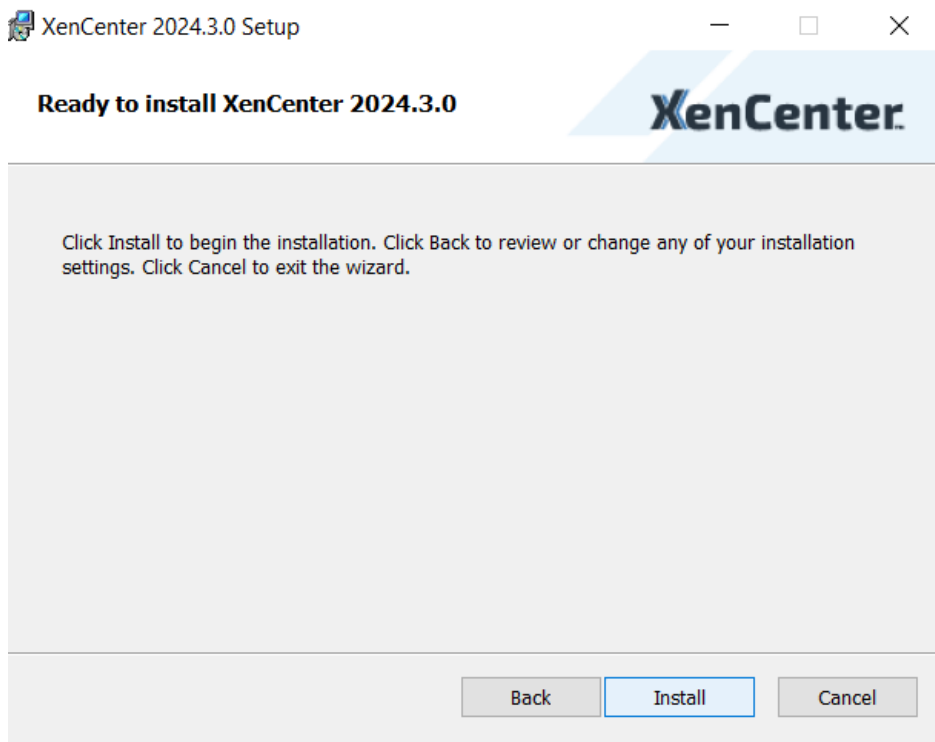
Step26: Now Install the Xen center application



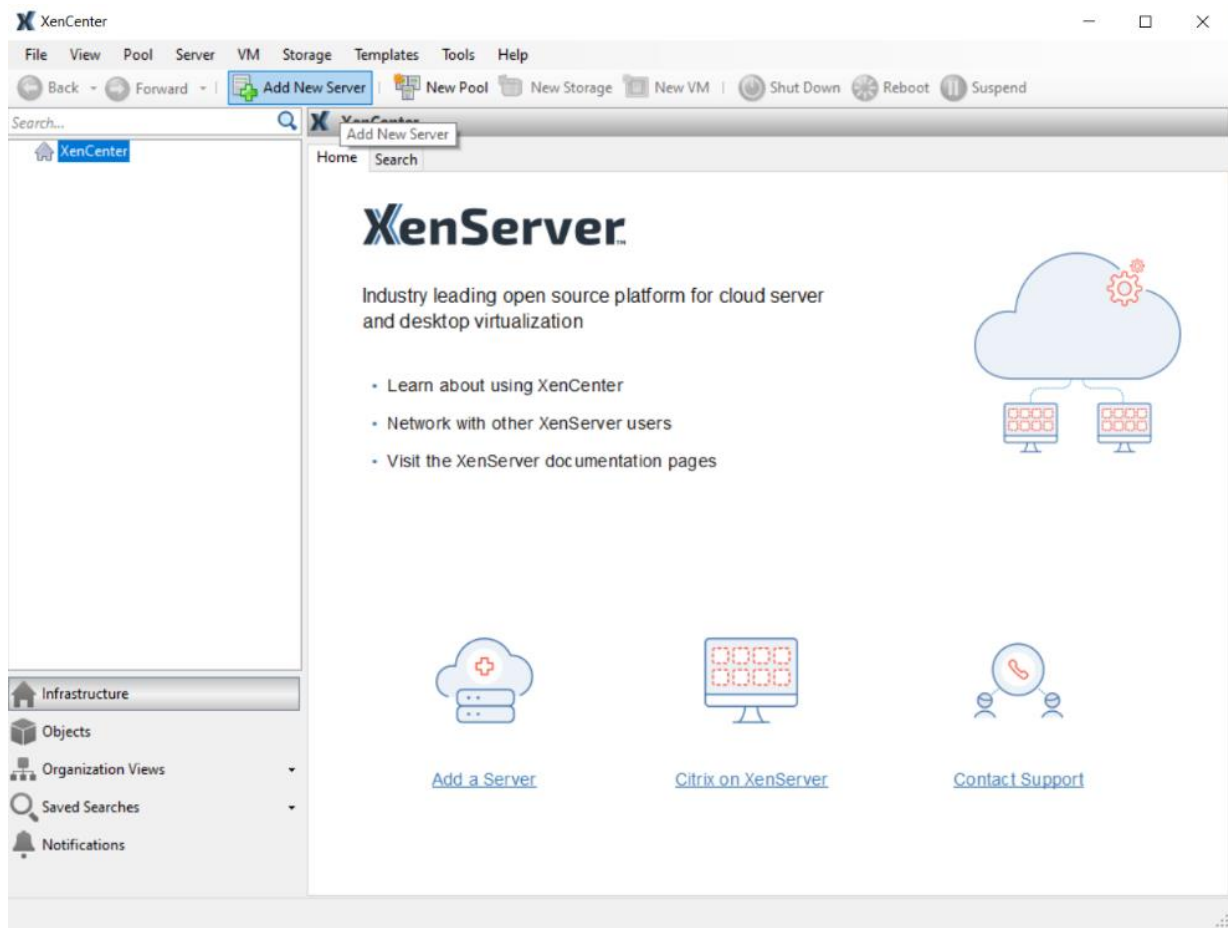
Step27: Click on Next



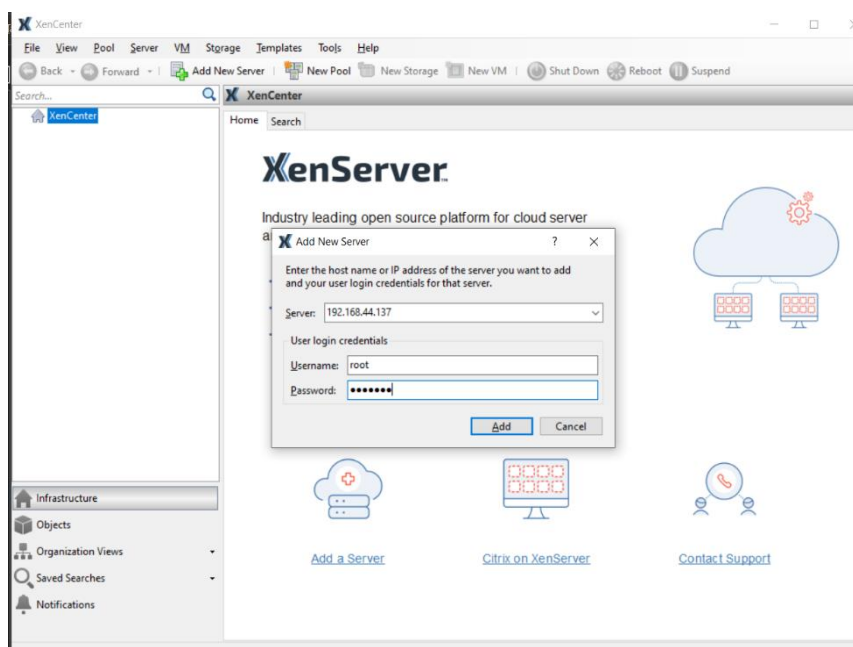
Step28: Click on Install & then Next



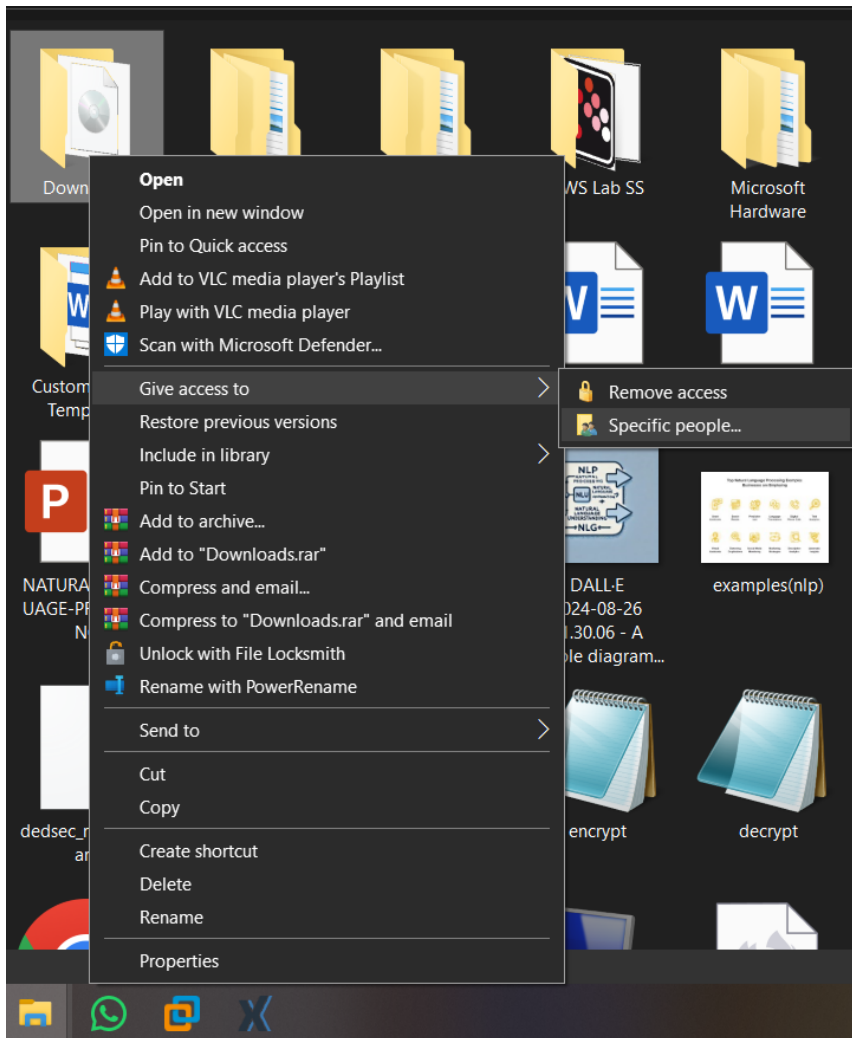
Step29: Open the Xen Center app and Click on Add New Server



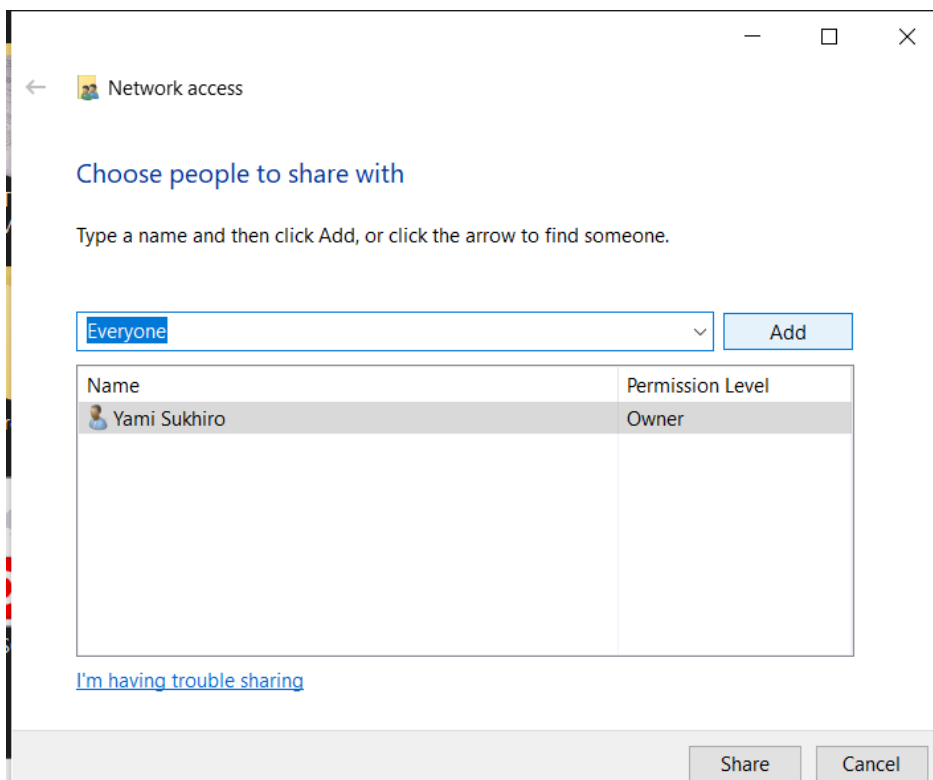
Step30: Copy the Ip Address from the VMWare panel and put 6 digit password which was set previously.



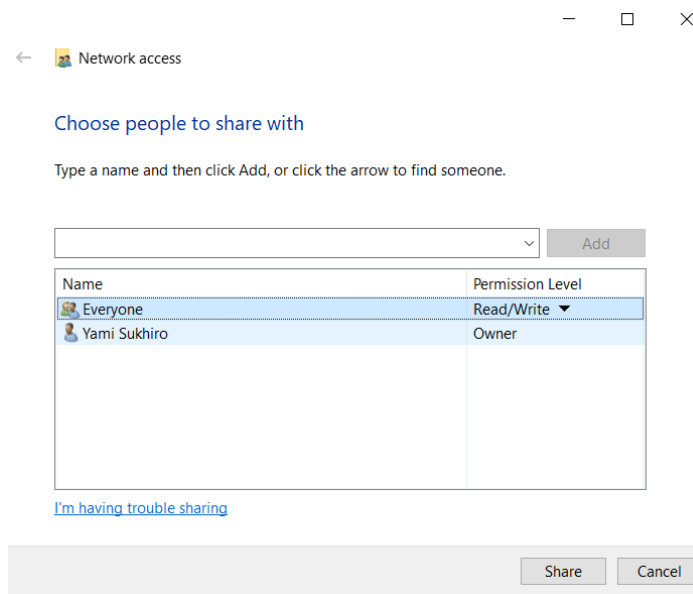
Step31: In the Base Machine Share a Iso file of Windows server 2022 over network .



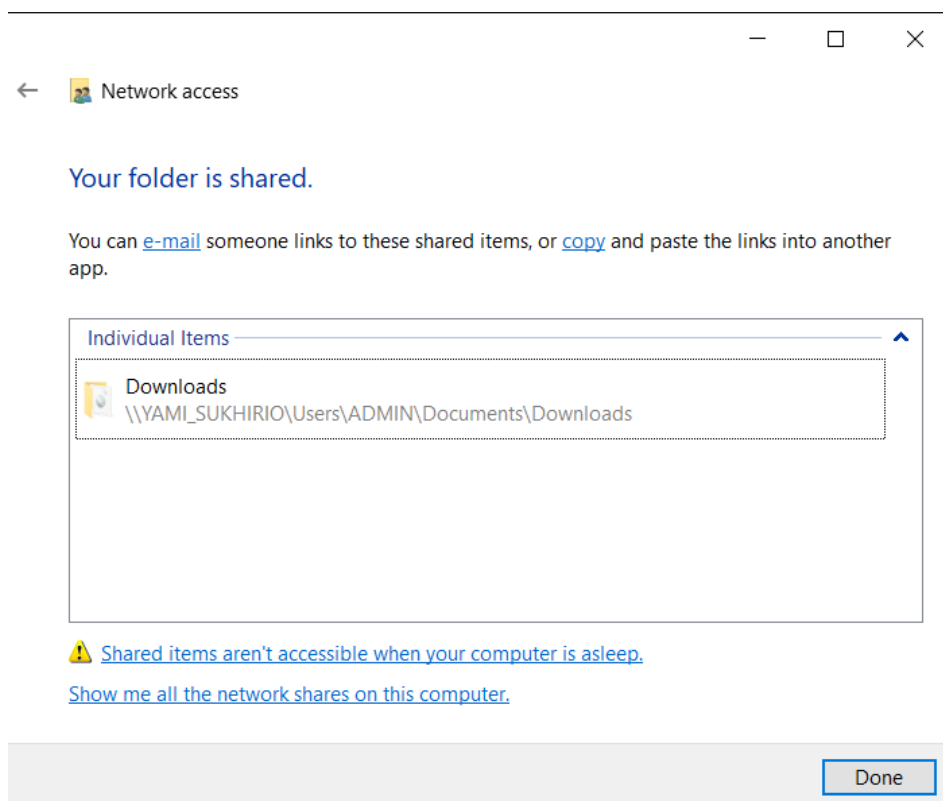
Step32: Select Everyone and Click on add.



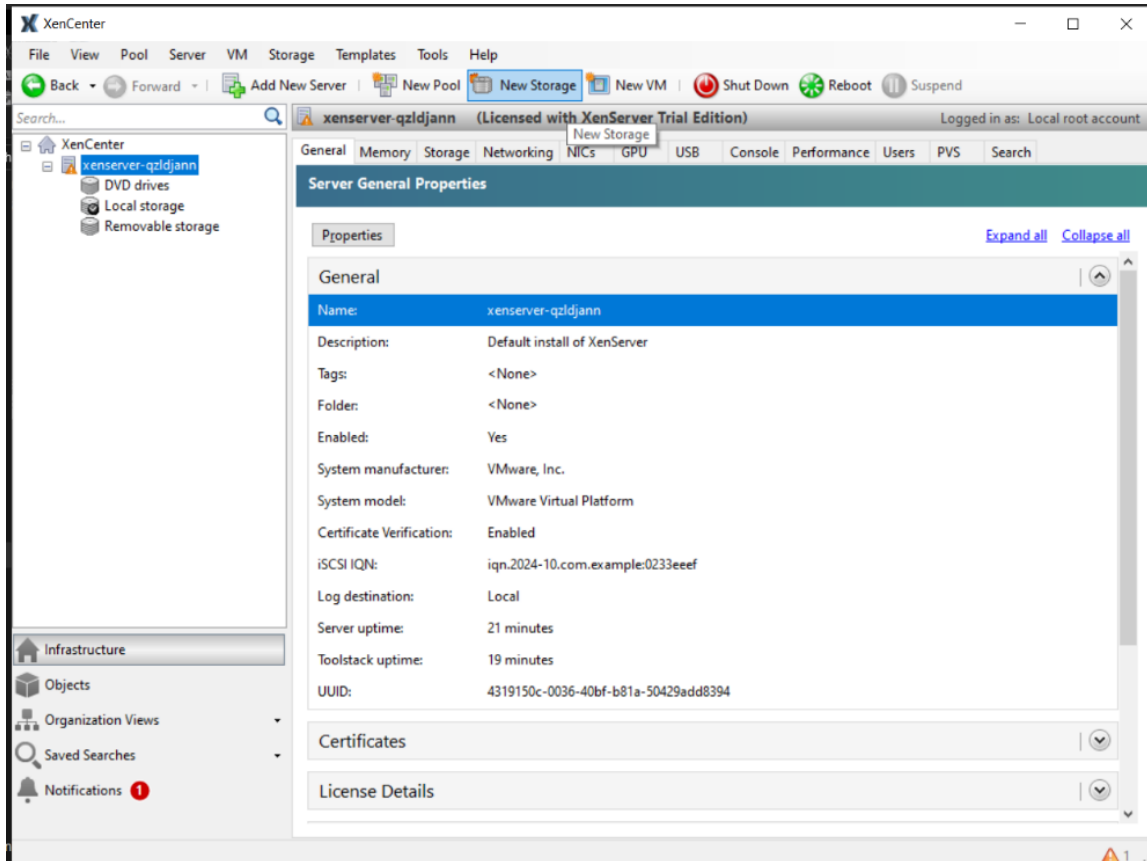
Step33: Change the permission level to Read/Write and click on Share.



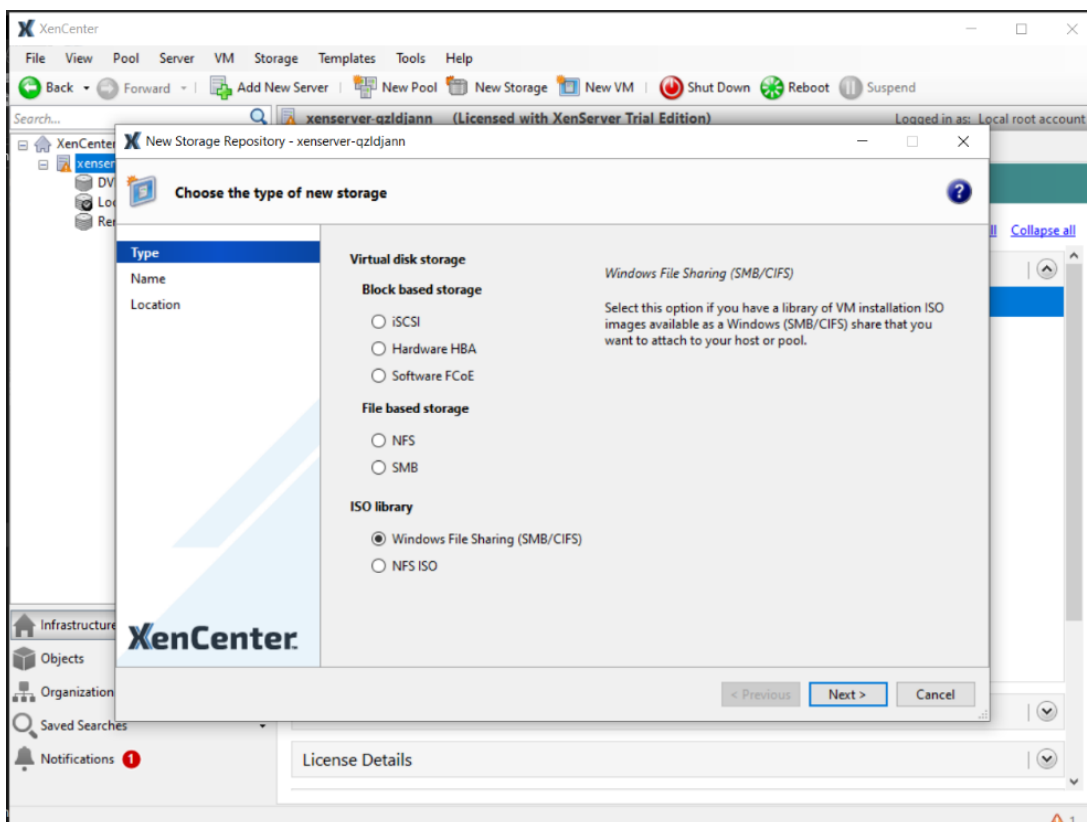
Step34: Copy the path.



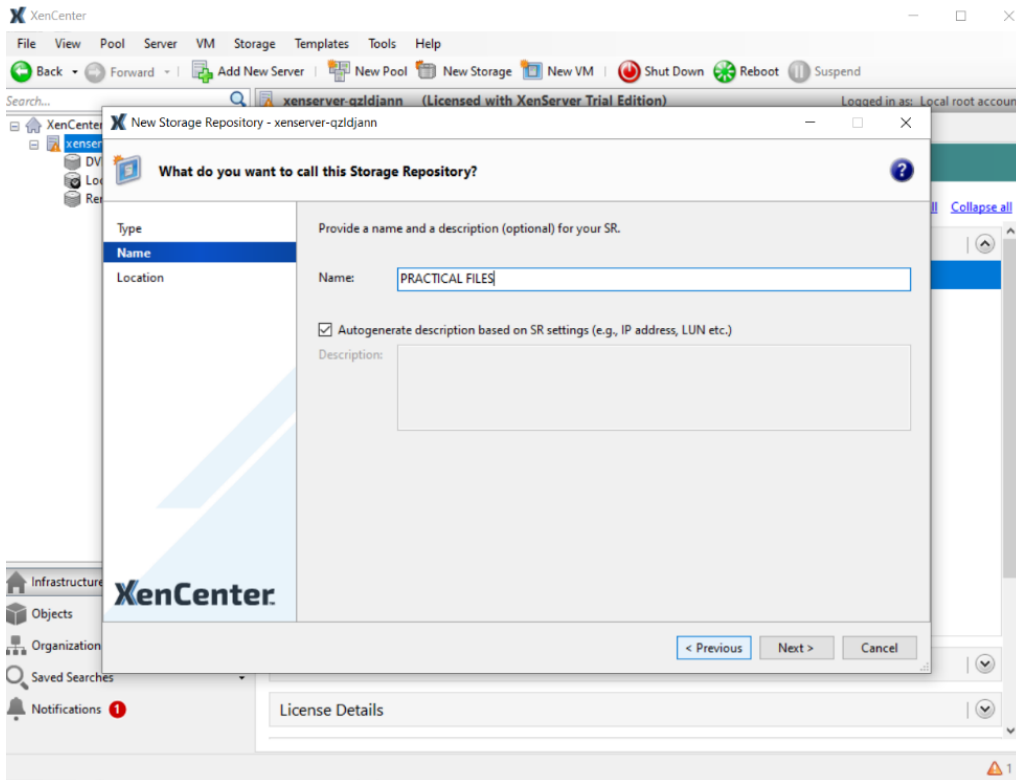
Step35: After Add the server Click on New Storage



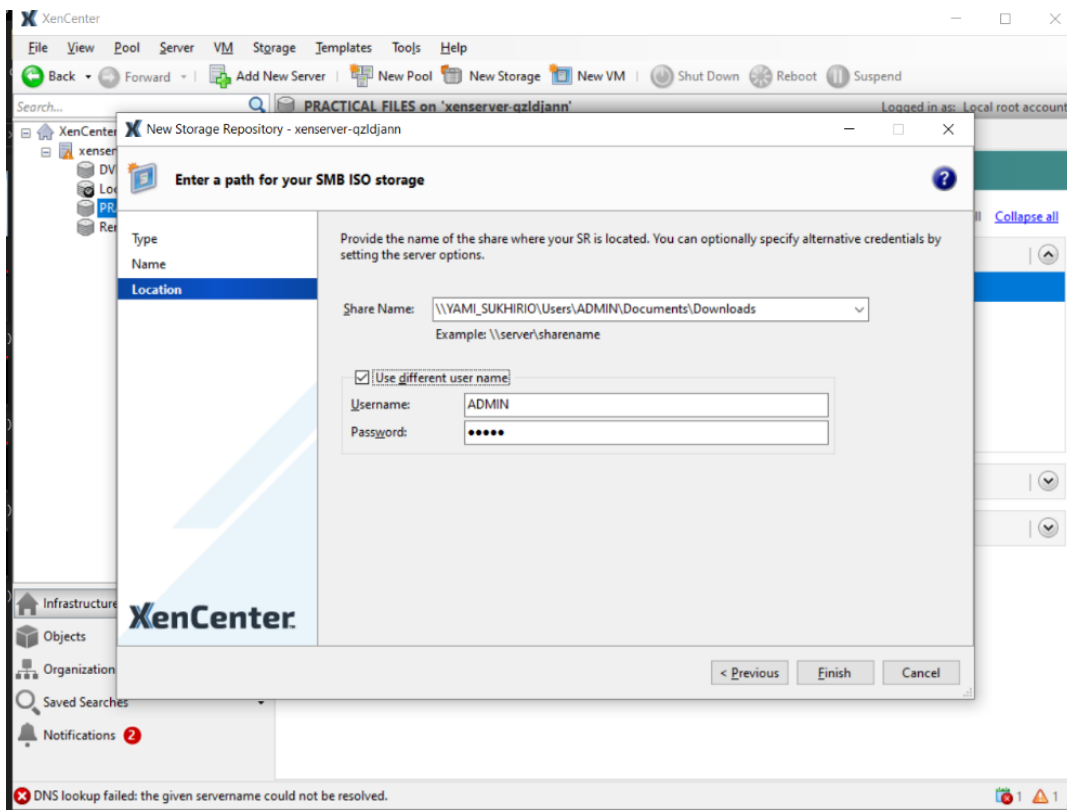
Step36: Select Winows File Sharing(SMB/CIFS)



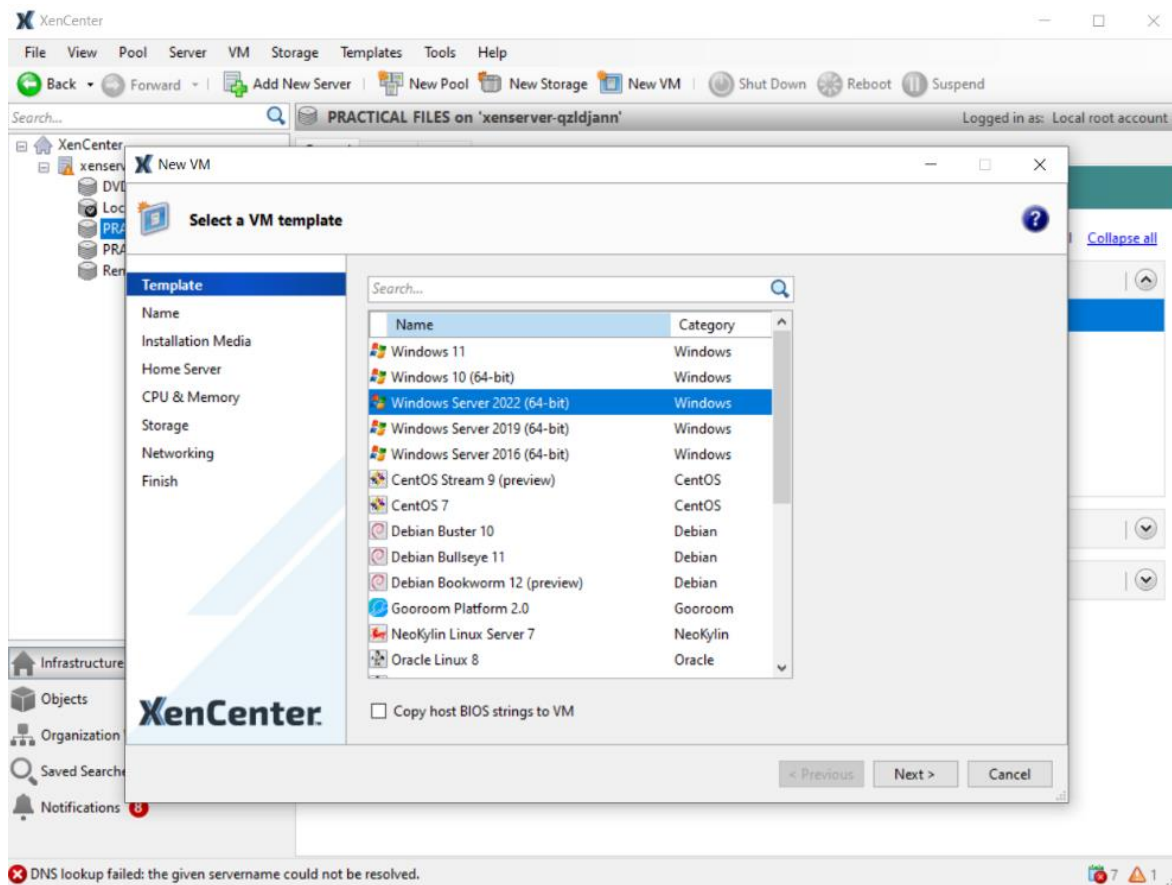
Step37: Change name to “PRACTICAL FILES”



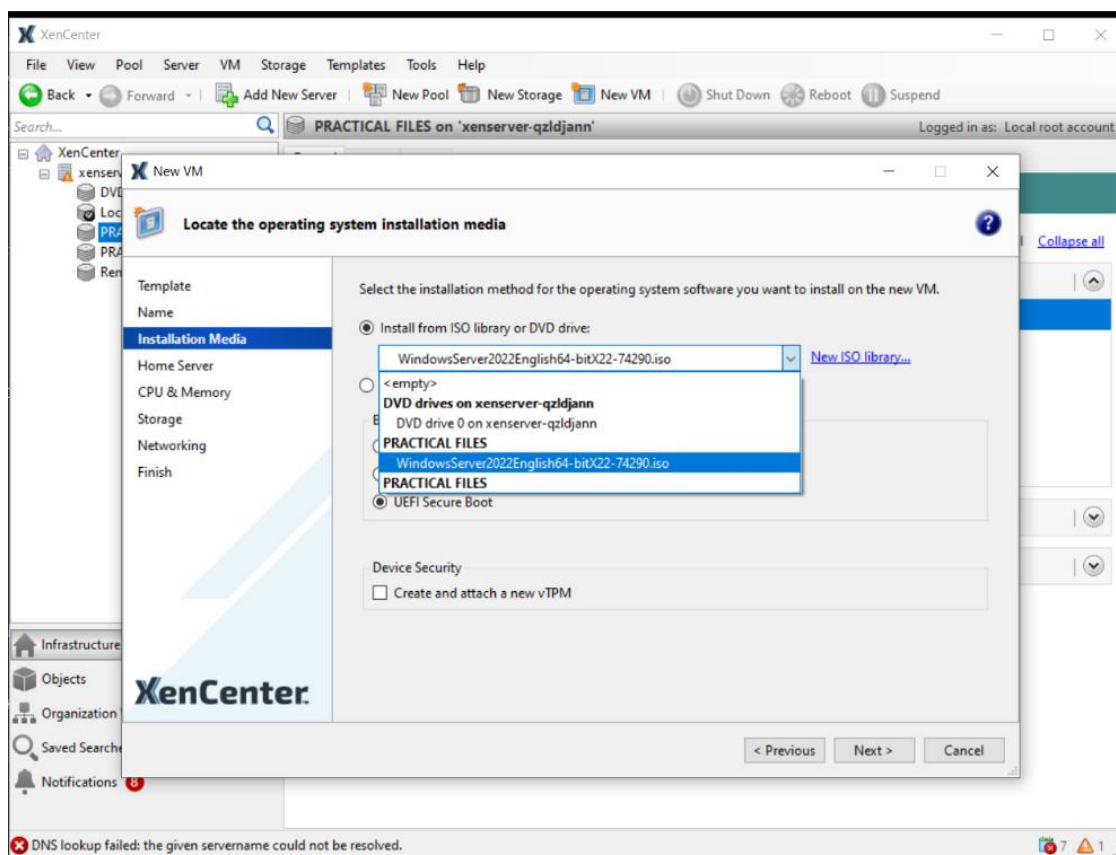
Step38: Paste the path of the file shared over the network
 (remember file name should be written by \\Username\foldername\..)
 eg: “\\Downloads\Windows_server2022”



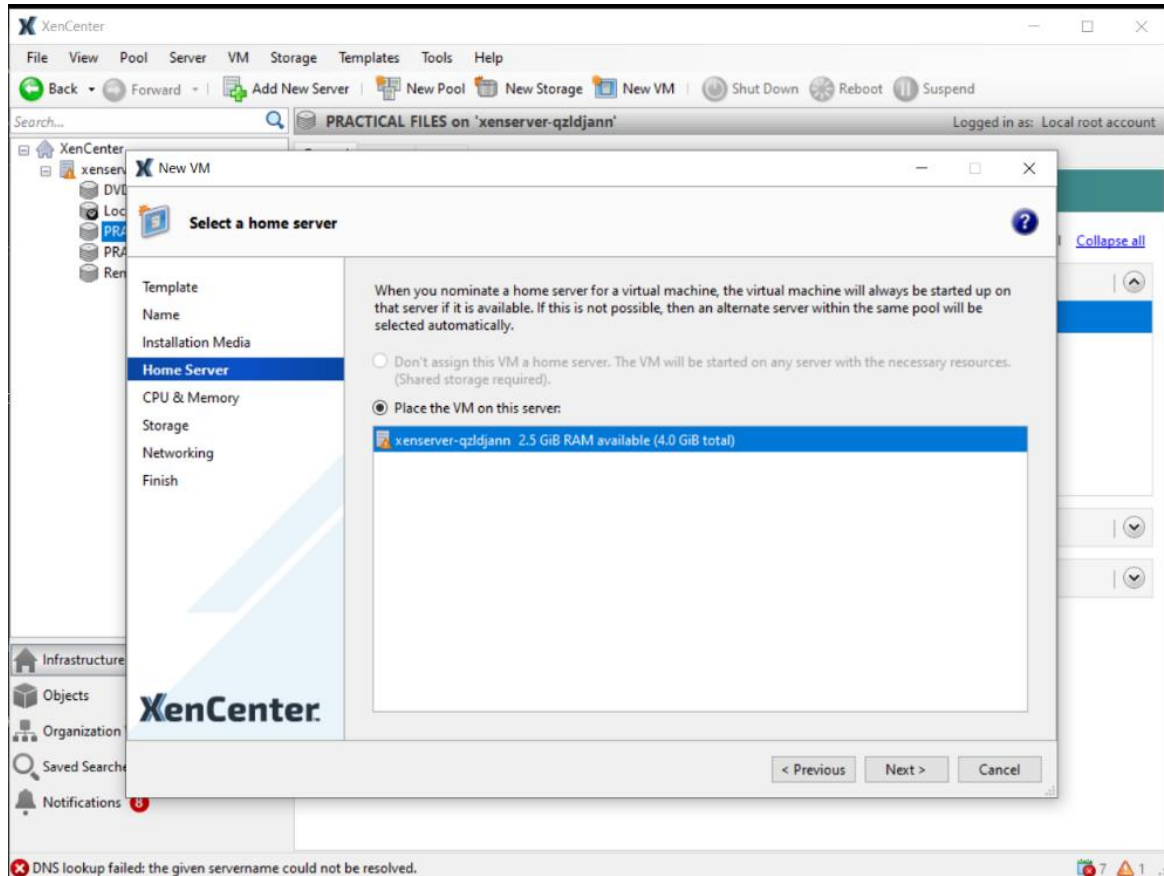
Step39: After adding a New Storage Click on New VM And Select Windows Server 2022(64-bit)



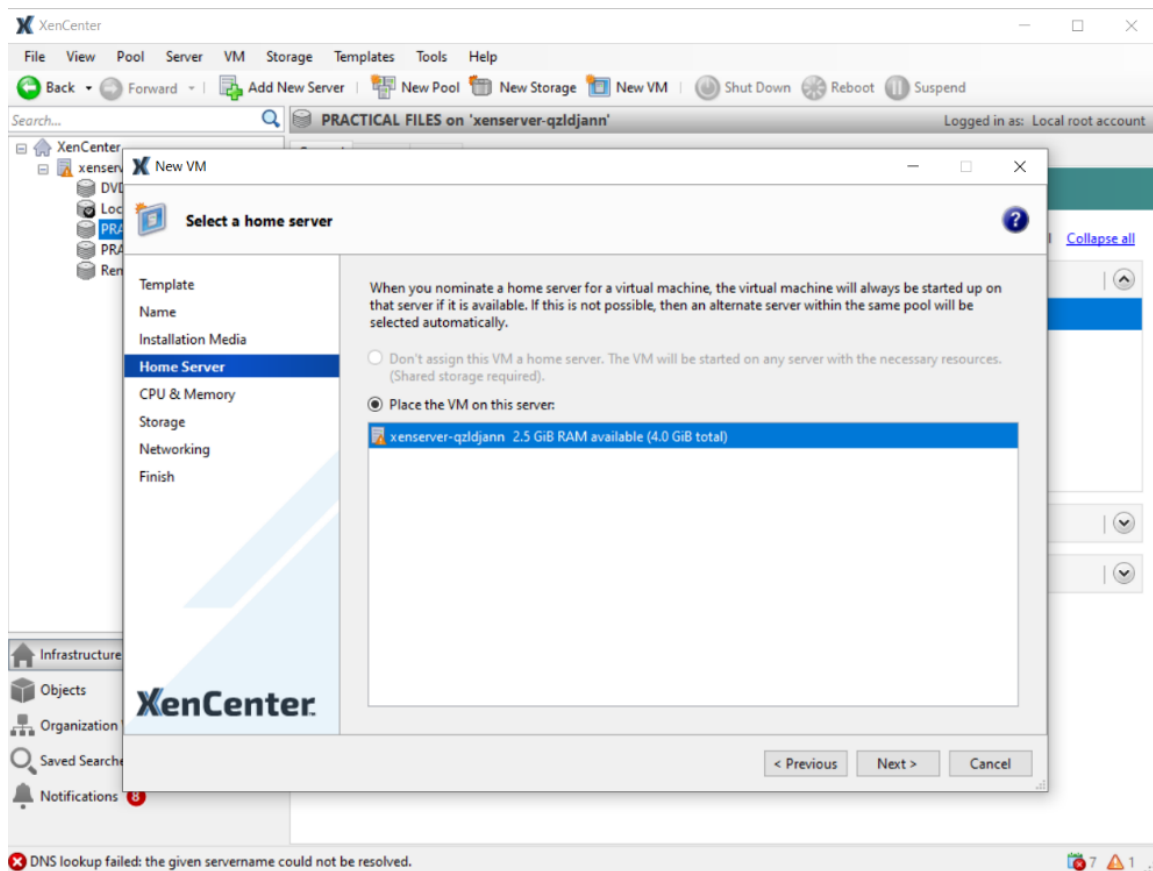
Step40: Select the ISO image which was shared over the network.



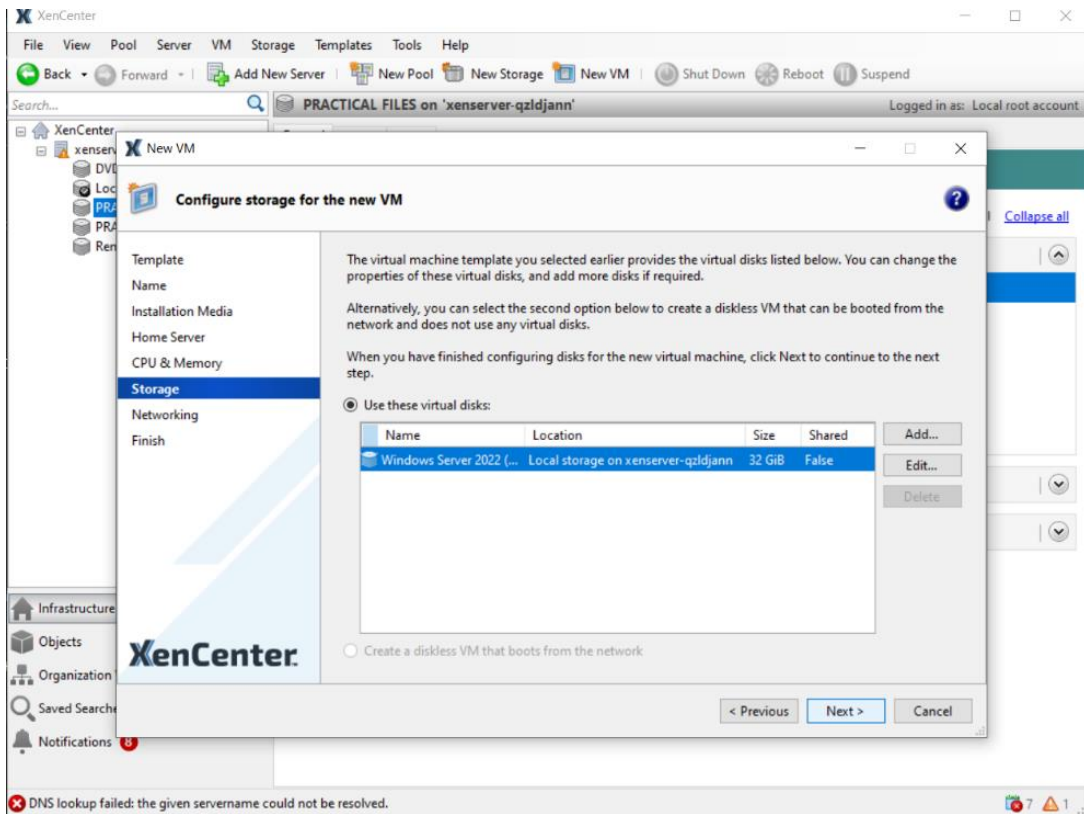
Step41: Click on Next



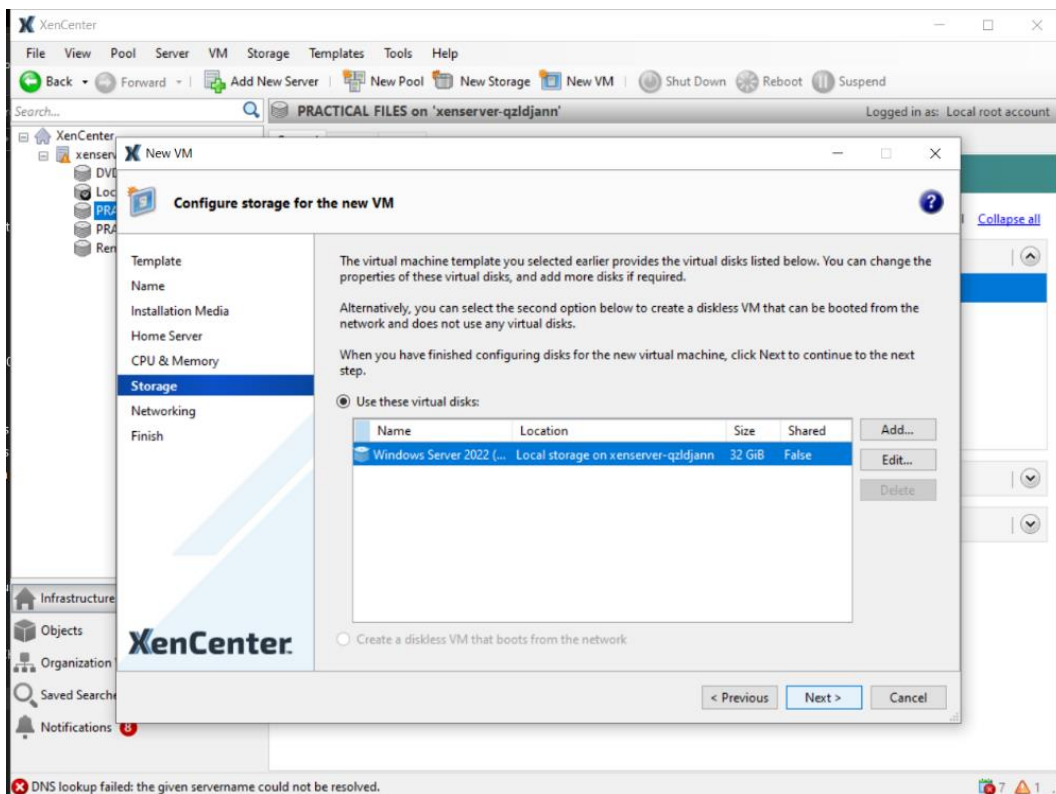
Step42: Click on Next



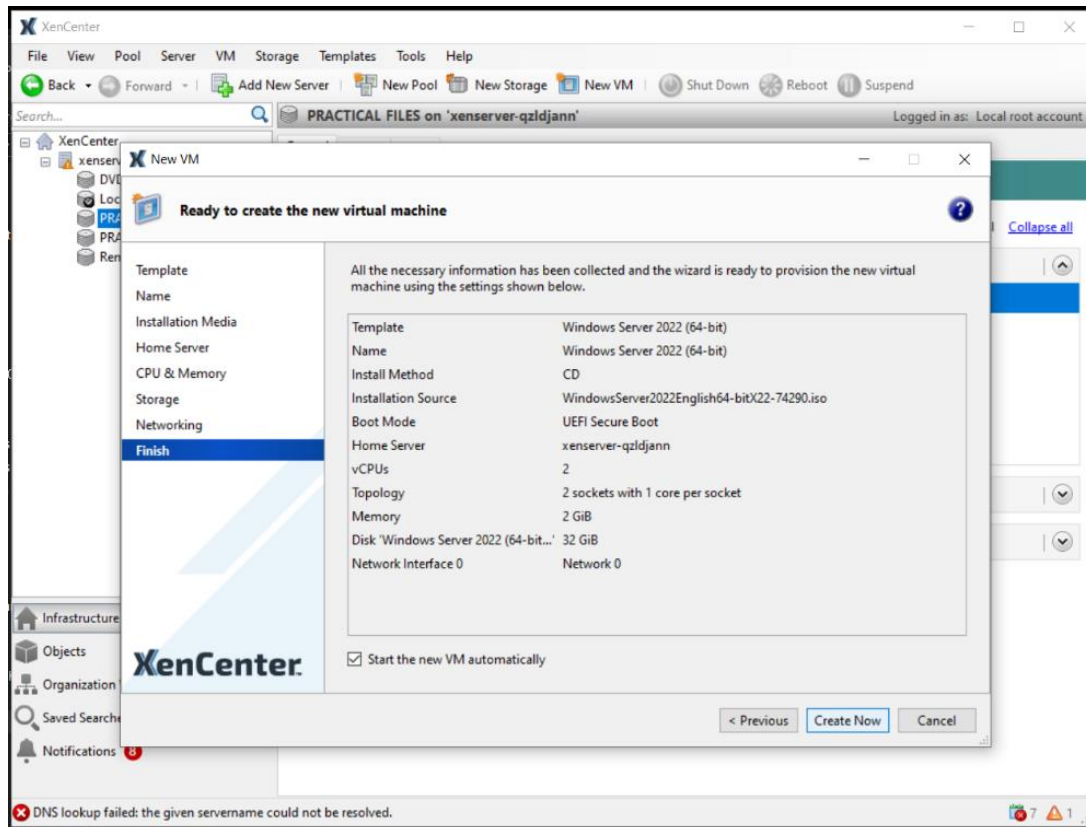
Step43: Click on Next



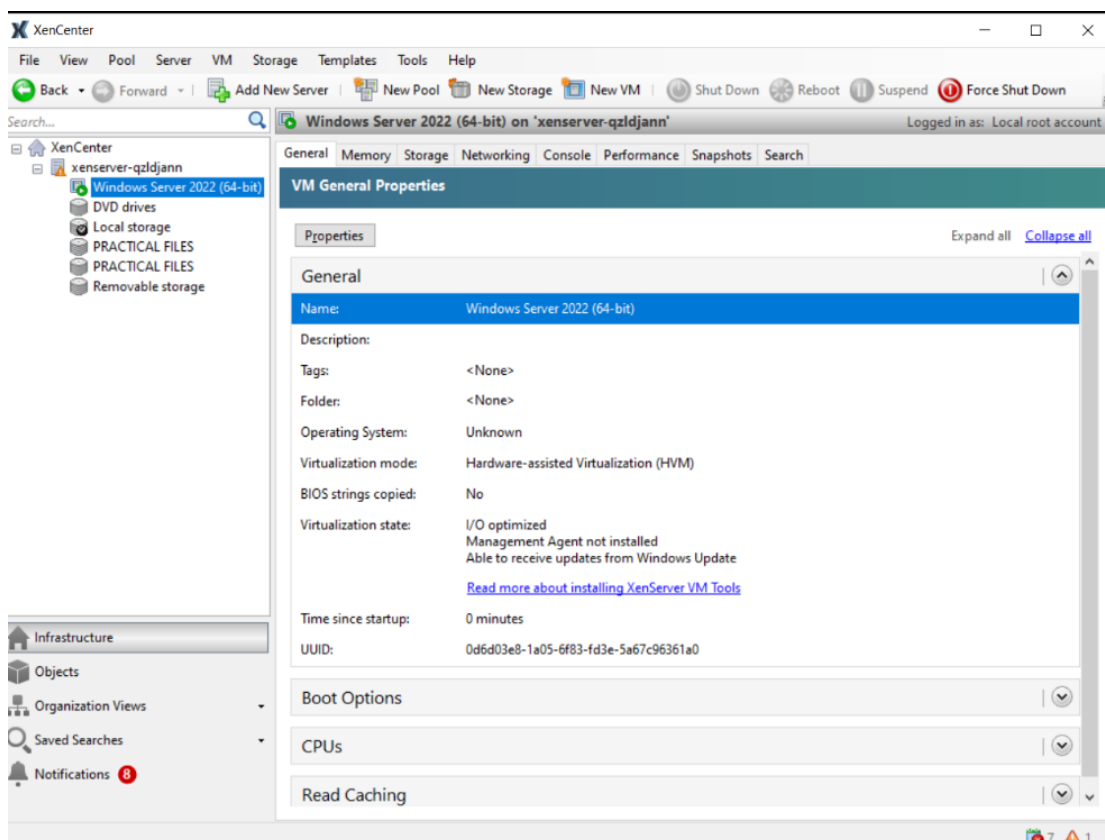
Step44: Click on Next



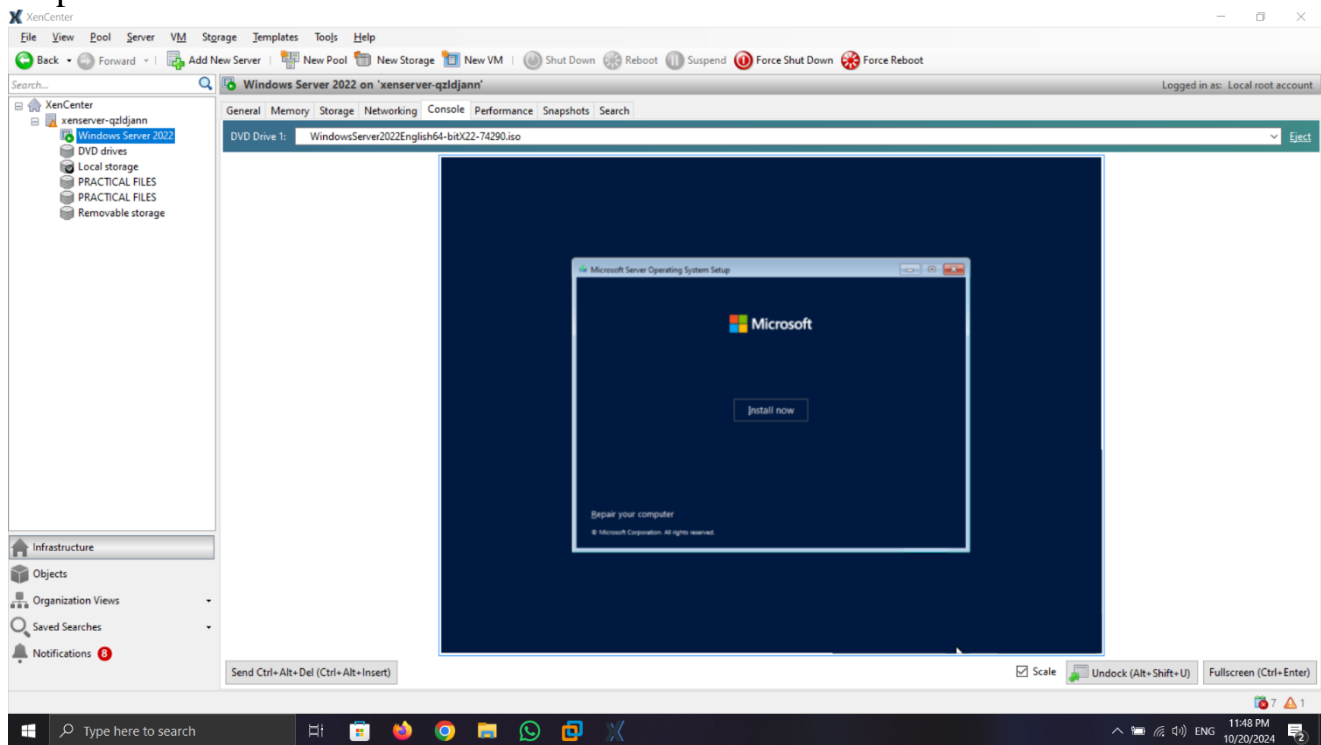
Step45: Click on Create Now



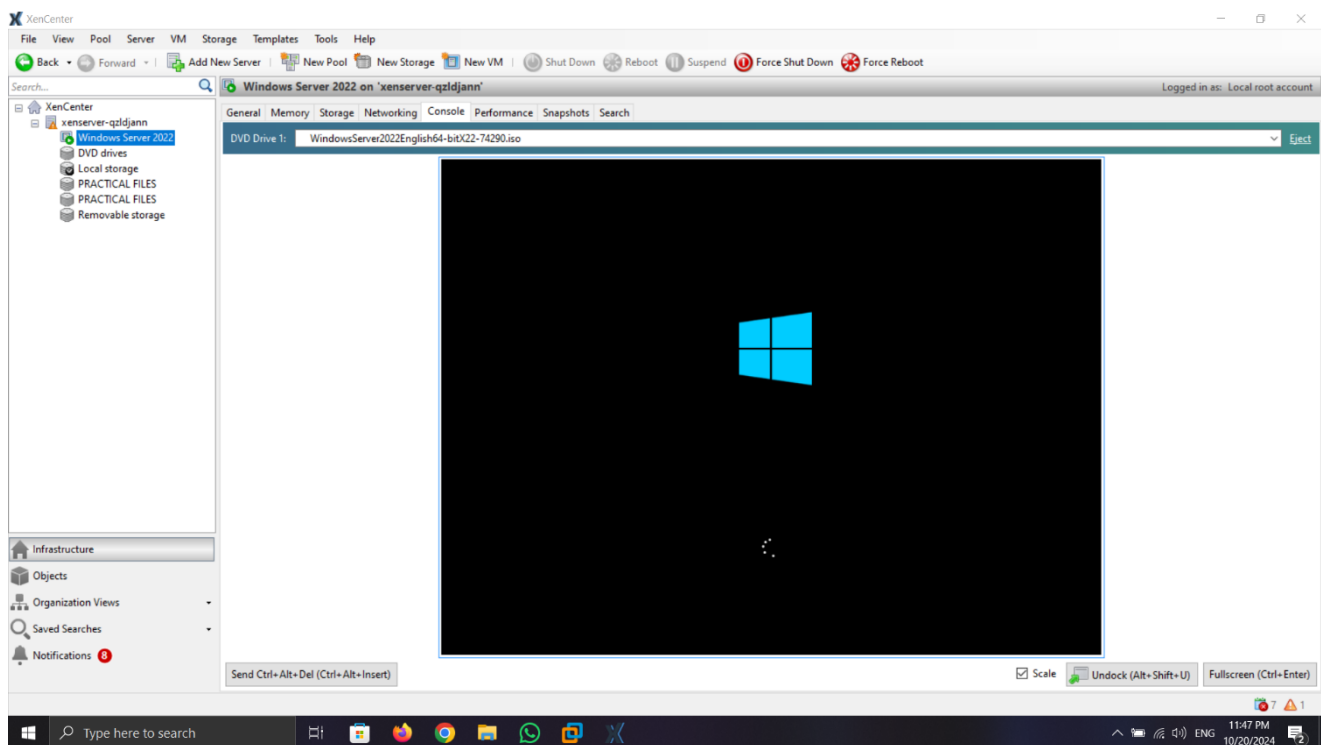
Step46: Click on Windows Server 2022(64-bit) & Navigate to Console tab



Step47: Click on Install



Step48: And Install Windows Server in Xen-Server



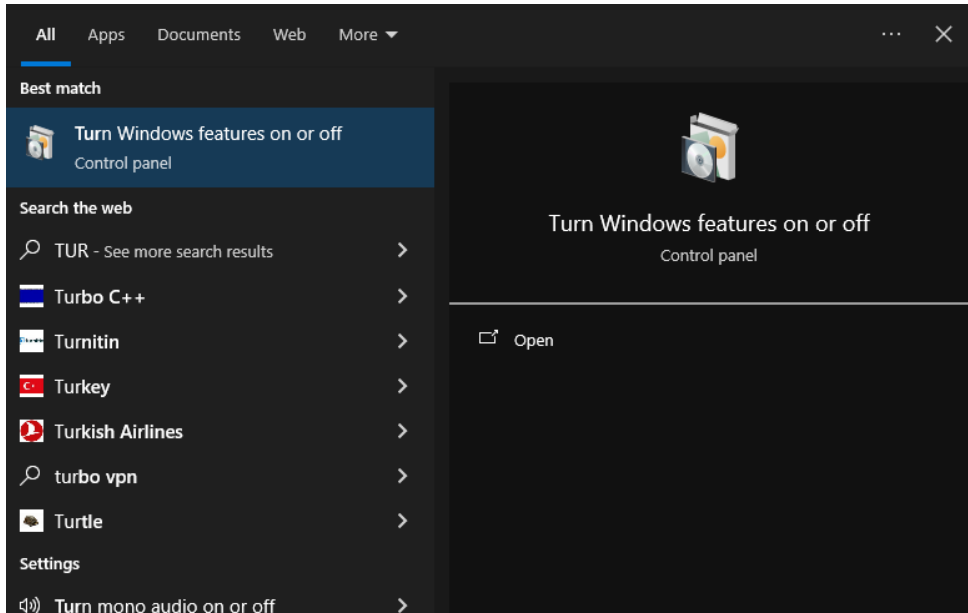
PRACTICAL 6

Aim:- Implementing Hypervisor

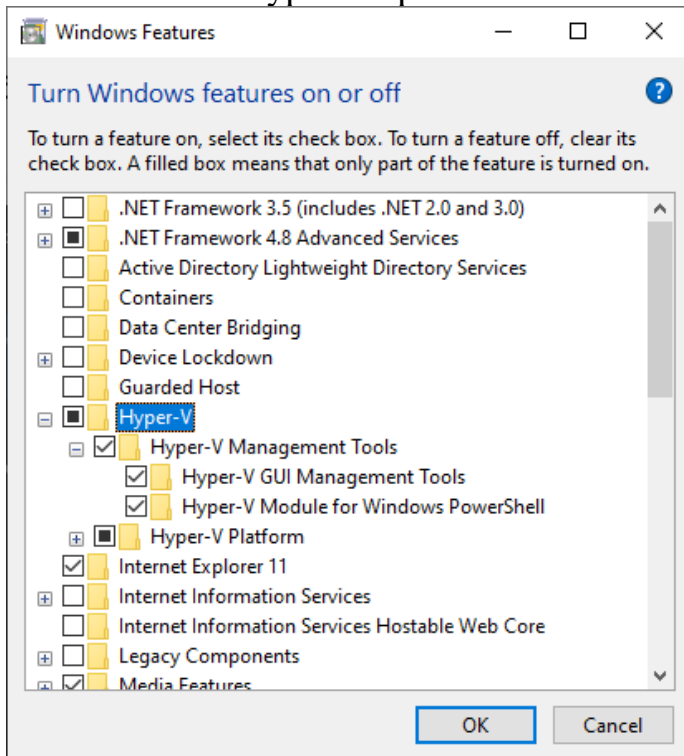
Requirements :- Hyper V manager

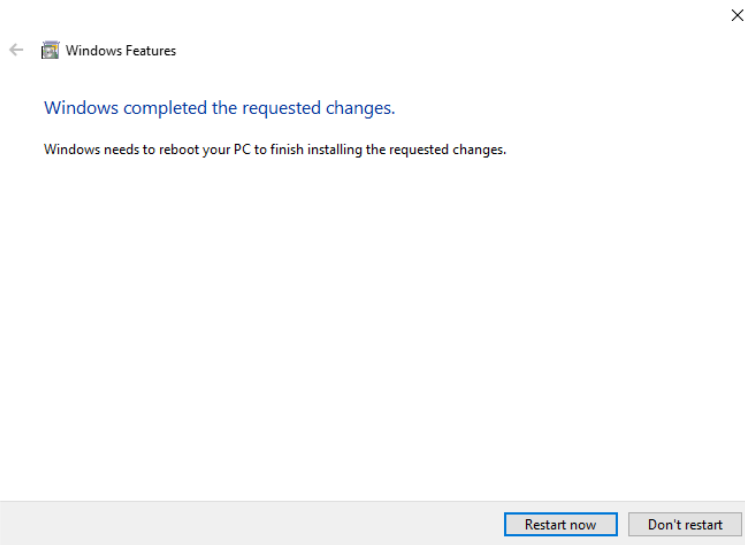
Steps:-

Search for Turn Windows feature on or off

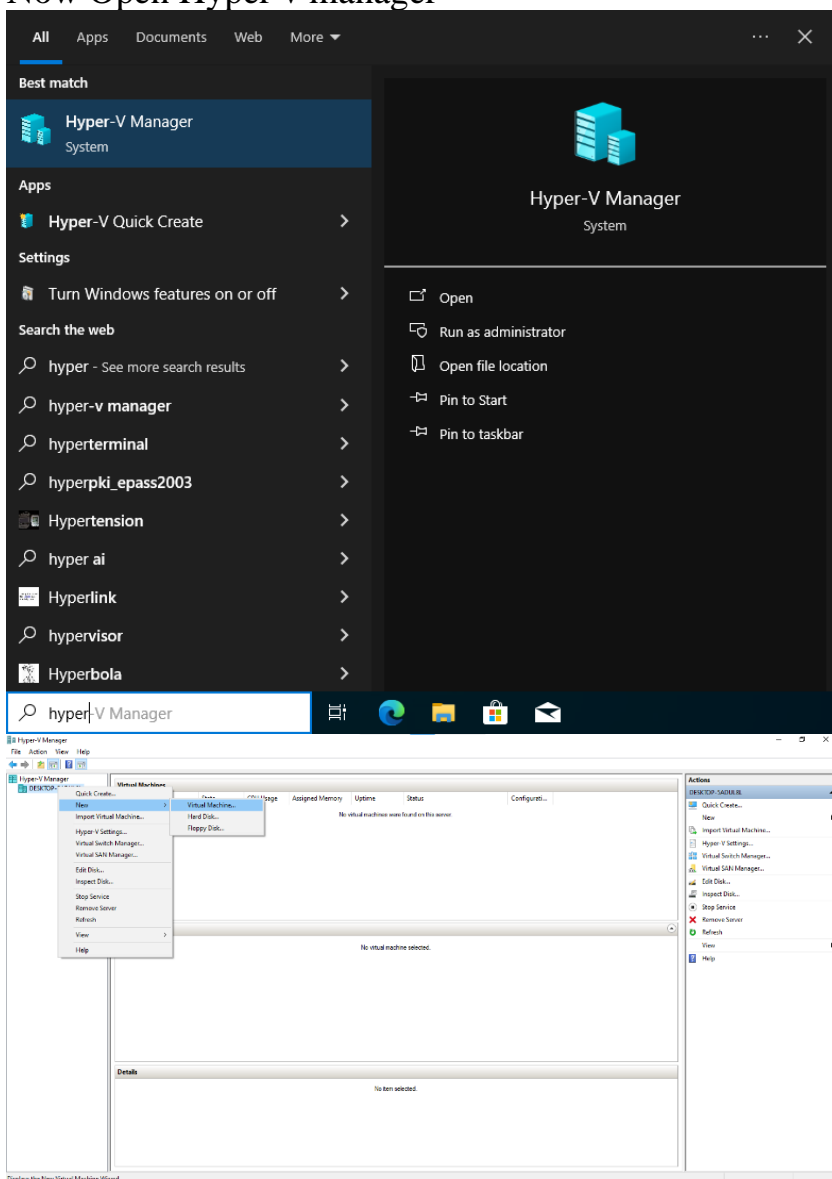


Now check the Hyper V option → Ok





Now Open Hyper v manager



New Virtual Machine Wizard

Before You Begin

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

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

New Virtual Machine Wizard

Specify Name and Location

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

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:

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

New Virtual Machine Wizard

Specify Generation

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

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.

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

[More about virtual machine generation support](#)

< Previous
Next >
Finish
Cancel

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.

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:

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.

New Virtual Machine Wizard

Installation Options

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

You can install an operating system now if you have access to the setup media, or you can install it later.

☐ Install an operating system later

☒ Install an operating system from a bootable CD/DVD-ROM

Media

☐ Physical CD/DVD drive: [v]

☒ Image file (.iso): [WindowsServer2022English64-bitX22-74290.iso] Browse...

☐ Install an operating system from a bootable floppy disk

Media

Virtual floppy disk (.vfd): [] Browse...

☐ Install an operating system from a network-based installation server

⚠ Your network adapter is disconnected. To perform a network-based installation, return to the Configure Networking page and connect the network adapter.

< Previous Next > Finish Cancel

New Virtual Machine Wizard

Completing the New Virtual Machine Wizard

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

You have successfully completed the New Virtual Machine Wizard. You are about to create the following virtual machine.

Description:

Name:	New Virtual Machine
Generation:	Generation 1
Memory:	1024 MB
Network:	Not Connected
Hard Disk:	C:\ProgramData\Microsoft\Windows\Virtual Hard Disks\New Virtual Machine.vhdx
Operating System:	Will be installed from D:\WindowsServer2022English64-bitX22-74290.iso

< >

To create the virtual machine and close the wizard, click Finish.

< Previous Next > **Finish** Cancel

Hyper-V Manager

File Action View Help

DESKTOP-SADULBL

Name	State	CPU Usage	Assigned Memory	Uptime	Status	Configurati...
New Virtual Machine	Running	0%	1024 MB	00:00:36		9.0

Checkpoints

Automatic Checkpoint - New Virtual Machine - (18-10-2024 - 11:00:02)

Now

New Virtual Machine

Created: 18-10-2024 10:56:51
Configuration Version: 9.0
Generation: 1
Notes: None

Clustered: No
Heartbeat: No Contact

Summary Memory Networking

Actions

DESKTOP-SADULBL

- Quick Create...
 - New
 - Import Virtual Machine...
 - Hyper-V Settings...
 - Virtual Switch Manager...
 - Virtual SAN Manager...
 - Edit Disk...
 - Inspect Disk...
 - Stop Service
 - Remove Server
 - Refresh
 - View
 - Help
- New Virtual Machine
 - Connect...
 - Settings...
 - Turn Off...
 - Shut Down...
 - Save
 - Pause
 - Reset
 - Checkpoint
 - Revert...

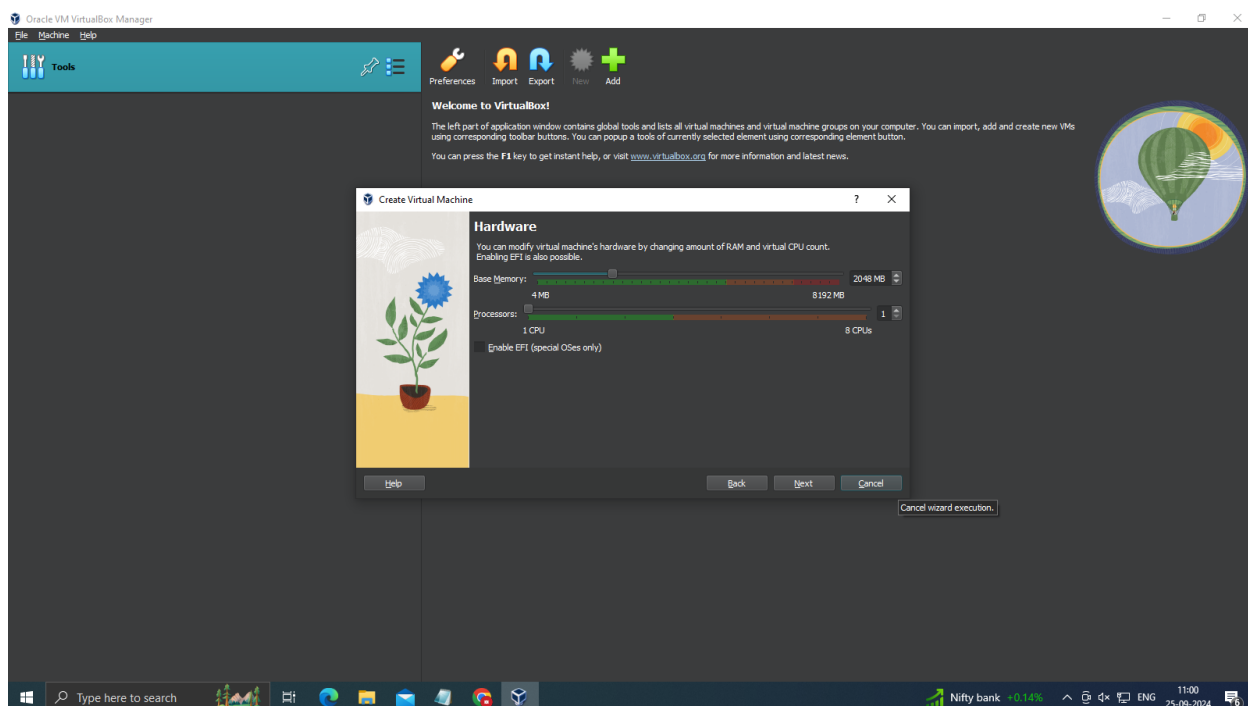
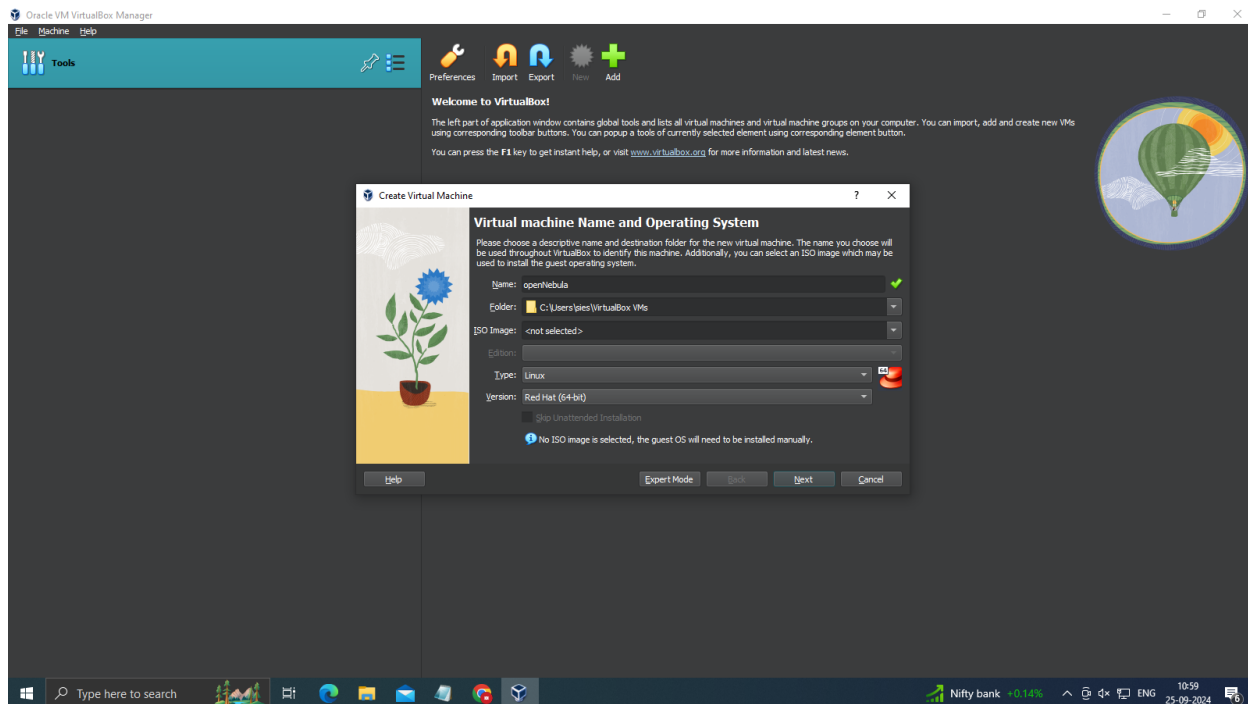
PRACTICAL 7

Aim - Implementing open Nebula

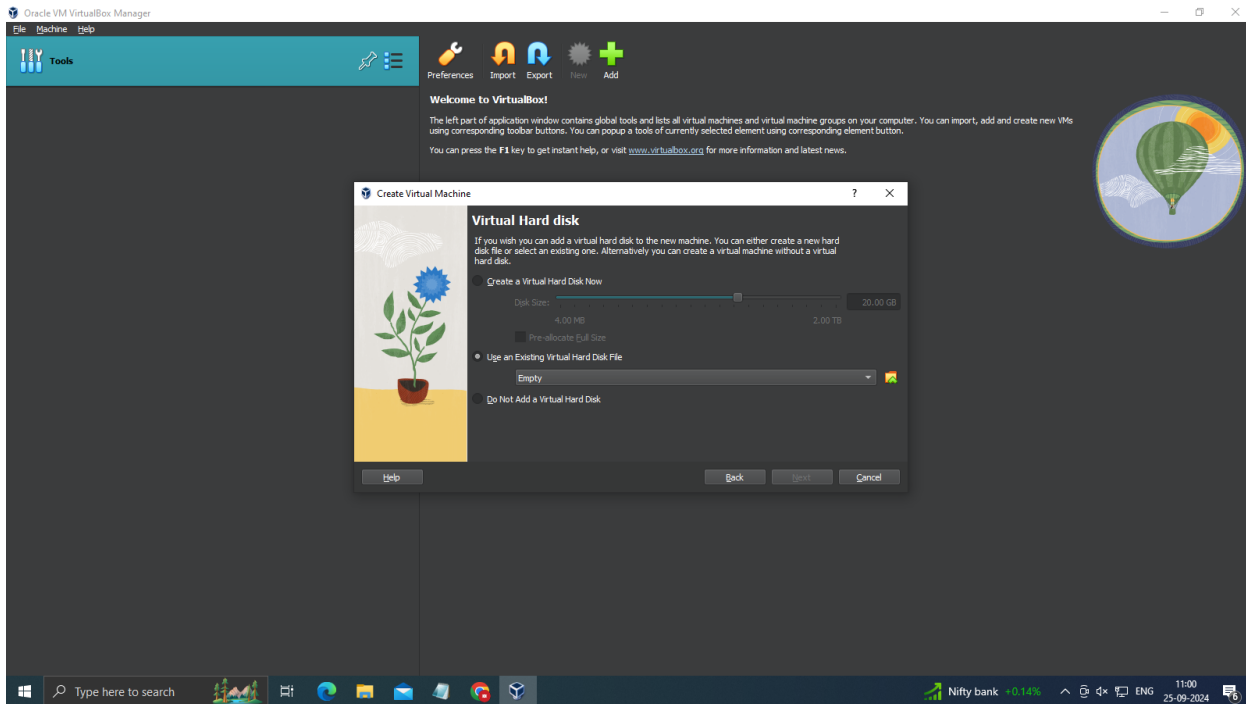
Requirements :- oracle vm virtual box , open nebula sandbox

Steps:-

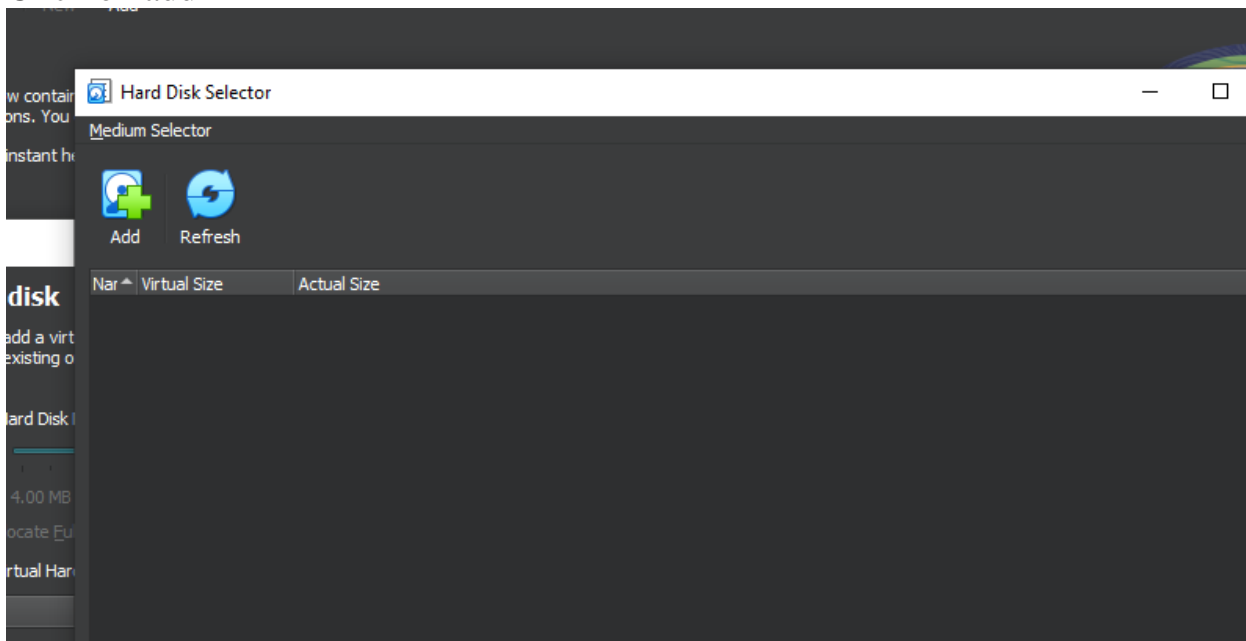
Open oracle Vm VirtualBox → Click on New → Give name, Type - Linux, Version - Red Hat(64-bit) → Next



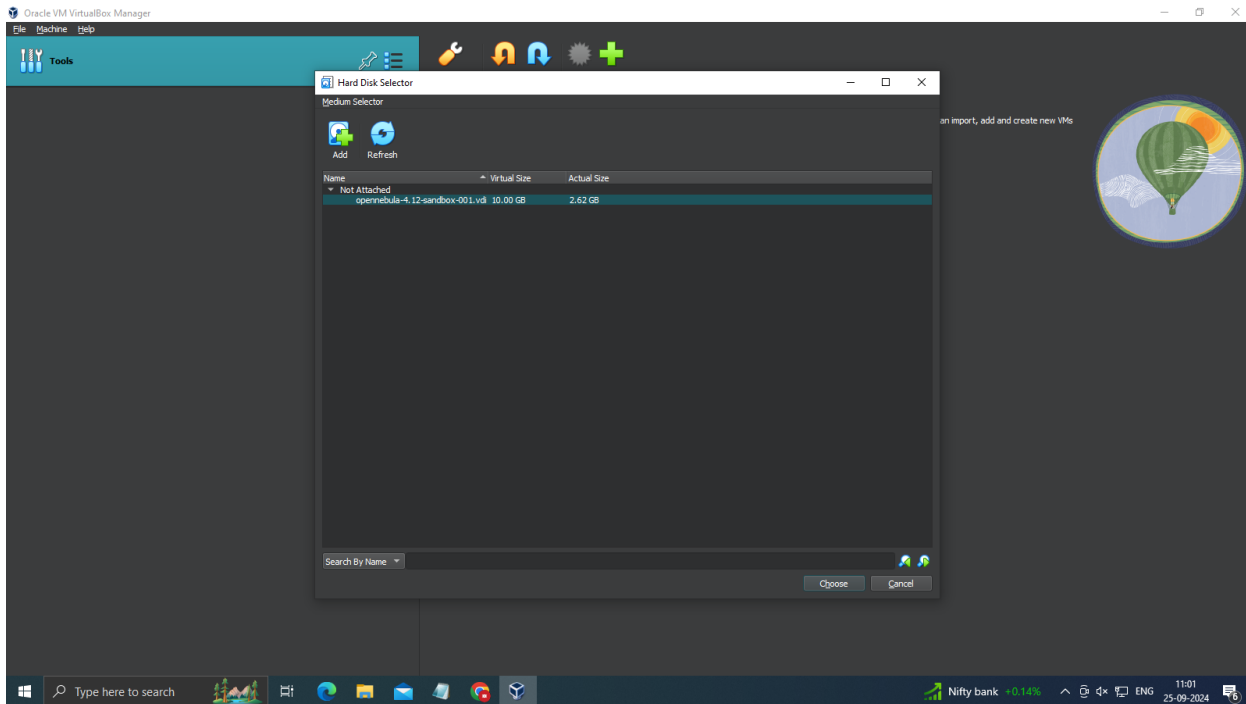
Click on a “use existing virtual hard disk file”



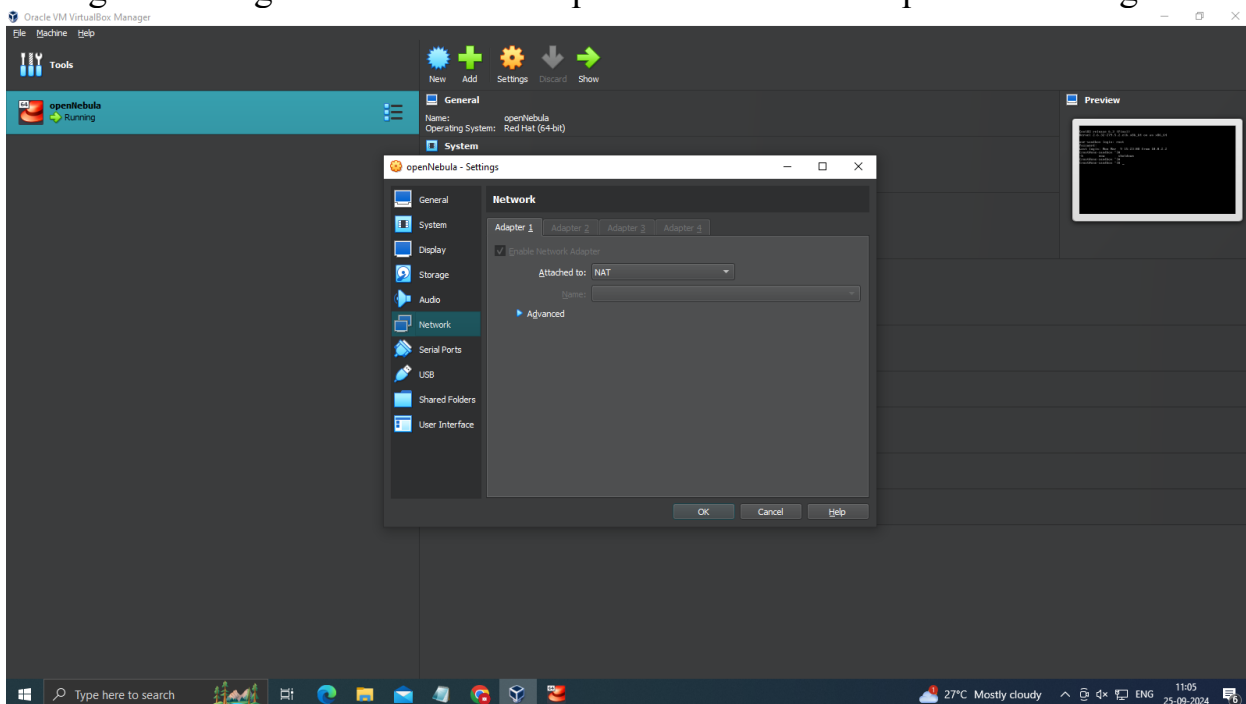
Click on add



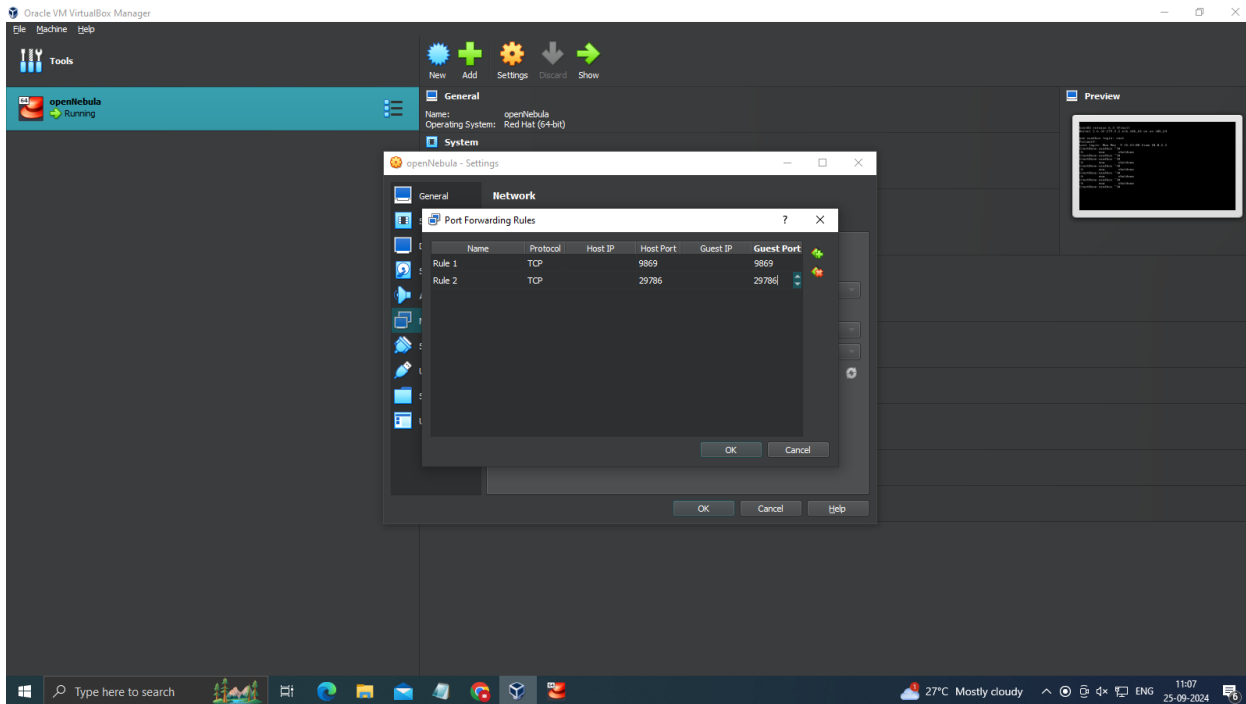
Add open nebula sandbox → Choose → finish



Now go to settings → Network → adapter1 → Advanced → port forwarding



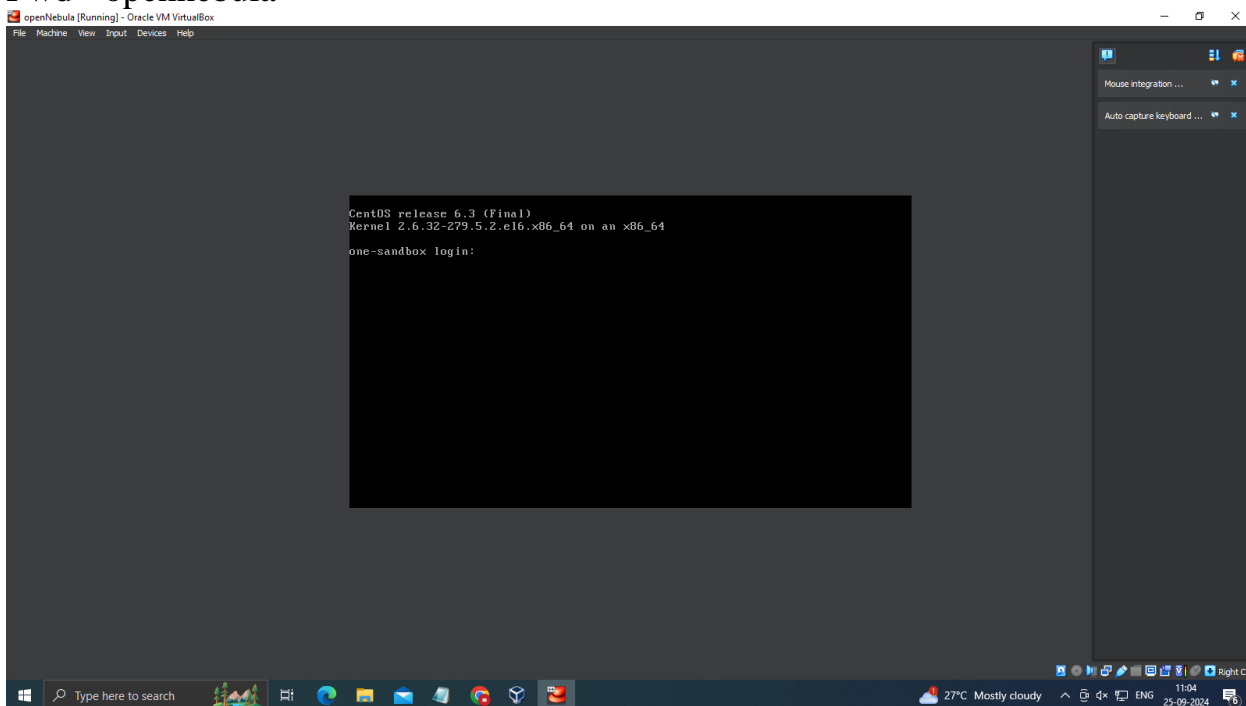
Now add host port and guest port number then add one more
(Remember the port numbers)



Click Ok → ok → click on start

Login - root

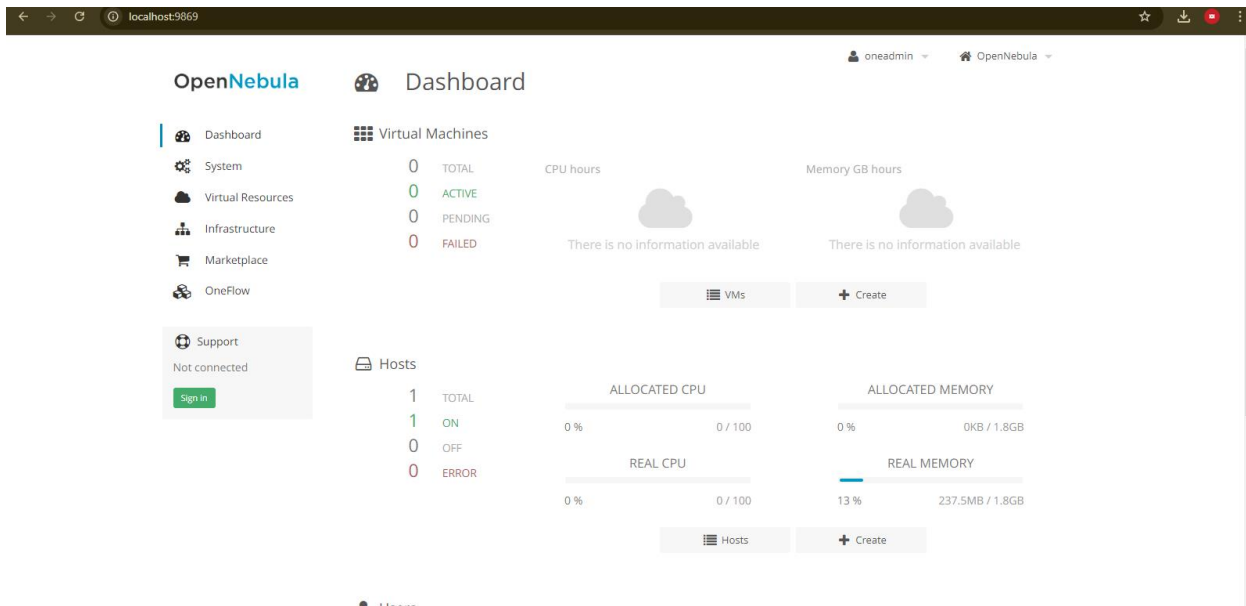
Pwd - opennebula



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



Now u can see this interface



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

OpenNebula OpenNebula Marketplace

tt Import

Name	Publisher	Hypervisor	Arch	Format
<input checked="" type="checkbox"/> Ttylinux - KVM	OpenNebula Systems	KVM	x86_64	qcow2

Showing 1 to 1 of 1 entries (filtered from 75 total entries) Previous 1 Next 10

OpenNebula 4.12.0 by OpenNebula Systems.

Support
Not connected
Sign in

Change Image & template name → just add **MSCIT** at the end → import

Import Appliance

The following images will be created in OpenNebula. If you want to edit parameters of the image you can do it later in the images tab

Select the datastore for the images
1: default

0 - Image Name 200MB
ttylinux-vdMSCIT

The following template will be created in OpenNebula and the previous images will be referenced in the disks if you want to edit parameters of the template you can do it later in the templates tab

Template Name
Ttylinux - KVM MSCIT

Import

Click Virtual Resources → Virtual Machines → Click on “+” button

- Dashboard
- System
- Virtual Resources
- Virtual Machines
- Templates
- Images
- Files & Kernels
- Infrastructure
- Marketplace
- OneFlow

Support

Not connected

Sign in

		<input type="text" value="Search"/>							
<input type="checkbox"/>	ID	Owner	Group	Name	Status	Host	IPs		



There is no data available

Showing 0 to 0 of 0 entries

Previous Next 10

0 TOTAL 0 ACTIVE 0 OFF 0 PENDING 0 FAILED

OpenNebula 4.12.0 by OpenNebula Systems.

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



Search

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

Previous 1 Next

You selected the following template: Ttylinux - KVMMSCT

Create

- Dashboard
- System
- Virtual Resources
- Virtual Machines
- Templates
- Images
- Files & Kernels
- Infrastructure
- Marketplace
- OneFlow

Support

Not connected

Sign in

<input checked="" type="checkbox"/>	ID	Owner	Group	Name	Status	Host	IPs
<input checked="" type="checkbox"/>	0	oneadmin	oneadmin	Ttylinux - KVMMSCT-0	RUNNING	one-sandbox	--

Showing 1 to 1 of 1 entries

Previous 1 Next 10

1 TOTAL 1 ACTIVE 0 OFF 0 PENDING 0 FAILED

OpenNebula 4.12.0 by OpenNebula Systems.

PRACTICAL 8

Aim - Implementing Amazon Web Service AWS

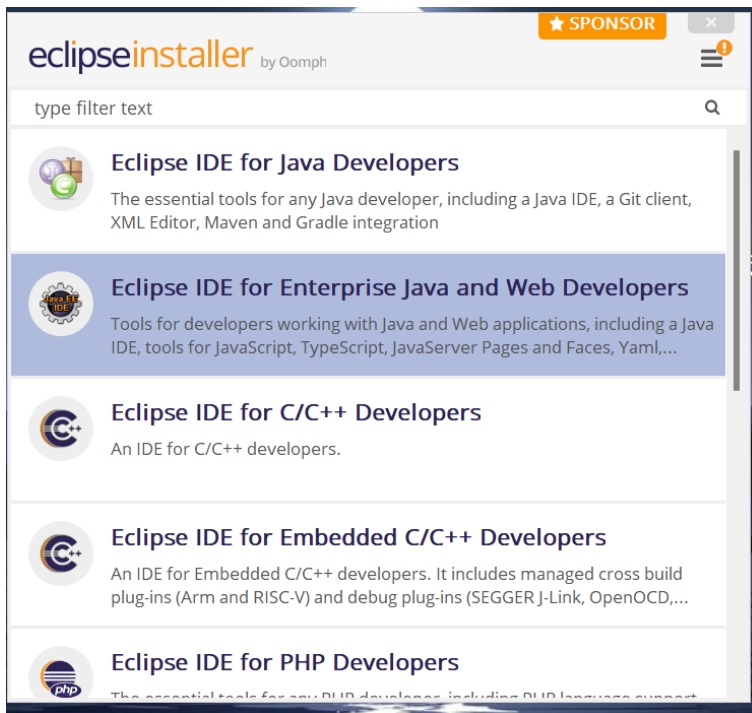
Requirements:- Eclipse installer , tomcat Apache 10.1 v

Steps:-

Install tomcat Apache in ur pc .install 10.1 version and then execute it

Install eclipse from its official website

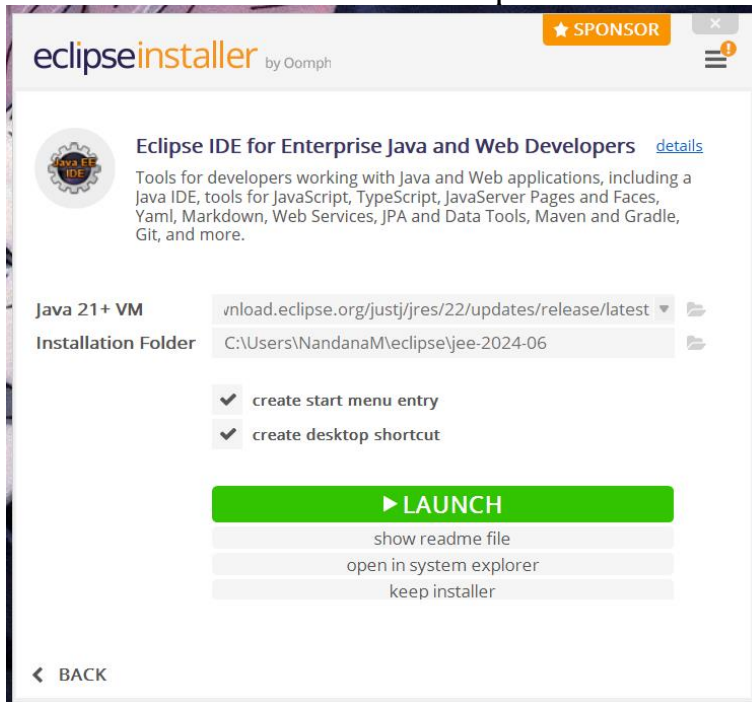
Click on



Click on Install

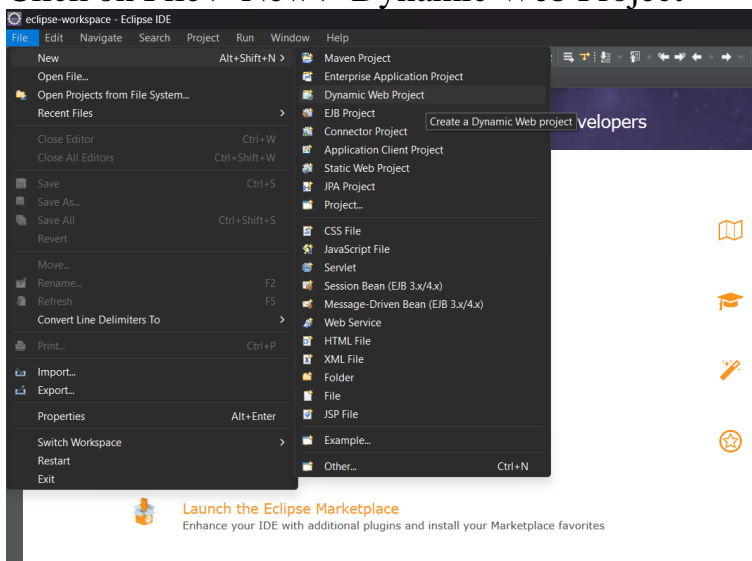


Wait until the installation is completed

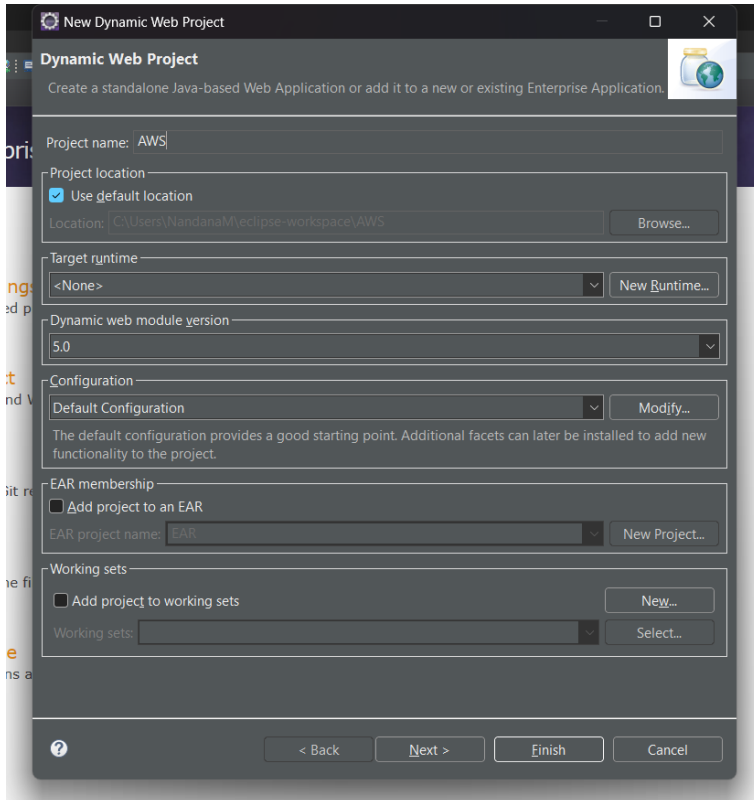


Click on Launch

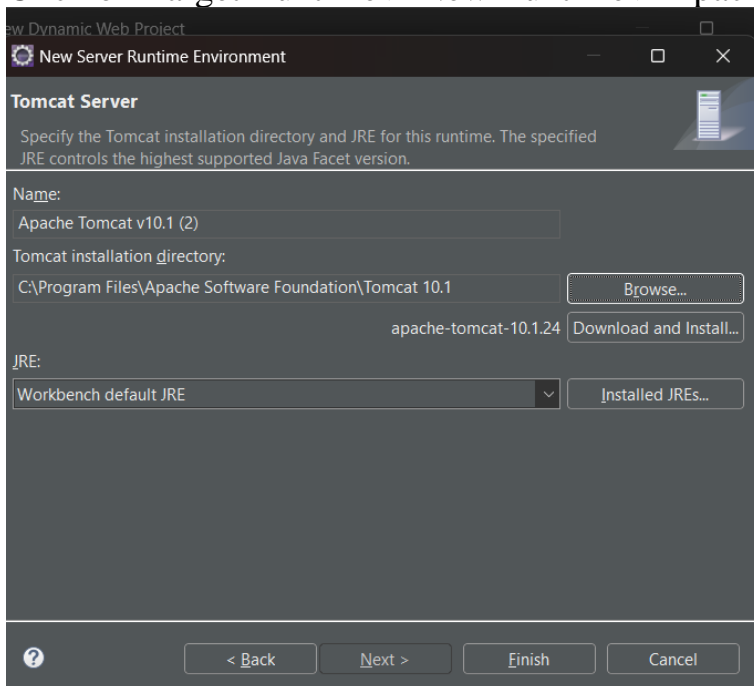
Click on File > New > Dynamic Web Project



Give project name as “AWS” and then click on “Next”

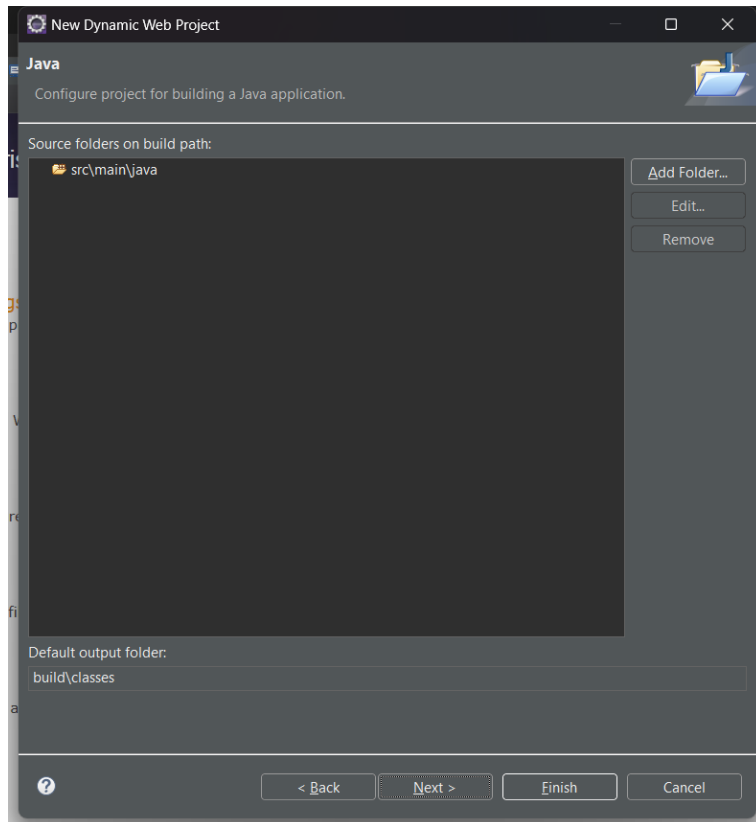


Click on Target Runtime > New Runtime > Apache > Apache tomcat v10.1 > Next

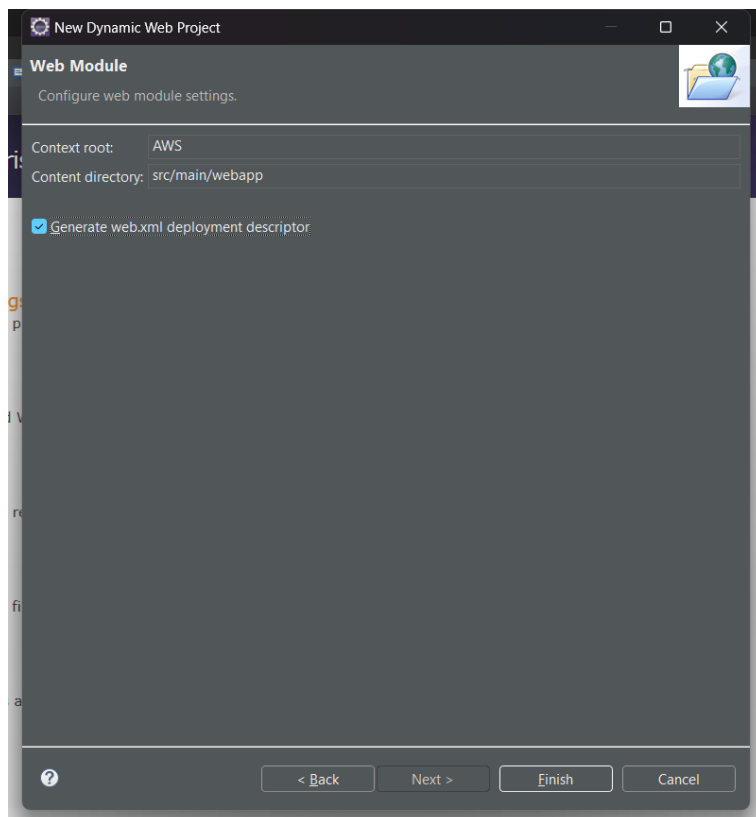


Click Browse > C drive > program files > Apache Software foundation > Tomcat 10.1
>Click on Continue > give access

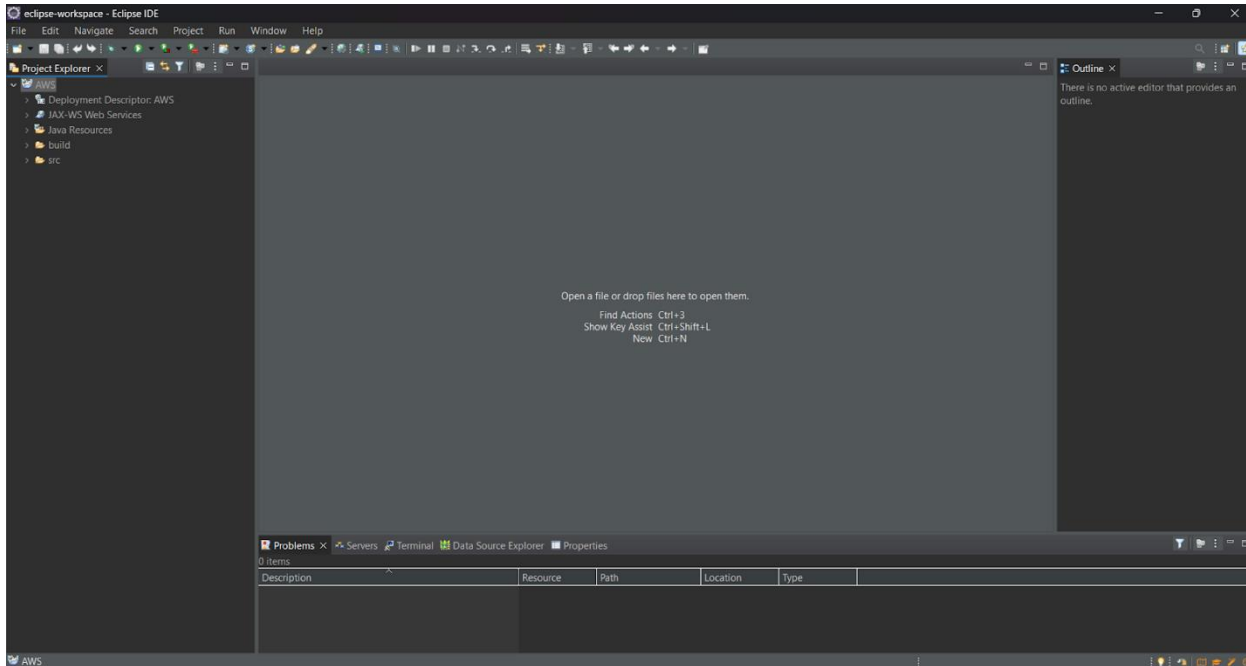
Select that and then click “Next”



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

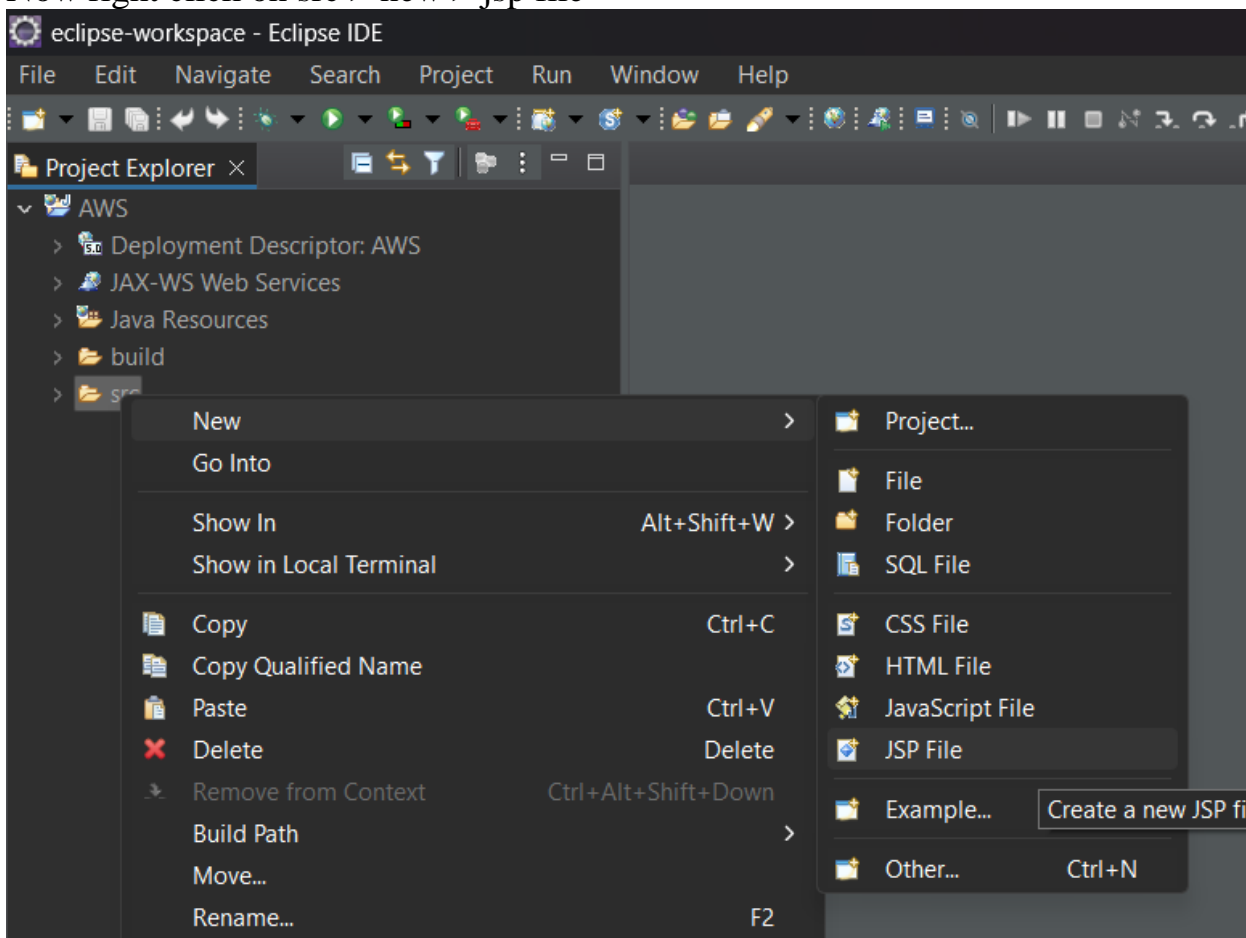


U will be navigated to this page



If u don't see "project explorer" which is on the lhs ..then click on "windows > show view > project explorer"

Now right click on src > new > jsp file

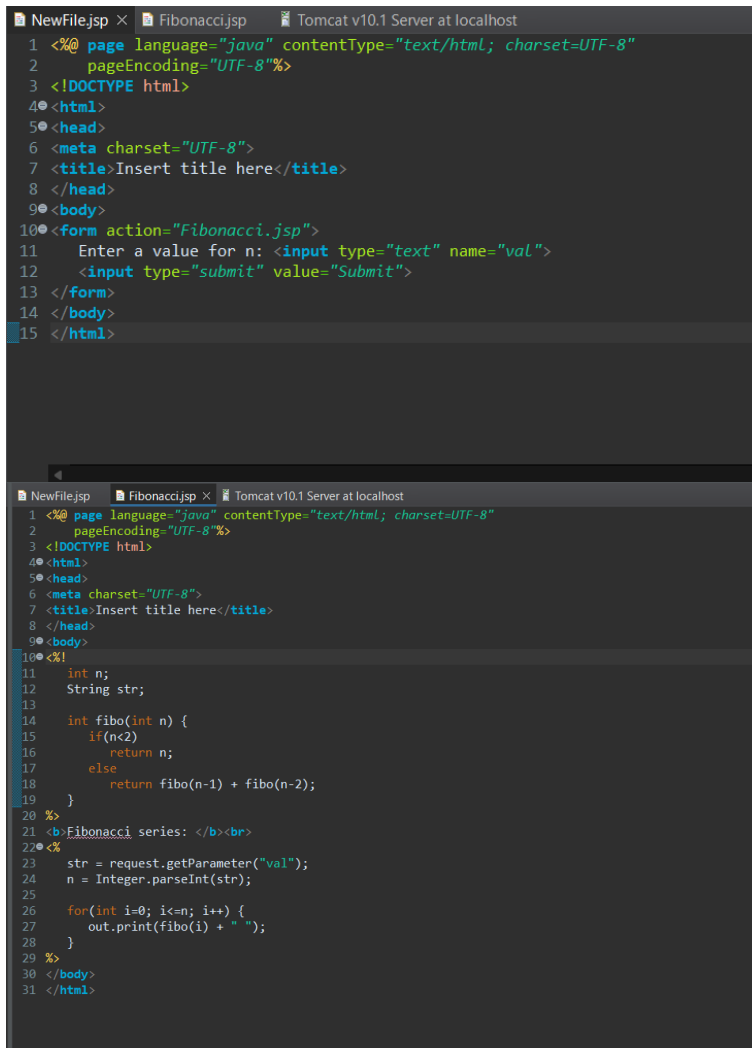


Create 2 jsp files ..one as newfile.jsp and the other as fibonacci.jsp

To create jsp file

Click on jsp file and then name ur jsp file if u want then click next and then finish

Write the code



```

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>

```

```

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>

```

Now run the code

Enter a value for n:

Fibonacci series:
0 1 1 2 3 5