



**Hindi Vidya Prachar Samiti's**  
**Ramniranjan Jhunjhunwala College of Arts,**  
**Science & Commerce (Autonomous),**  
**Ghatkopar(W) MUMBAI - 400 086**

**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**2021 - 2022**

**M.Sc. (I.T.) SEM II**  
**Virtualization**

**Name: Pavan Yadav**

**Roll No.: 24**



Hindi Vidya Prachar Samiti's  
**RAMNIRANJAN**  
**JHUNJHUNWALA COLLEGE**  
**(AUTONOMOUS)**

Opposite Ghatkopar Railway Station, Ghatkopar West, Mumbai-400086



## **CERTIFICATE**

This is to certify that Mr/Miss/Mrs **Pavan Yadav** with **Seat No: 24** has successfully completed the necessary course of experiments in the subject of **Virtualization** during the academic year 2021 – 2022 complying with the requirements of RAMNIRANJAN JHUNJHUNWALA COLLEGE OF ARTS, SCIENCE AND COMMERCE, for the course of M.Sc. (IT) Semester-II.

**24th March 2022**

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Internal Examiner

Date

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Head Of Department

College Seal

External Examiner

# **INDEX**

<b>Practical No.</b>	<b>Title</b>	<b>Date</b>	<b>Page No</b>
1	Implement VMwareESXi for server virtualization. A. Install VMwareESXi server and vSphere client. B. Install vCenter Single Sign-On as Part of a vCenter Server Simple Install.	12/02/2022	1-29
2	Manage VMwareESXi server with vCentre server. A. Create a virtual machine in vmwareESXi Server. B. Migrate the virtual machine from one ESXi server to another ESXi server.	10/03/2022	30-58
3	Create a Template in the vSphere Client A. Convert a Virtual Machine to a Template in the vSphere Client B. Clone a Template in the vSphere Client C. Clone Virtual Machine to Template in the vSphere Client	10/03/2022	59-64
4	Manage the storage and Security of VMware ESXi server. A. Add Virtual storage in VMware ESXi Server with vSphere Client. B. Create a one user account of VMware ESXi server using vSphere WebClient application.\ C. Prevent Users from Spying on Remote Console Sessions	11/03/2022	65-88
5	Upgrade the VMware ESXi server 6.7 to 7.0 using simple installation.	19/03/2022	89-99
6	Implement the NFS with the vCenter Server.	11/03/2022	100-103
7	Implement and Manage the network of VMware ESXi server. A. Create vSphere Standard switch B. Create vSphere Distributed switch	16/03/2022	104-114
8	Perform vSphere Monitoring and Performance A. Monitoring Inventory Objects with different Performance Charts B. Monitoring Guest Operating System Performance a. View Performance Statistics for Windows Guest Operating Systems	16/03/2022	115-120

# Practical No. 1

**AIM:** Implement VMware ESXi for server virtualization

## A- Install VMware ESXi server and vSphere client.

Download VMWare ESXI server from VMWare Portal. On the VMWare download portal, you will need to find the last version of VMWare ESXi. Select the VMWare ESXi software and click on the Download button.

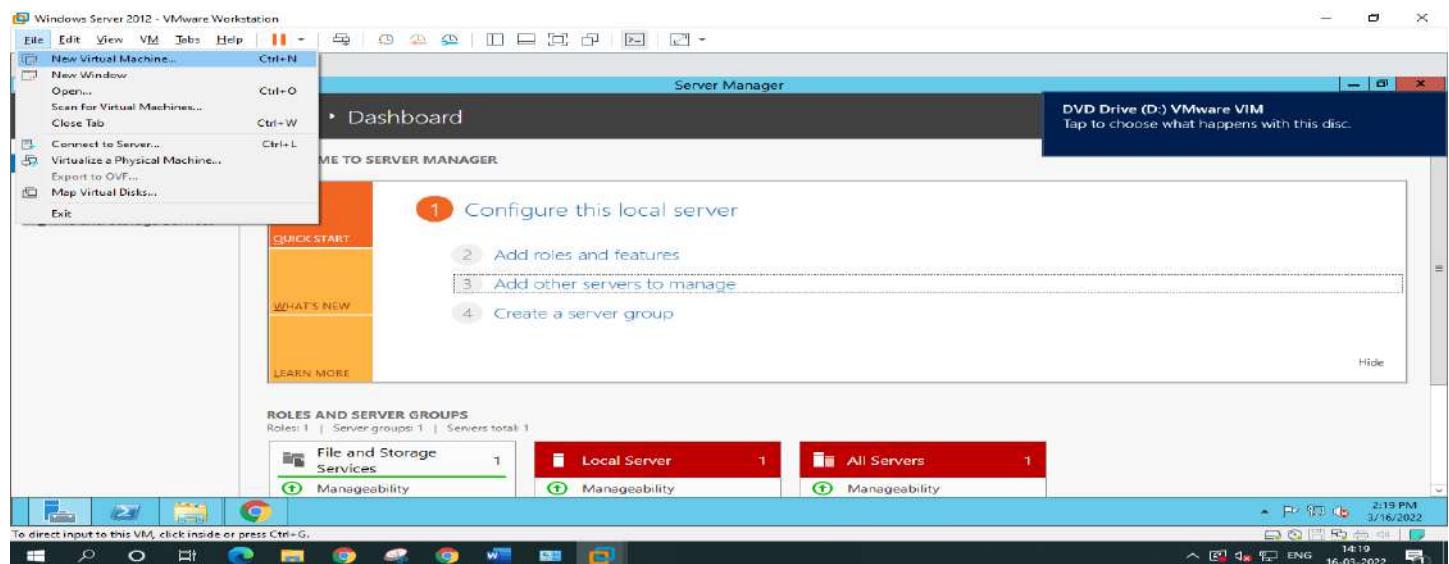
The screenshot shows the VMWare download portal interface. At the top, there's a message: "Your downloads are available below". Below it, a section titled "VMware vSphere Hypervisor 6.7 - Binaries" is expanded. It contains a link to "VMware vSphere Hypervisor [ESXi ISO] image (includes VMware Tools)" dated 2018-04-17, size 6.70 GB, and 330.31 MB ISO. To the right of the link is a blue "Manually Download" button. Below the link, there's a note: "Boot your server with this image in order to install or upgrade to ESXi [ESXi requires 64-bit capable servers]. This ESXi image includes VMware Tools." It also displays MD5SUM, SHA1SUM, and SHA256SUM values. At the bottom of this section, another collapsed item is visible: "VMware vSphere Hypervisor 6.5.0 Update 2 - Binaries".

The installation file name is

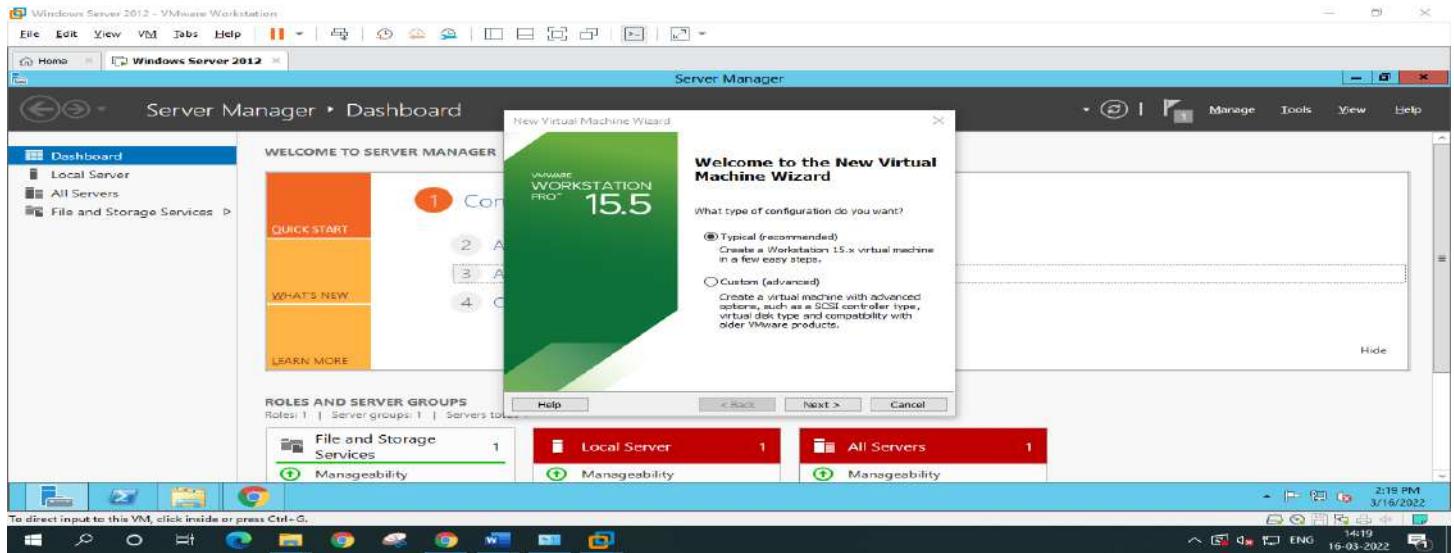
VMware-VMvisor-Installer-6.7.0.update03-14320388.x86\_64.iso.

Name	Date modified	Type
en_windows_server_2012_x64_dvd_915478	25-01-2013 22:47	WinRAR archive
VMware-VIM-all-6.7.0-19300125	08-03-2022 13:36	WinRAR archive
VMware-VMvisor-Installer-6.7.0.update0...	08-03-2022 13:03	WinRAR archive

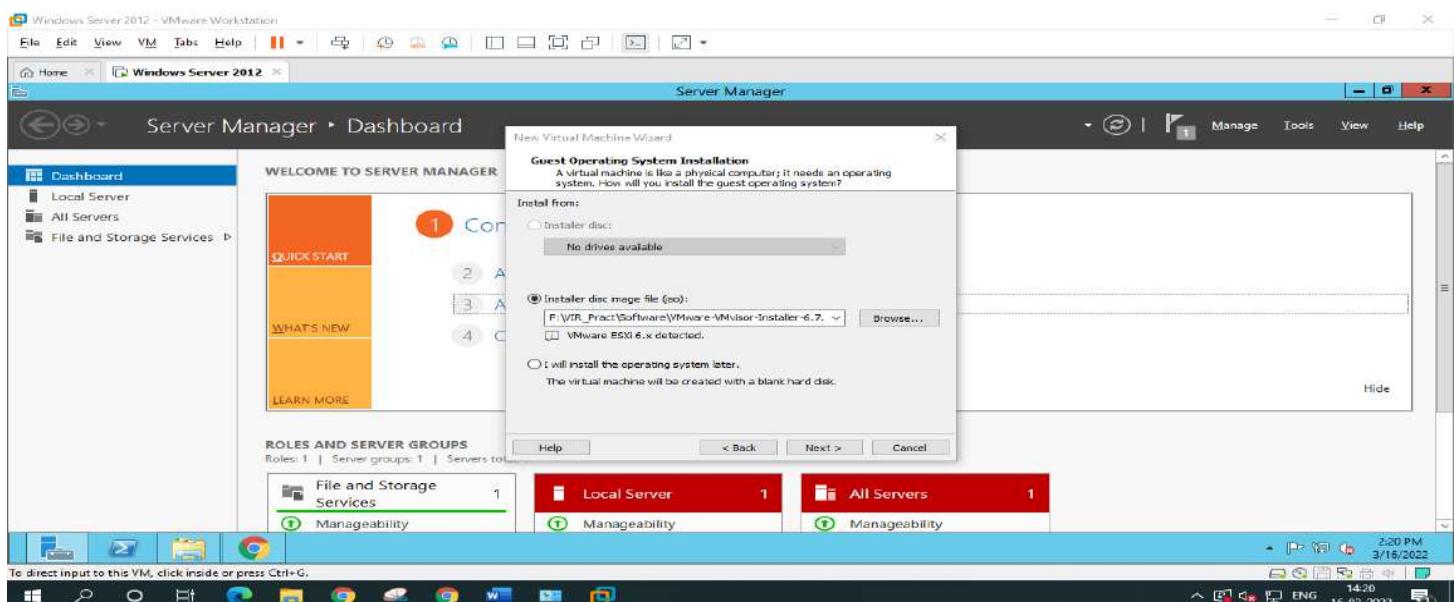
Create a new virtual machine in VMWare Workstation



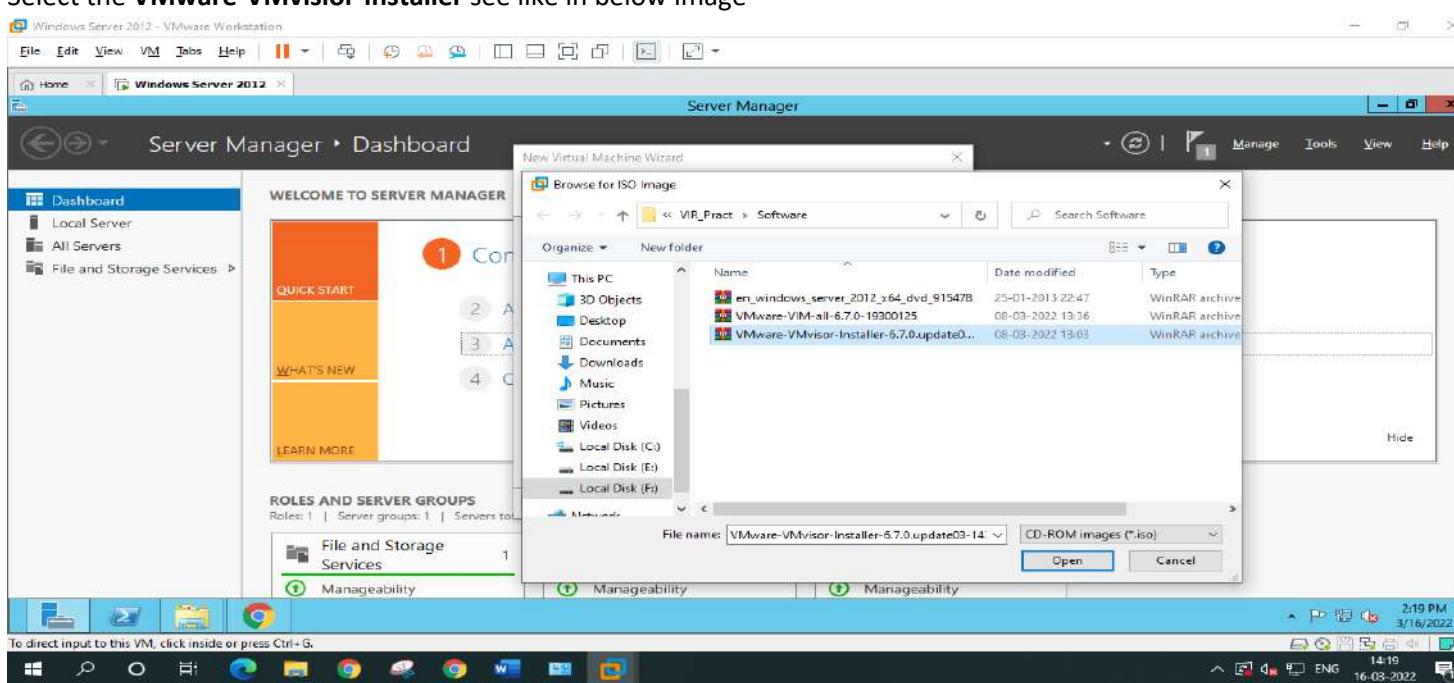
## Click on the Next Button



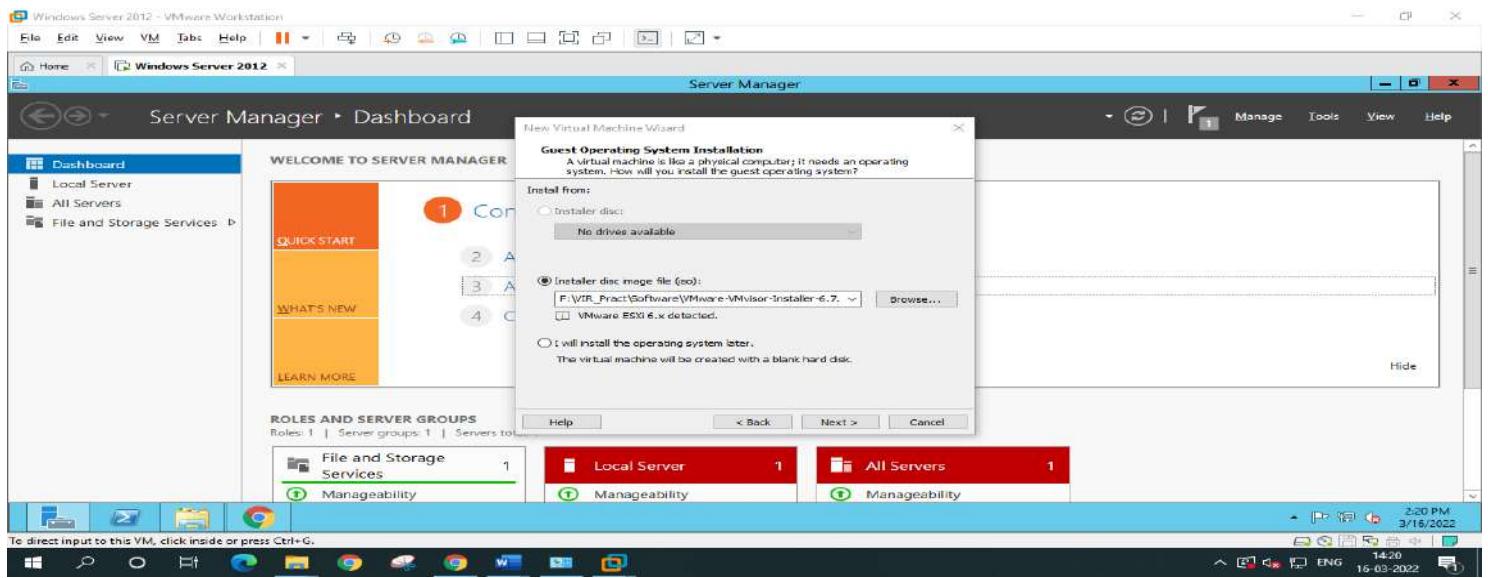
## Click on the Browser Button



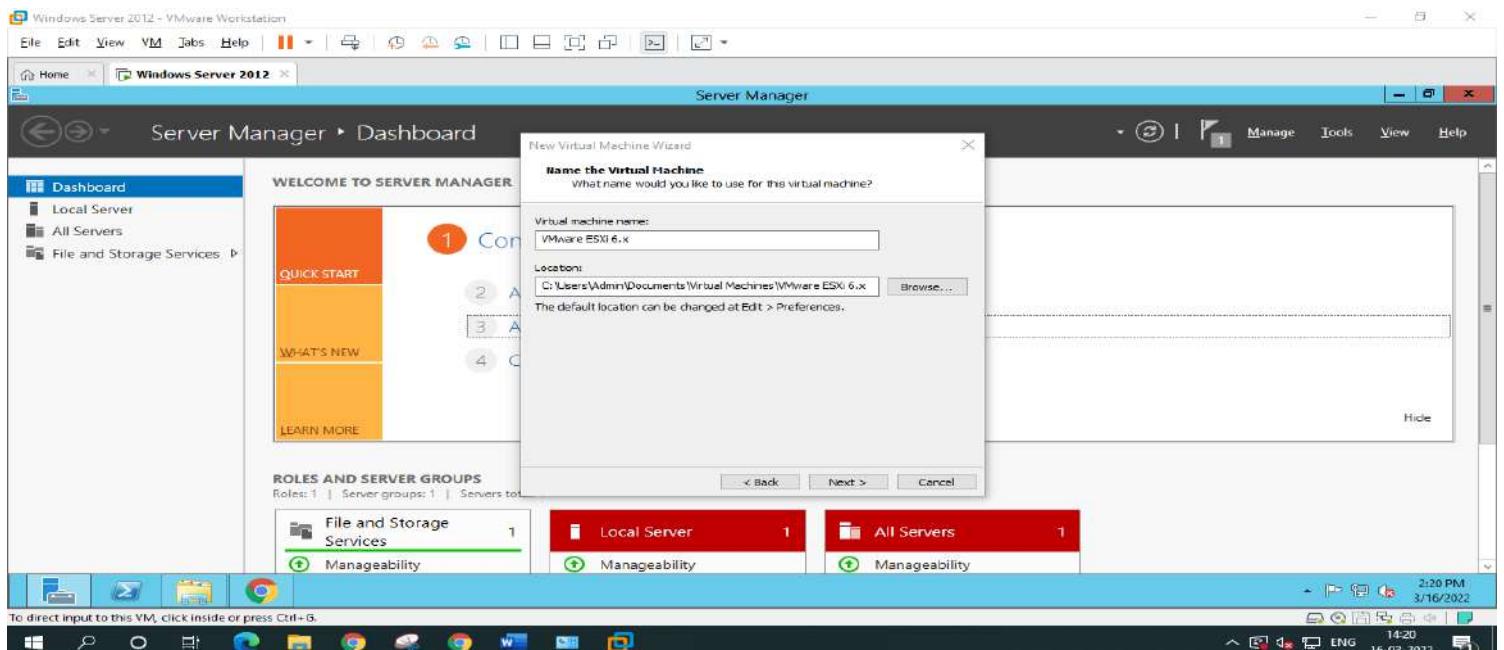
## Select the VMware-VMvisor-installer see like in below image



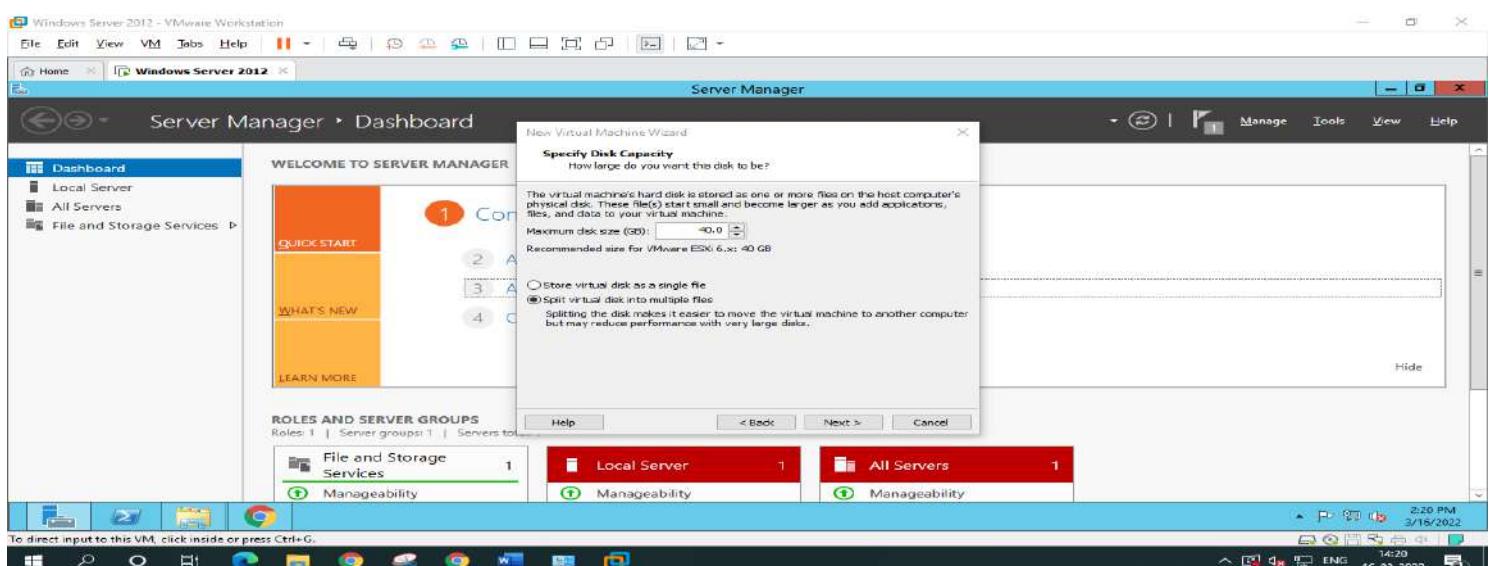
## Click on the Next Button



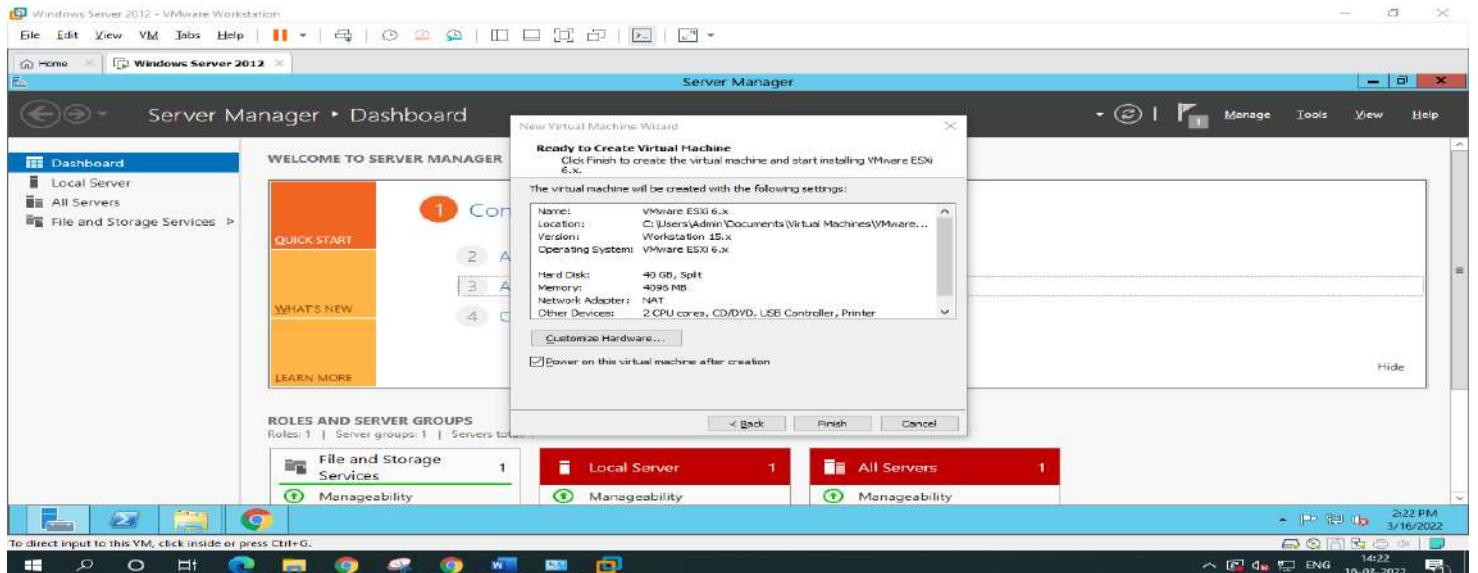
## Click on the Next Button



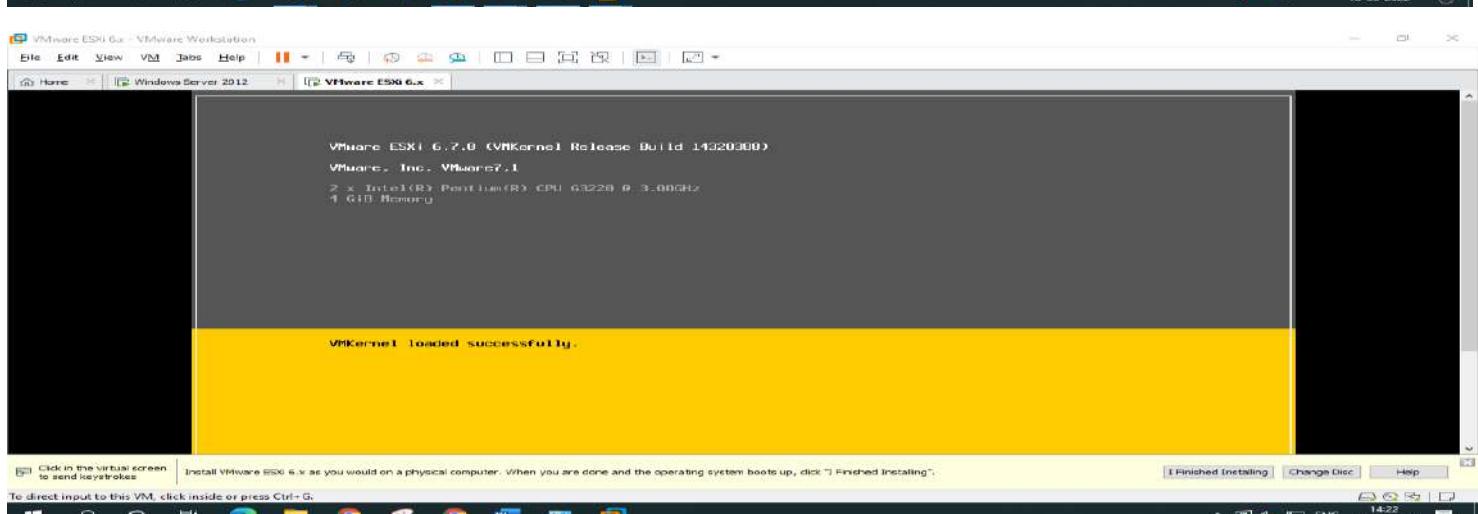
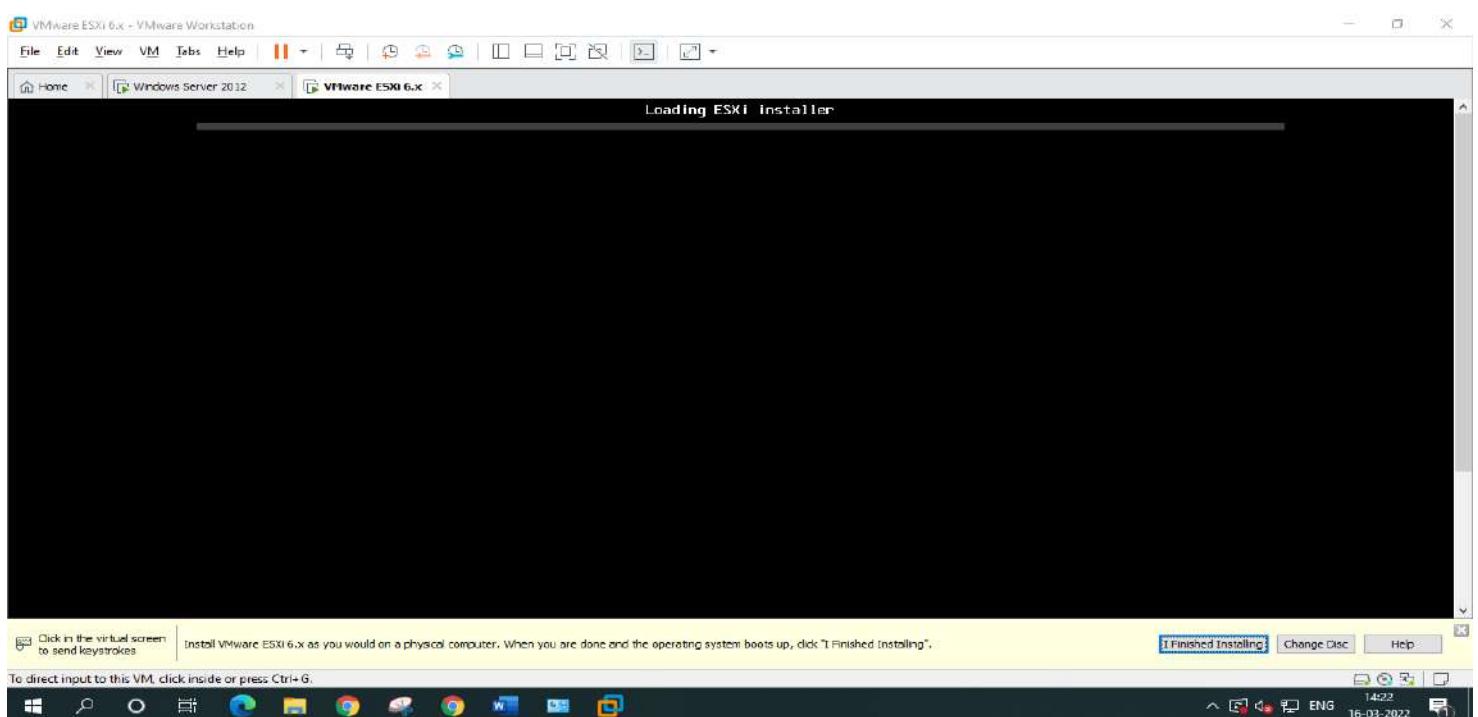
## Click on the Next Button



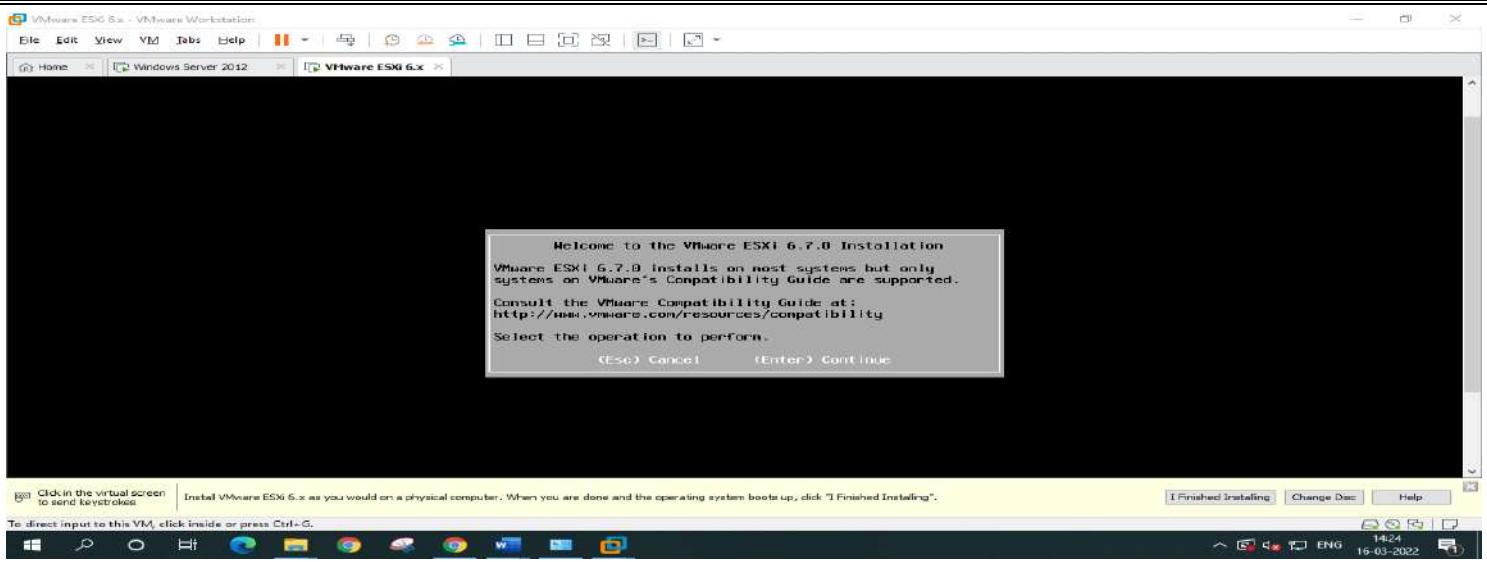
## Click on the Finish Button



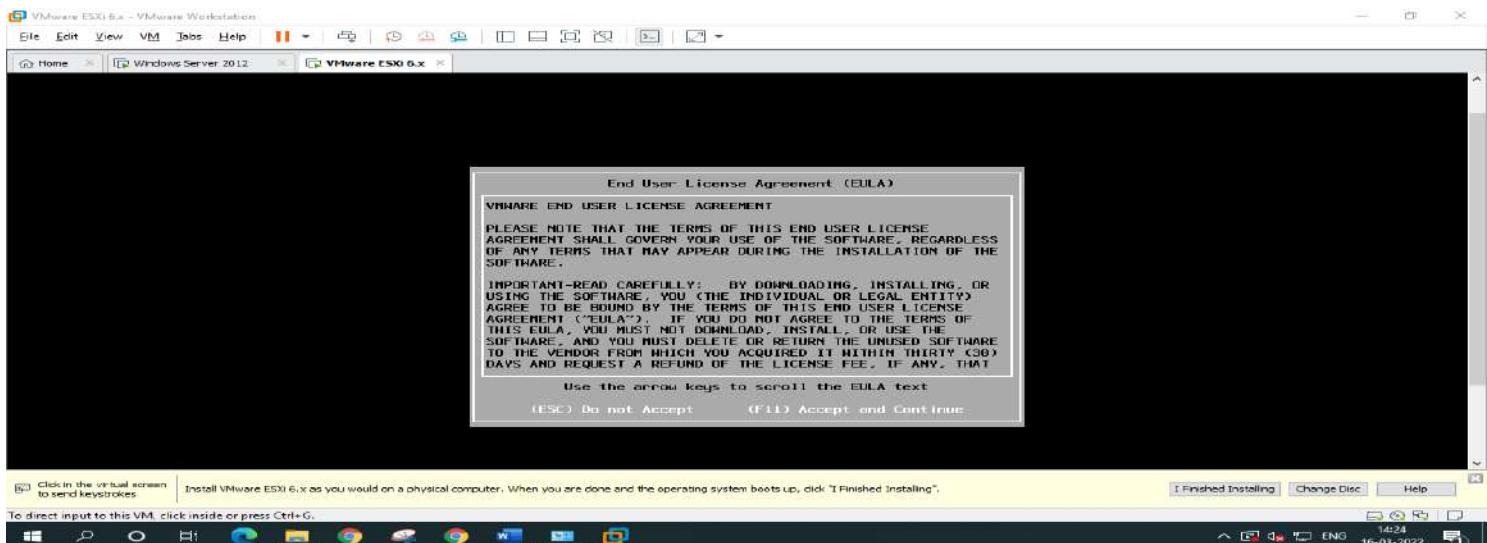
The following screen occurs:



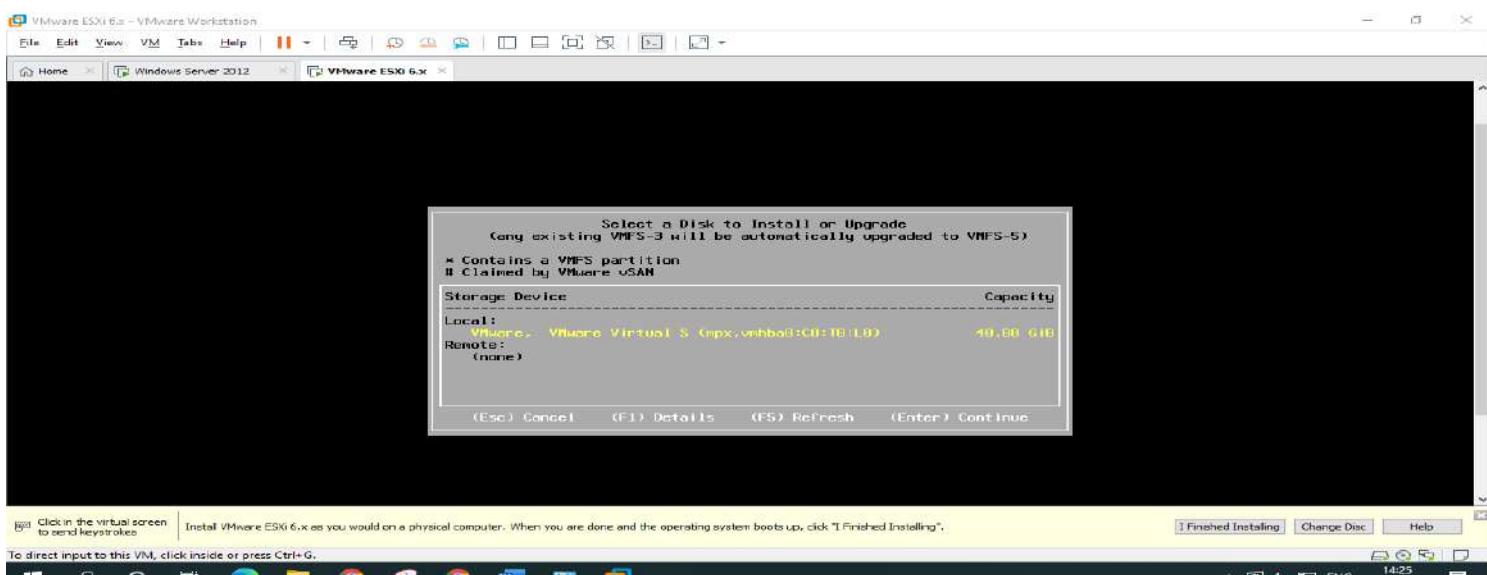
Press on the Enter button



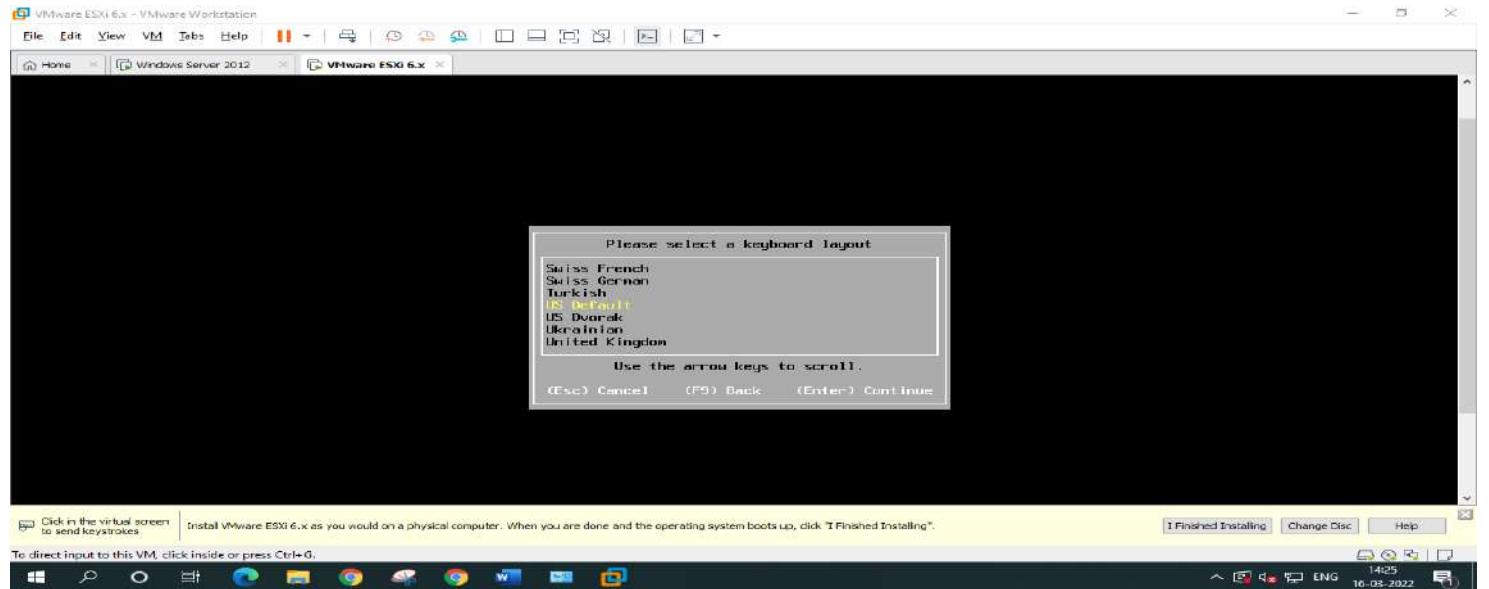
Press on the F11 button



Press on the Enter button

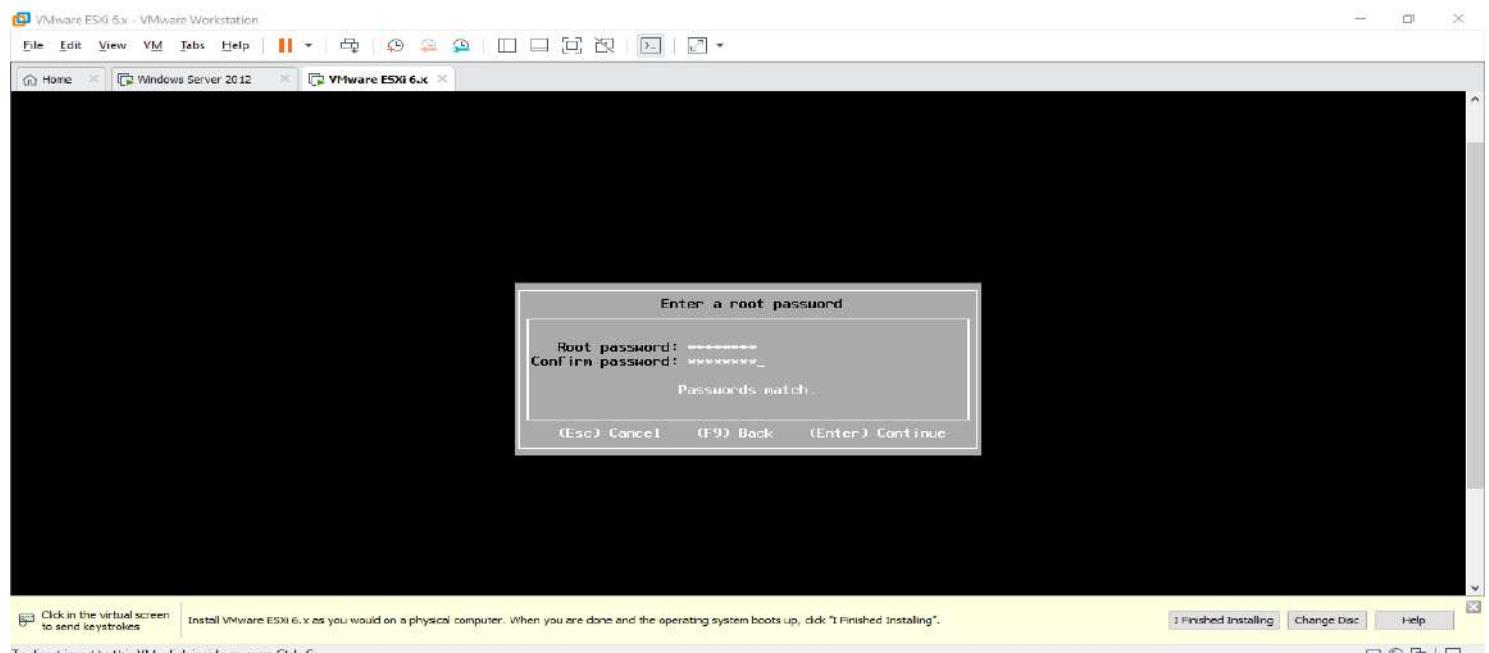


## Press on the Enter button

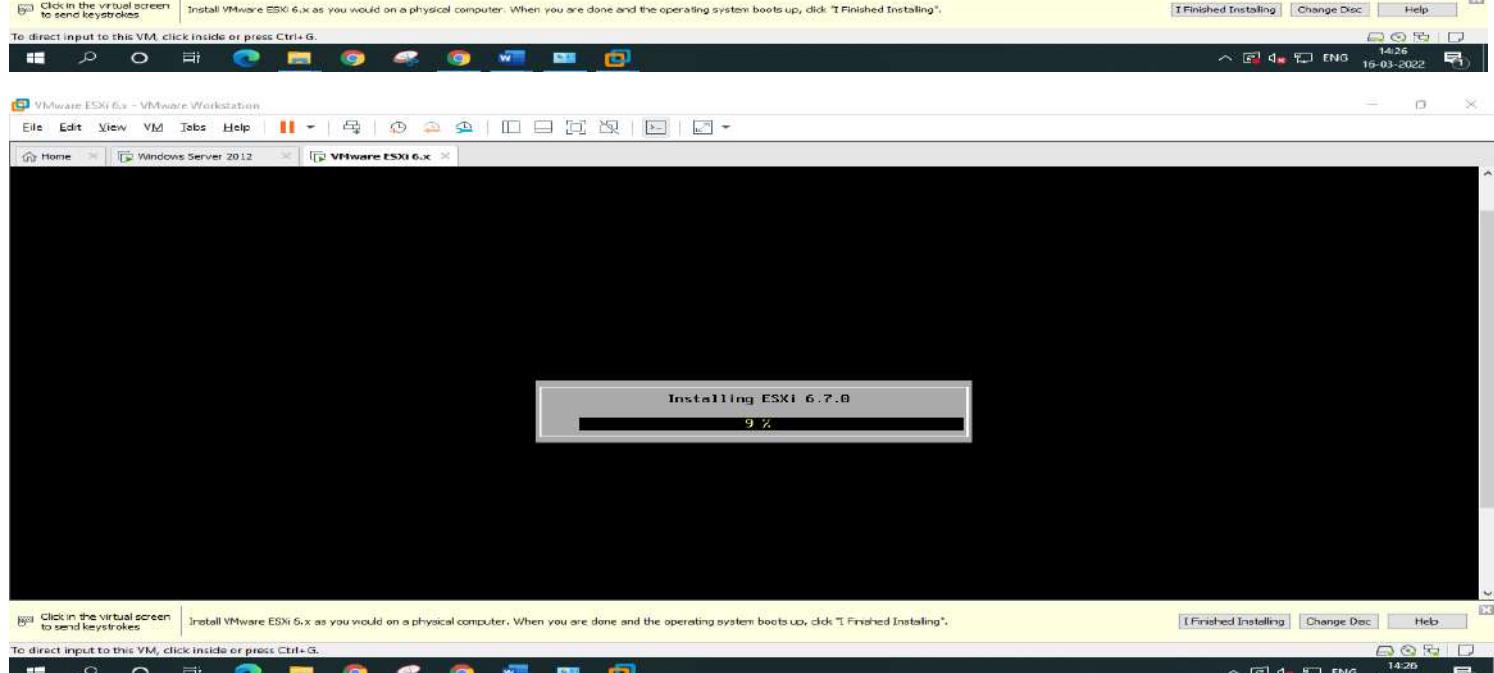
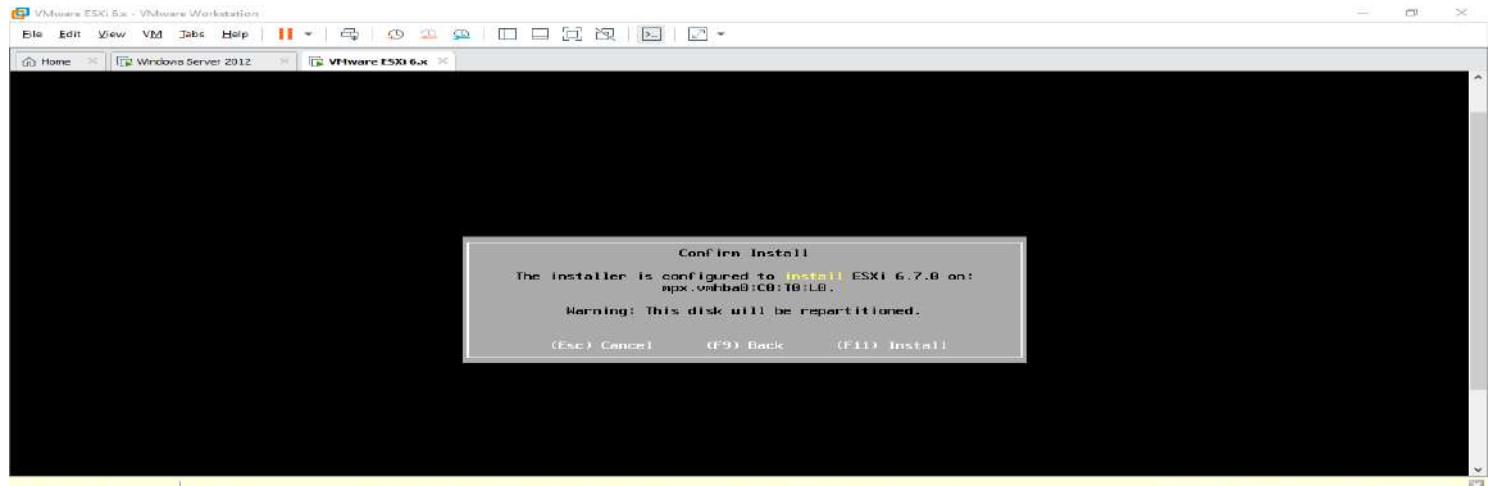


Press on the **Enter** button

Here Password is **It@13579**

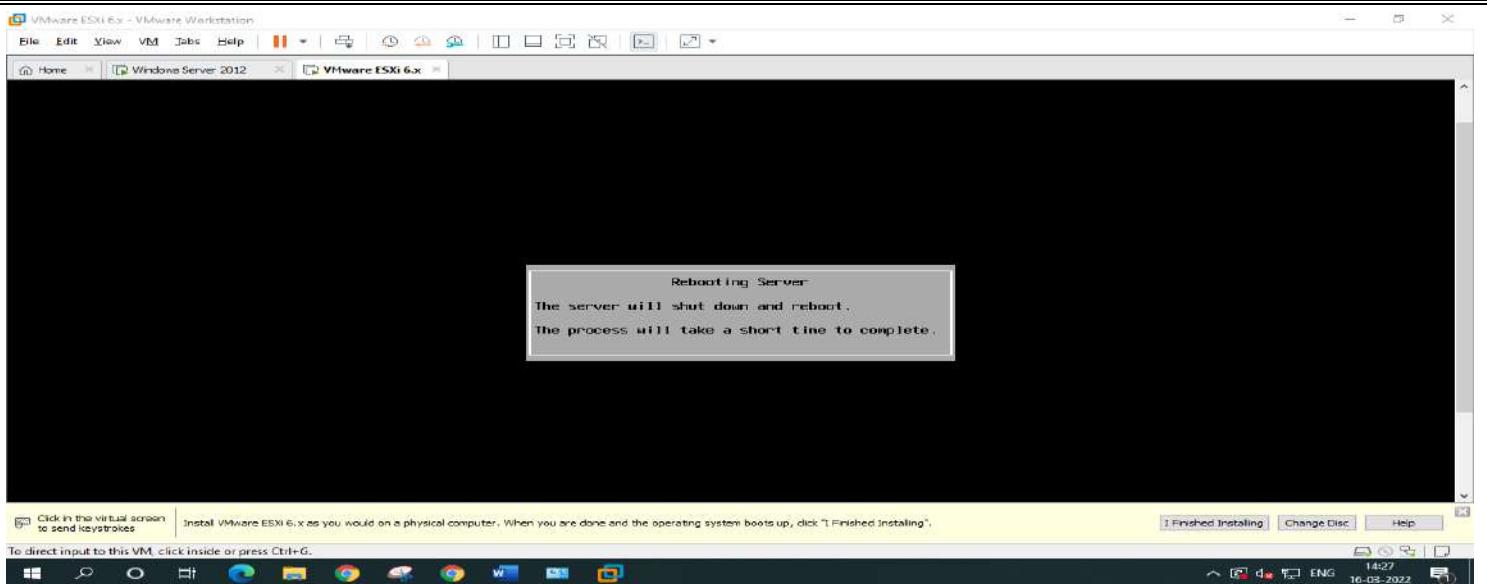


## Press on the F11 button

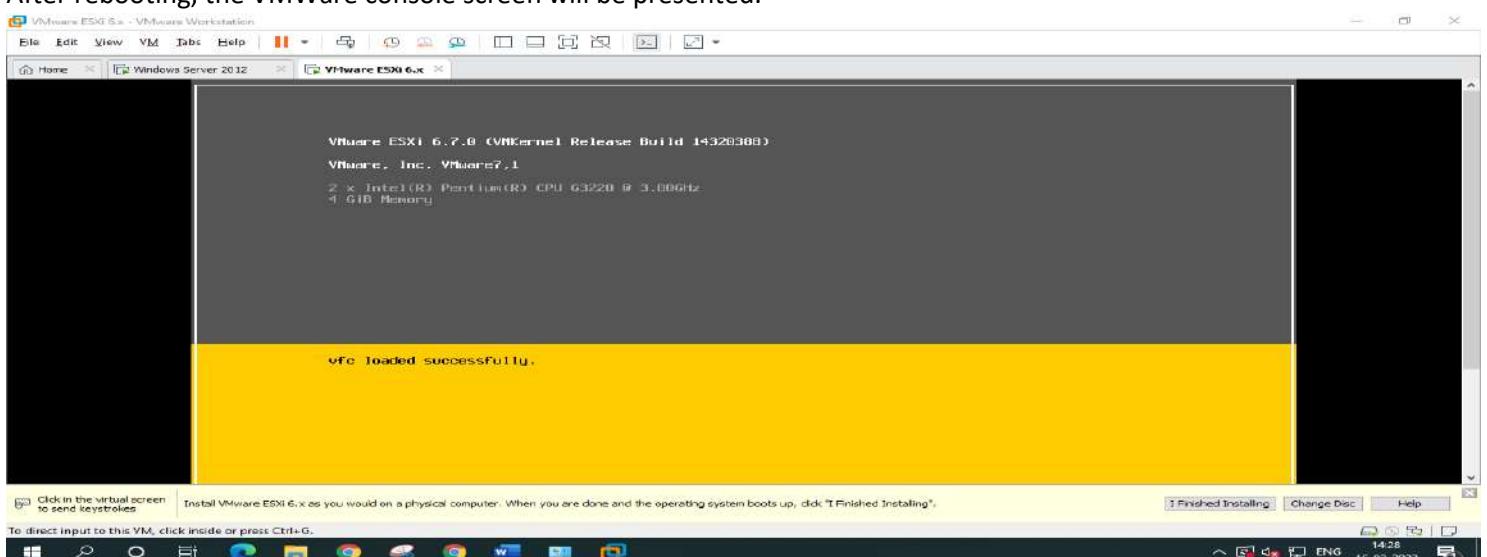


## Press on the Enter button



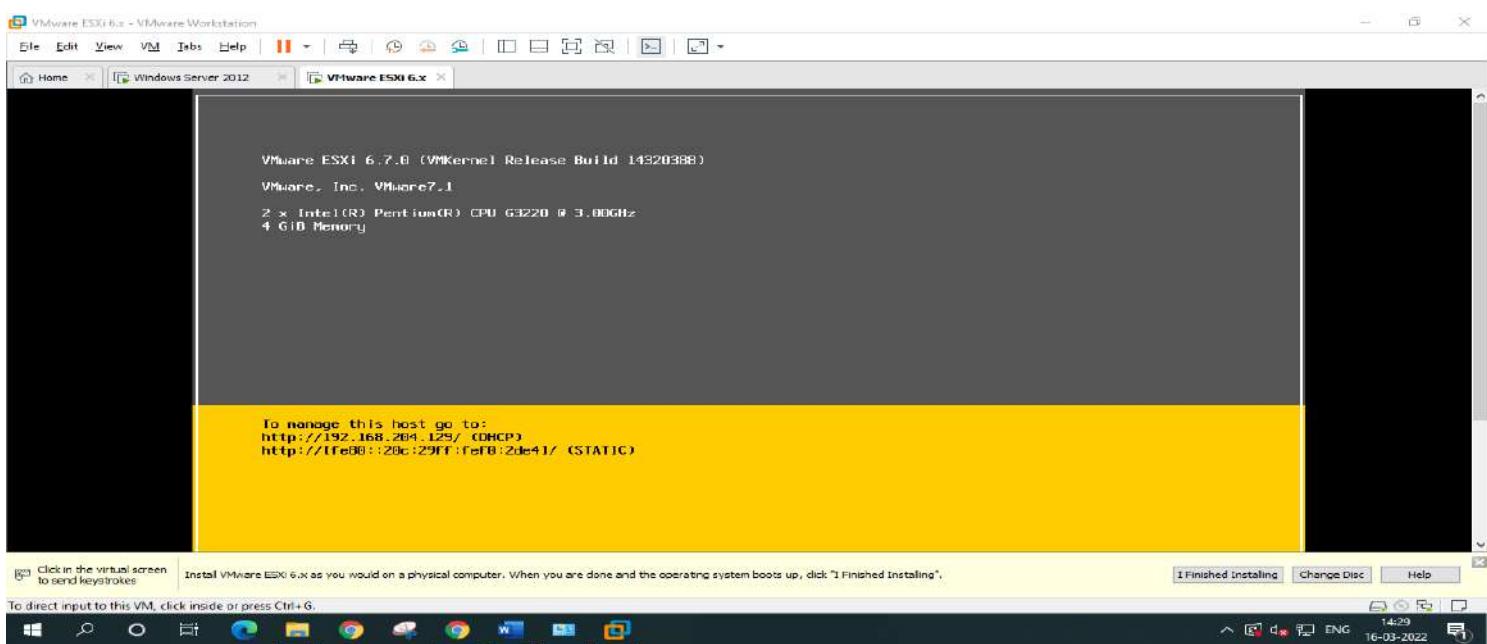


After rebooting, the VMWare console screen will be presented.



Congratulations VMWare ESXi successfully installed and

Used for Host IP Address: **192.168.204.129**

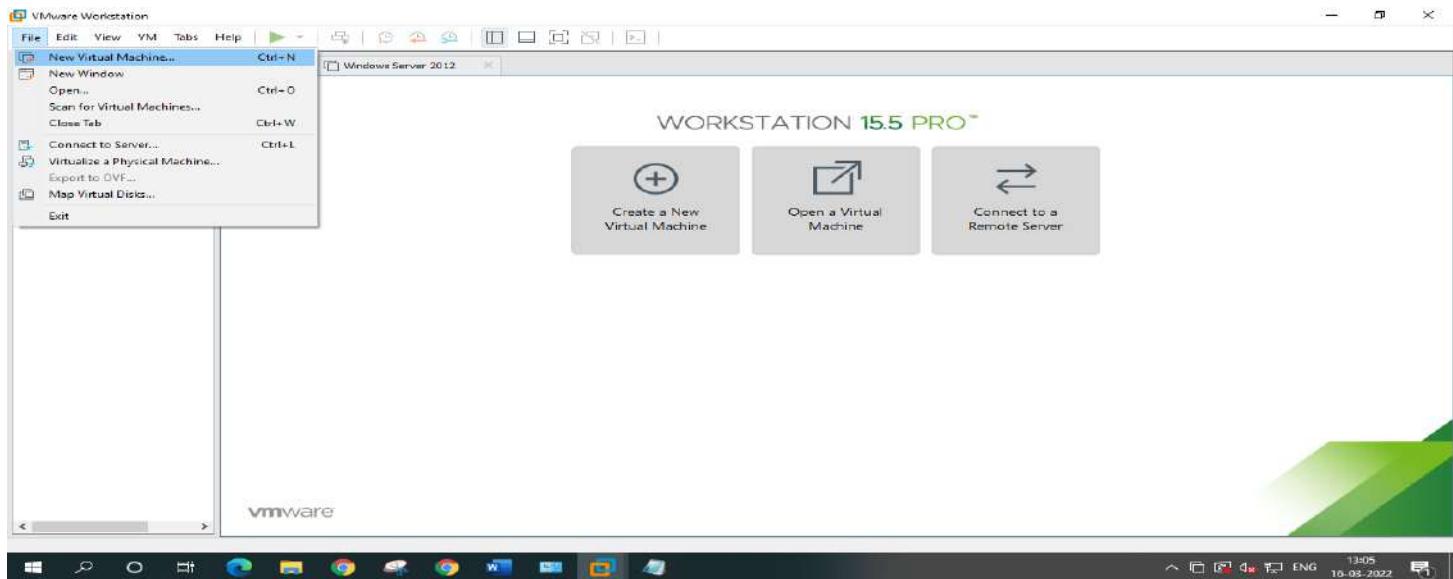


## B- Install vCenter Single Sign-On as Part of a vCenter Server Simple Install.

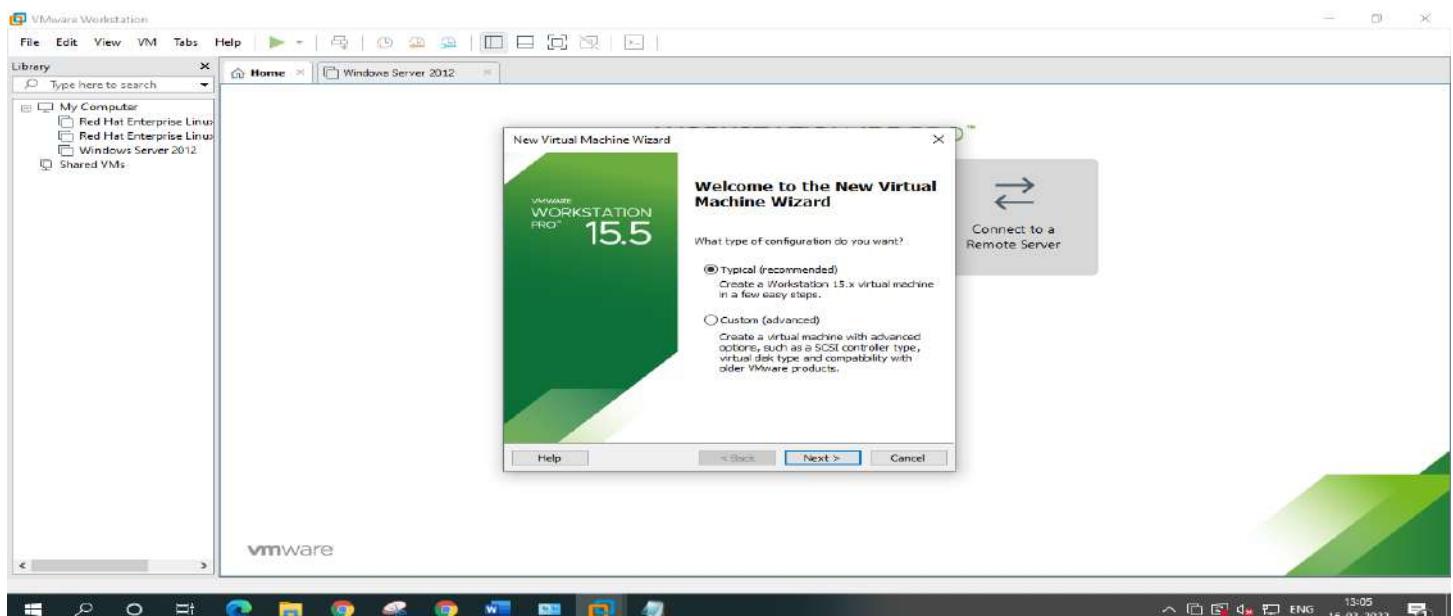
### Install Windows Server 2012 Machine:

First for installing vCenter, we need to **create a Windows Server virtual machine**.

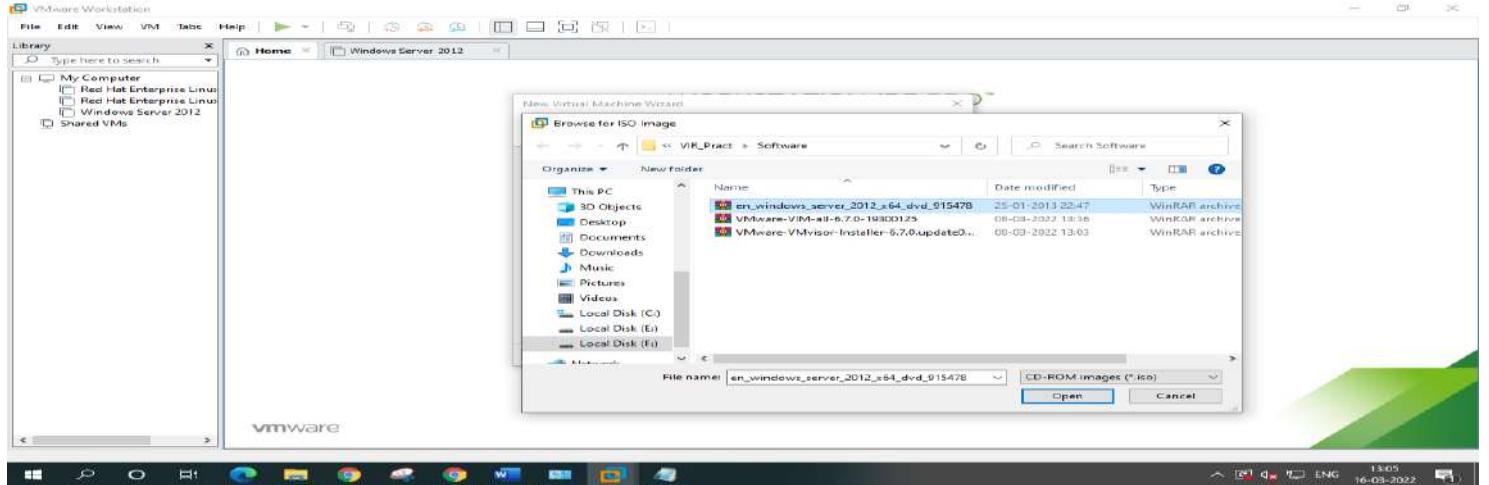
Open VMWare workstation and click on Create Virtual Machine and in the “**New Virtual Machine Wizard**”



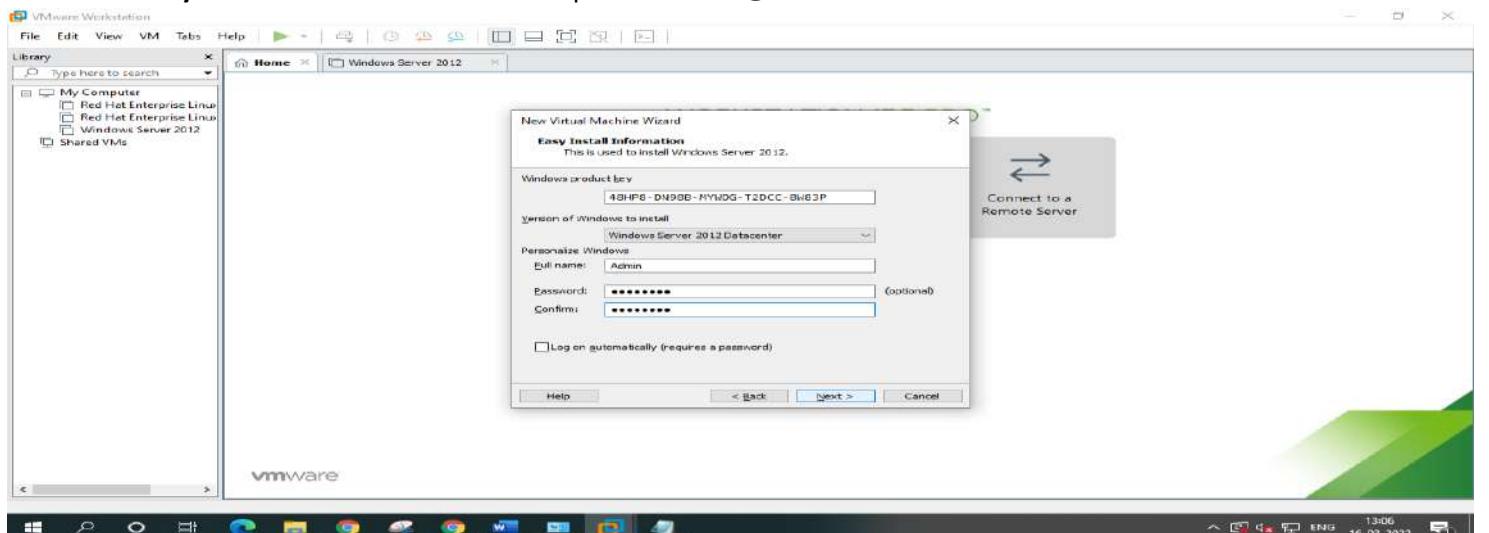
Select the “**Typical**” option and click on the “**Next**” button



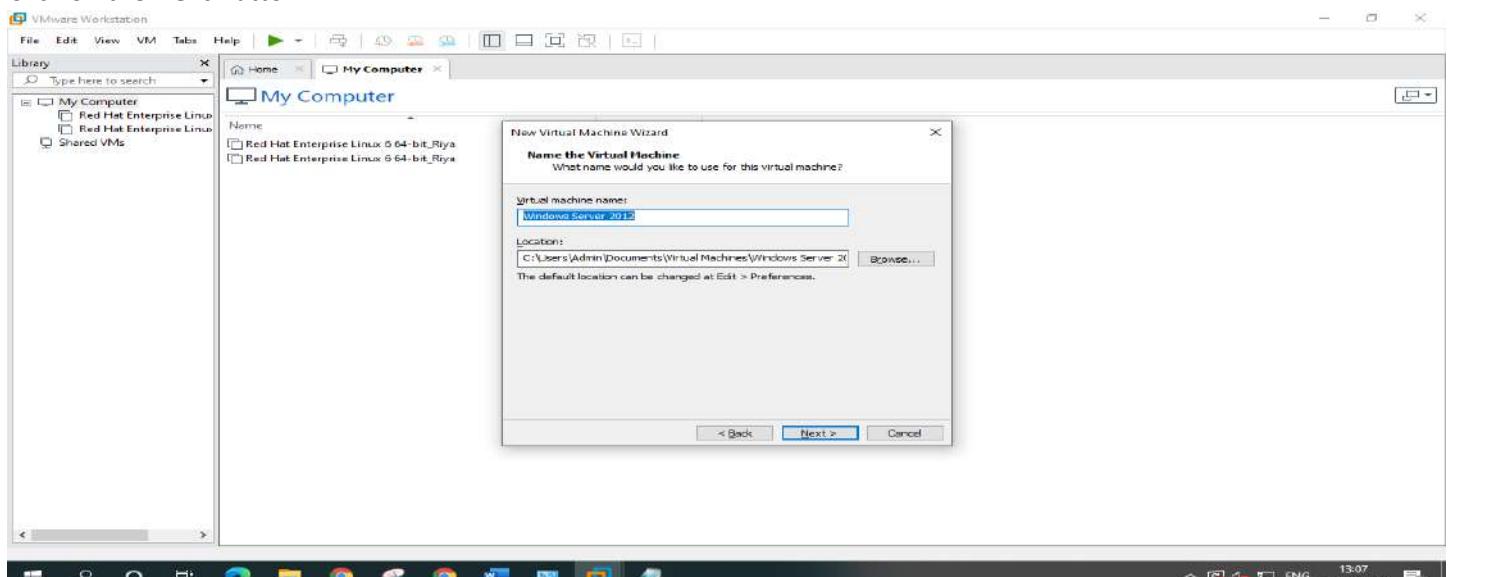
In the Next window, select the option **Installer Disc** and click on **Browse** to select the **Windows Server 2012 iso** file, and then click on **Next**.



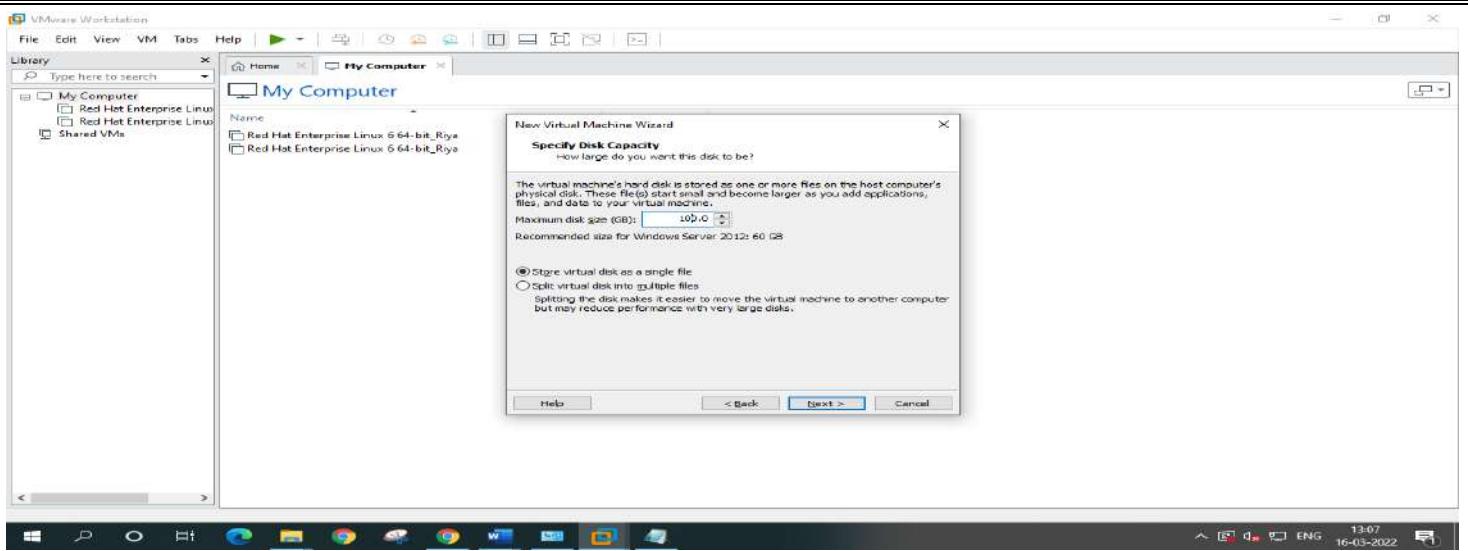
Provide the **key of windows server** and set the password as **lt@13579**



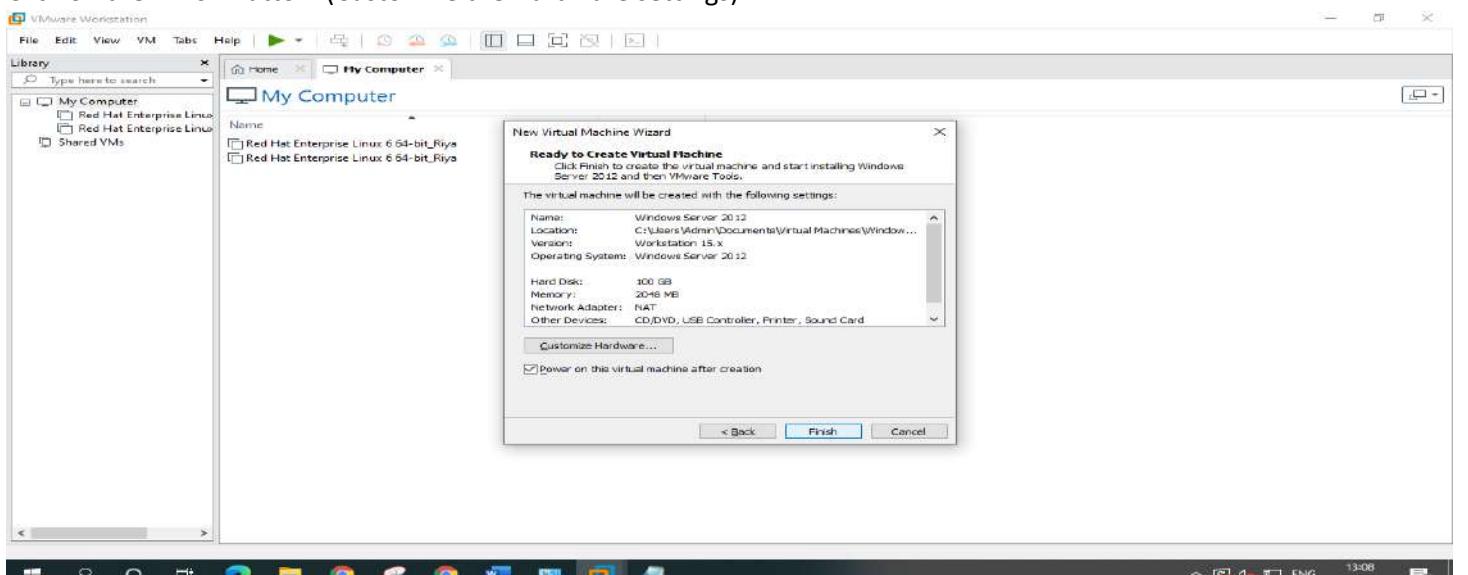
Click on the **Next** Button



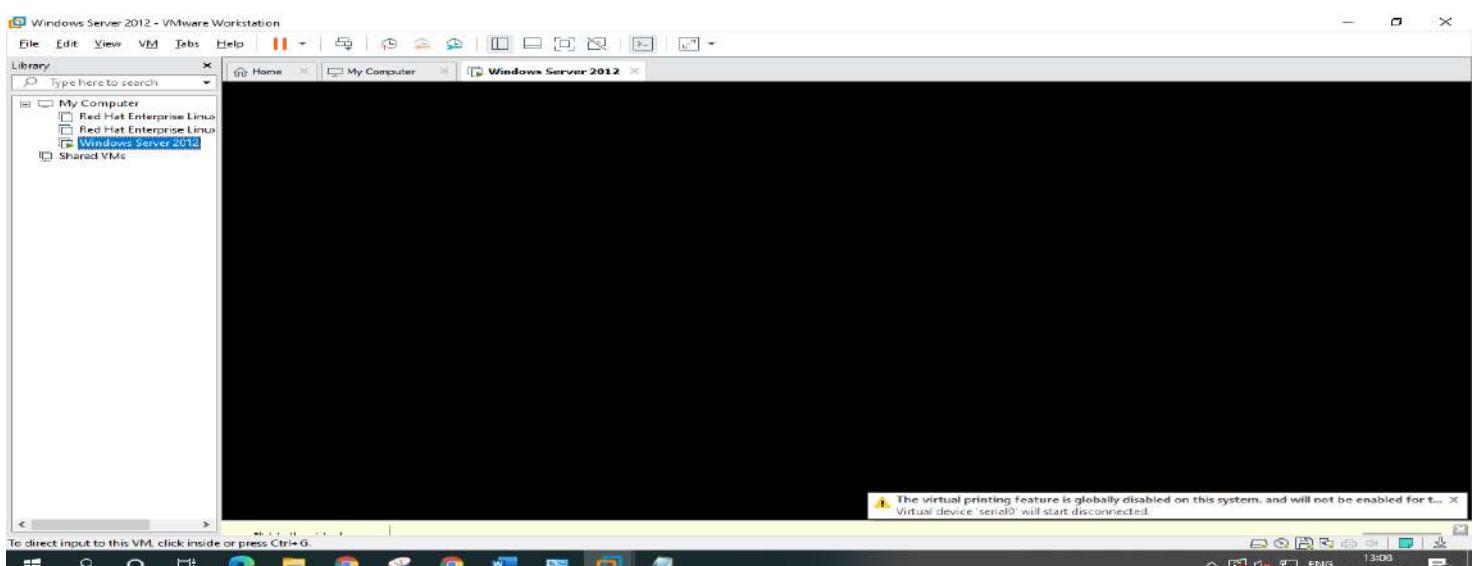
Provide the Disk size or default size then Click on the **Next** Button

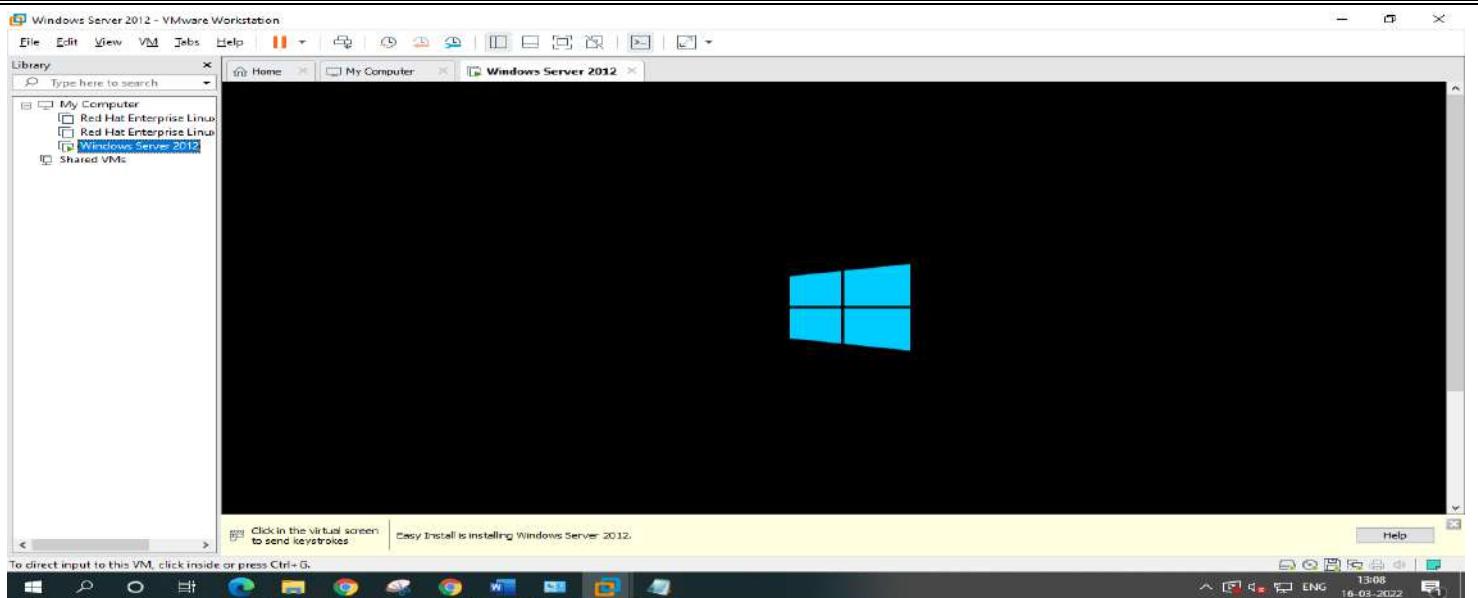


Click on the **Finish** Button. (Customize the Hardware settings)

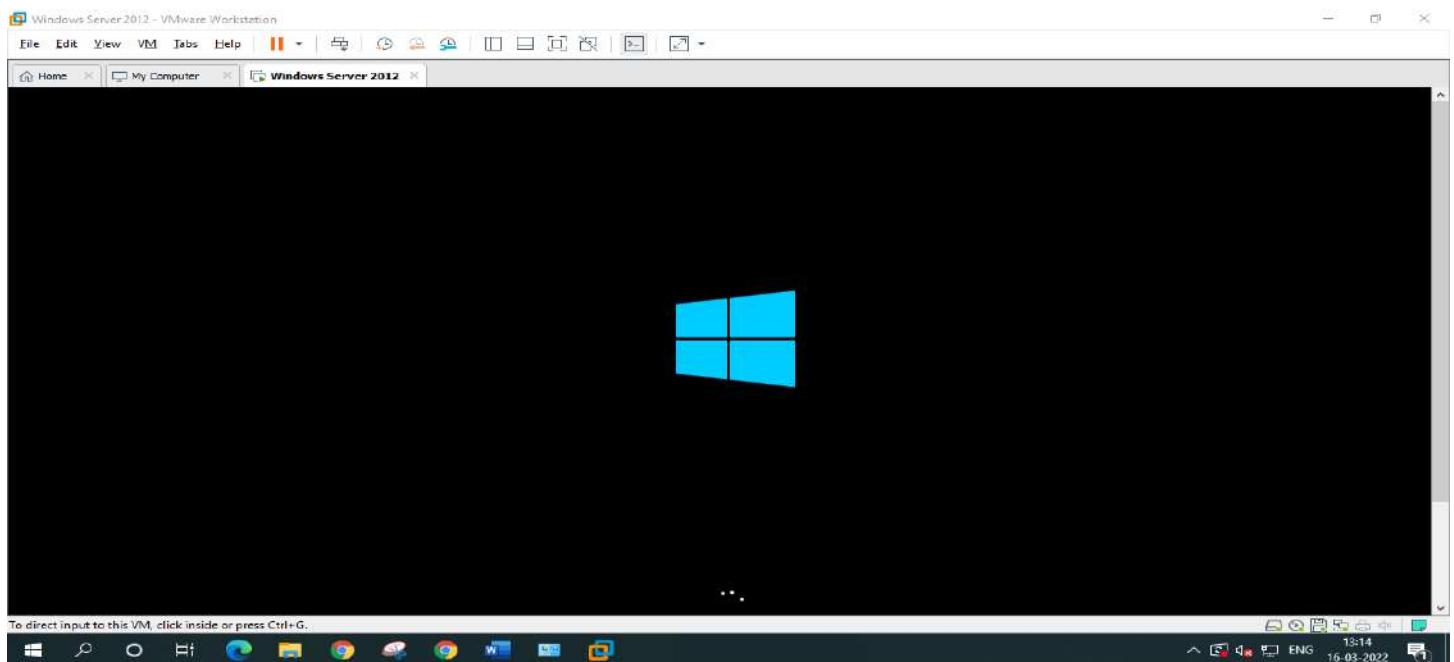
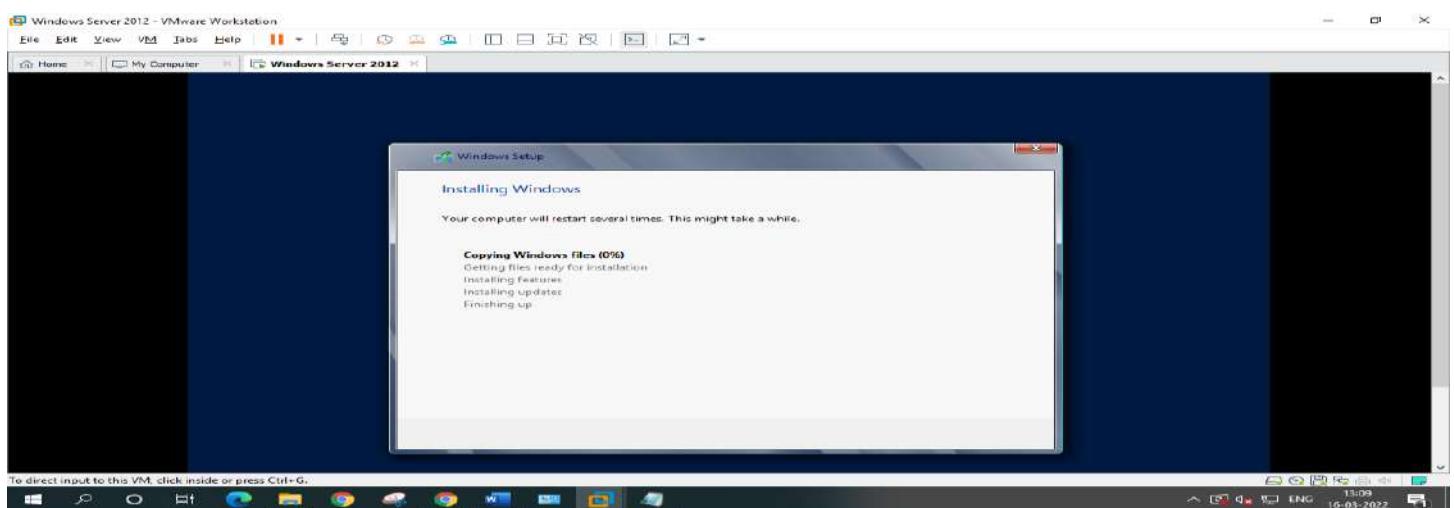


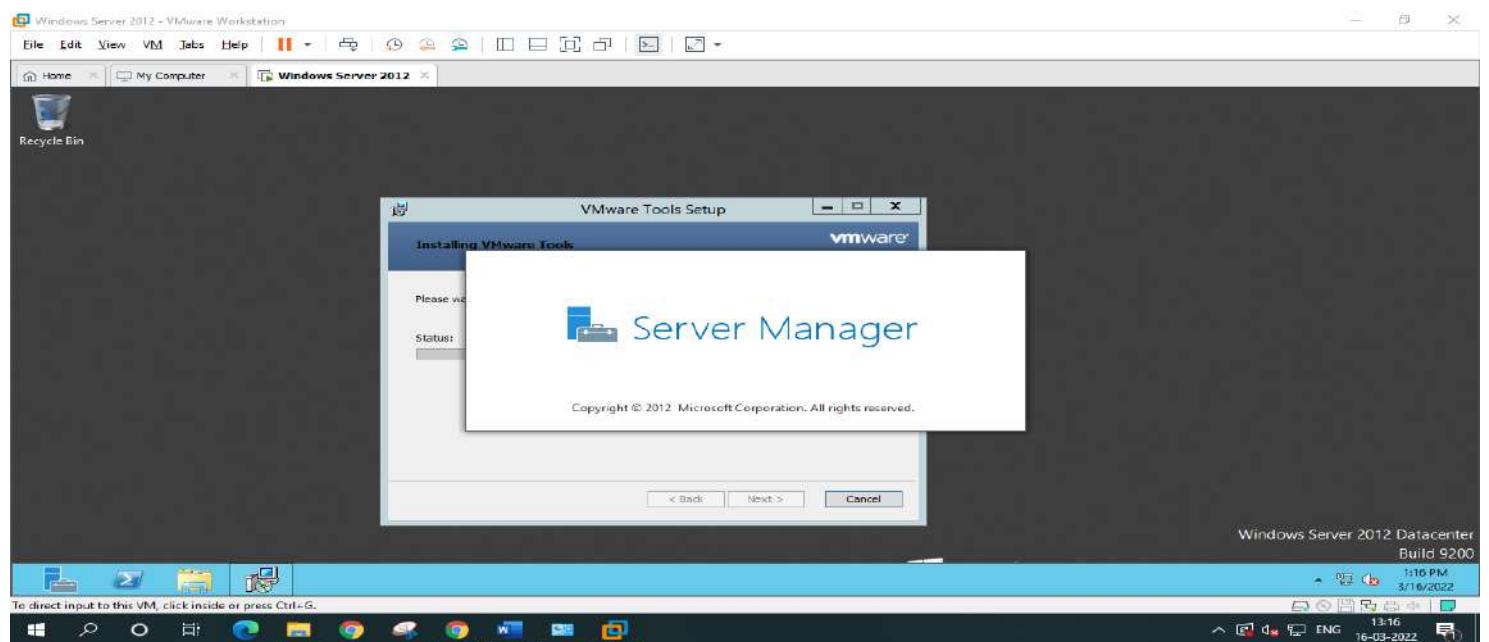
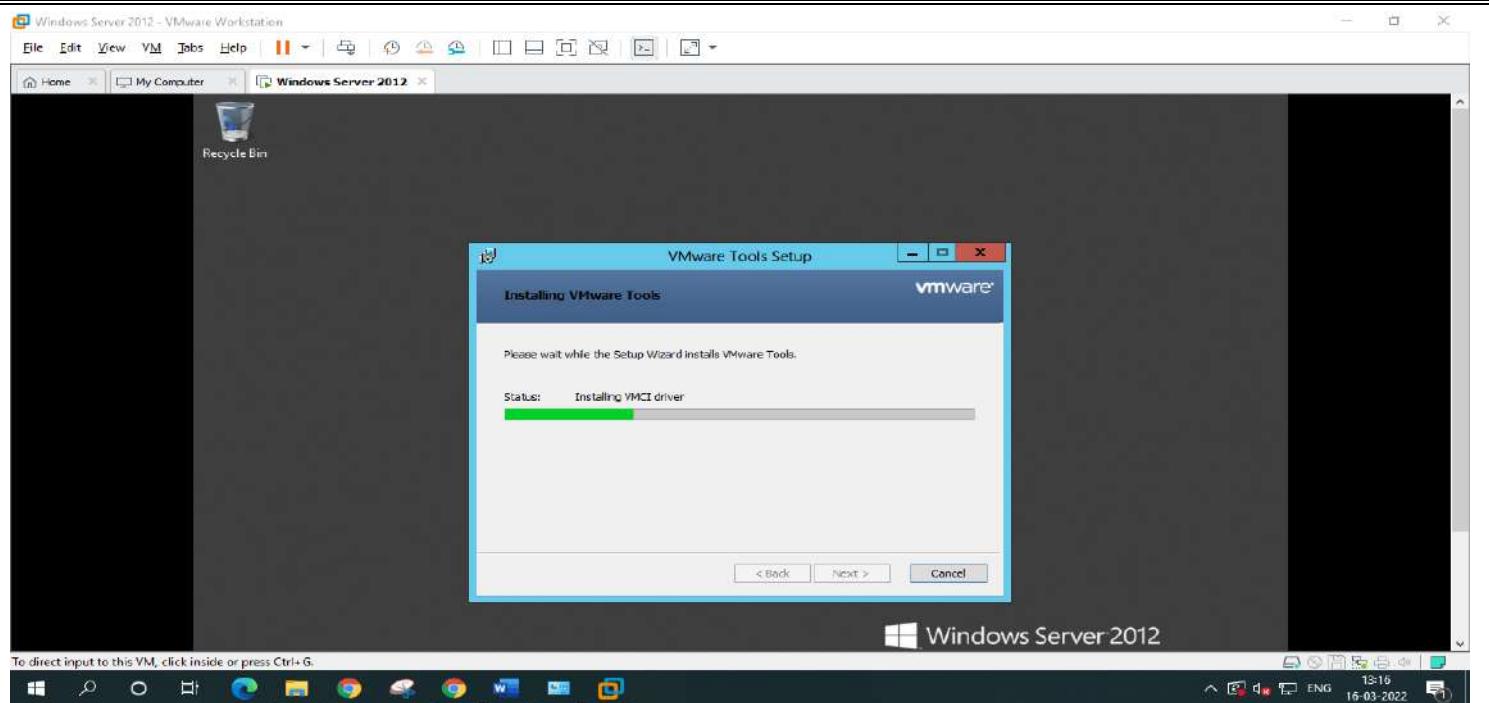
Installation of Windows Server 2012 begins.



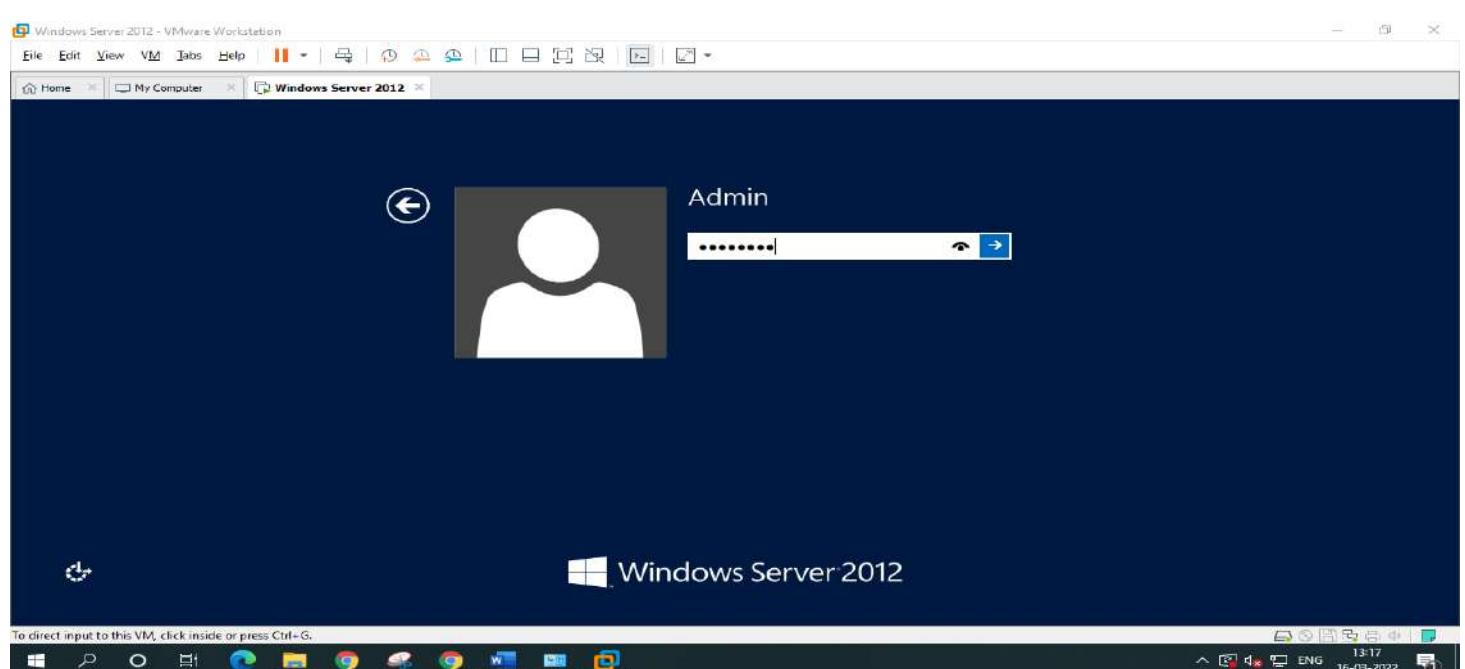
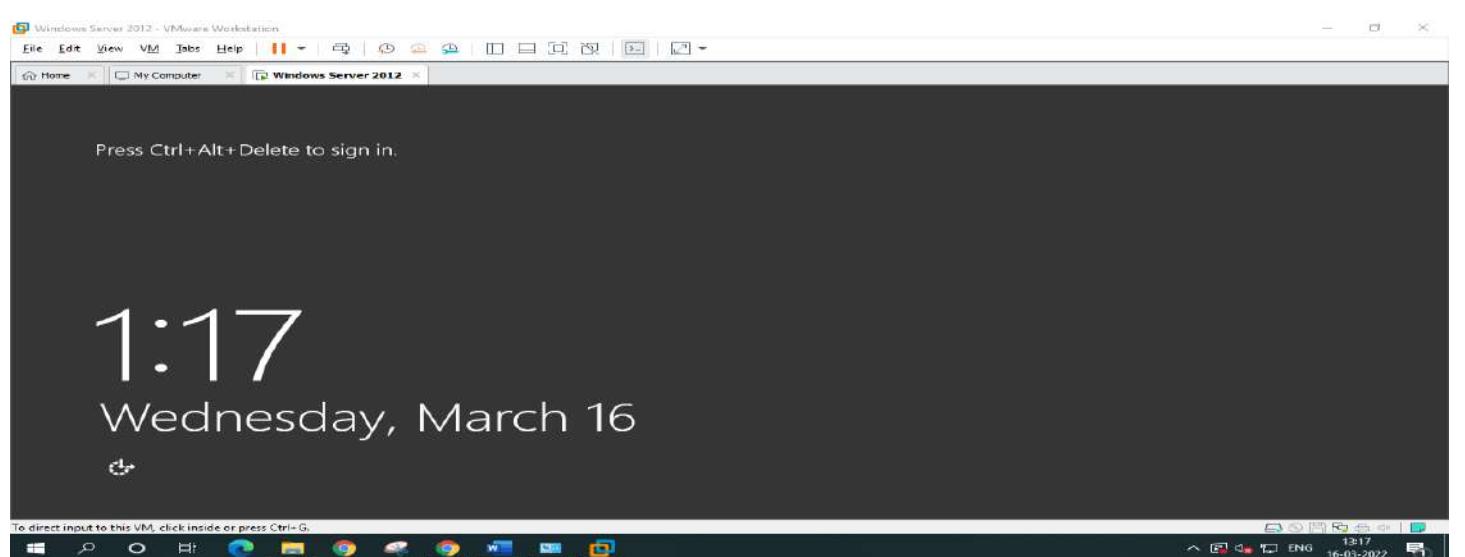
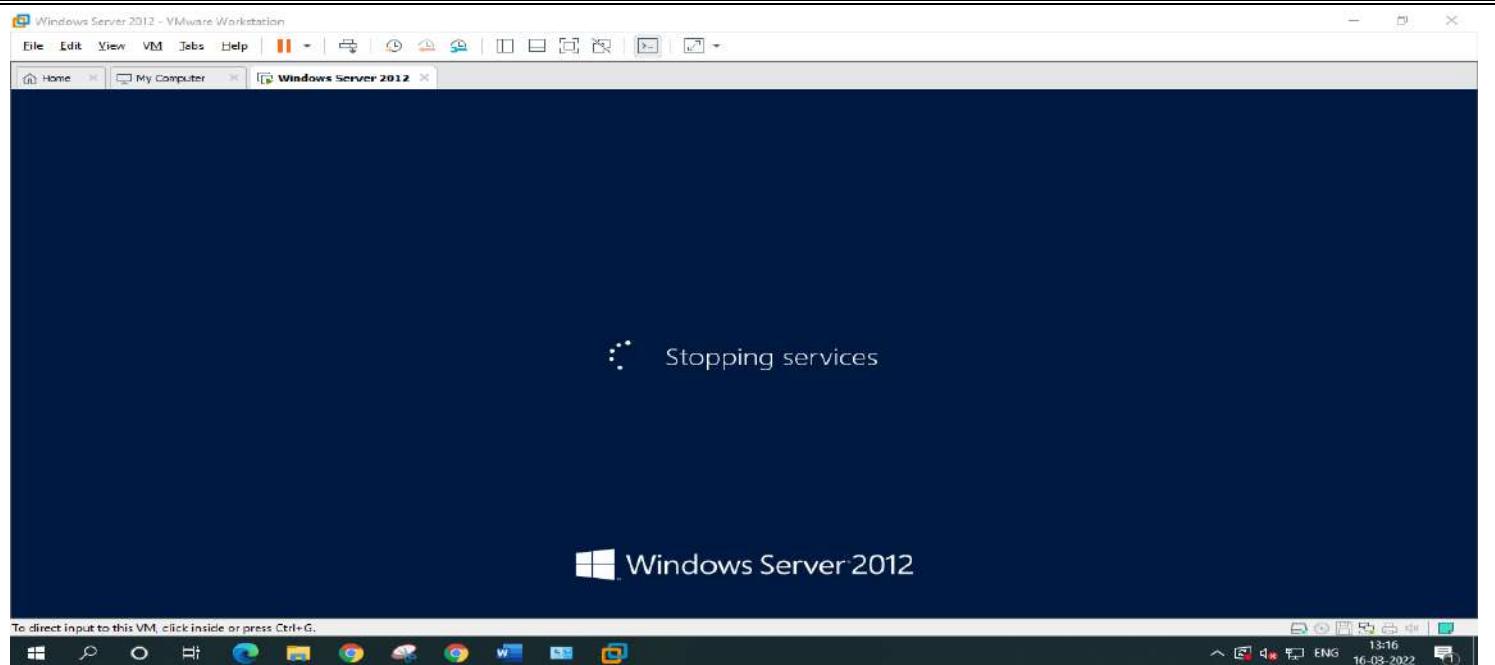


Copying of System Files will start.

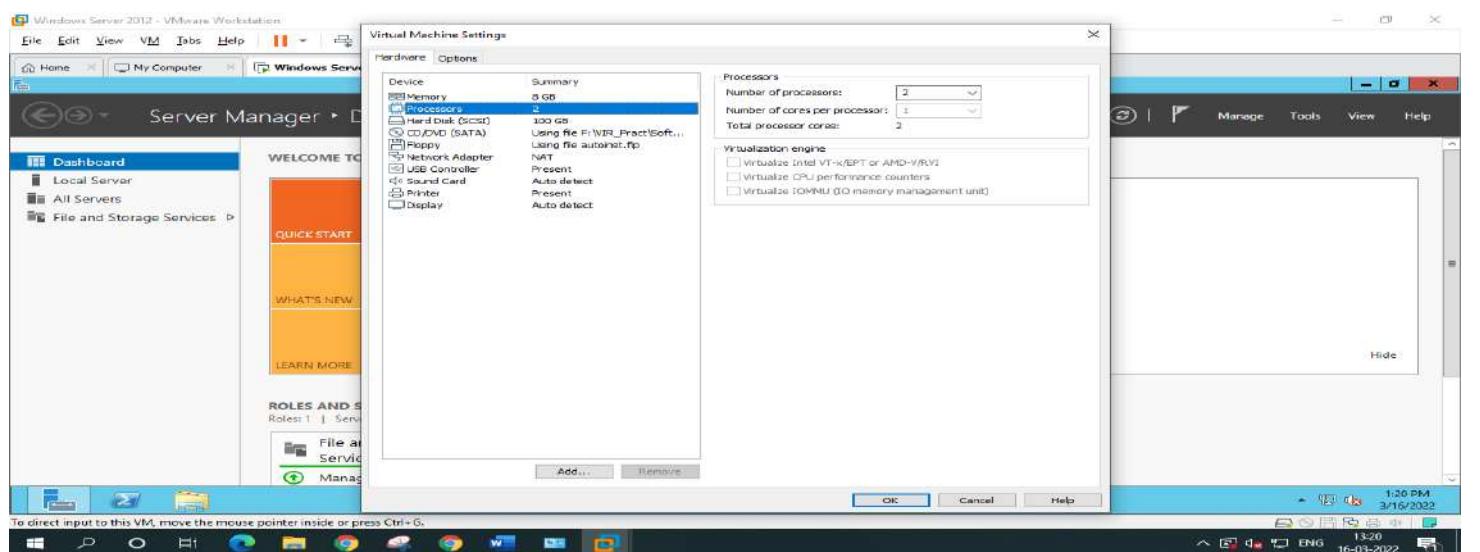
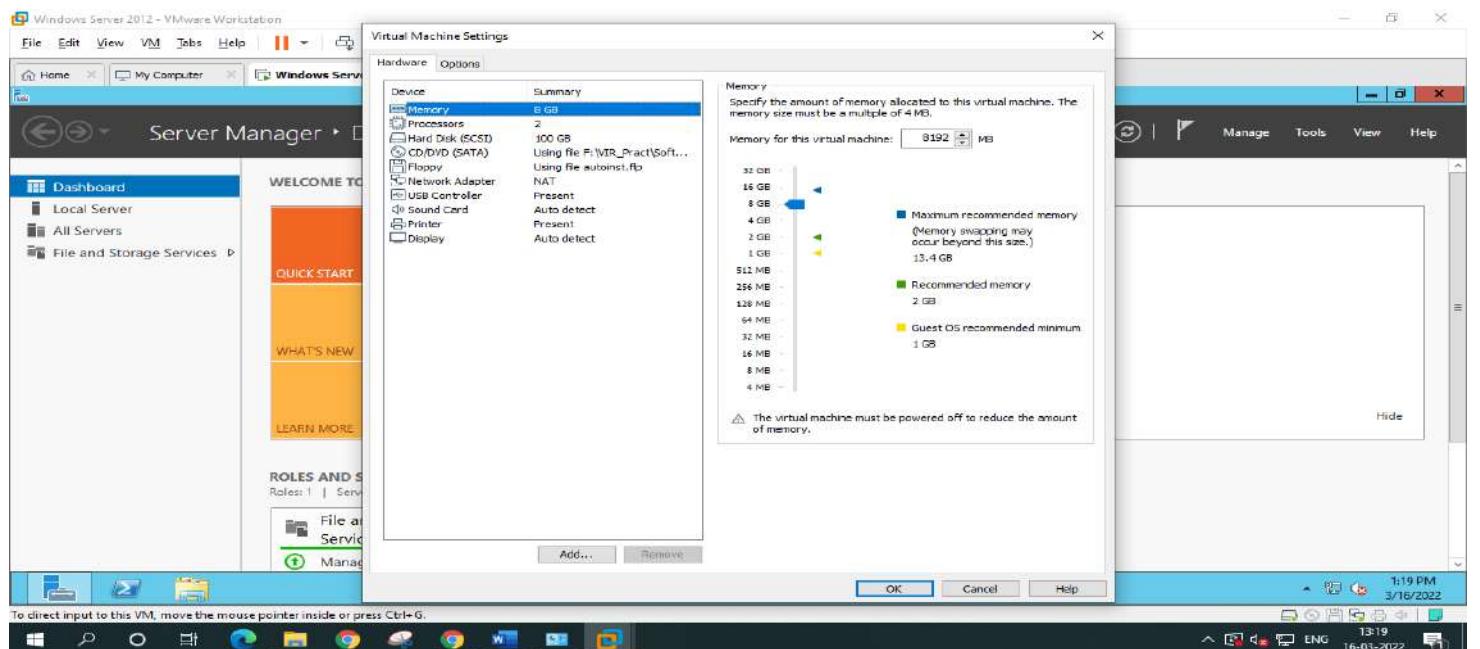
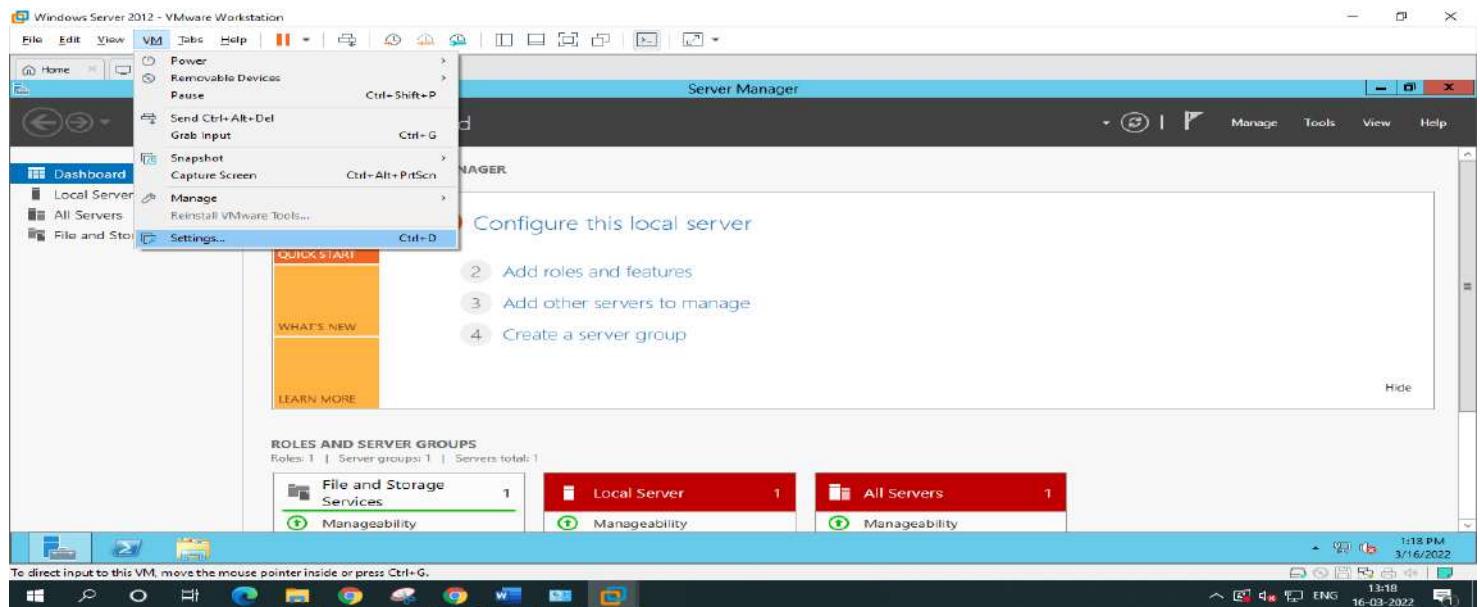


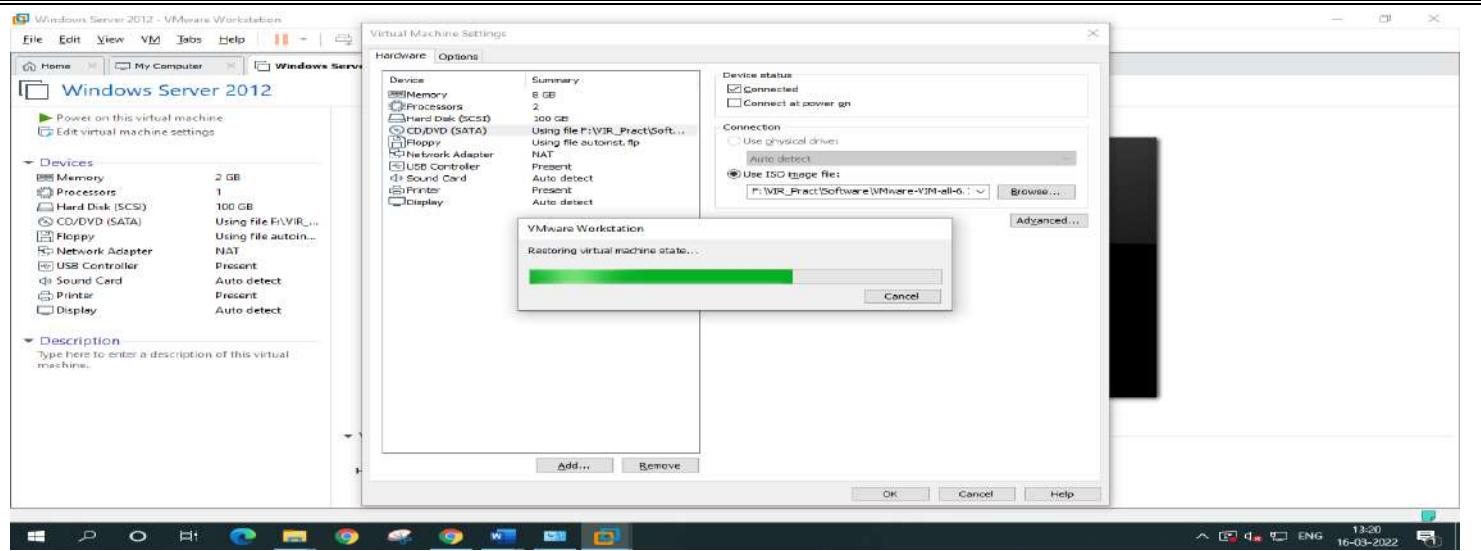


After installation the system will restart once, all options complete successfully.

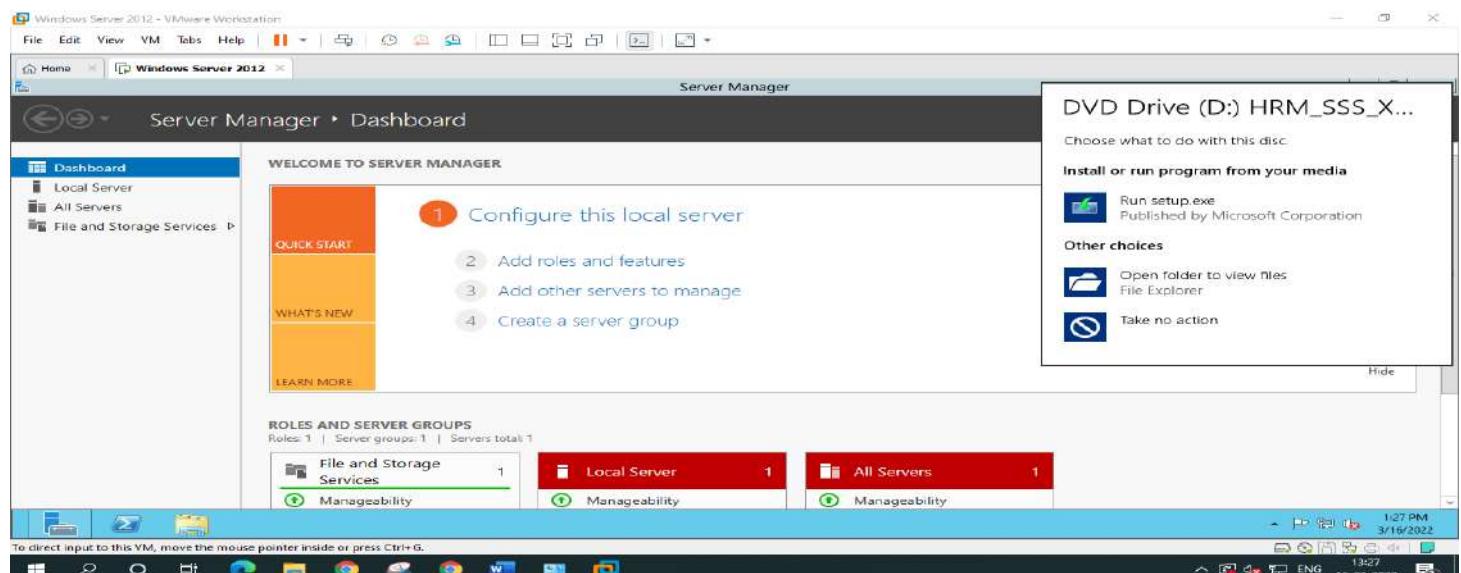
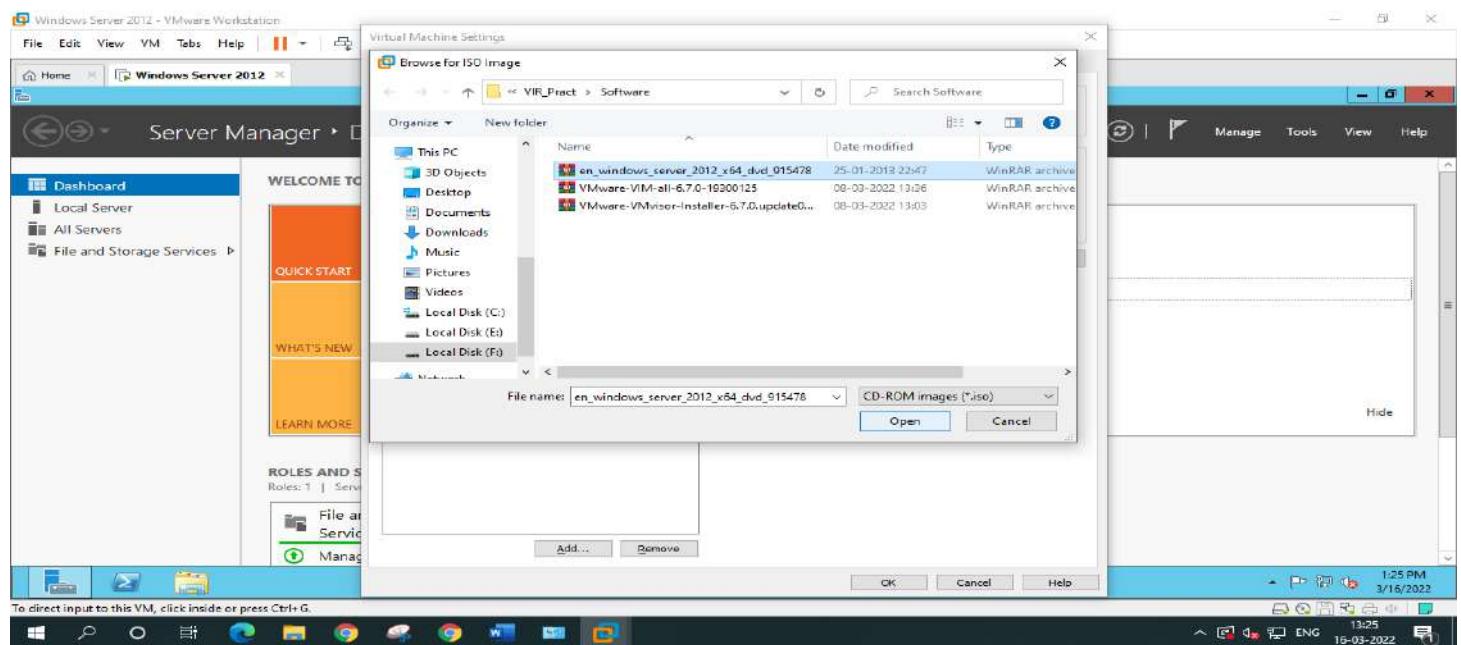


## Add roles and features of .NET Framework 3.5 Features:

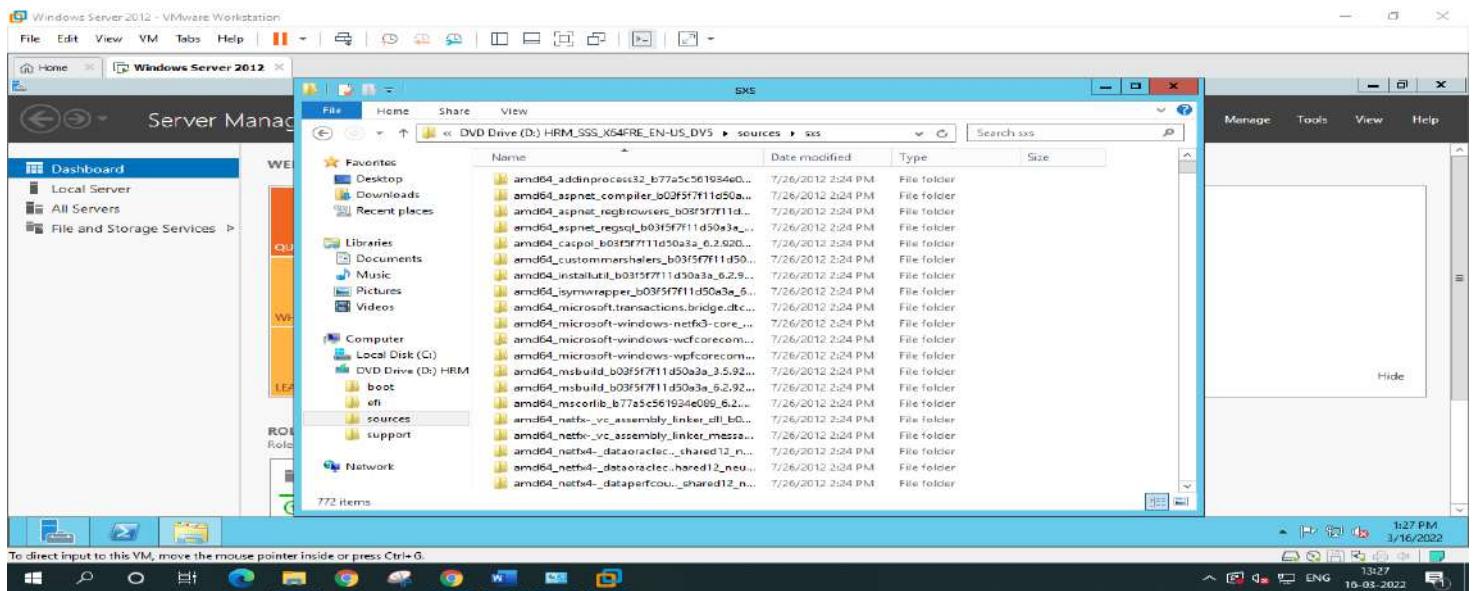




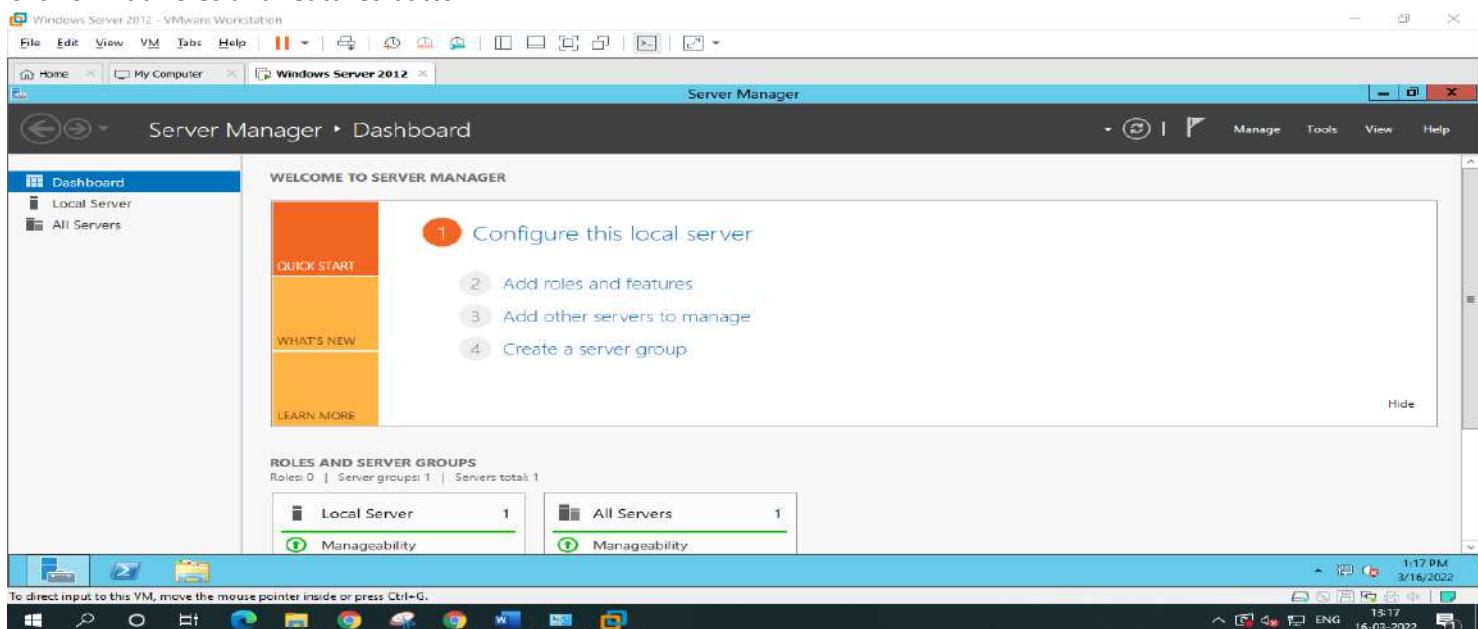
To specify the alternate source path go to the VM tab and click on setting and then browse the ISO of the Windows server, after that the device gets mounted to the system, where you can browse the source folder and copy the path of the source path.



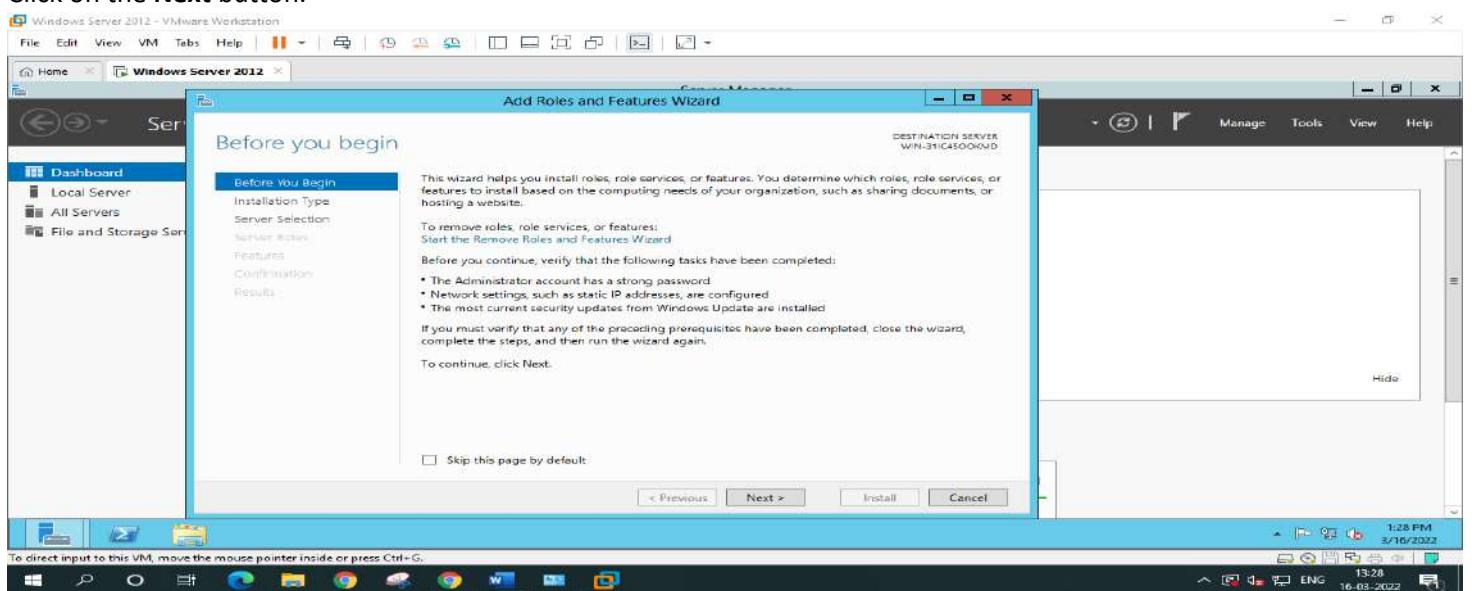
## Copy the path D:\sources\sxs



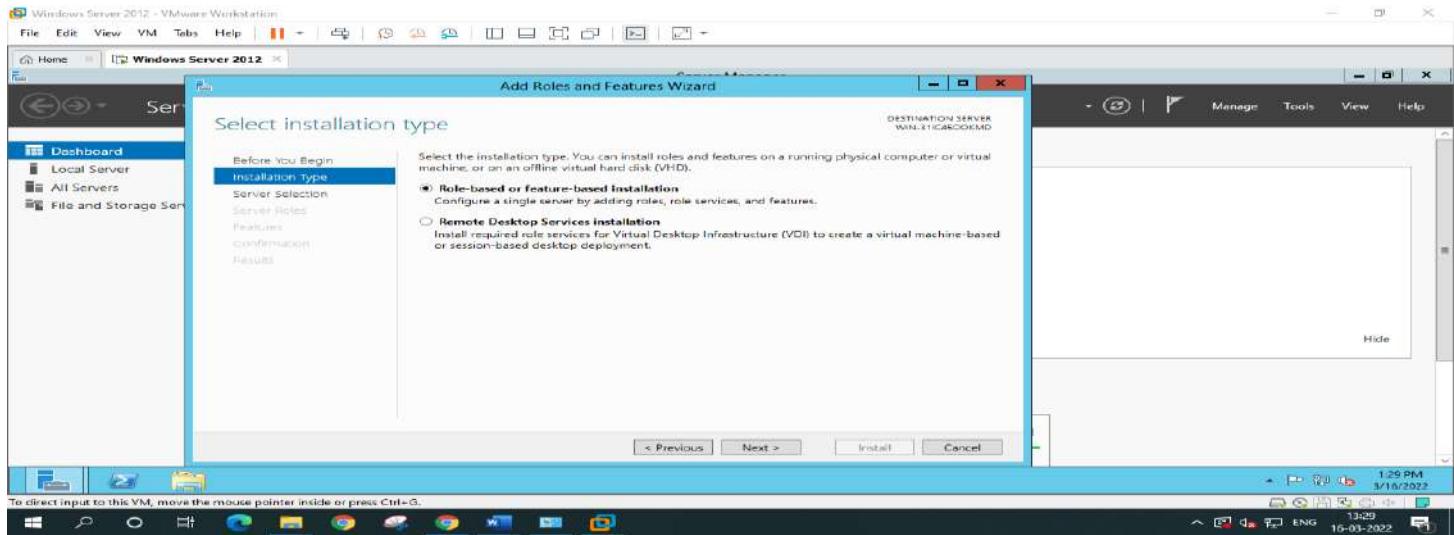
Click on Add roles and features button.



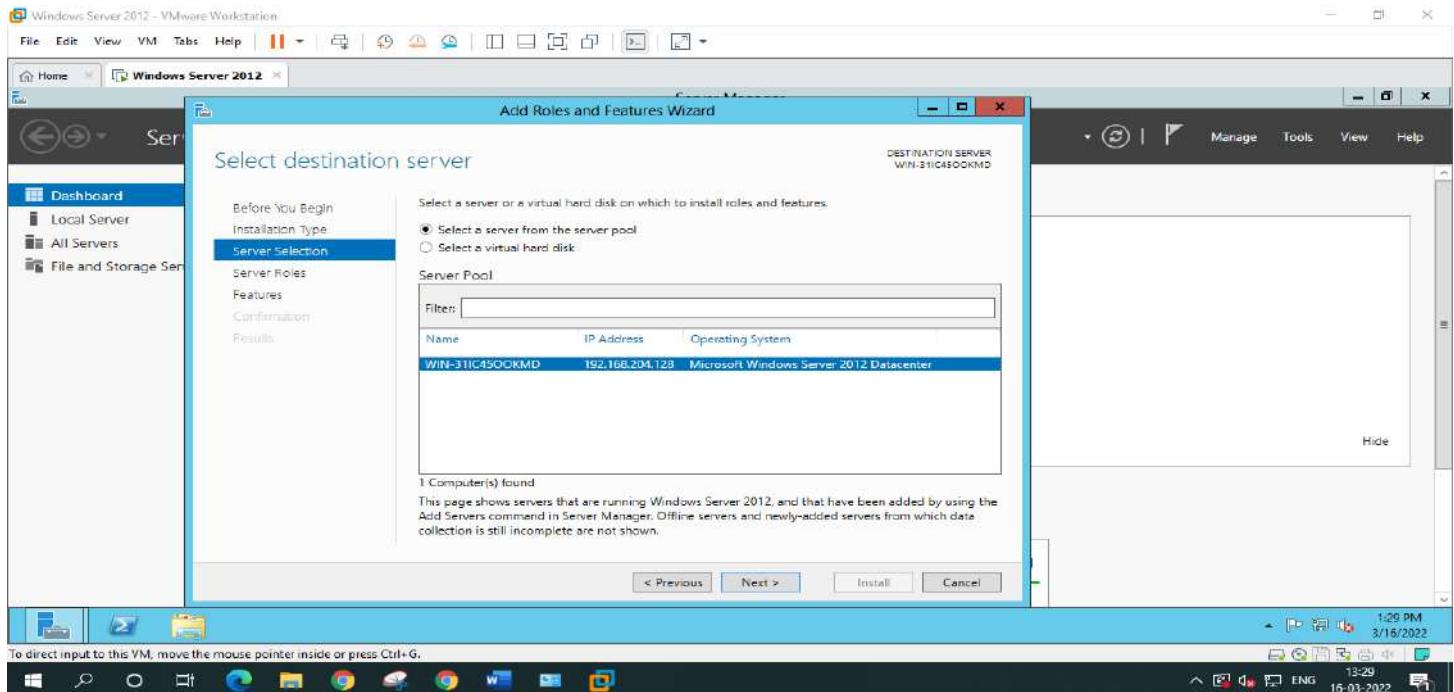
Click on the Next button.



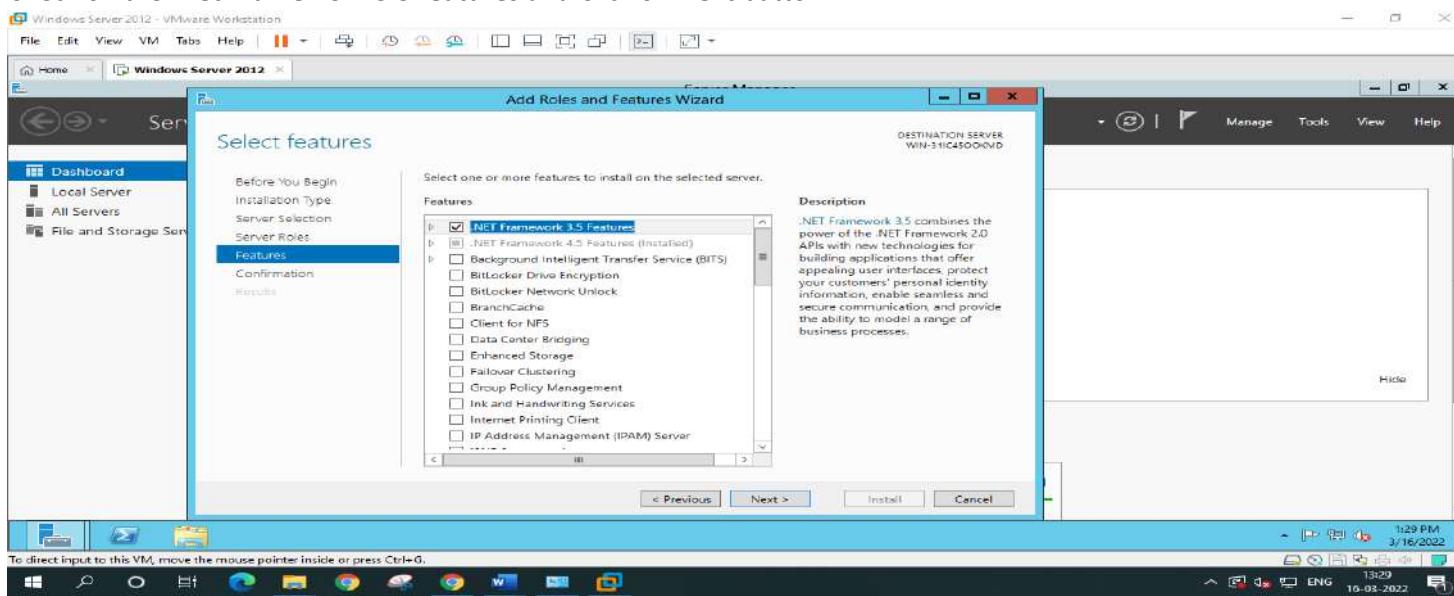
Select the **Role-based or feature-based installation** and Click on **Next** button.



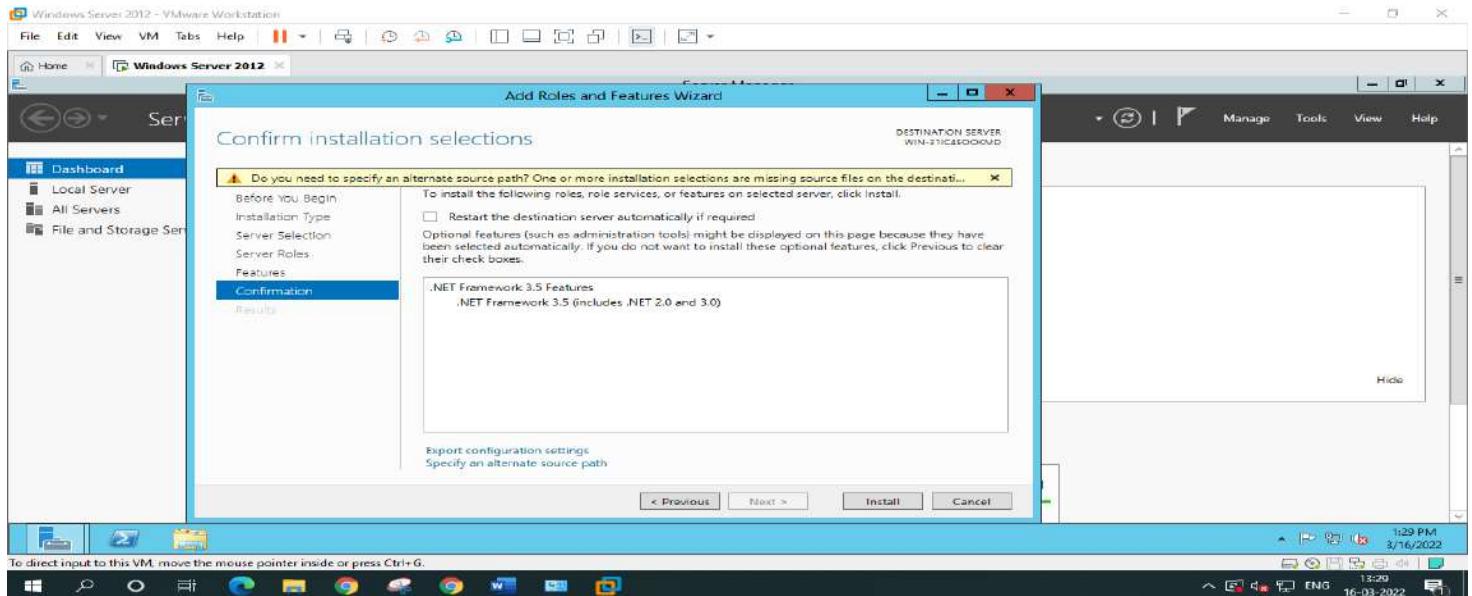
Click on **Next** button



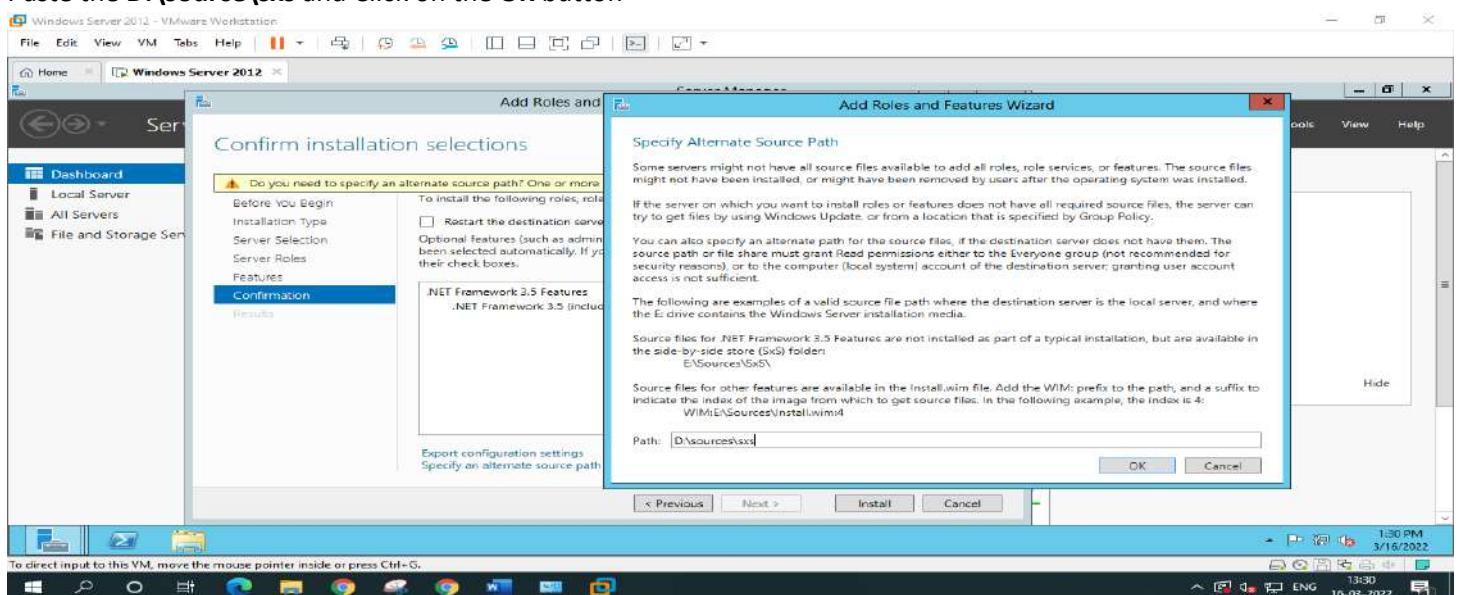
Check on the **.Net Framework 3.5 features** and Click on **Next** button



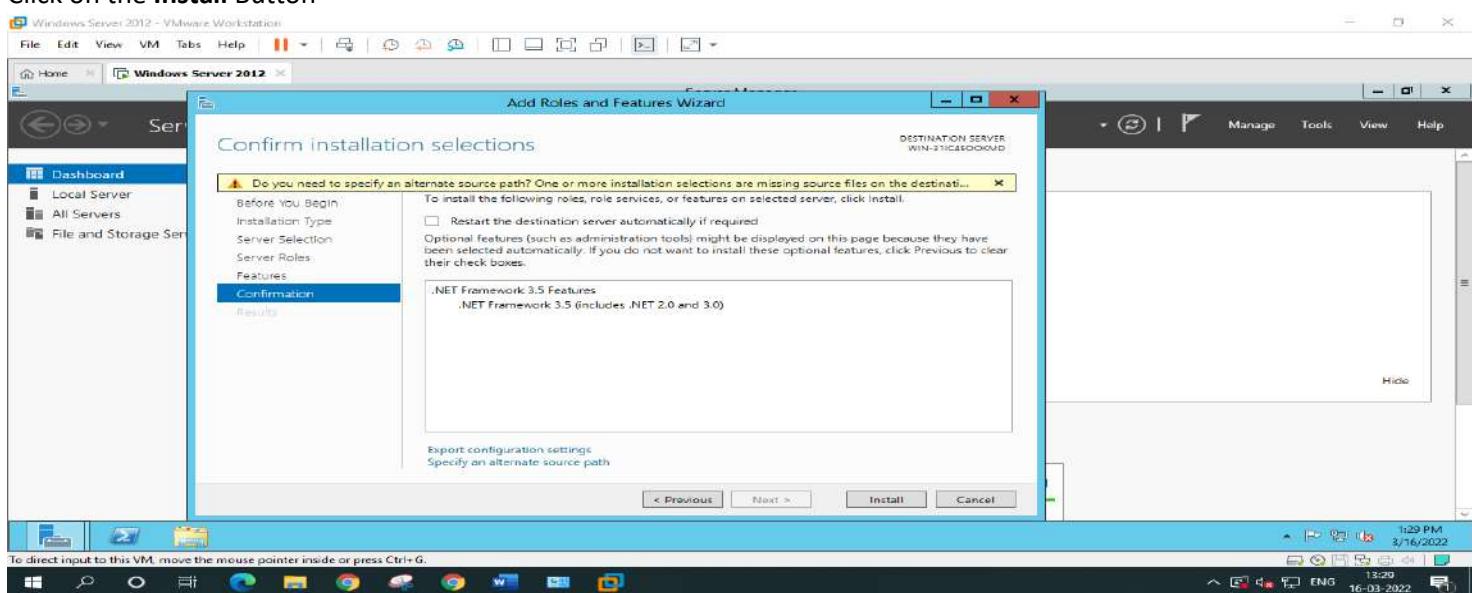
## Click on Specify an alternative source path button

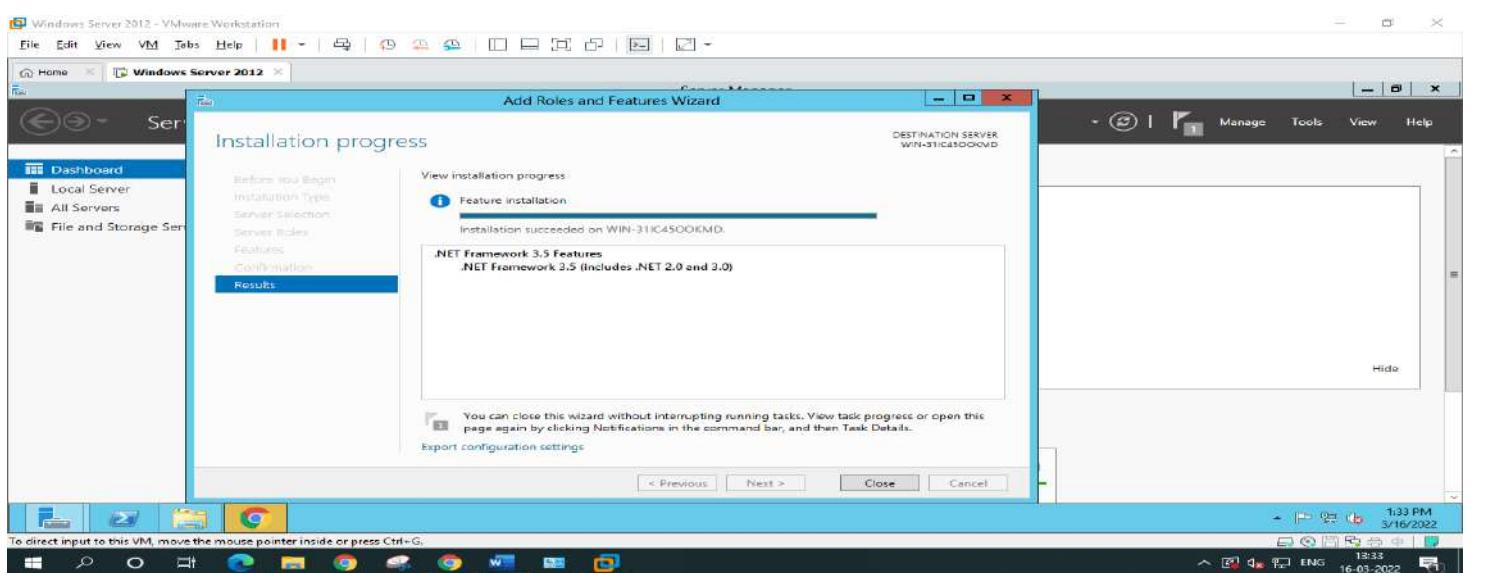
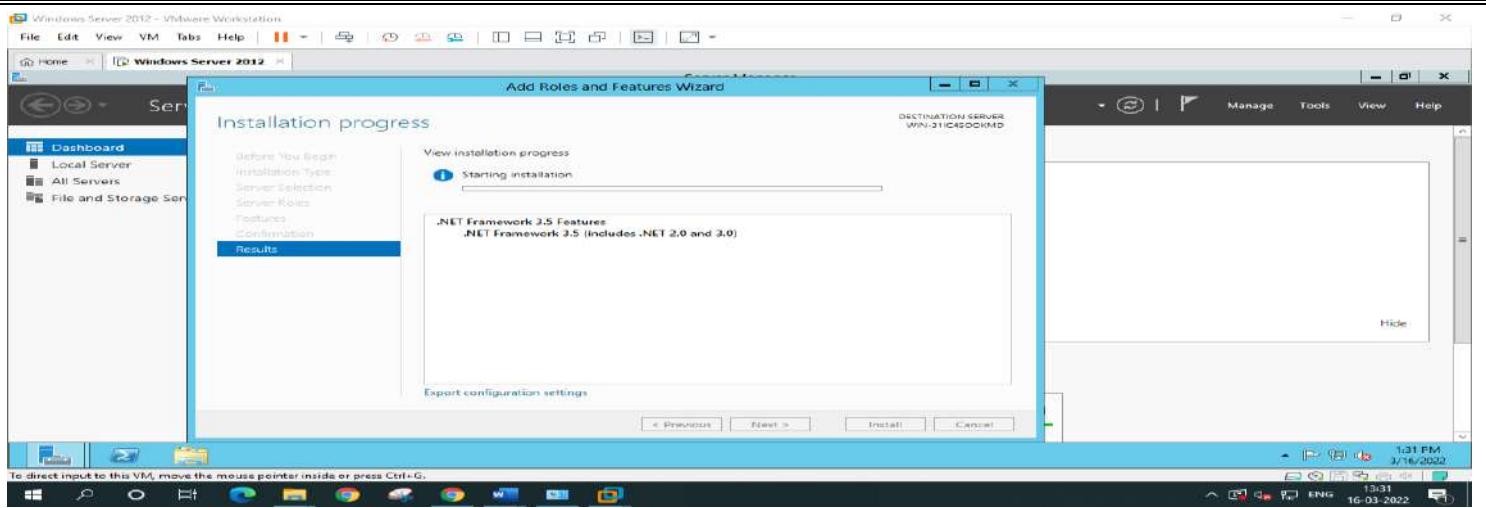


## Paste the D:\source\sxs and Click on the OK button



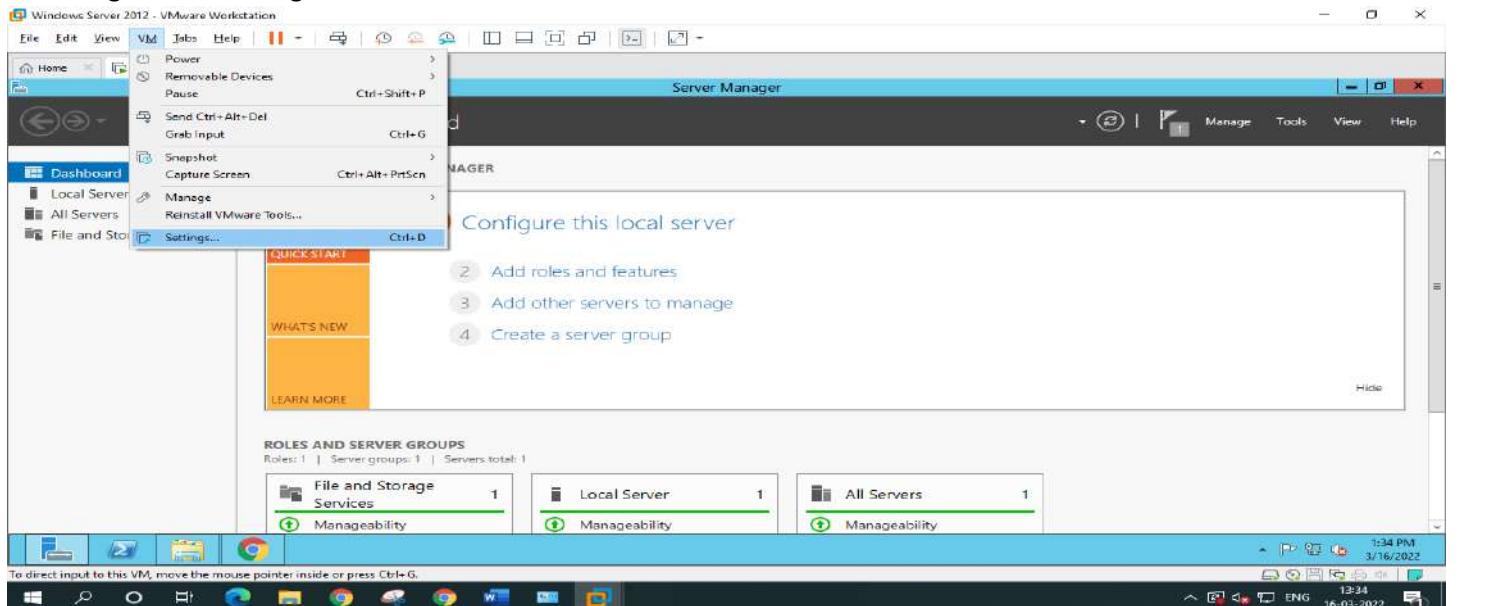
## Click on the Install Button



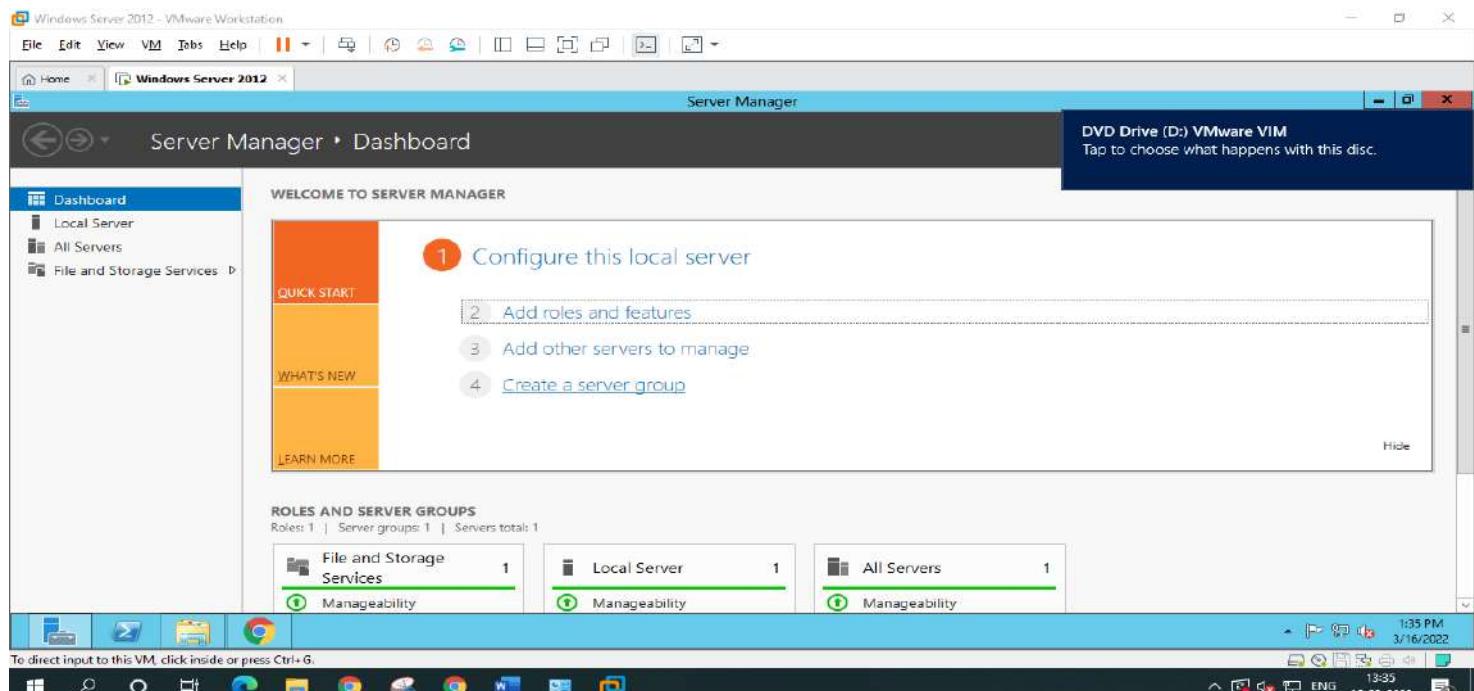
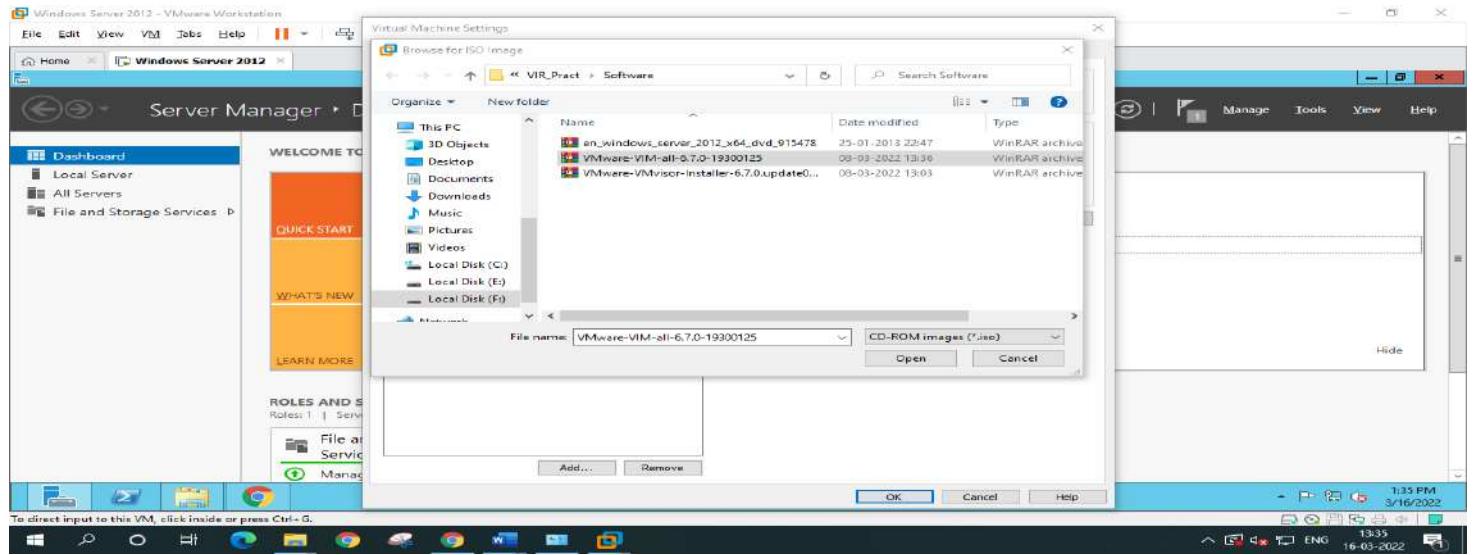


## Install vCenter Server for Windows

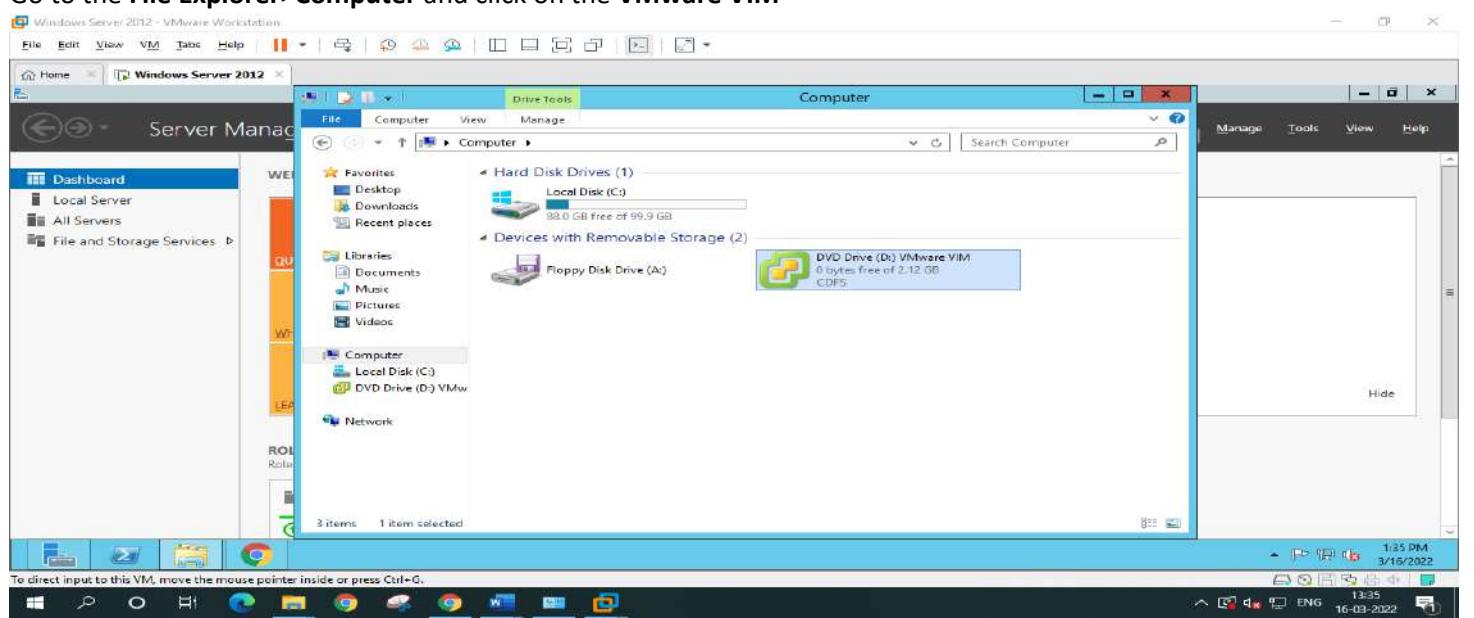
VM and go to the setting.



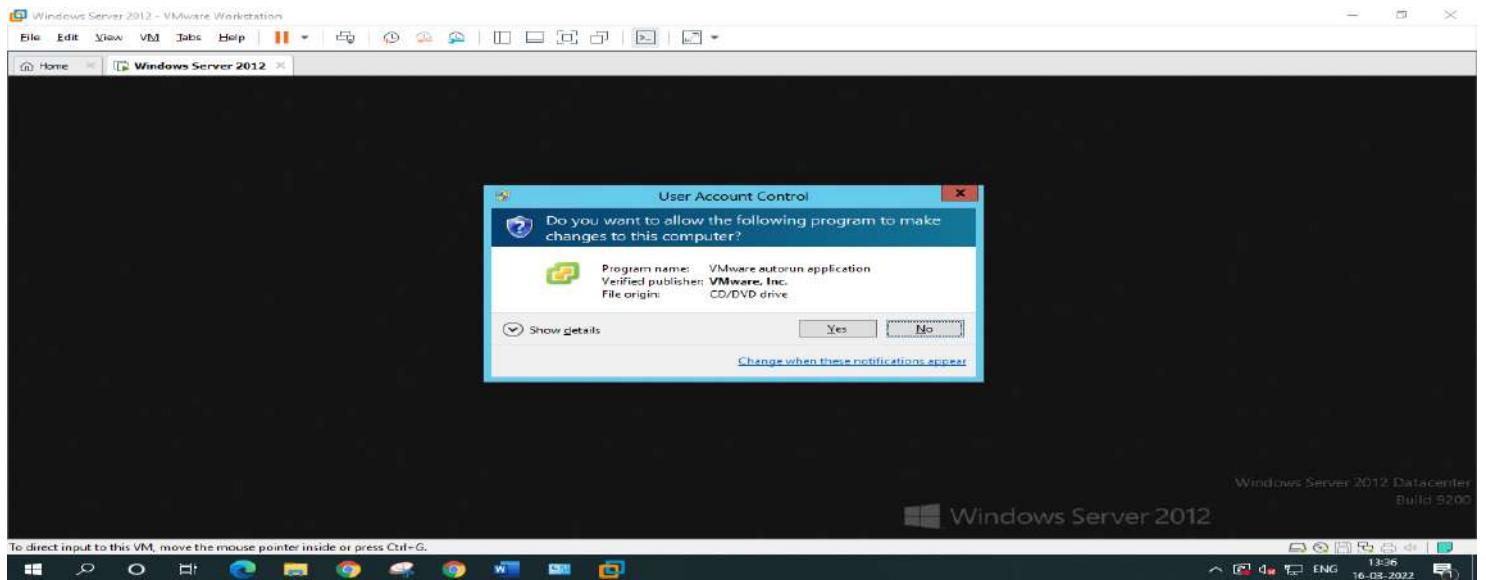
Select the CD/DVD(SATA) option then Browse the vCenter Server file and click on the **OK** button.



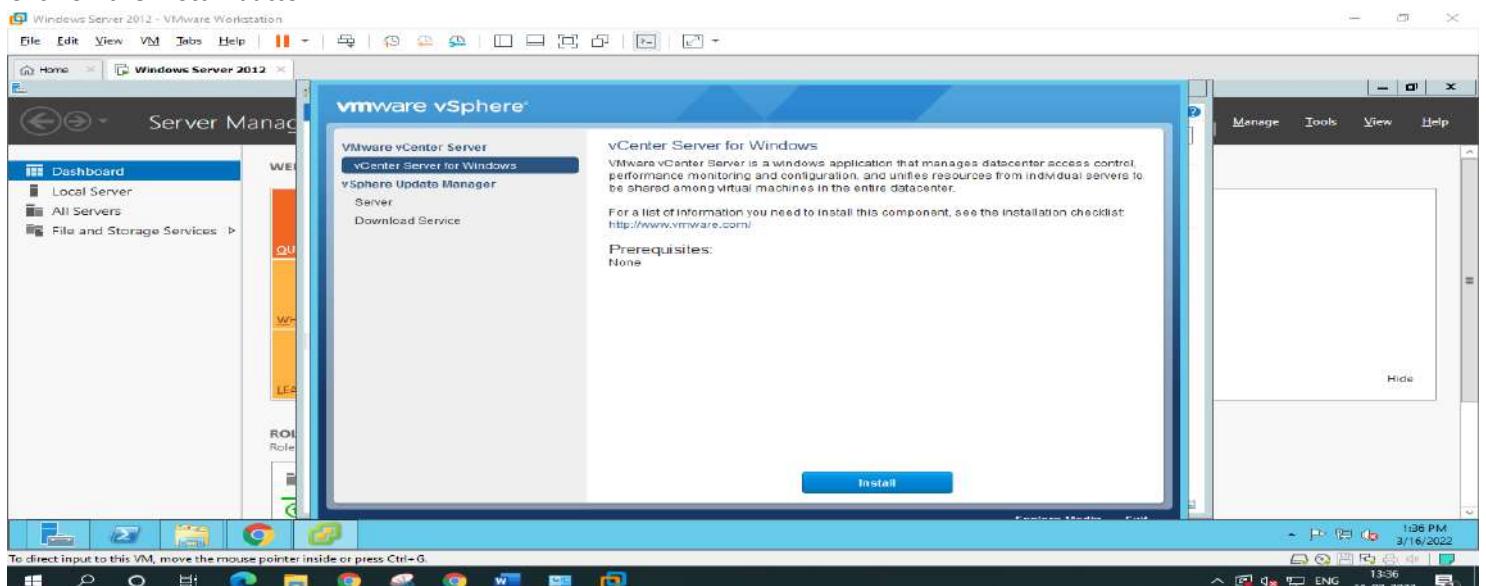
Go to the **File Explorer>Computer** and click on the **VMware VIM**



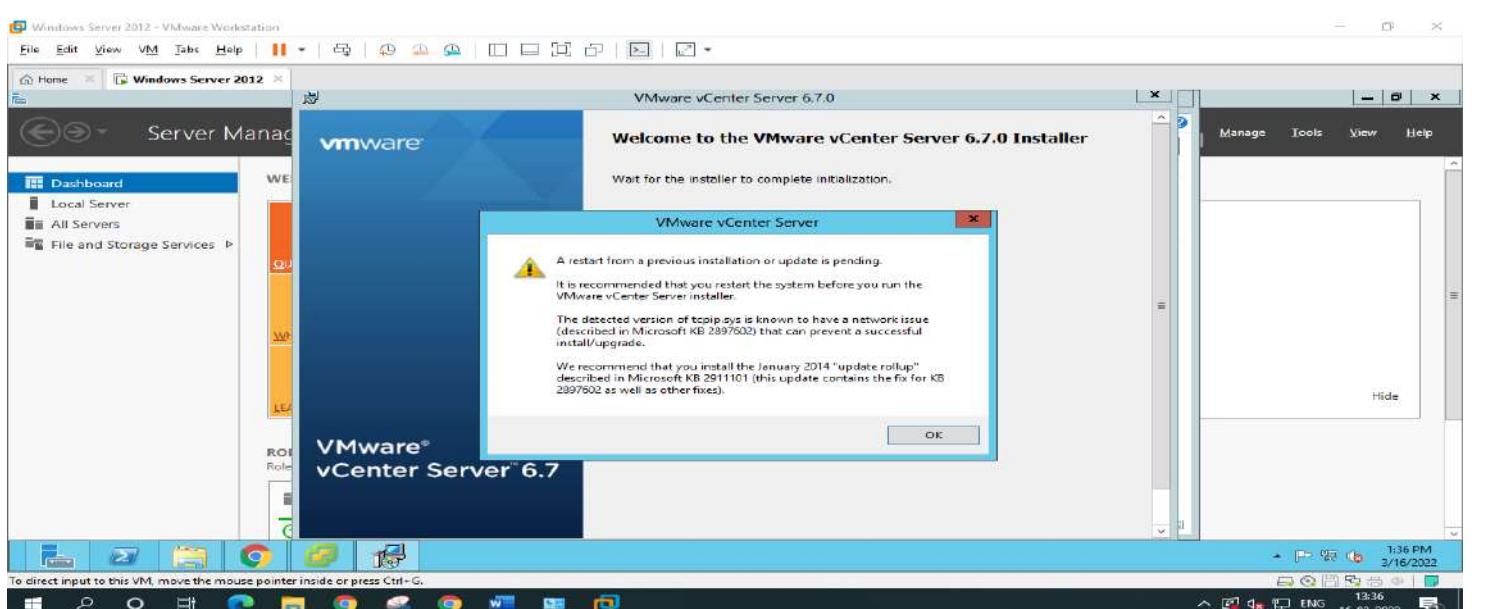
## Click on the Yes button



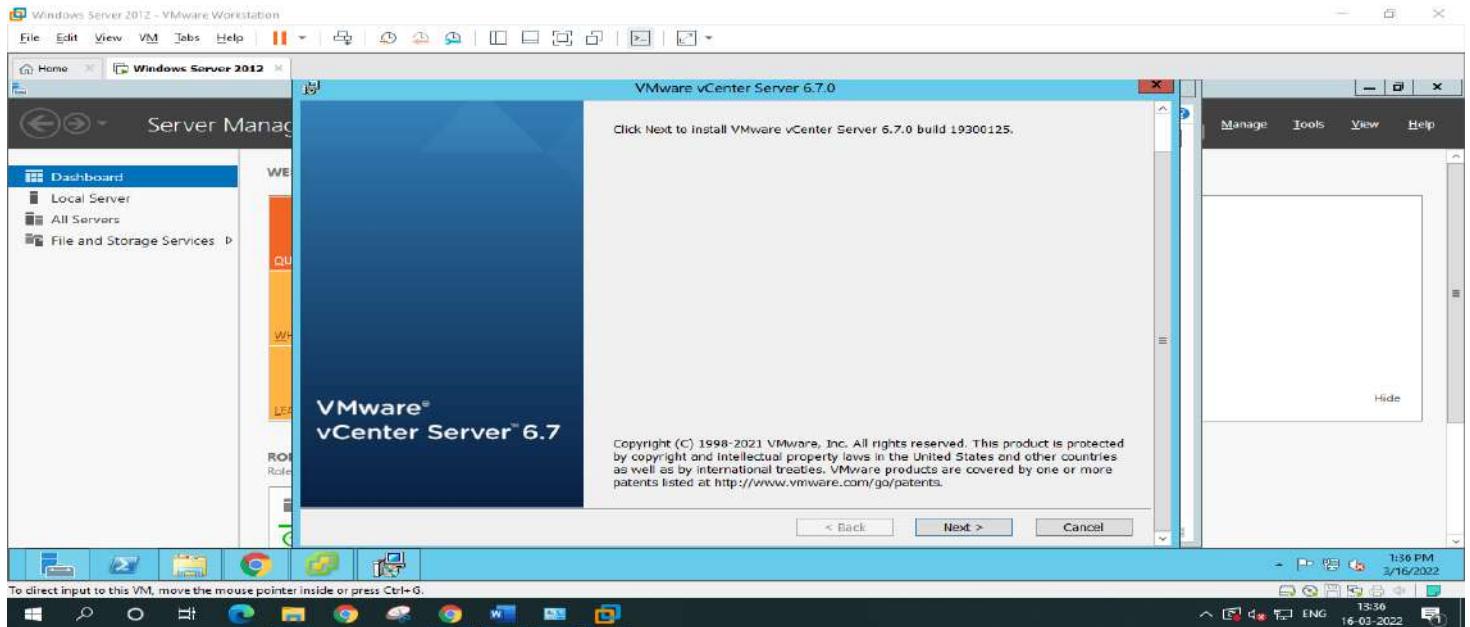
## Click on the Install button



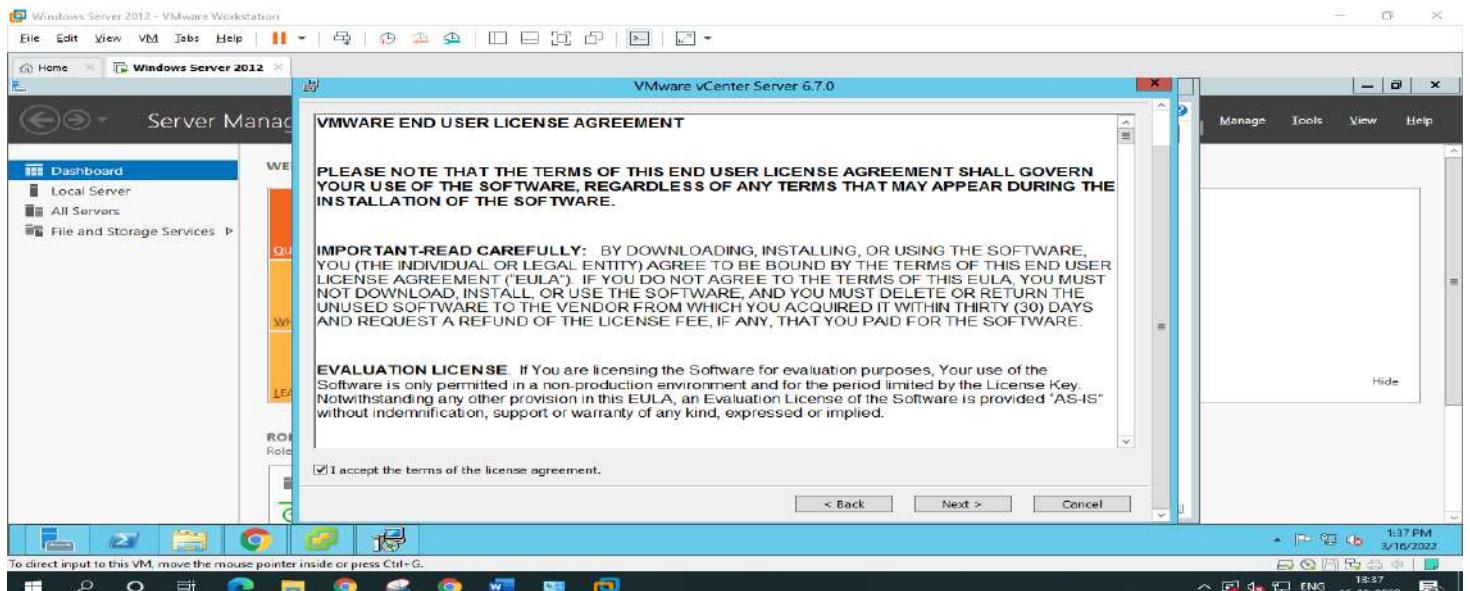
## Click on the OK button



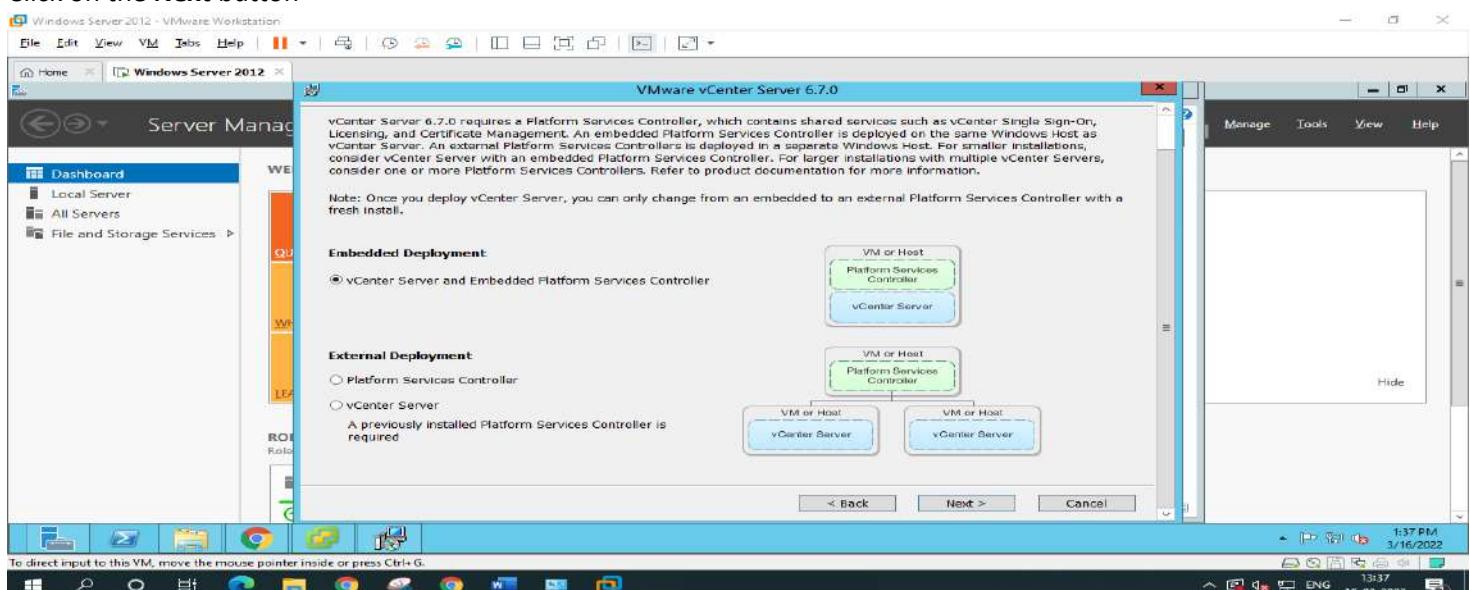
## Click on the Next button



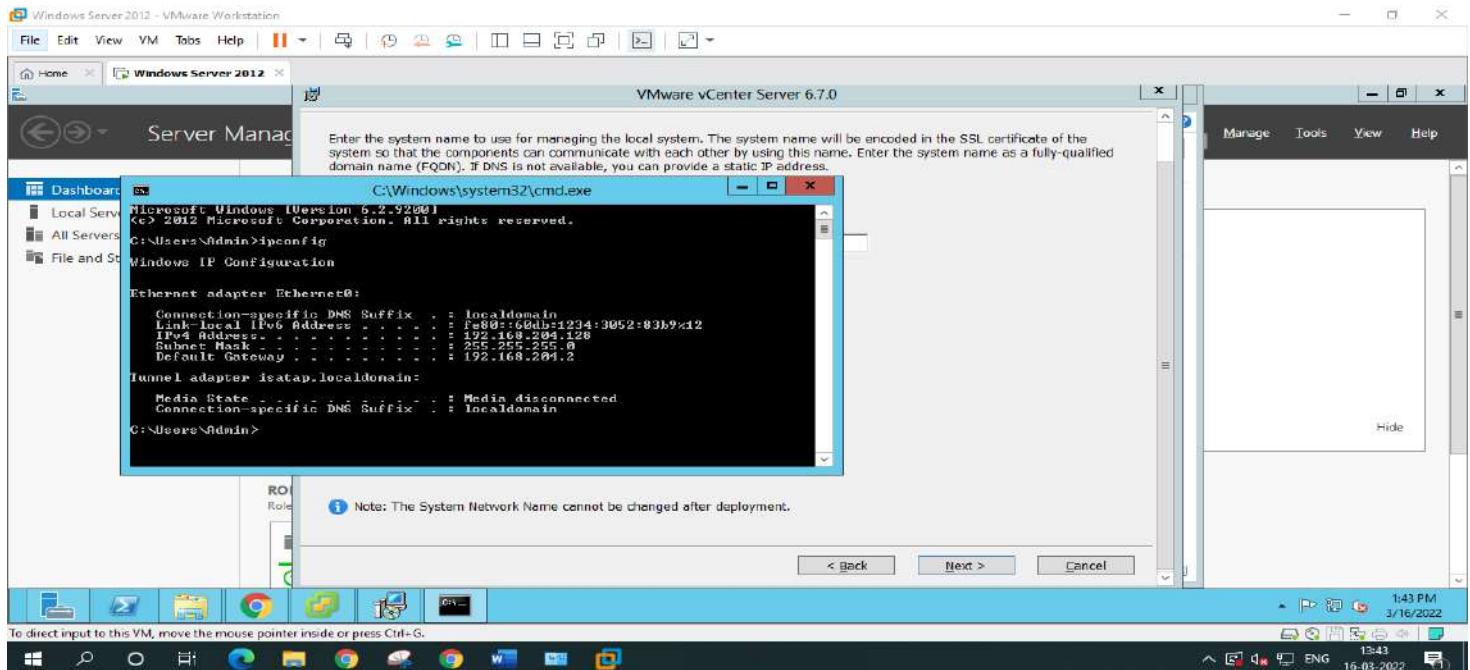
## Click on the Next button



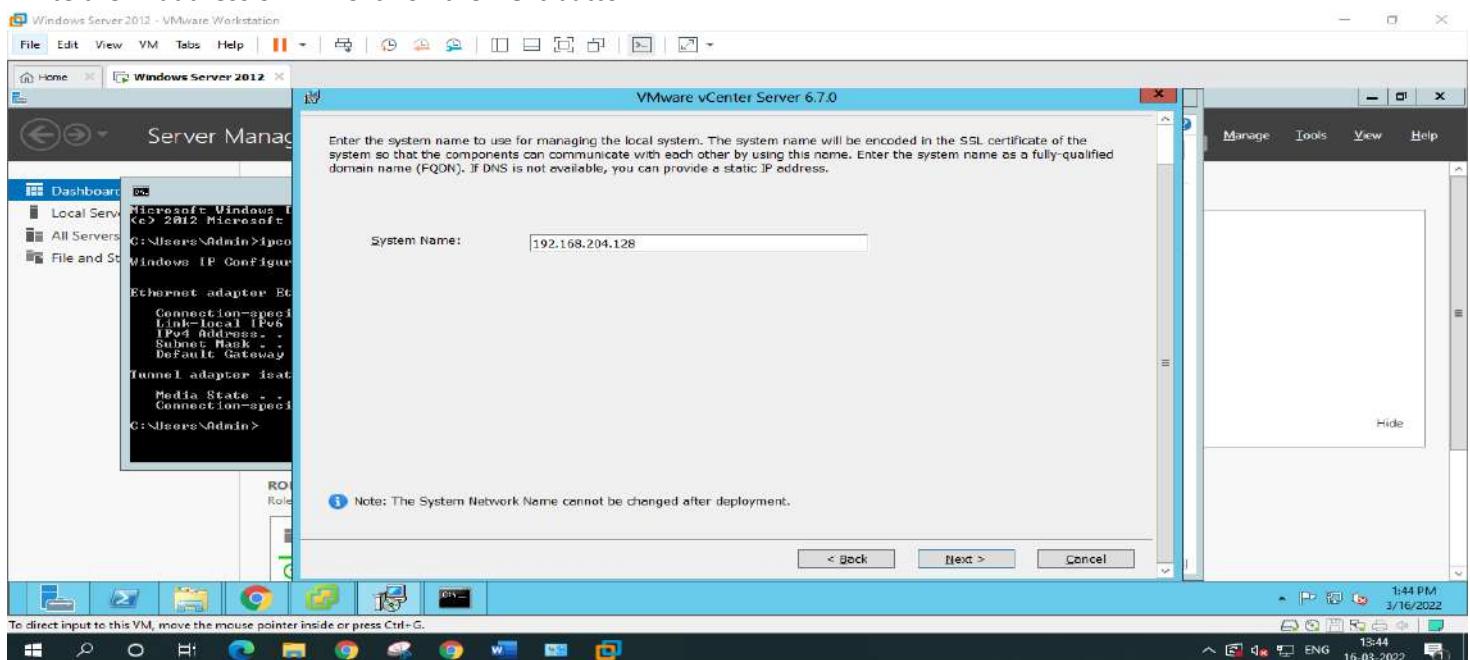
## Click on the Next button



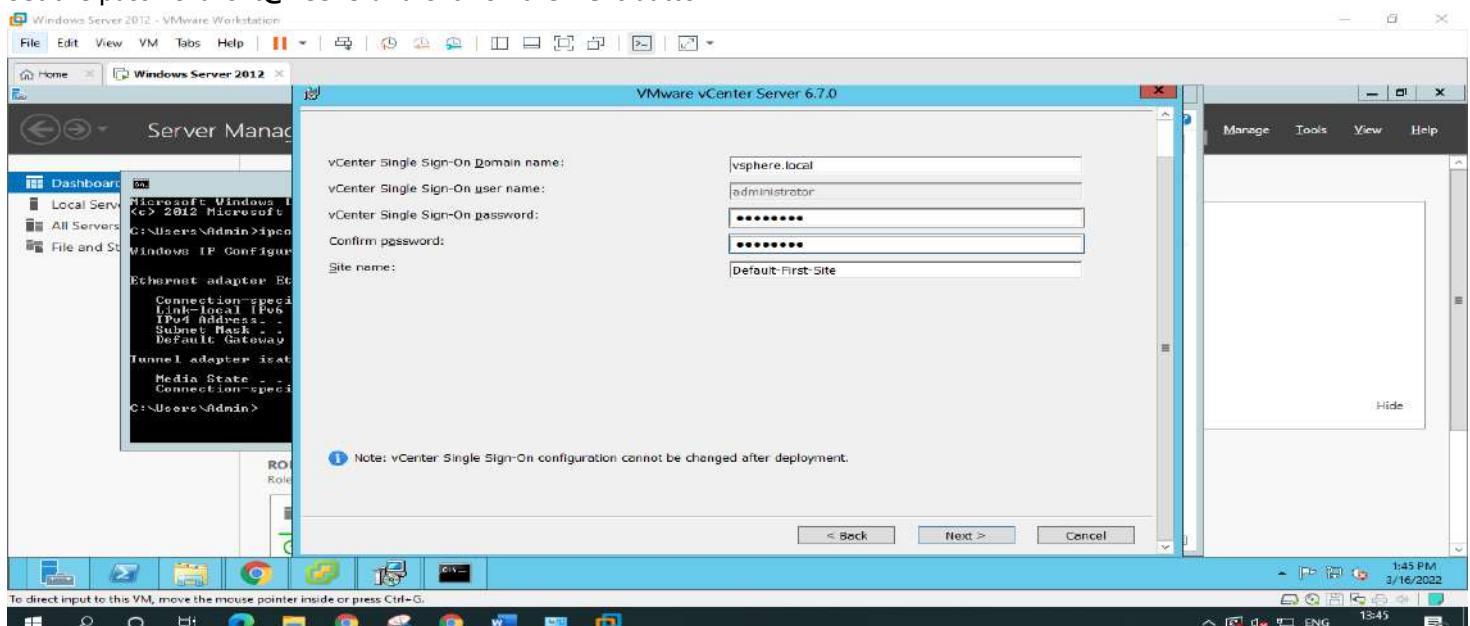
Go to the CMD and insert command **ipconfig** to get the IP address.



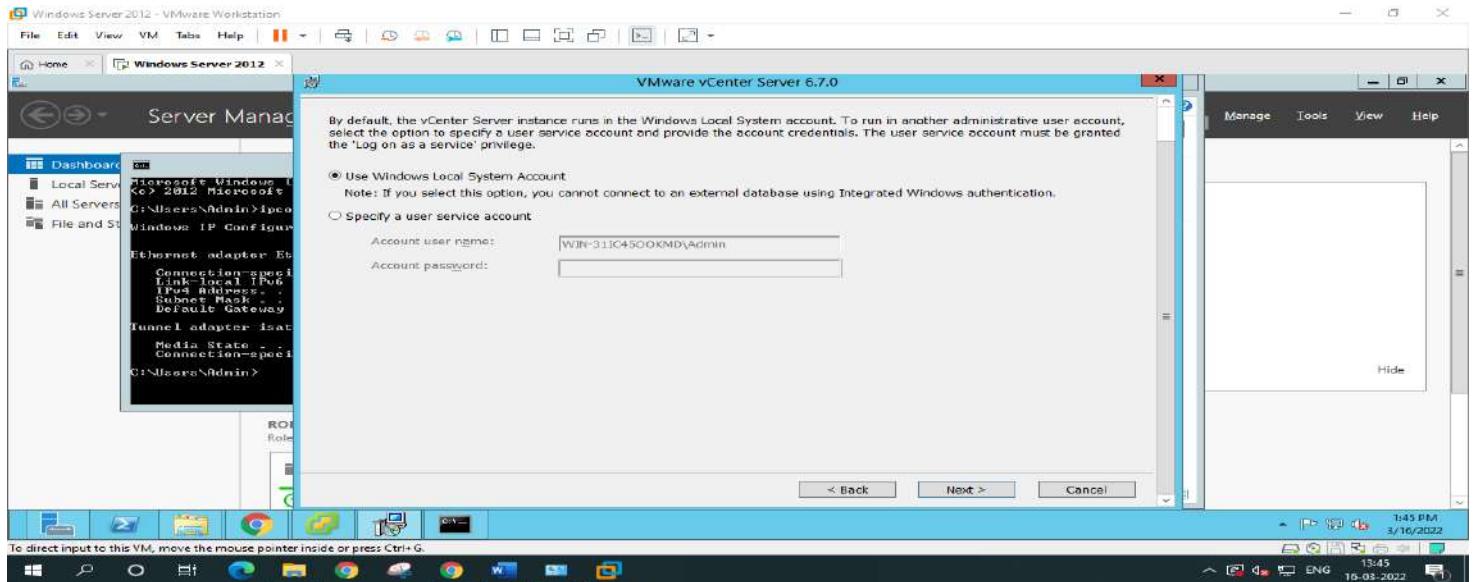
Write the IP address of VM. Click on the **Next** button



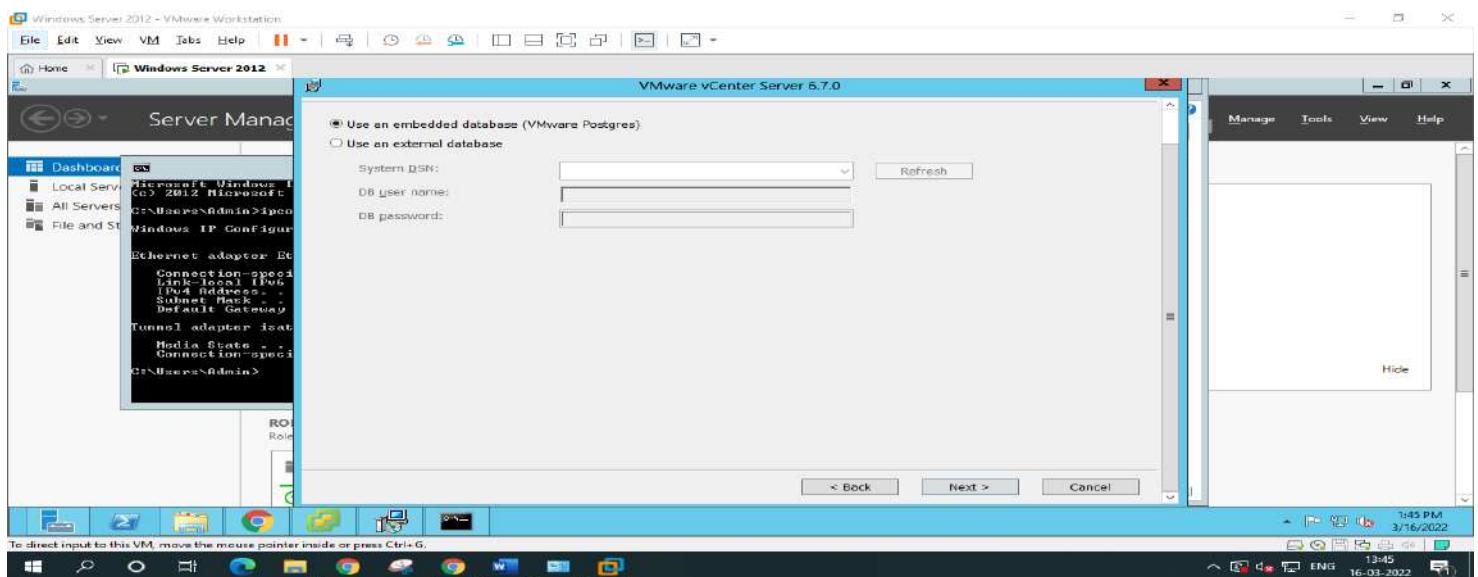
Set the password is **It@13579** and Click on the **Next** button



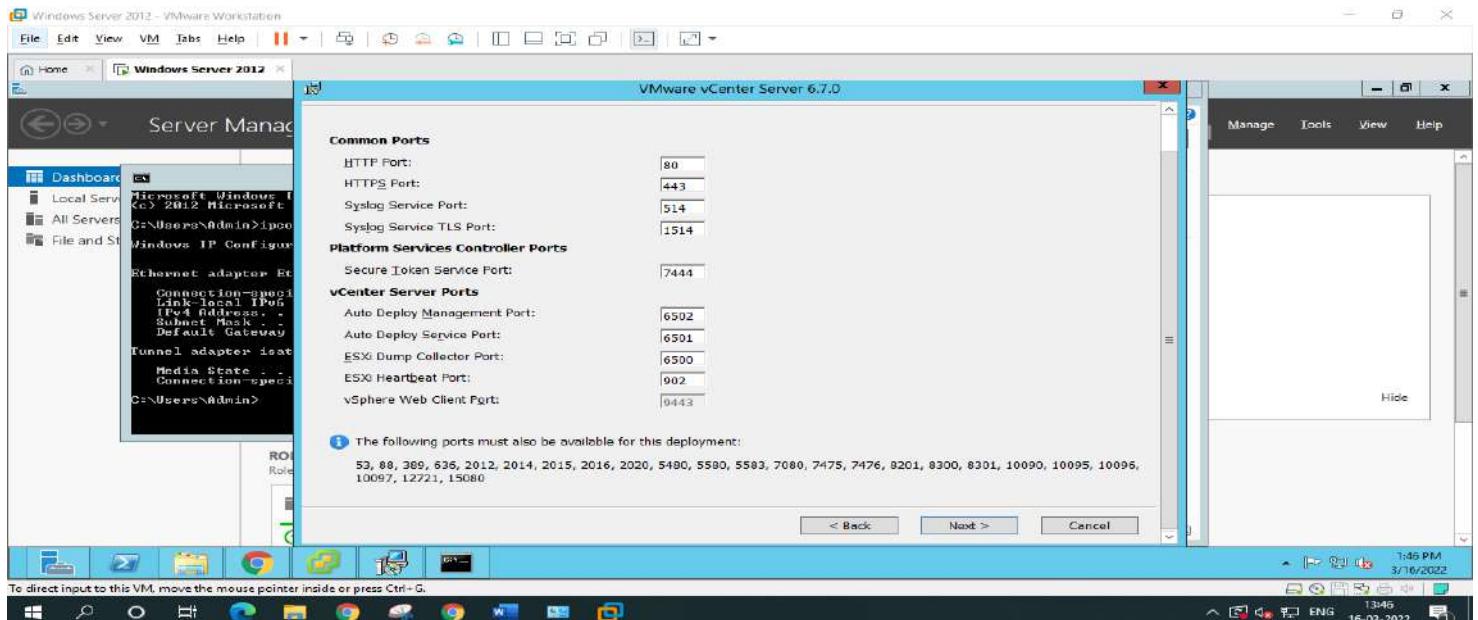
## Click on the Next button



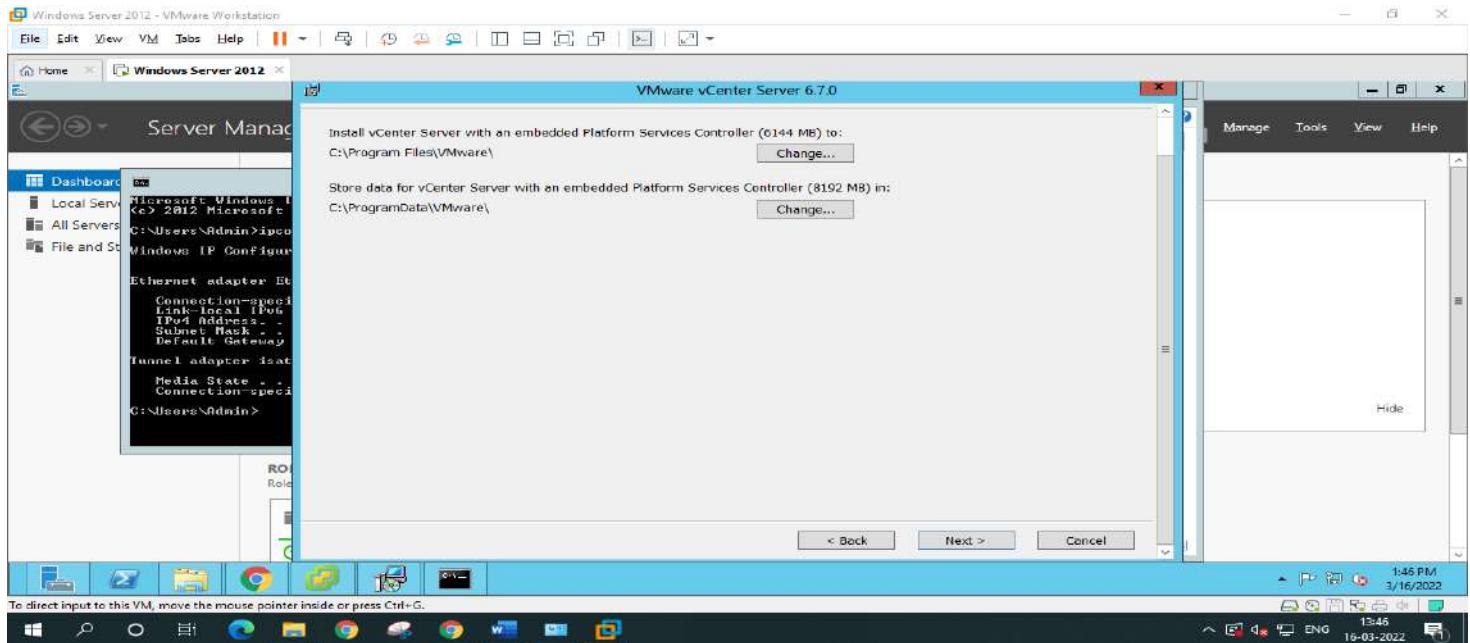
## Click on the Next button



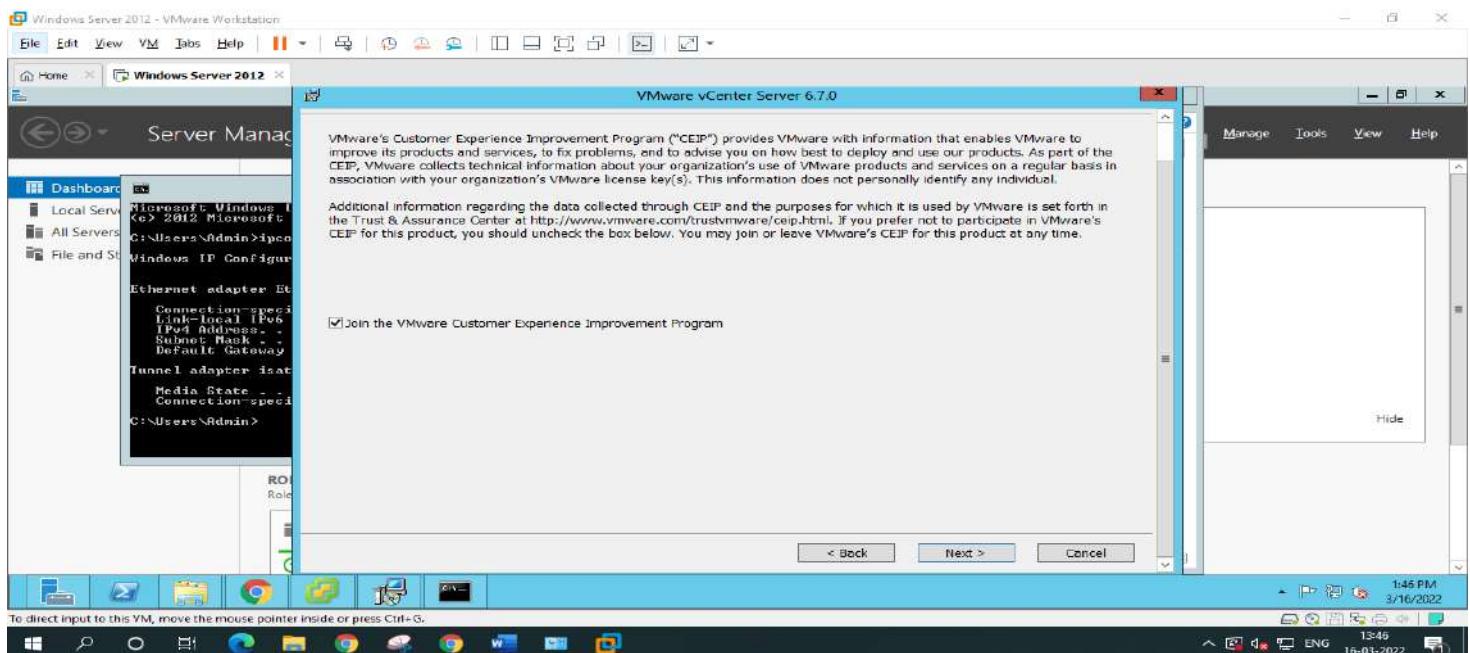
## Click on the Next button



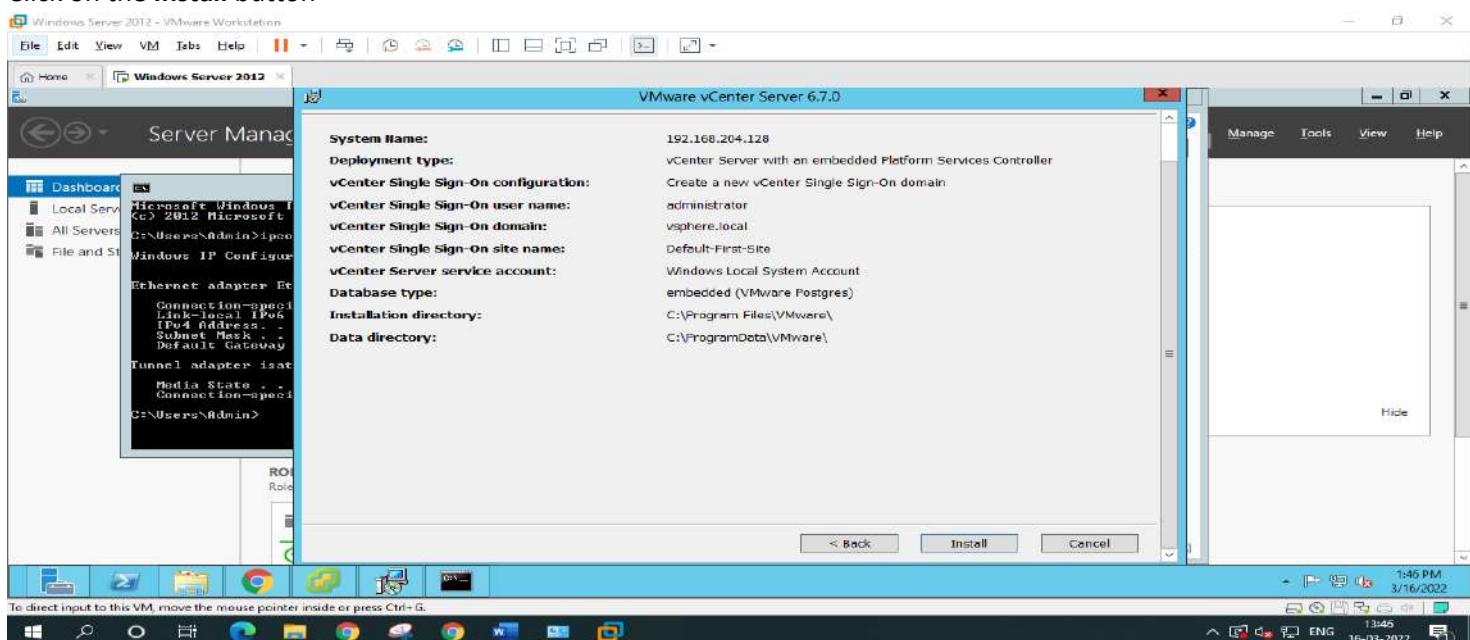
## Click on the Next button



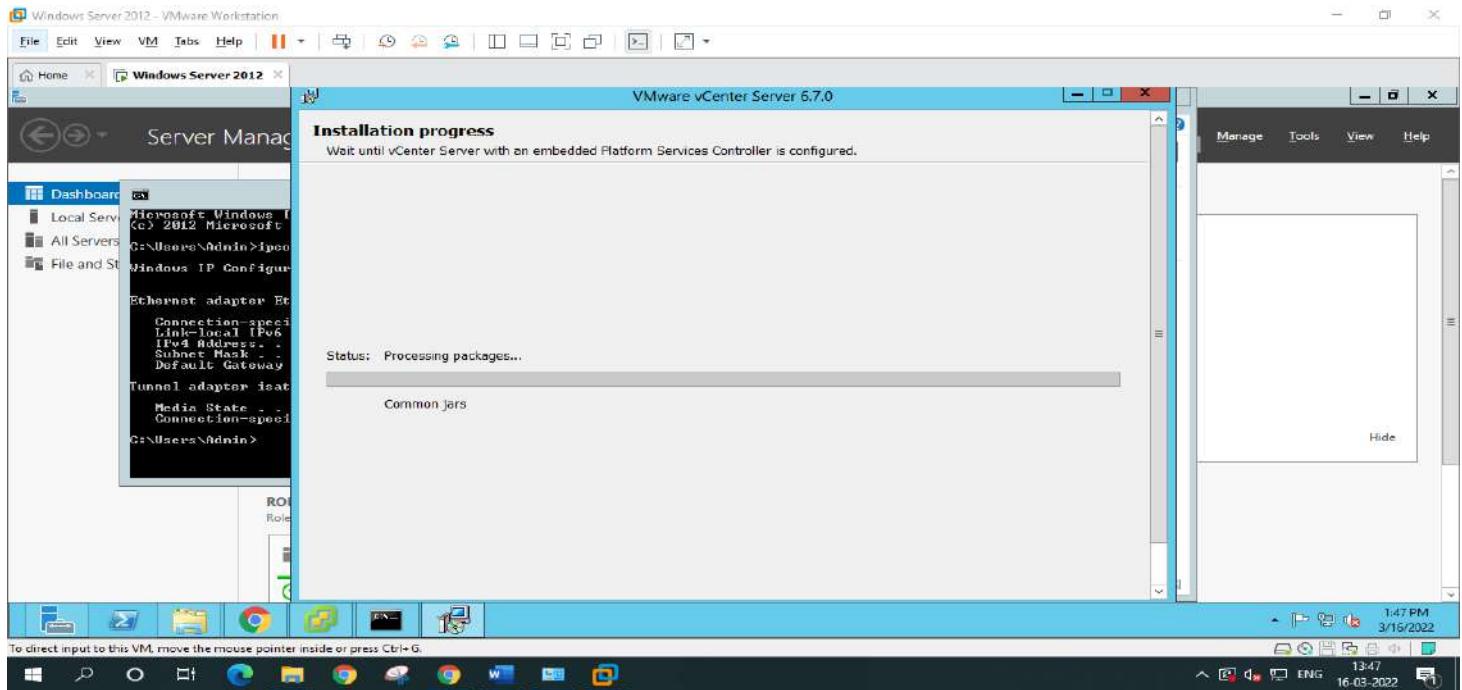
## Click on the Next button



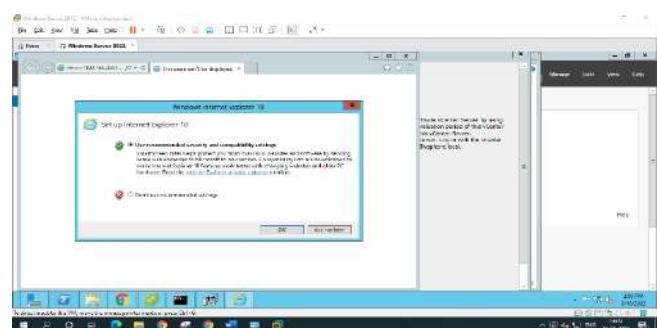
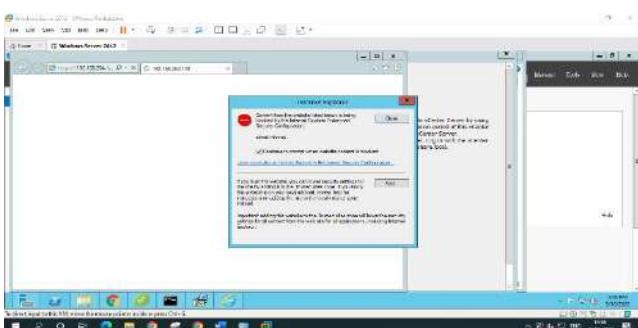
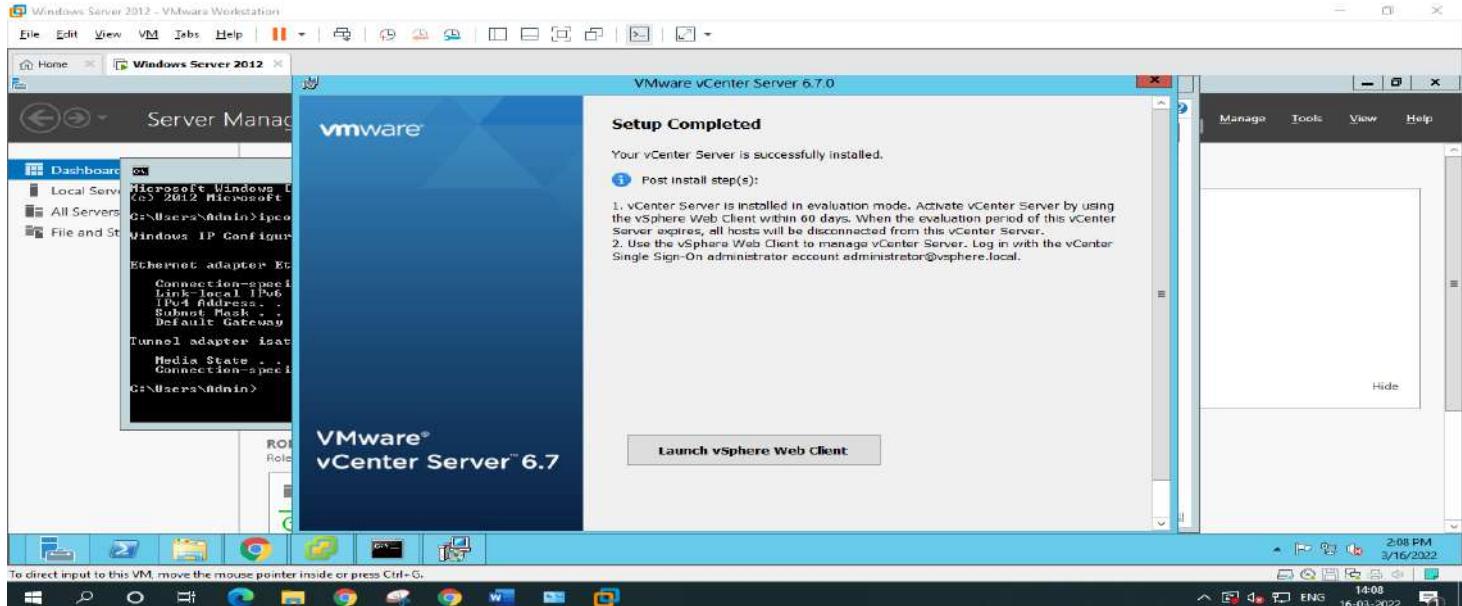
## Click on the Install button



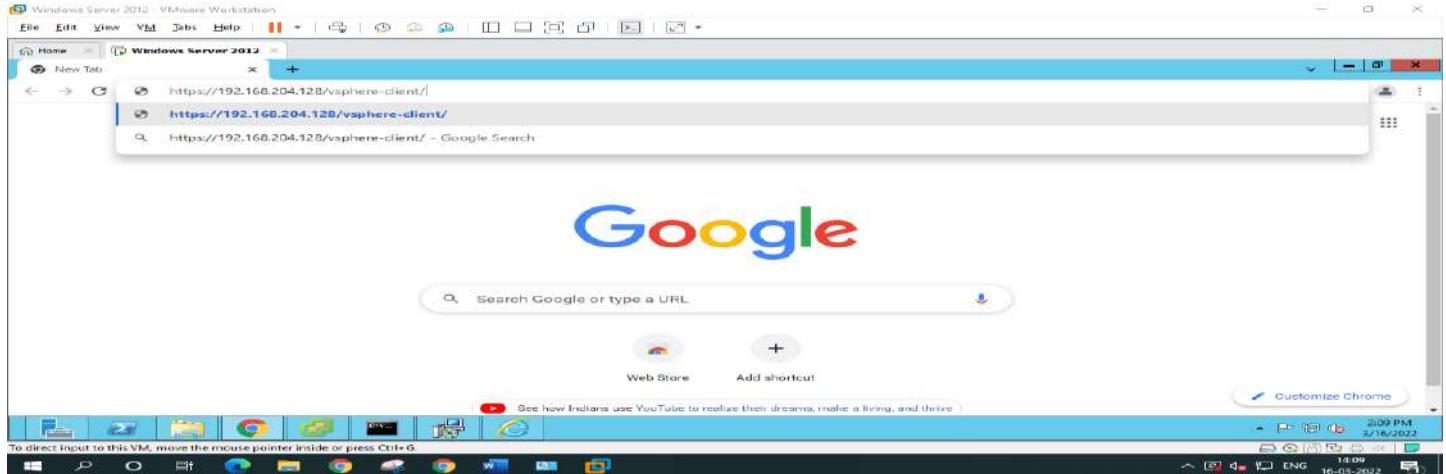
## Installation of VMware vCenter Server begins



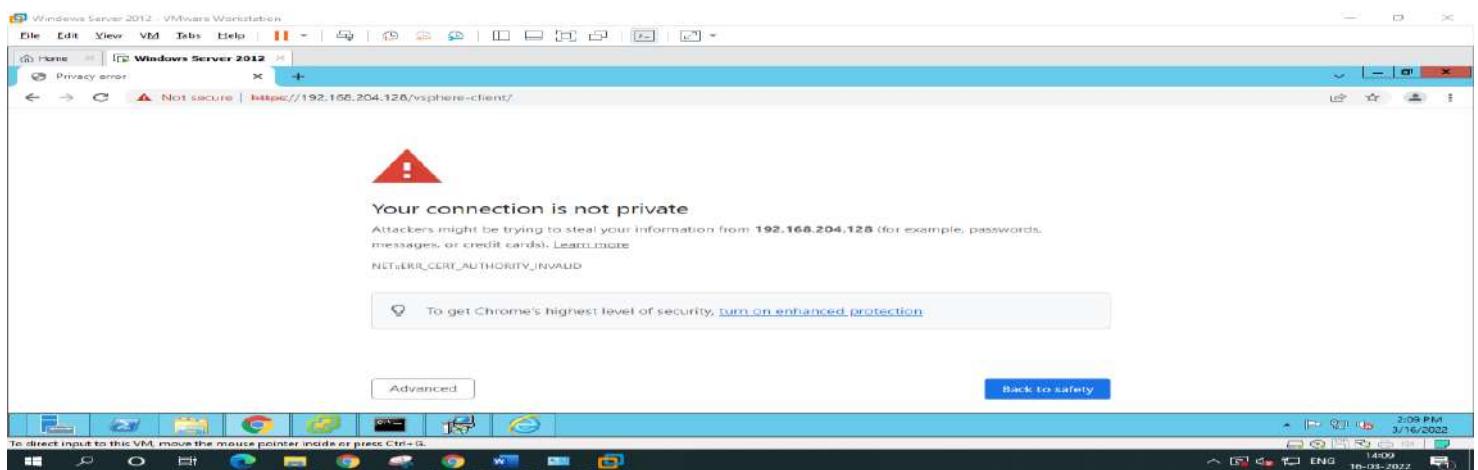
## vCenter installed successfully



First install the **Chrome Browser** and go to the Link i.e. <IP\_address>/vsphere-client



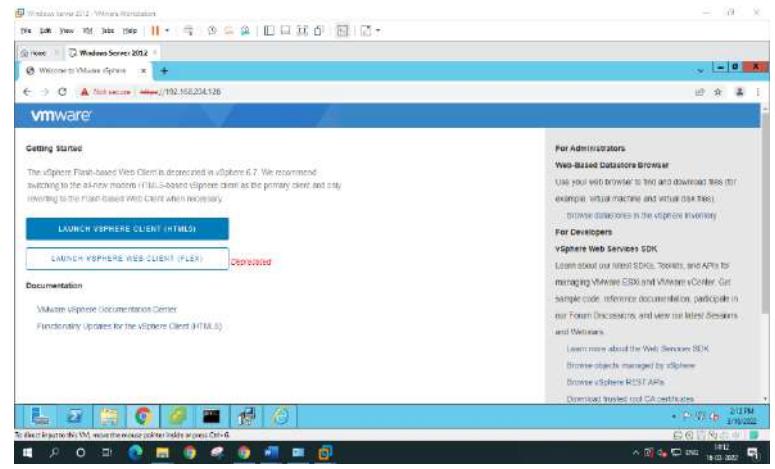
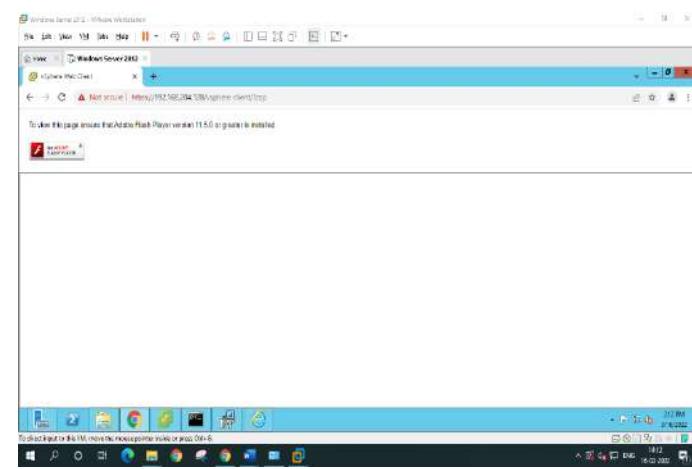
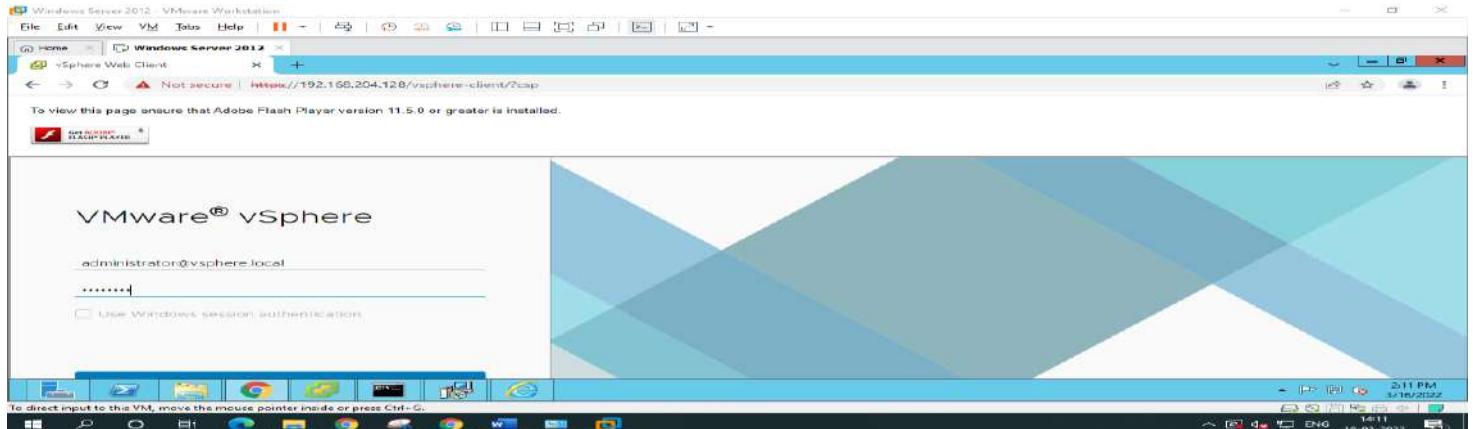
Click on an **Advanced** button and Next screen is coming then click on the **Proceed IP\_address**

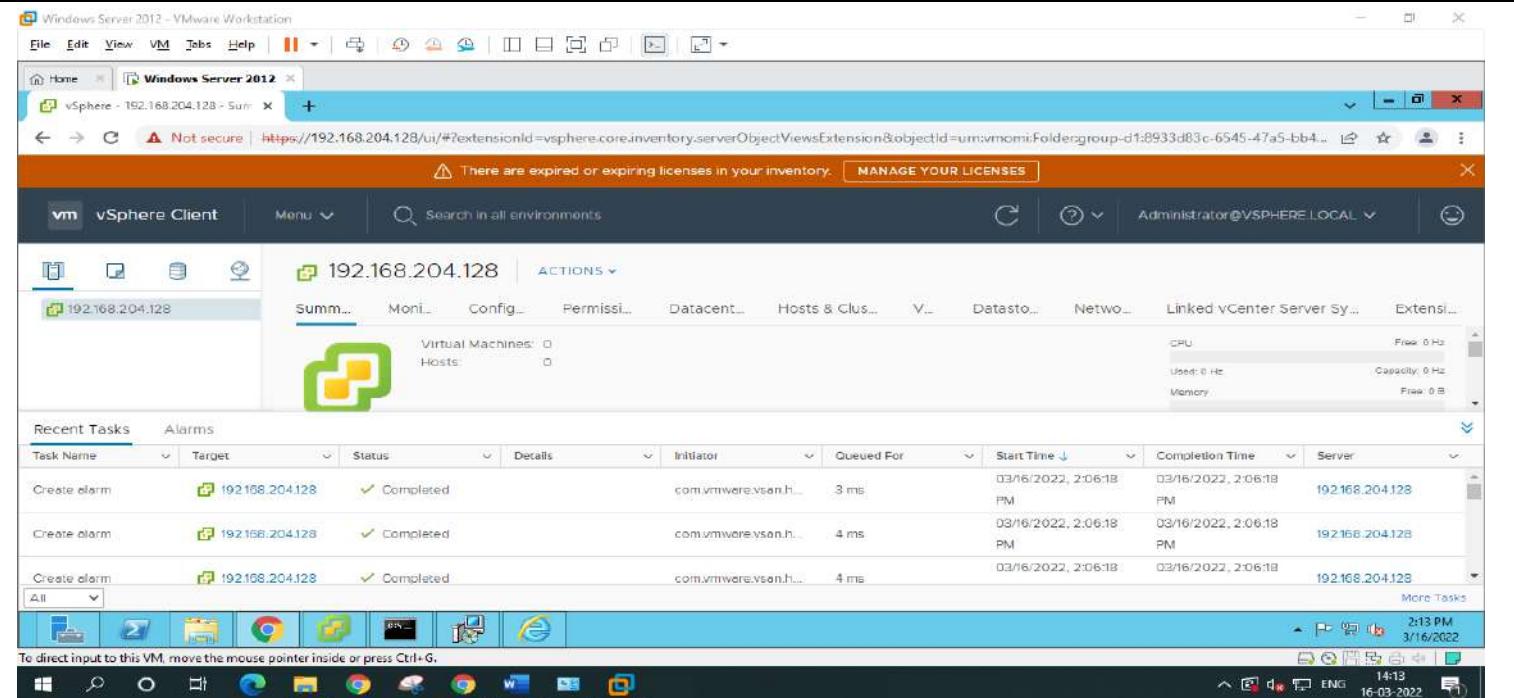


Now we can connect to the VMWare vCentre through its User interface.

Username: [administrator@vsphere.local](mailto:administrator@vsphere.local)

Password: It@13579





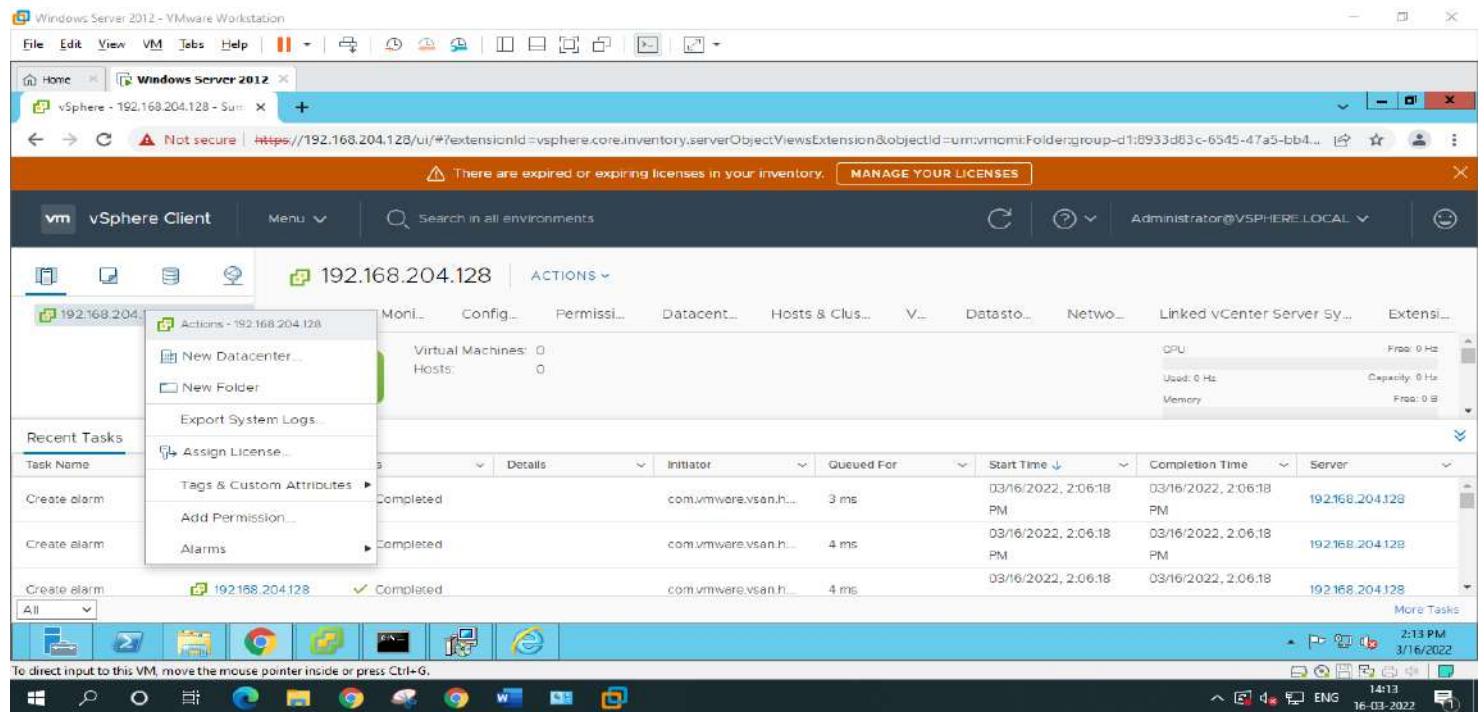
## Practical No. 2

**AIM:** Manage VMwareESXi server with vCentre server.

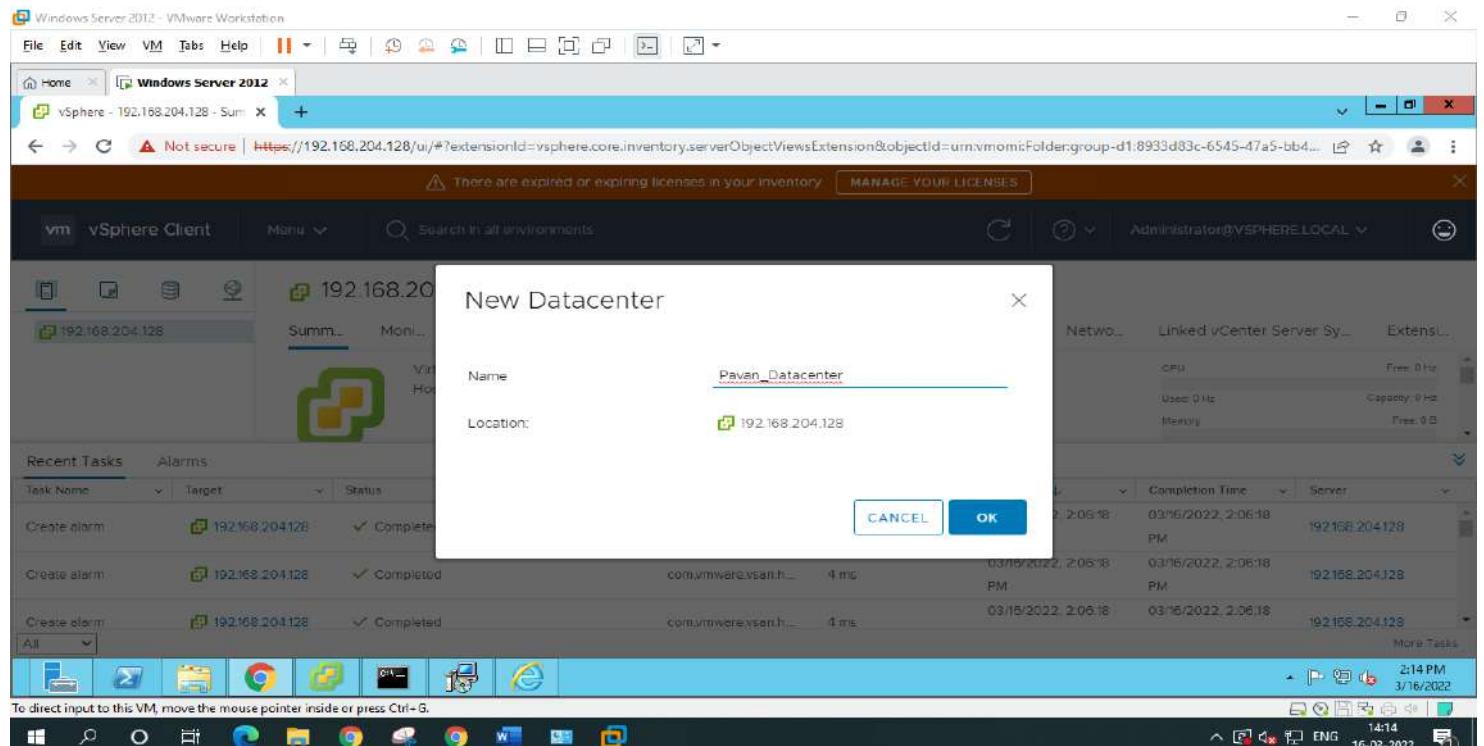
### A- Create a virtual machine in VMware ESXi Server.

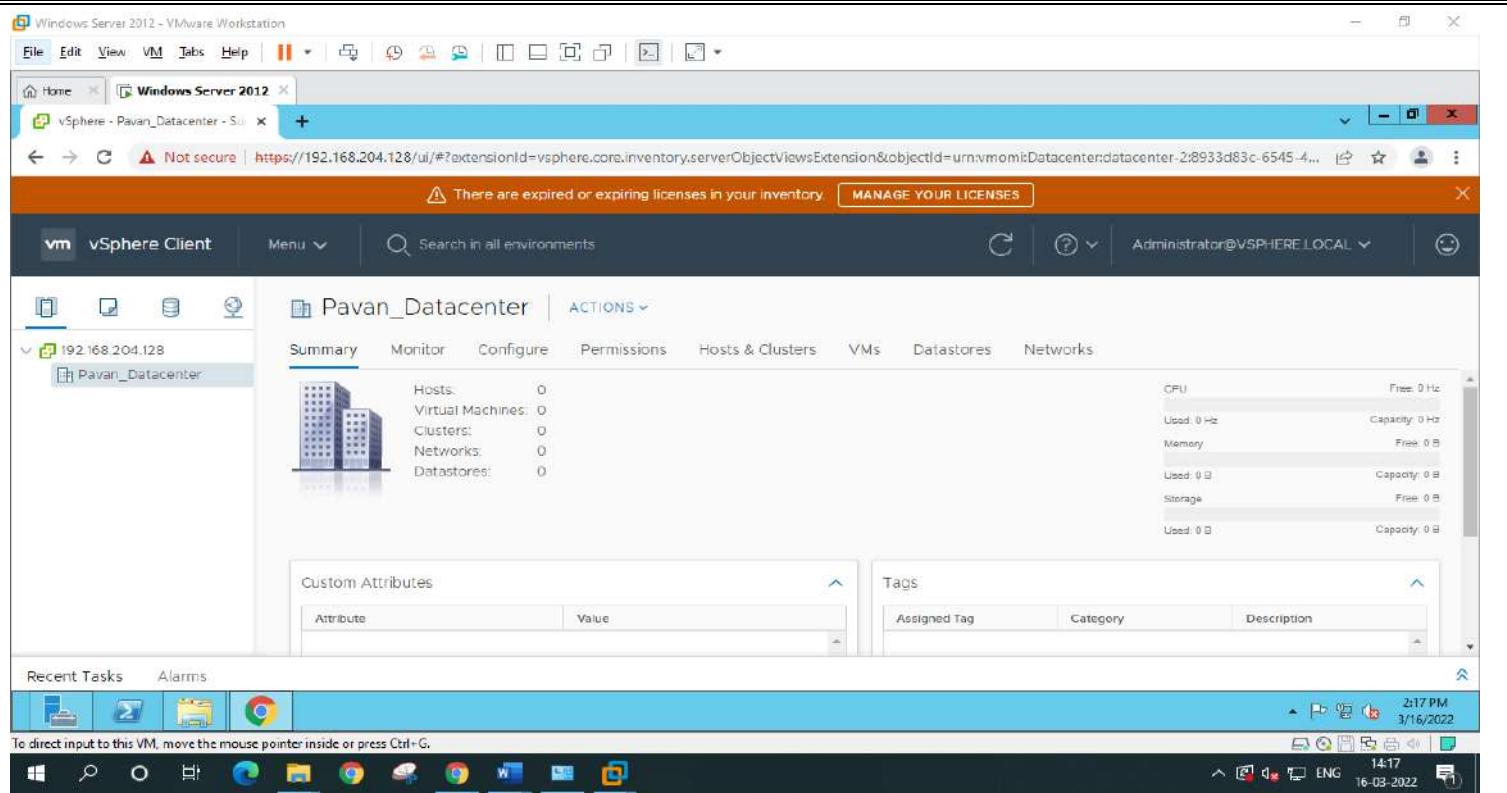
#### Create Datacenter and Add host on it:

After successful login, the below screen will appear, and after that click on the “Create a datacenter” button to add the data center into the vSphere server.

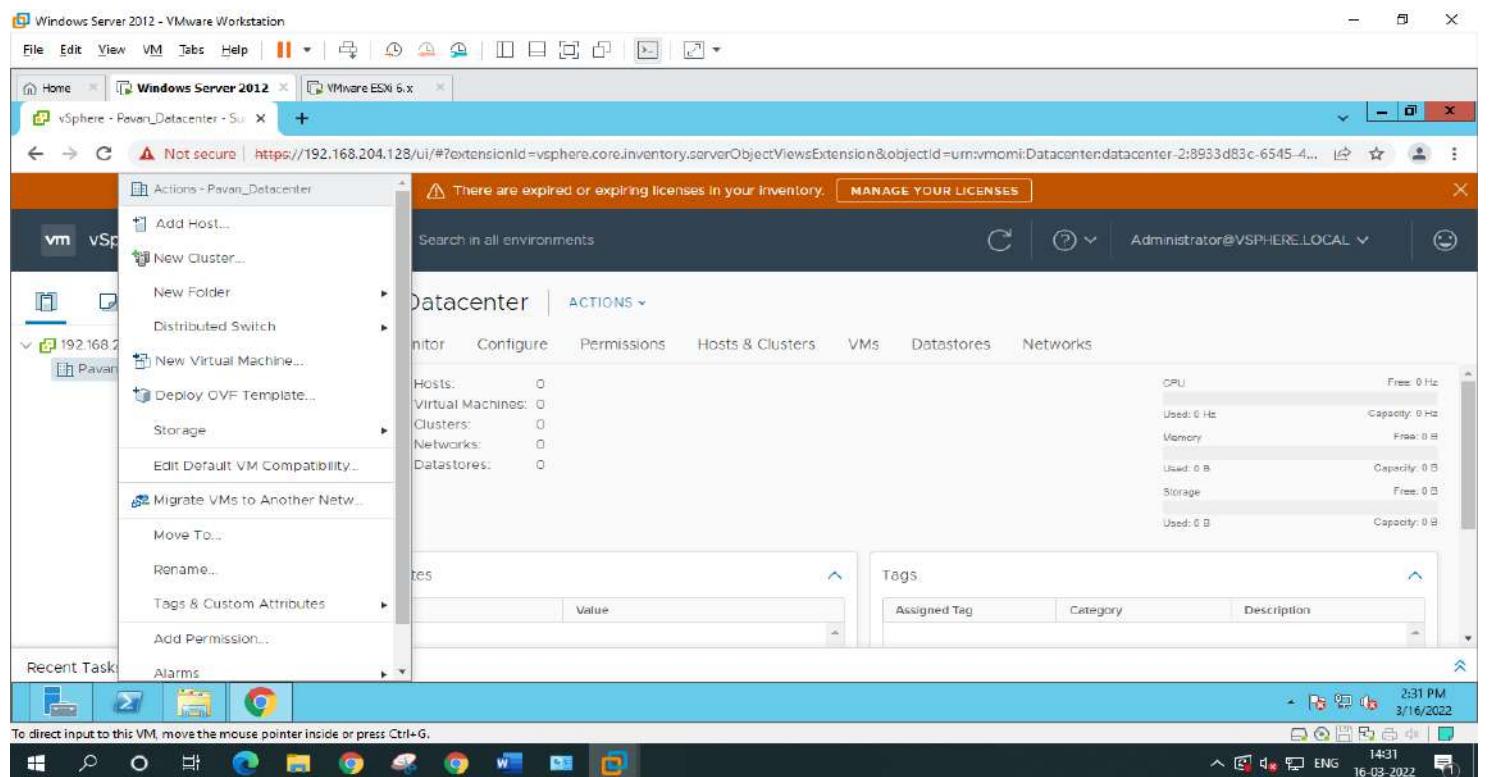


Give the name of Datacenter



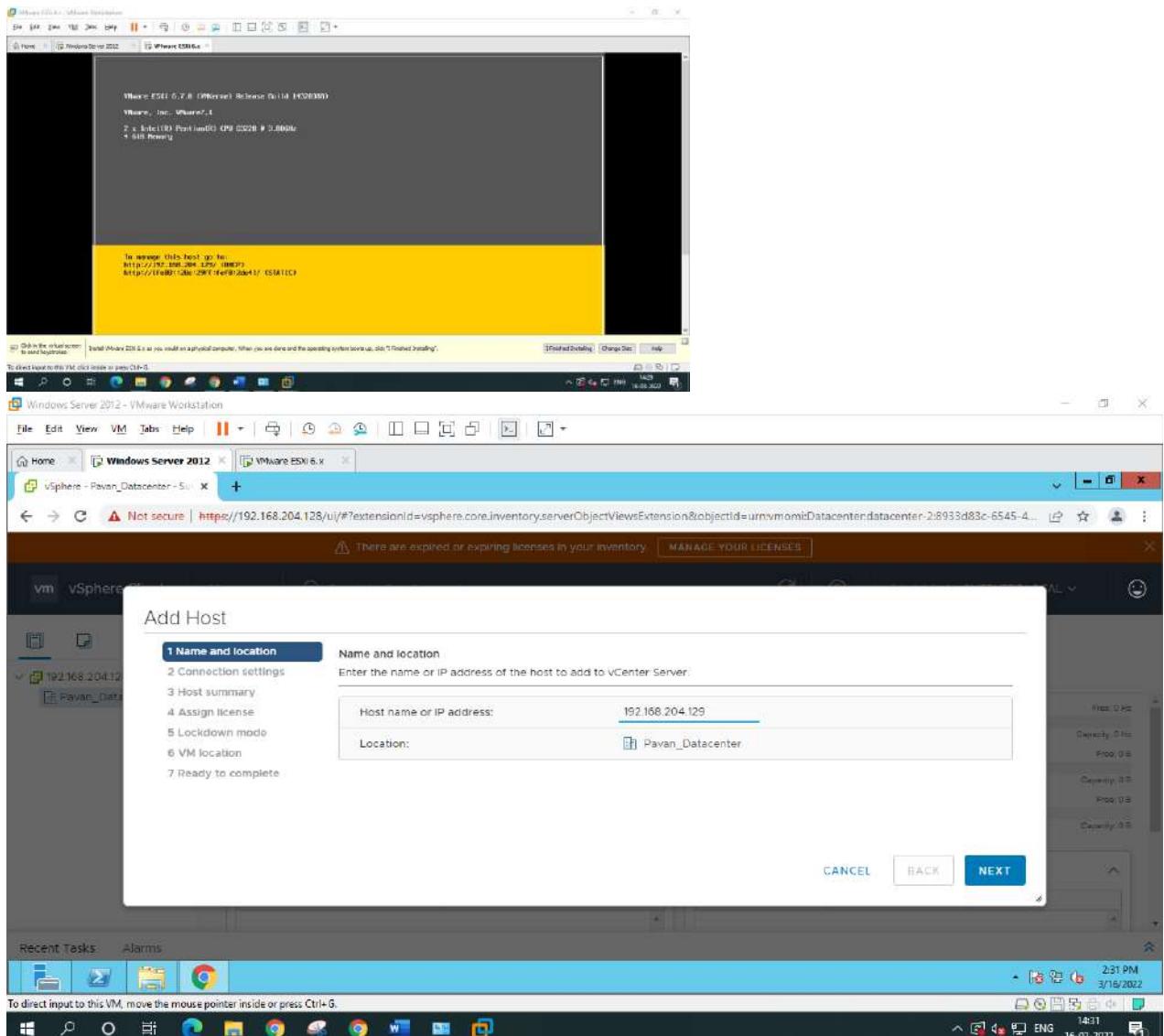


After that change, the name of the datacenter as you want, now click the “**Add a host**” button to add the host machine into the vSphere server.



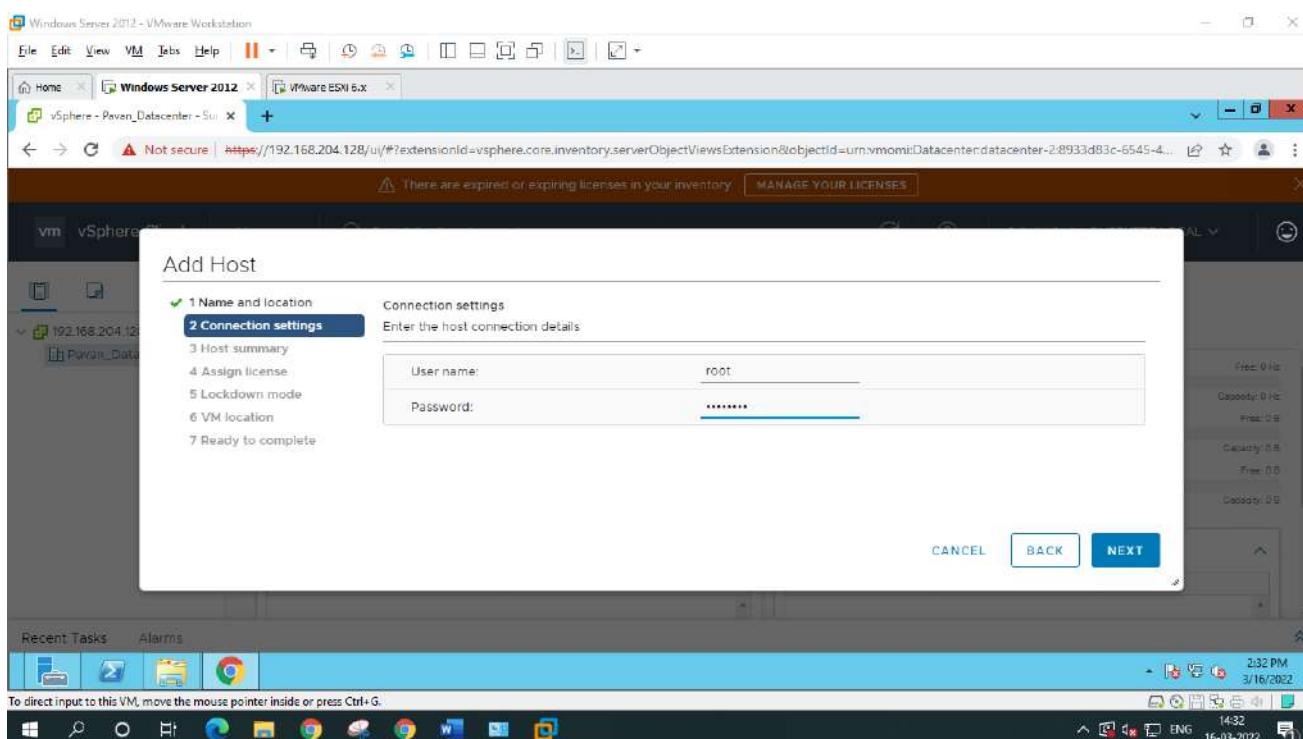
Enter the IP address of the host machine and enter the credential of the host machine i.e. of VMWare Esxi 6. x.

(i.e. Practical No.1 A last)

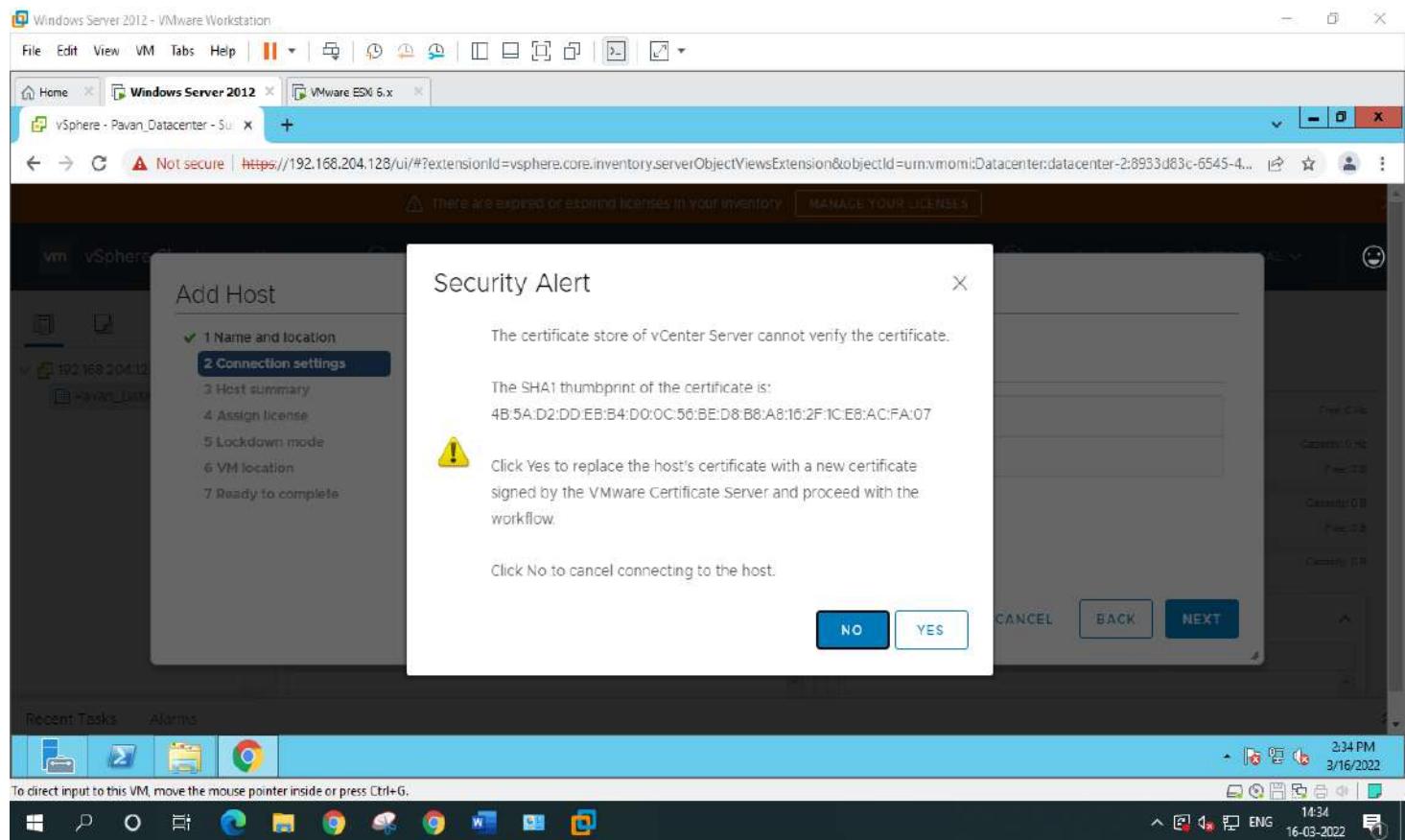


**Username:** root

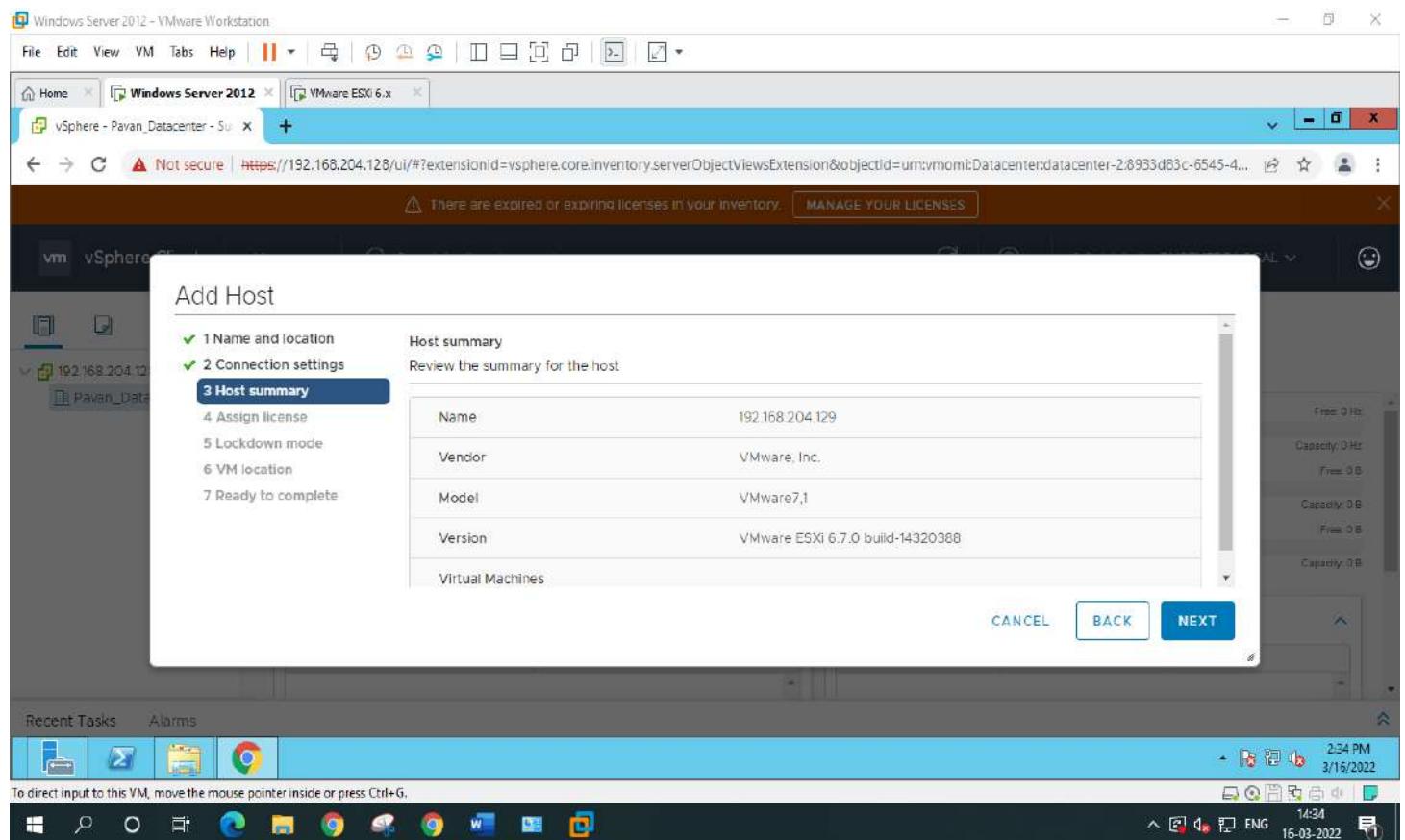
**Password:** It@13579



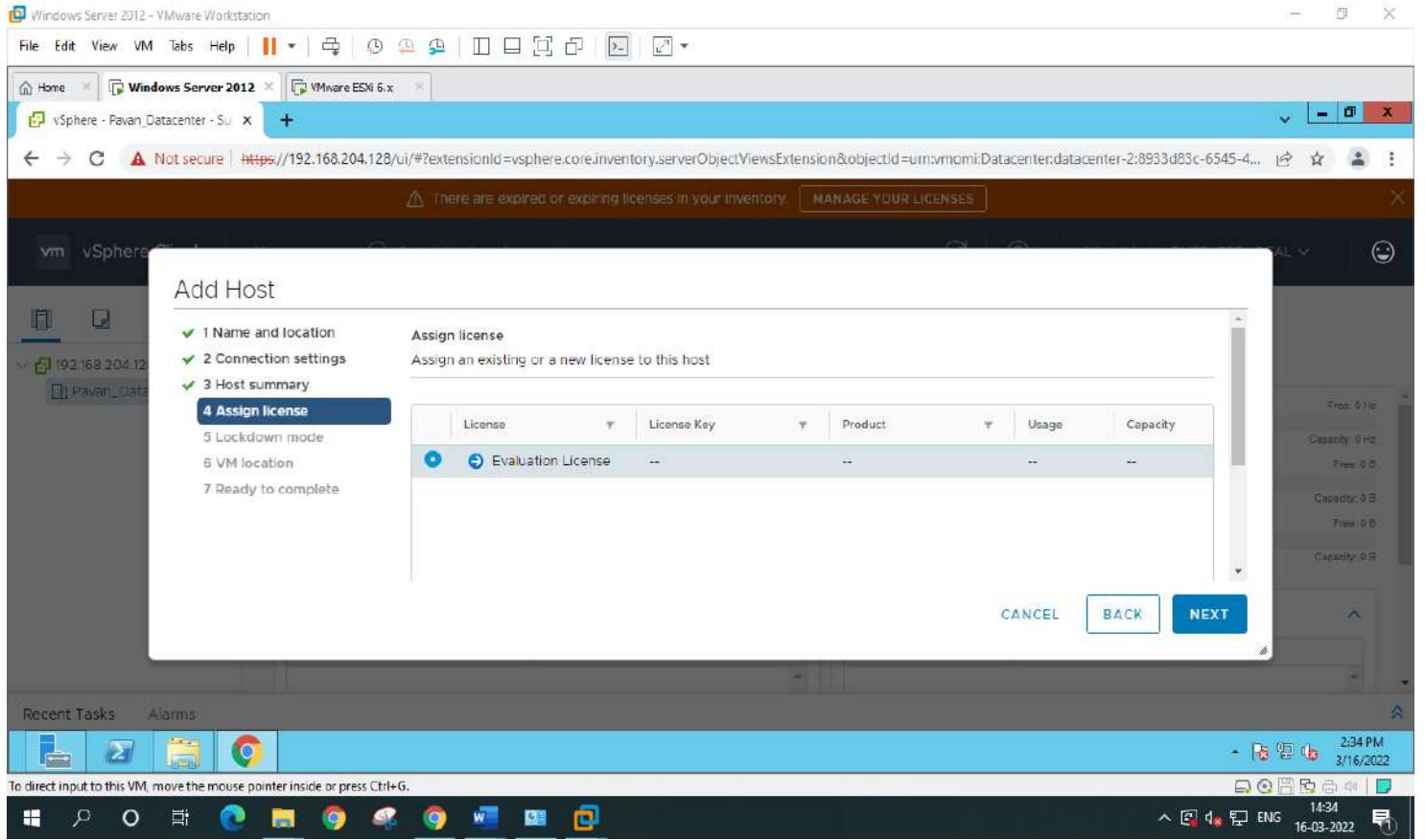
### Click on the Yes button



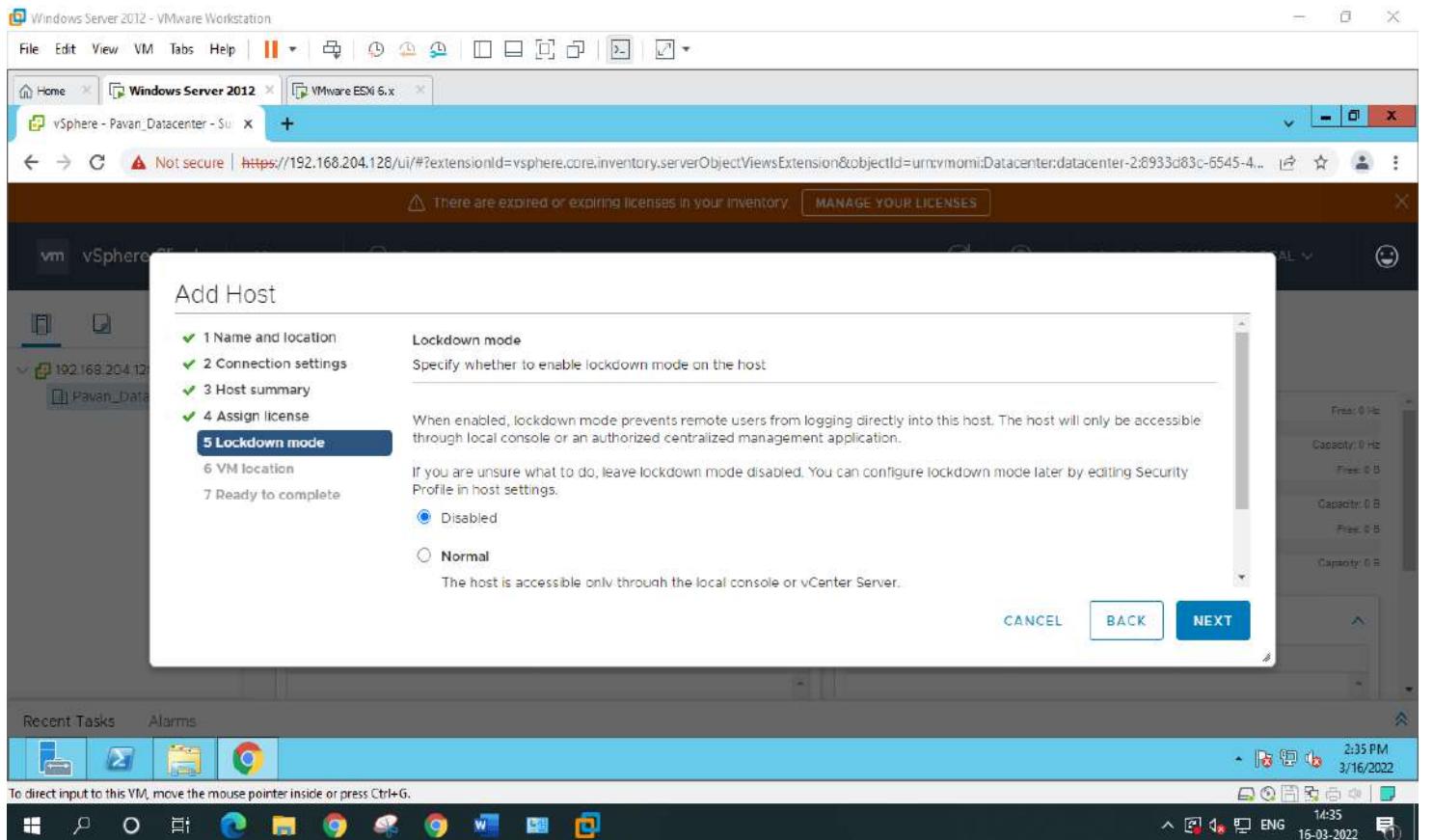
### Click on the Next button



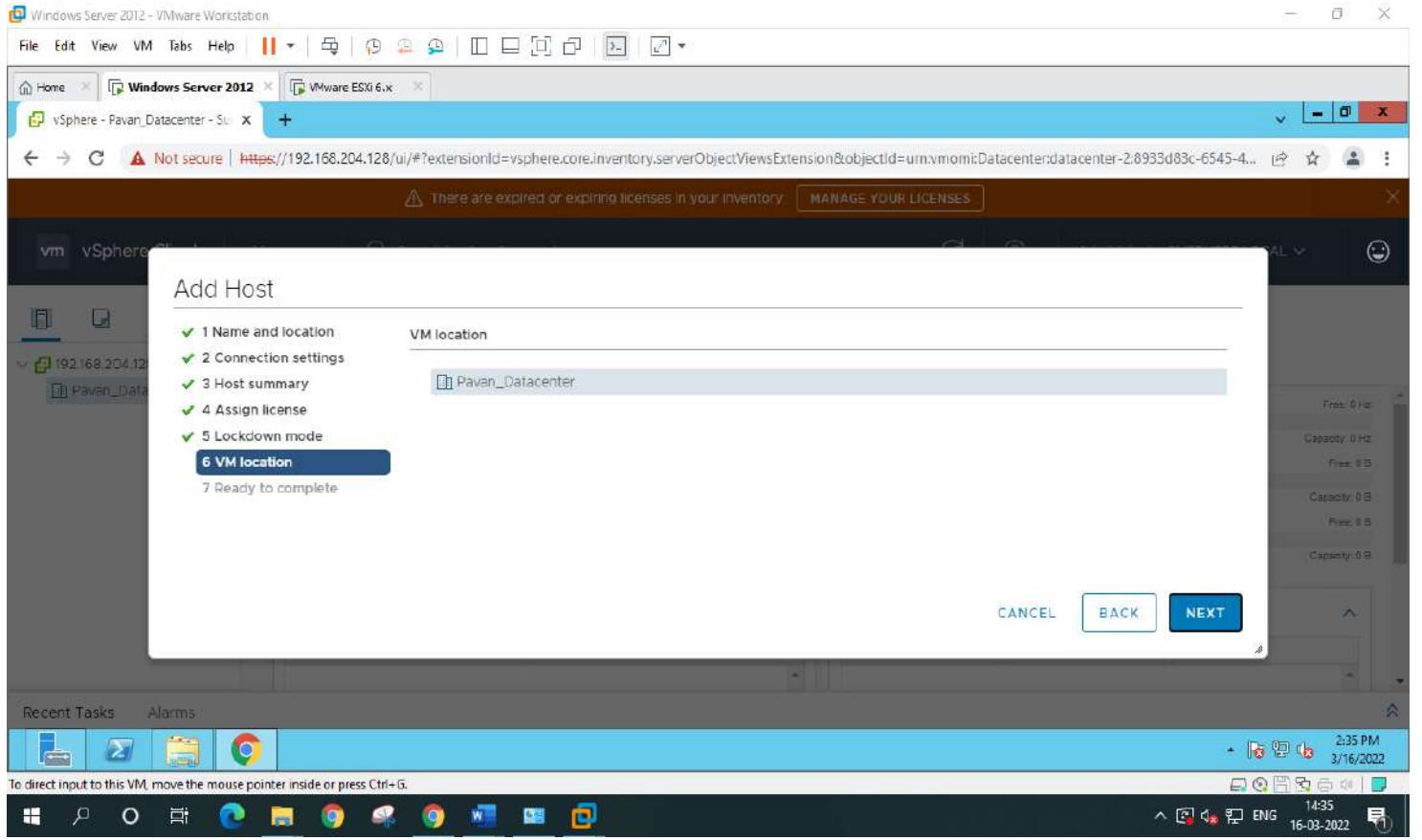
## Click on the **Next** button



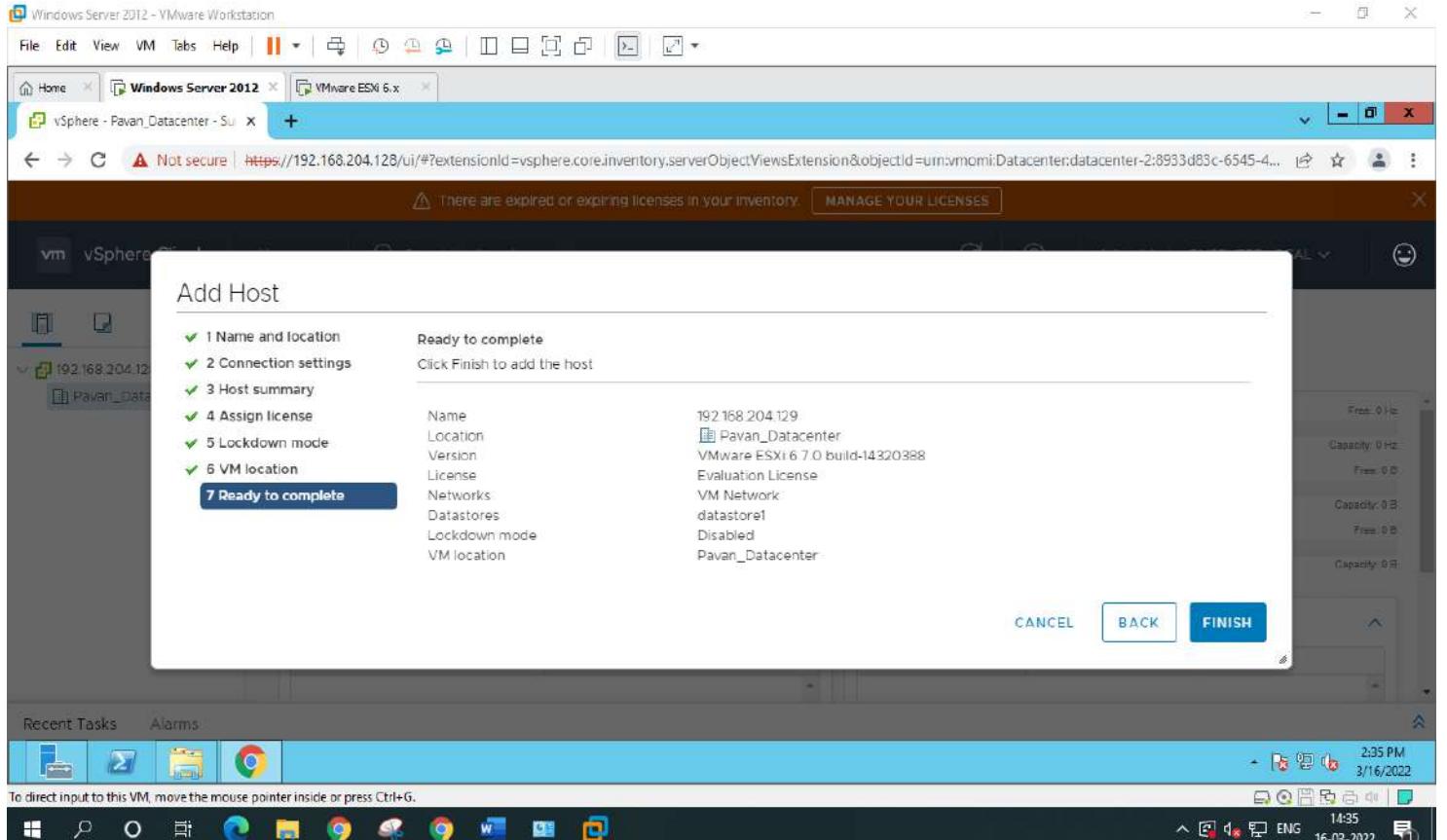
## Click on the **Next** button



## Click on the **Next** button



## Click on the **Finish** button



The screenshot shows the vSphere Client interface. The top navigation bar includes 'File', 'Edit', 'View', 'VM', 'Tabs', 'Help', and various icons for file operations. The title bar says 'Windows Server 2012 - VMware Workstation'. A banner at the top indicates 'There are expired or expiring licenses in your inventory' with a 'MANAGE YOUR LICENSES' button. The main window displays a summary for host '192.168.204.129'. The left sidebar shows a tree view with nodes like '192.168.204.128' and 'Pavan\_Datacenter'. The summary pane shows details such as Hypervisor: VMware ESXi 6.7.0, Processor Type: Intel(R) Pentium(R) CPU G3220 @ 3.00GHz, and Logical Processors: 2. Below the summary, a table lists recent tasks: 'Add standalone host' was completed successfully by 'VSHERE.LOCALVA...' at 03/16/2022, 2:35:32 PM. The bottom status bar shows system icons and the date/time: '2:35 PM 3/16/2022'.

## Create Virtual Machine into host:

For the creation of a virtual machine into the host, we need to add the **virtual machine iso** file (**WXPVOL\_EN.iso**) into the datastore.

For that go to the configuration tab of the host and then click on the Storage button. After that double click on datastore1.

After that, you will be seen the below screen, just click on the “Browse this datastore” button

Click on the **upload file** button and **browse the iso file**.

The screenshot shows the vSphere Client interface running in a VMware Workstation window. The title bar reads "Windows Server 2012 - VMware Workstation". The main window displays a "datastore1" view under the "Pavan\_Datacenter" folder. The "Files" tab is selected, showing a list of items with the following details:

Name	Size	Modified	Type	Path
sdd.sf		03/06/2022, 2:26:32 ...	Folder	[datastore1].sdd.sf

At the top of the client window, there is a banner message: "⚠ There are expired or expiring licenses in your inventory. [MANAGE YOUR LICENSES](#)". The bottom status bar indicates: "To direct input to this VM, move the mouse pointer inside or press Ctrl+G." The system tray at the bottom right shows the date and time as "16-03-2022 14:39" and the language as "ENG".

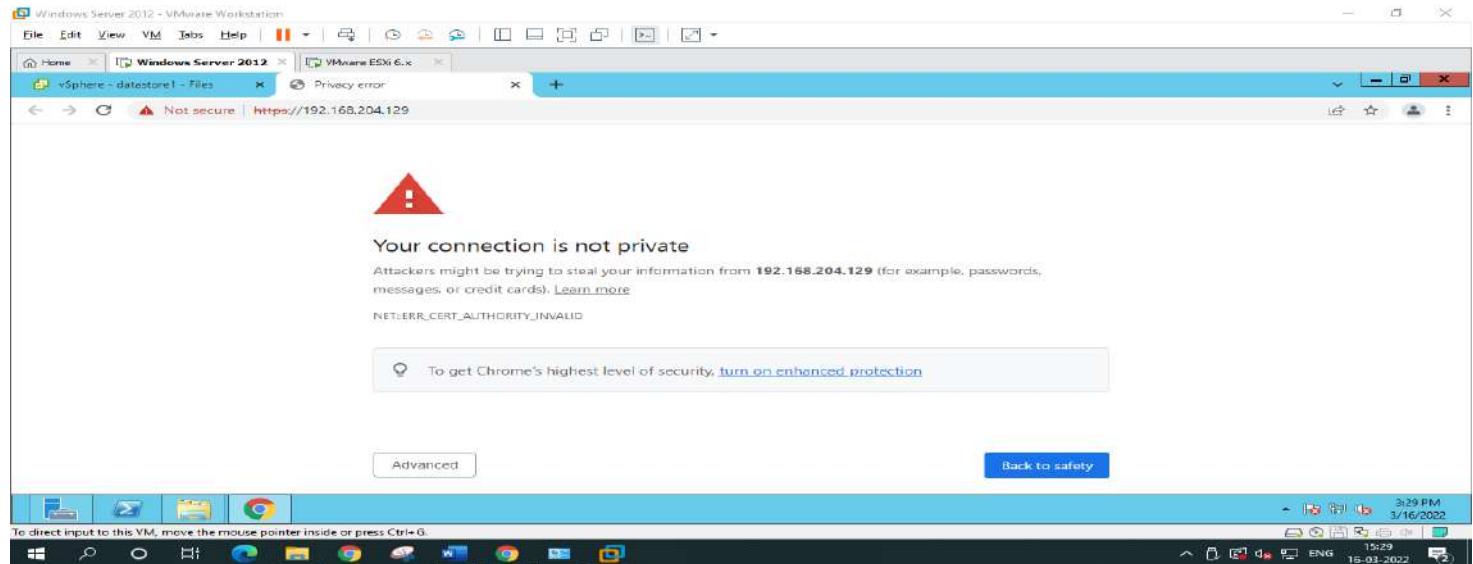
## Click on details and browse the hyperlink. (Note: Click on the Details)

The screenshot shows the vSphere Client interface. In the center, there's a 'datastore1' view with a 'Files' tab selected. A file named '[datastore1] WXPVOL\_EN.iso' has a status message: 'The operation failed. Details...' which is highlighted with a red box. Below the table, a tooltip provides more information: 'The operation failed for an undetermined reason. Typically this problem occurs due to certificates that the browser does not trust. If you are using self-signed or custom certificates, open the URL below in a new browser tab and accept the certificate, then retry the operation.' A red box highlights the URL 'https://192.168.204.129'. The bottom status bar shows the date and time as 3/16/2022, 3:28:57 PM.

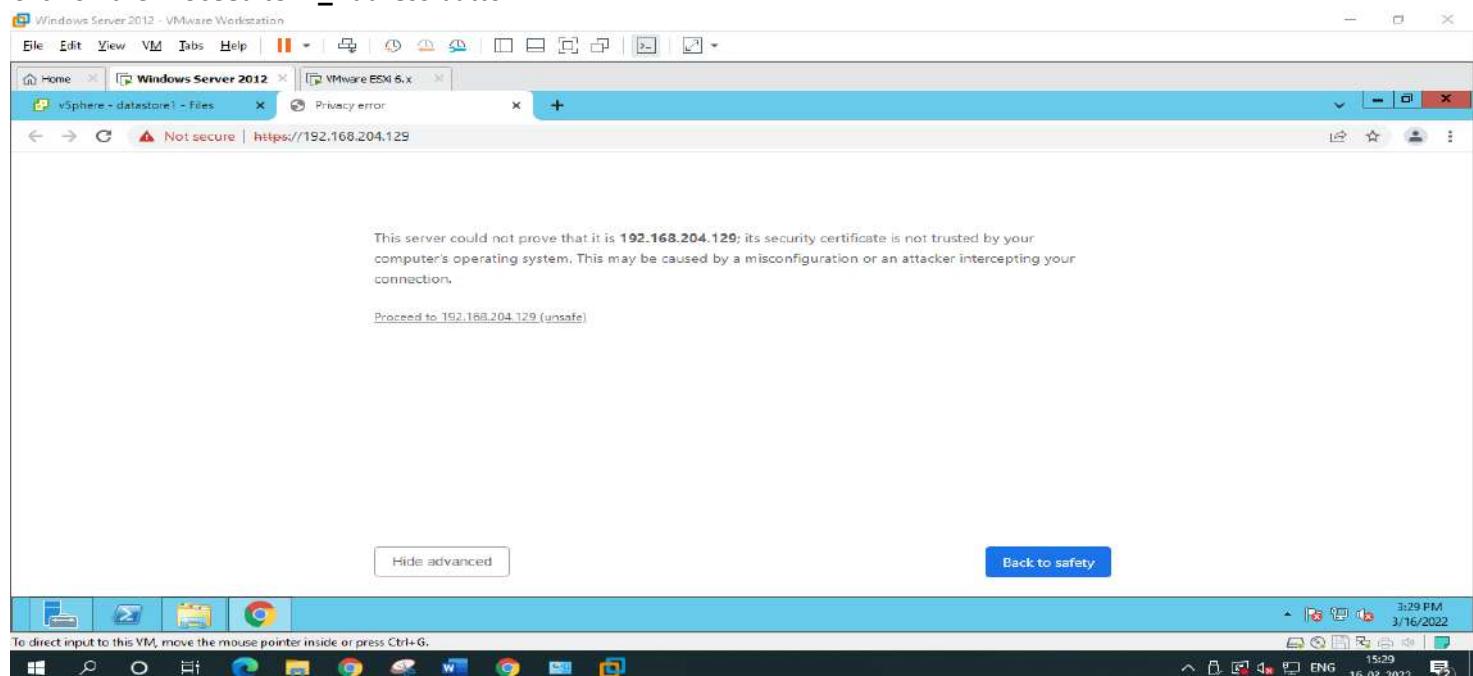
## Click on the IP address

This screenshot is similar to the previous one but shows a detailed error dialog box in the foreground. The dialog title is 'The operation failed' and contains the same explanatory text about certificates. It also includes the URL 'https://192.168.204.129' in a red box. An 'OK' button is at the bottom right of the dialog. The background shows the same vSphere Client interface with the 'datastore1' files view.

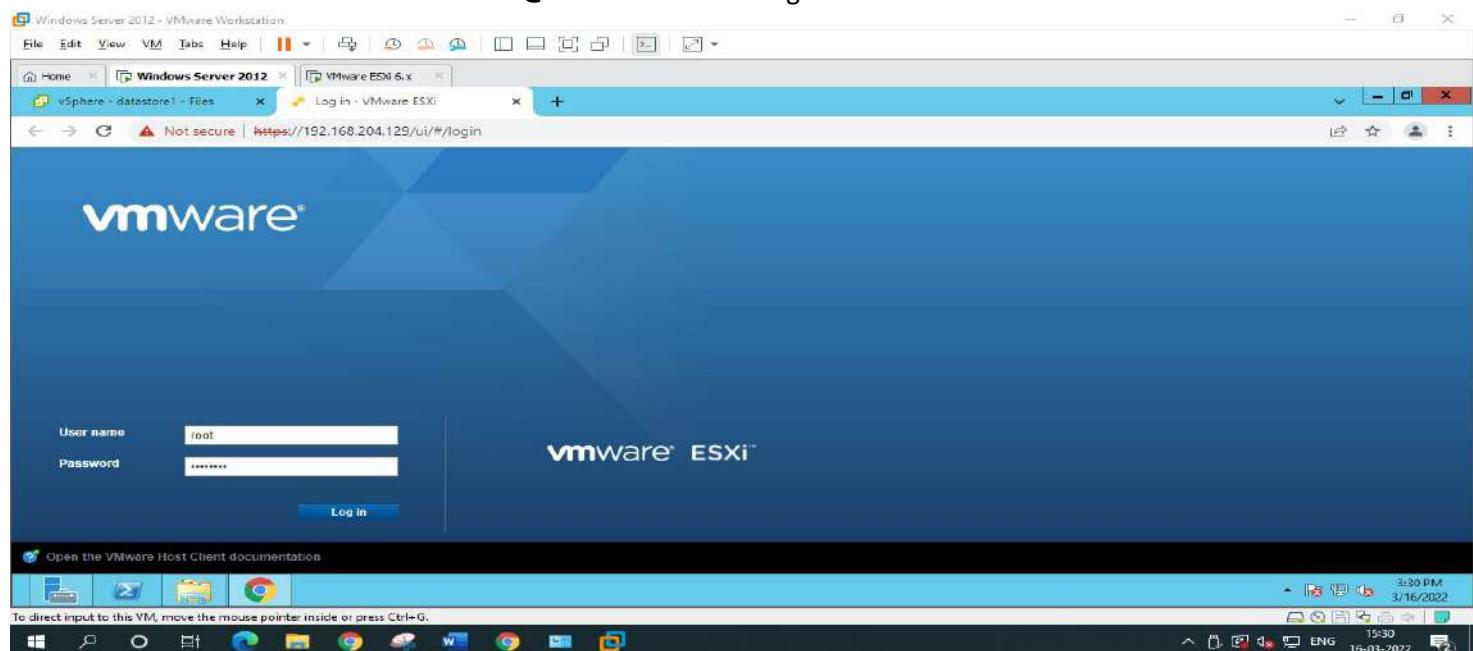
### Click on the Advanced button

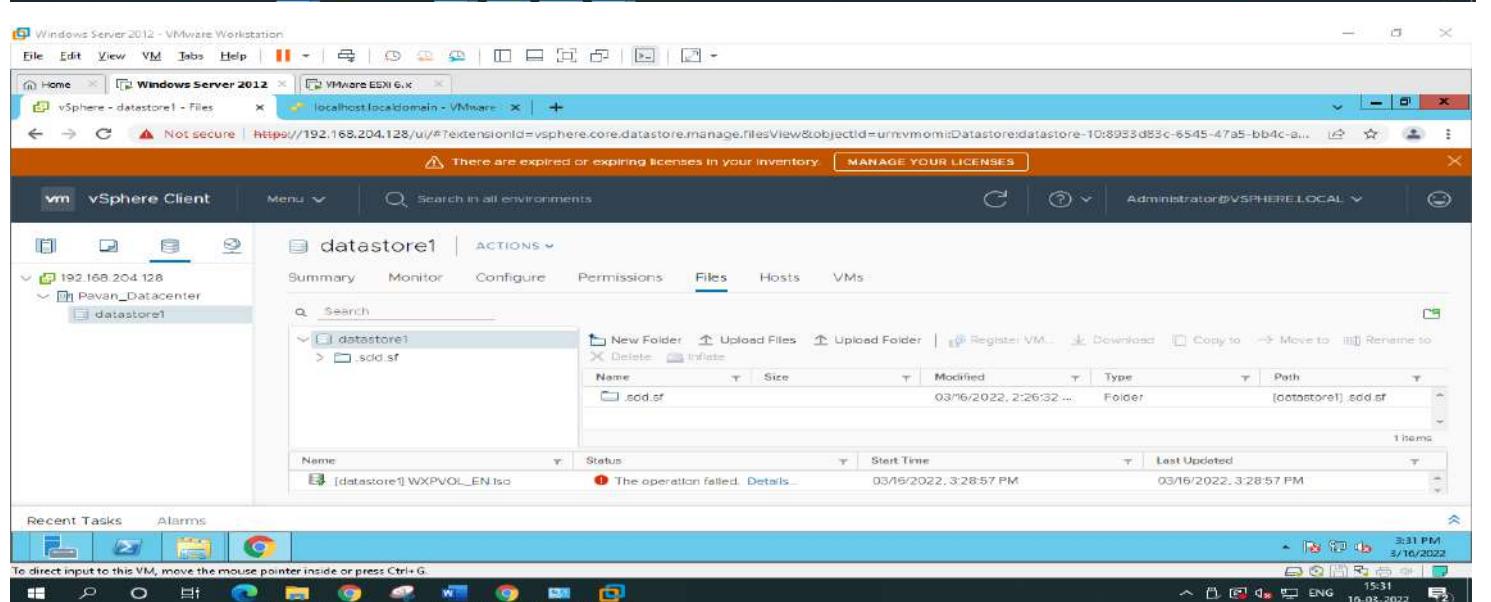
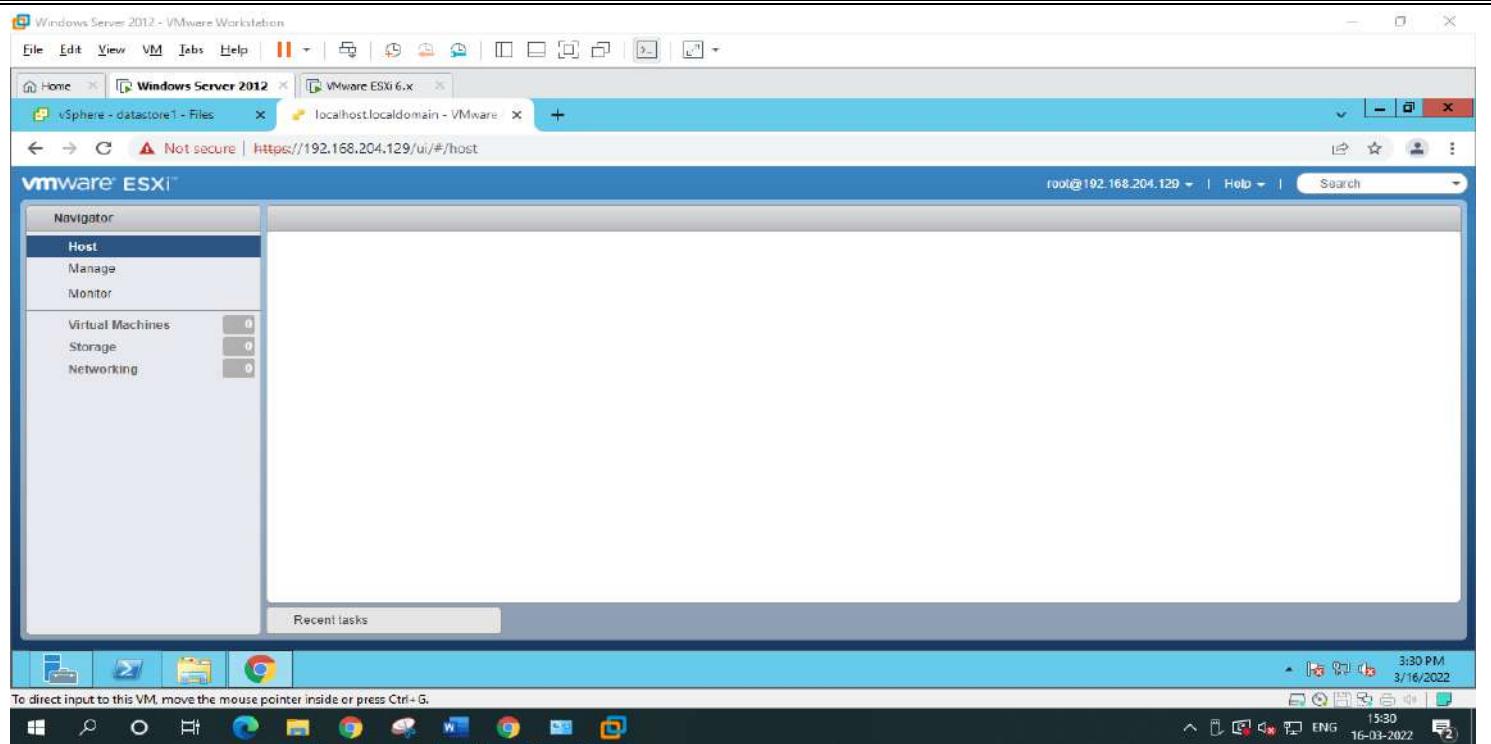


### Click on the Proceed to IP\_Address button

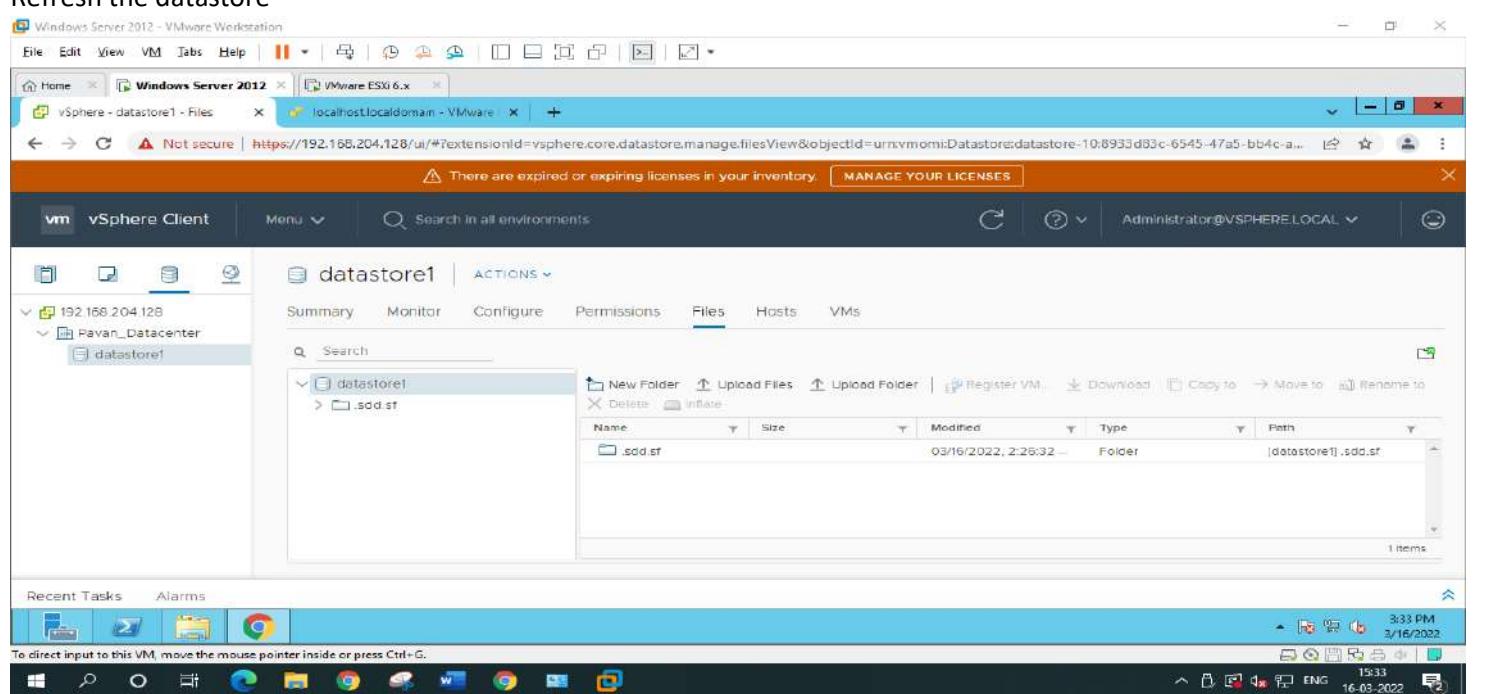


Enter the Username: **root** and Password: **lt@13579** when creating ESXi Server

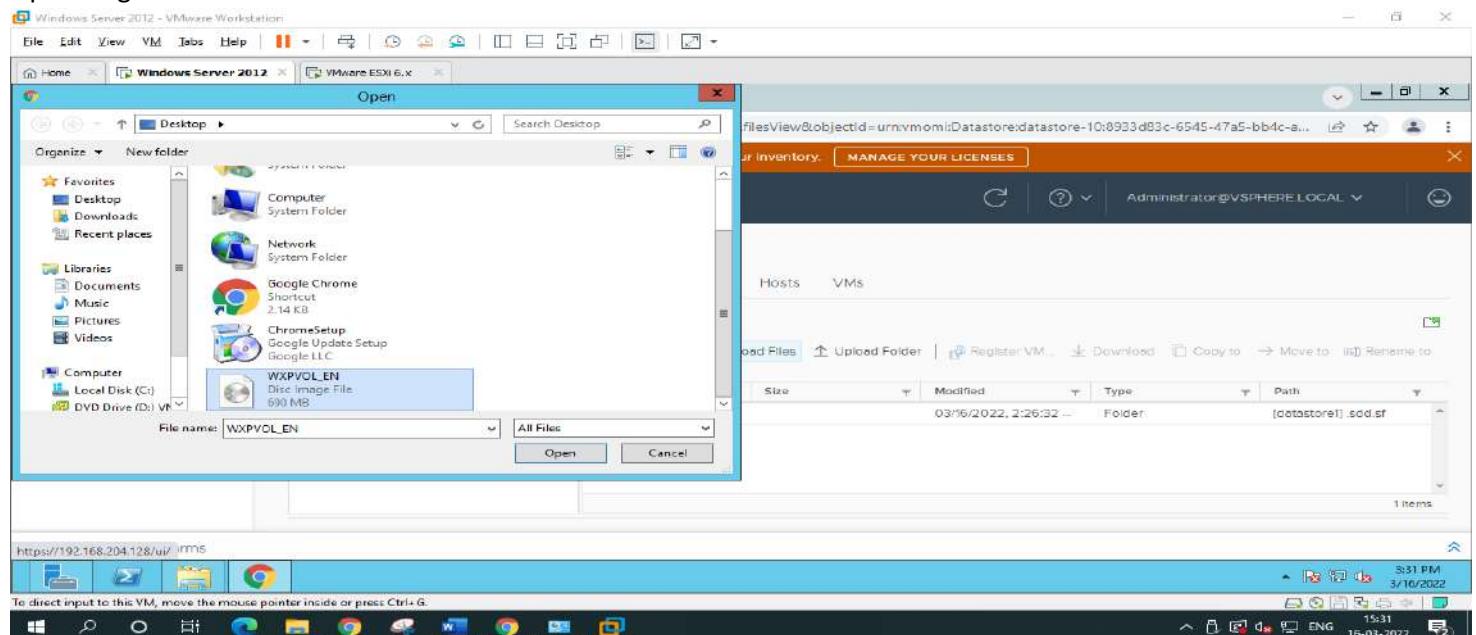




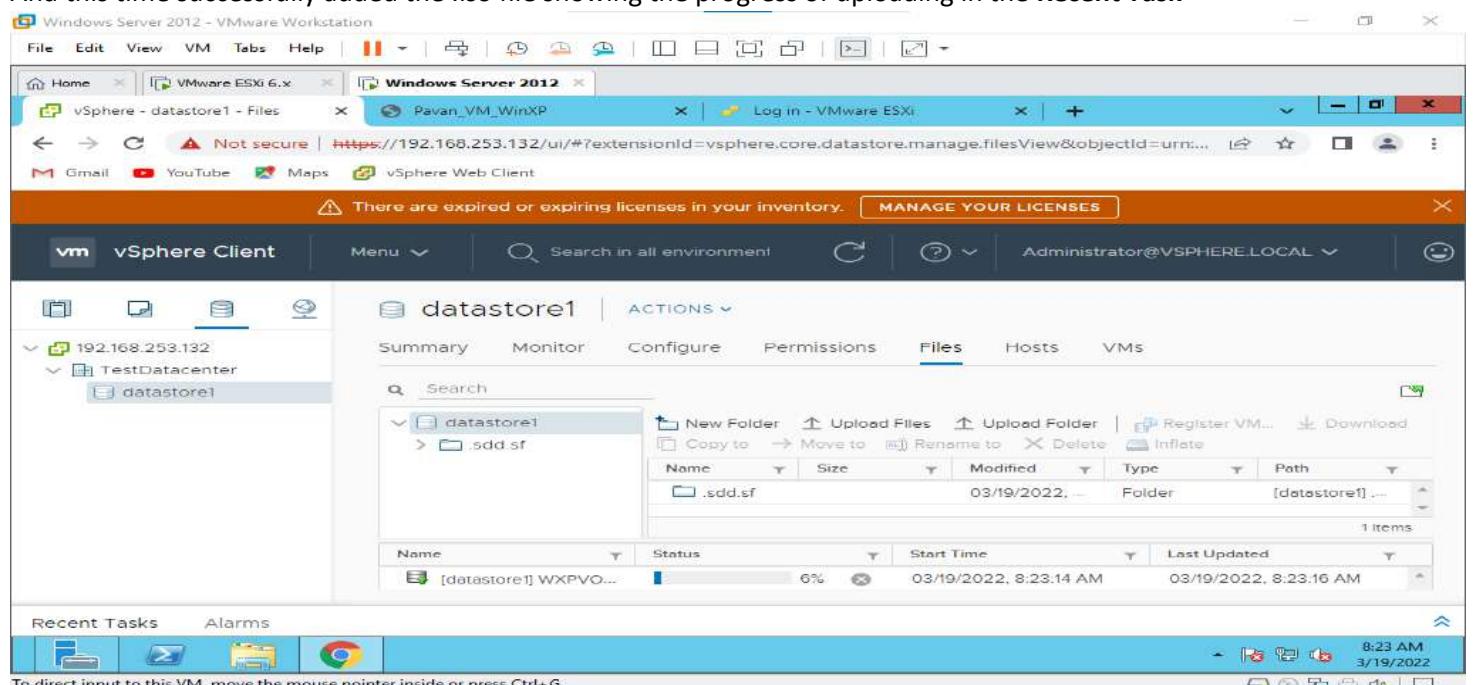
## Refresh the datastore



## Upload again the .iso file of WindowsXP



And this time successfully added the .iso file showing the progress of uploading in the Recent Task



## ISO file uploaded successfully into datastore

The screenshot shows the vSphere Client interface. On the left, a tree view shows a host at 192.168.253.132 and a datacenter named TestDatacenter containing a datastore named datastore1. The main pane is titled "datastore1" and has a "Files" tab selected. It displays a folder structure under "datastore1" with a file named ".sdd.st". A progress bar at the bottom indicates the file "ISO\_WXPVO" is being uploaded, with a status message "Completed" and a timestamp of "03/19/2022, 8:23:14 AM". The top navigation bar shows tabs for Home, VMware ESXi 6.x, Windows Server 2012, and Pavan\_VM\_WinXP. A warning message "There are expired or expiring licenses in your inventory" is visible at the top.

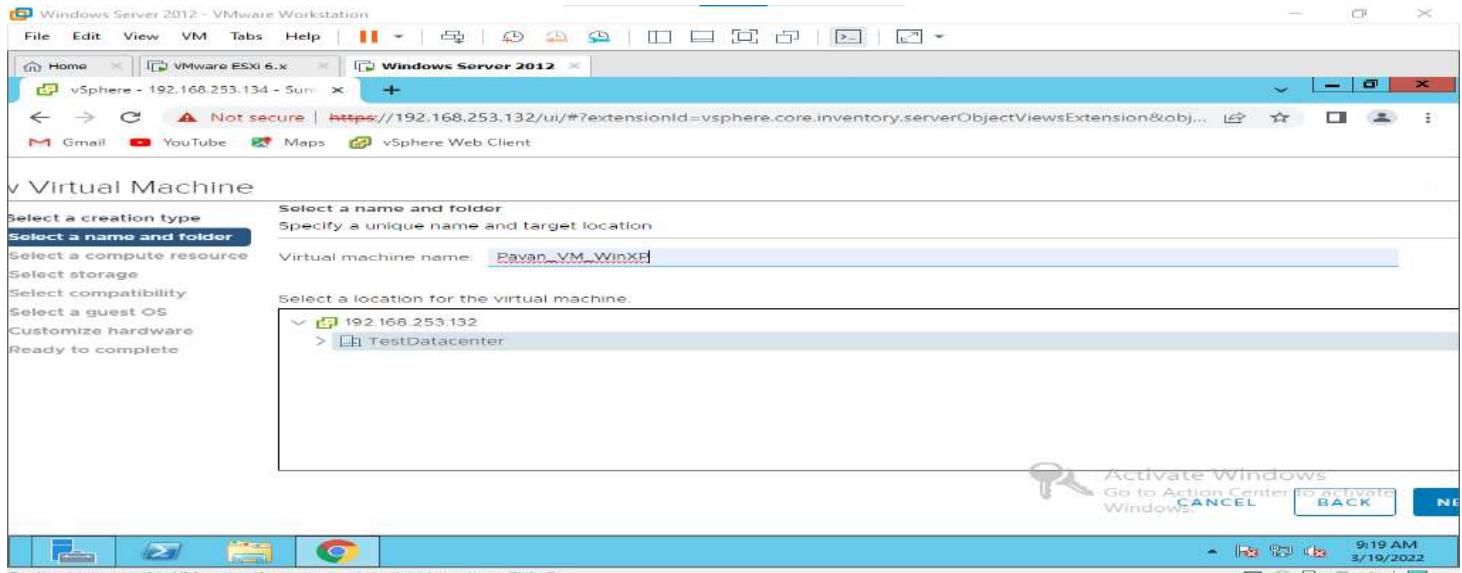
Again go to the **host tab** and **right-click** on the **host (IP\_address of Host)** and select **New Virtual Machine**.

The screenshot shows the vSphere Client interface. On the left, a tree view shows a host at 192.168.253.134 and a datacenter named TestDatacenter. A context menu is open over the host entry, with "New Virtual Machine..." highlighted. The main pane displays host details: Hypervisor: VMware ESXi, 6.7.0, 14320388; Model: VMware7.1; Processor Type: Intel(R) Core(TM) i5-10400 CPU @ 2.90GHz; Logical Processors: 2; NICS: 1; Virtual Machines: 0; State: Connected; Uptime: 3 hours. Resource usage bars show CPU (Used: 2.94 GHz, Capacity: 5.61 GHz), Memory (Used: 1.35 GB, Capacity: 4 GB), and Storage (Used: 26.16 GB, Capacity: 32.5 GB). The top navigation bar shows tabs for Home, VMware ESXi 6.x, Windows Server 2012, and Pavan\_VM\_WinXP. A watermark for "Activate Windows" is visible in the bottom right.

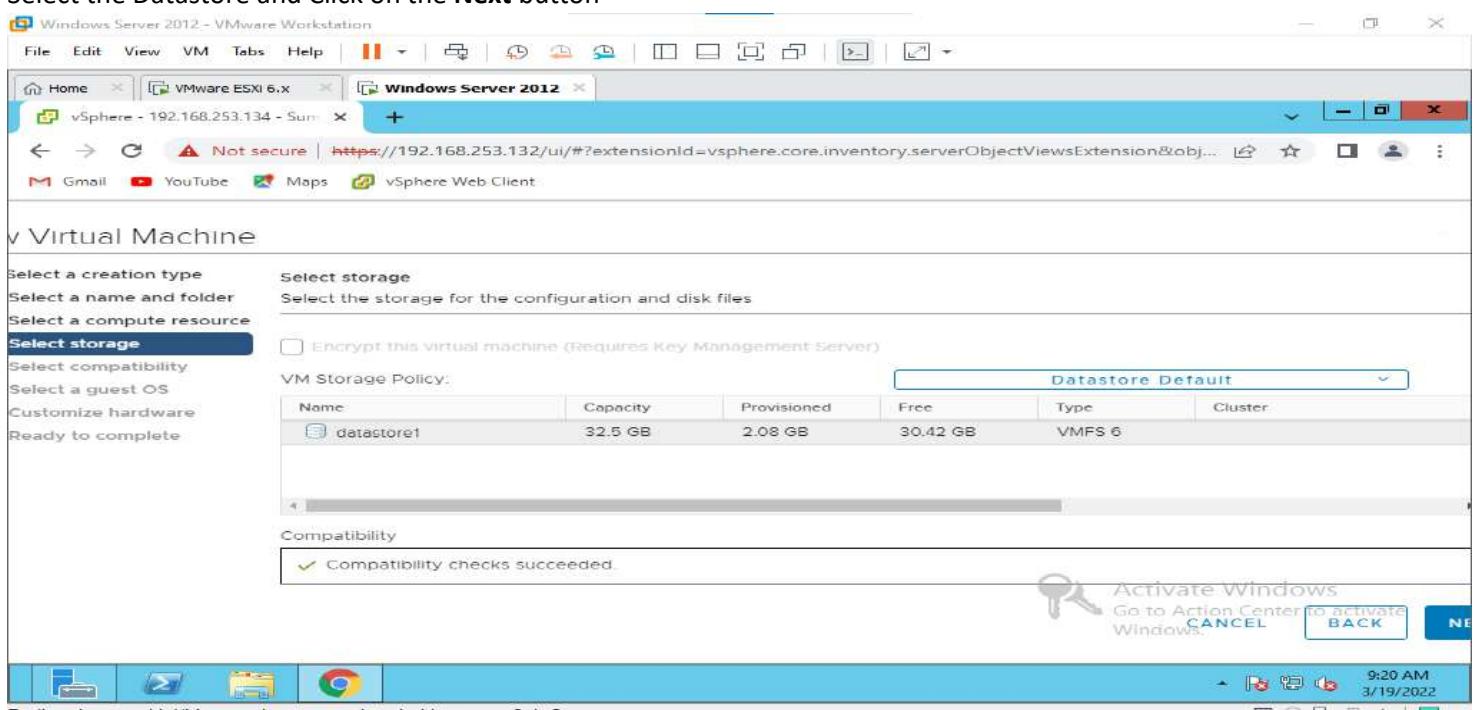
Click on the **Next button**

The screenshot shows the "Create a new virtual machine" wizard. Step 1, "Select a creation type", is selected. It lists options: Deploy from template, Clone an existing virtual machine, Clone virtual machine to template, Clone template to template, and Convert template to virtual machine. A detailed description on the right explains the "Deploy from template" option: "This option guides you through creating a new virtual machine. You will be able to customize processors, memory, network connections, and storage. You will need to install a guest operating system after creation." The top navigation bar shows tabs for Home, VMware ESXi 6.x, Windows Server 2012, and Pavan\_VM\_WinXP. A watermark for "Activate Windows" is visible in the bottom right.

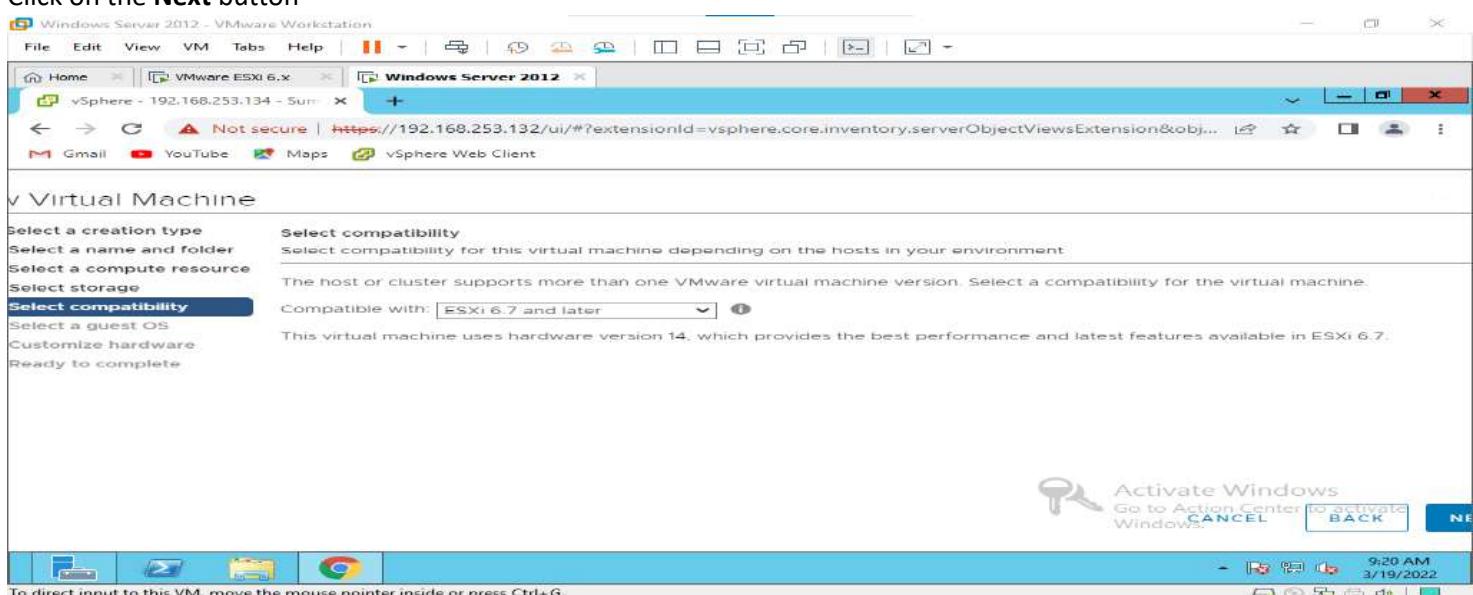
Enter the VM name and click on the **Next** button



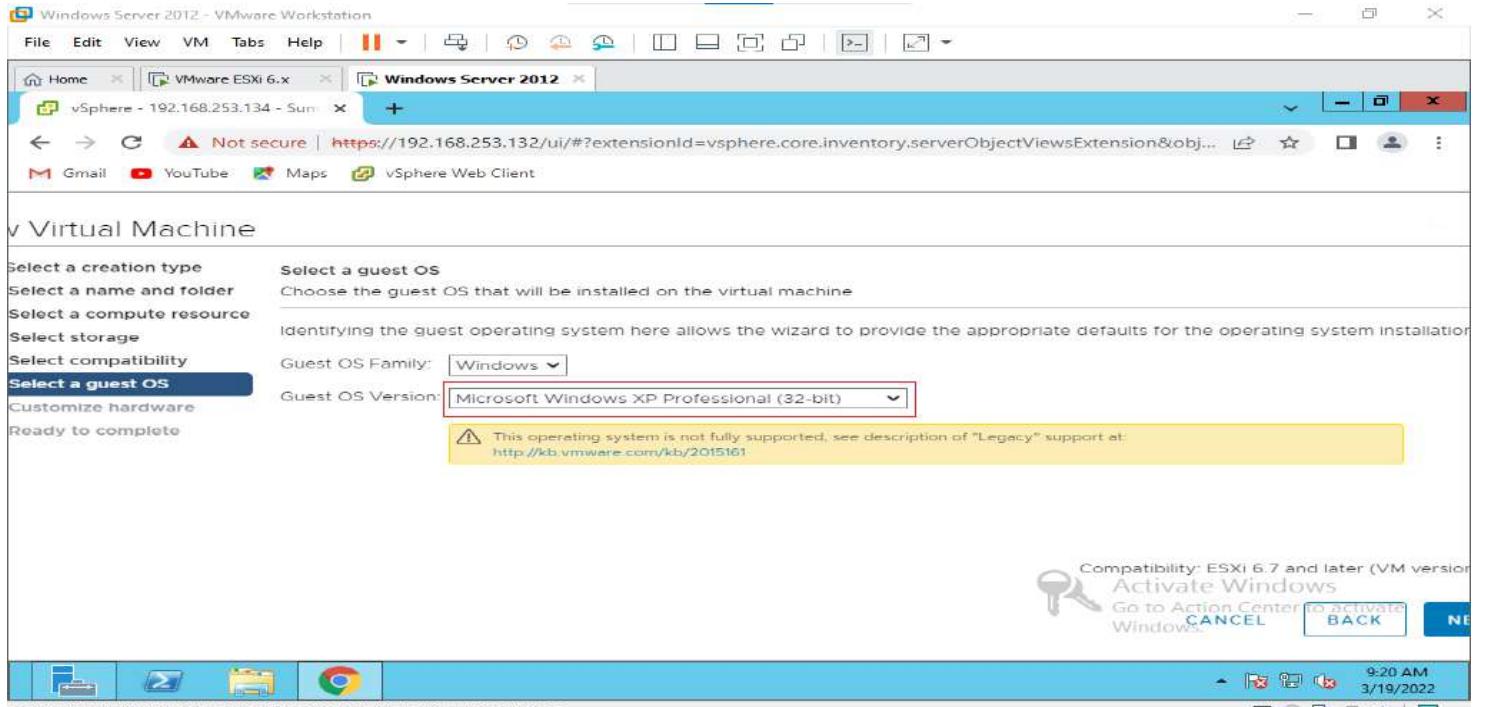
Select the Datastore and Click on the **Next** button



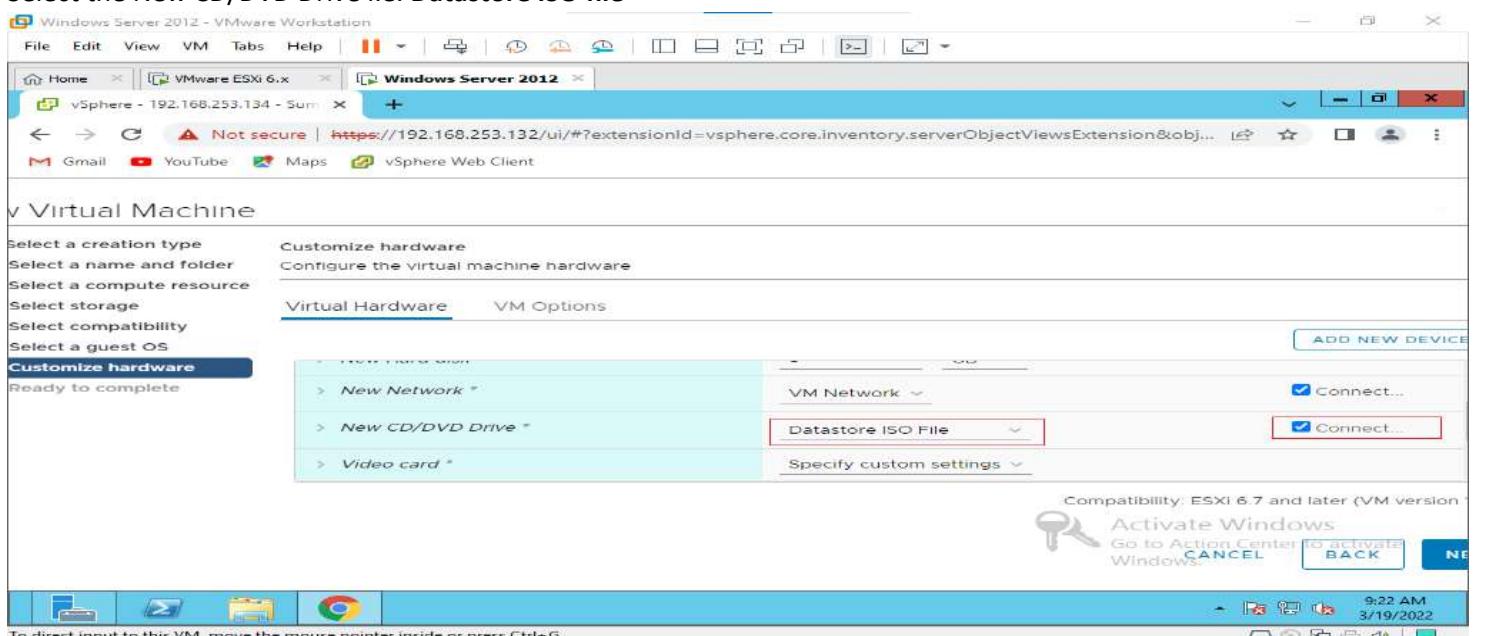
Click on the **Next** button



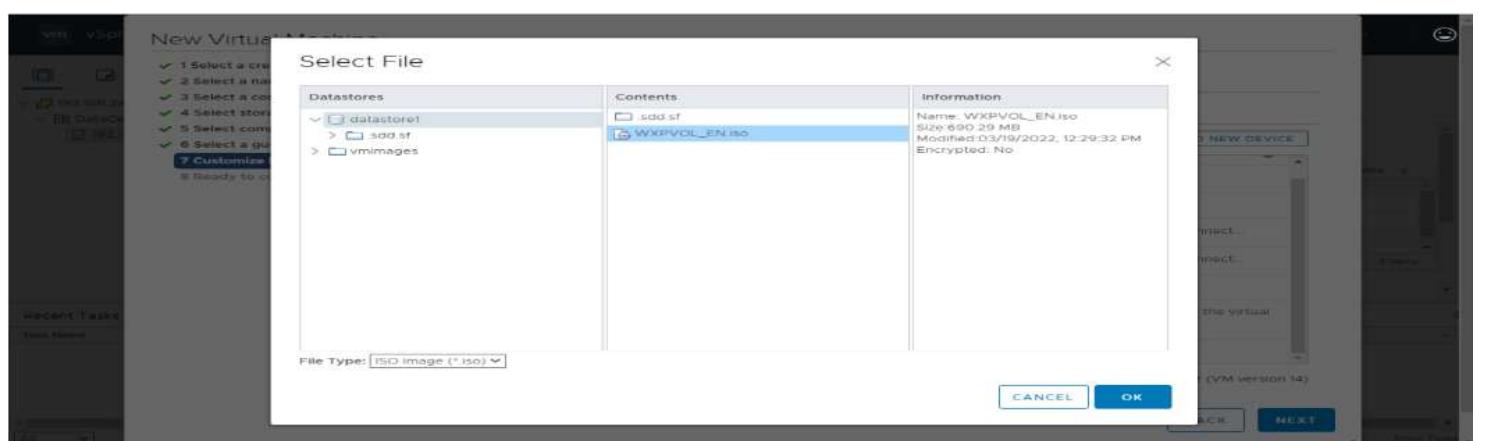
Select the Guest OS Version (in our case we choose the **WinXp Pro (32 bit)** because the .iso file is WinXPPro32) and Click on the **Next** button



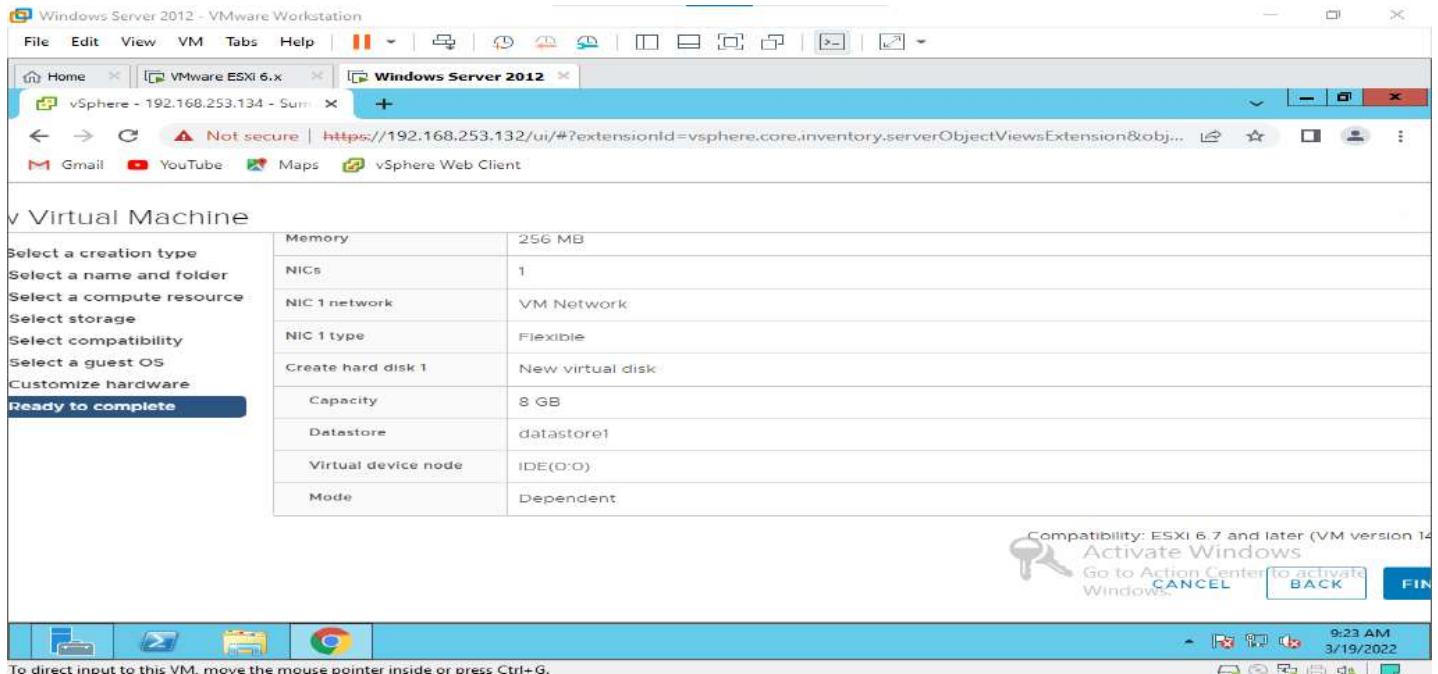
Select the New CD/DVD Drive i.e. Datastore ISO file



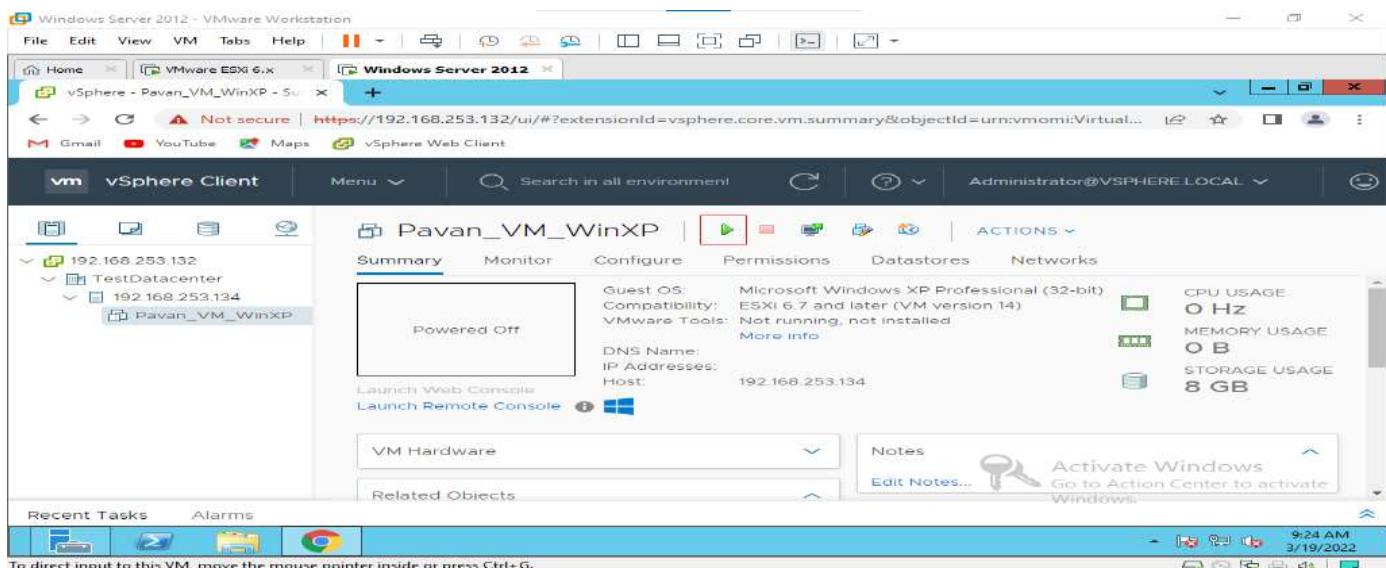
And select the uploaded iso file and Click on the **OK** button. After click on the **Next** button



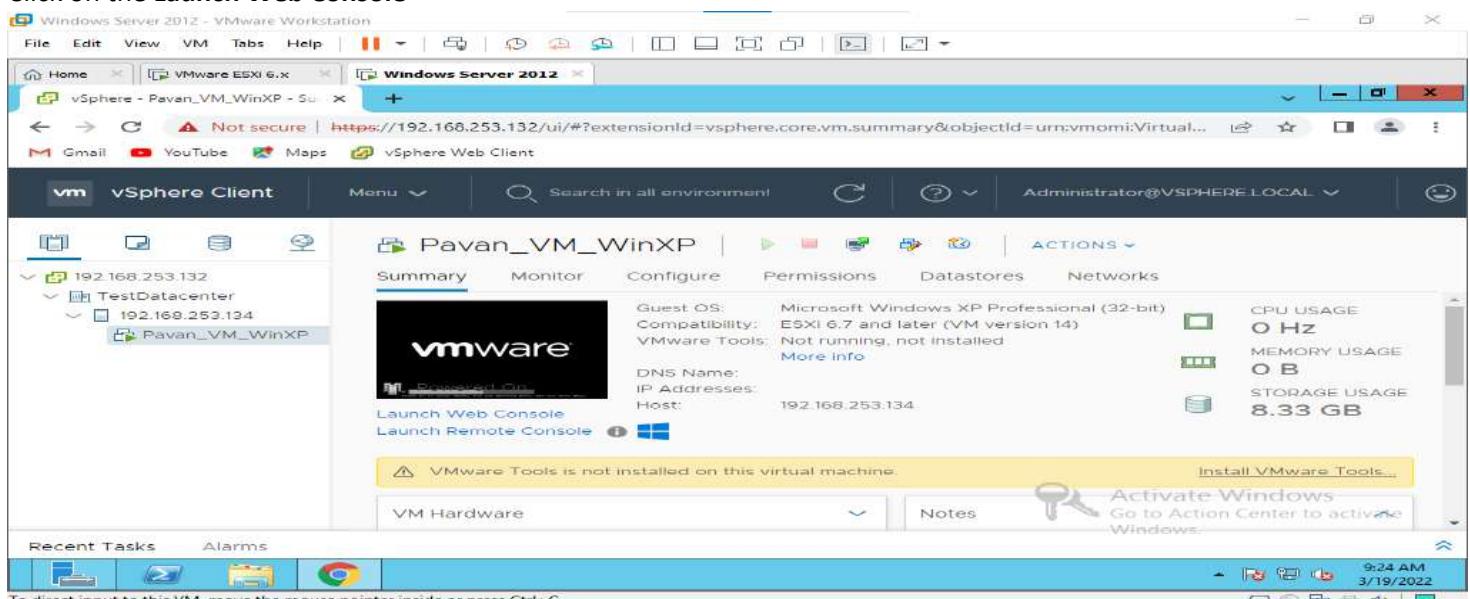
## Click on the Finish button



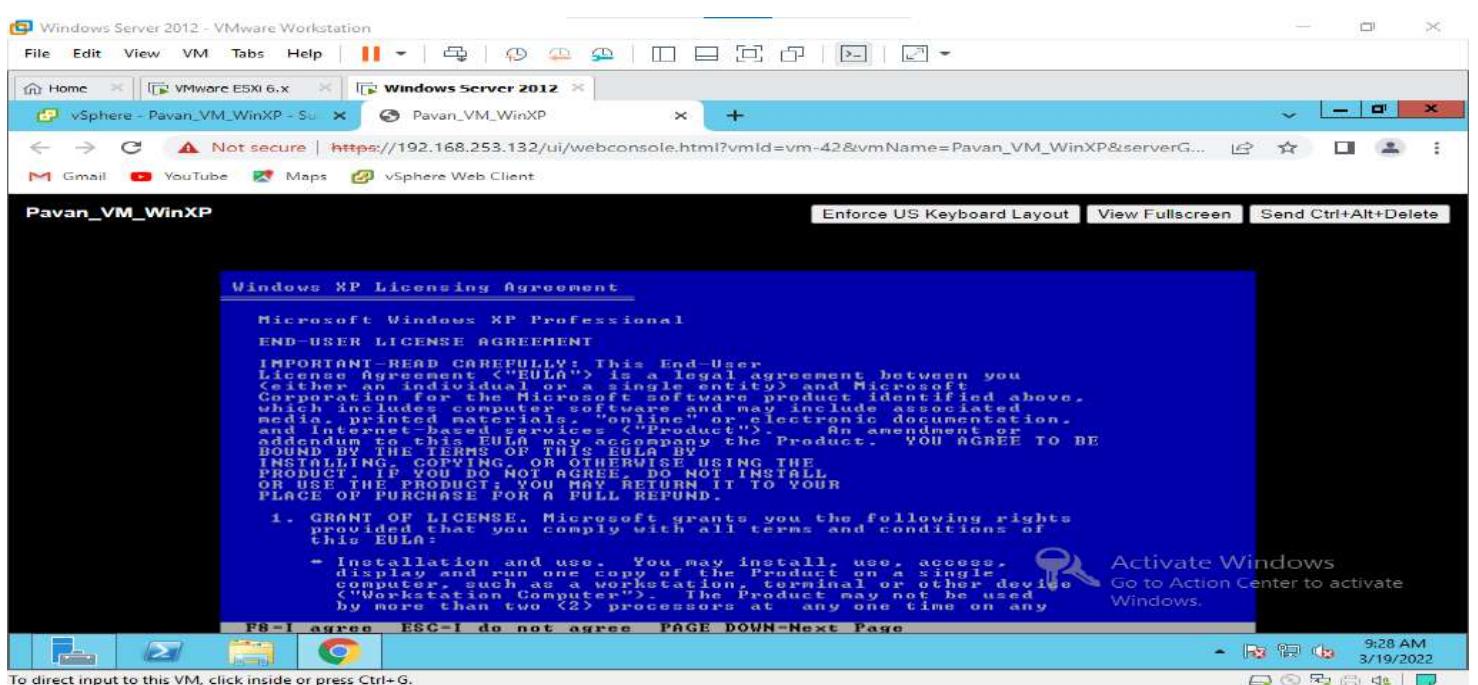
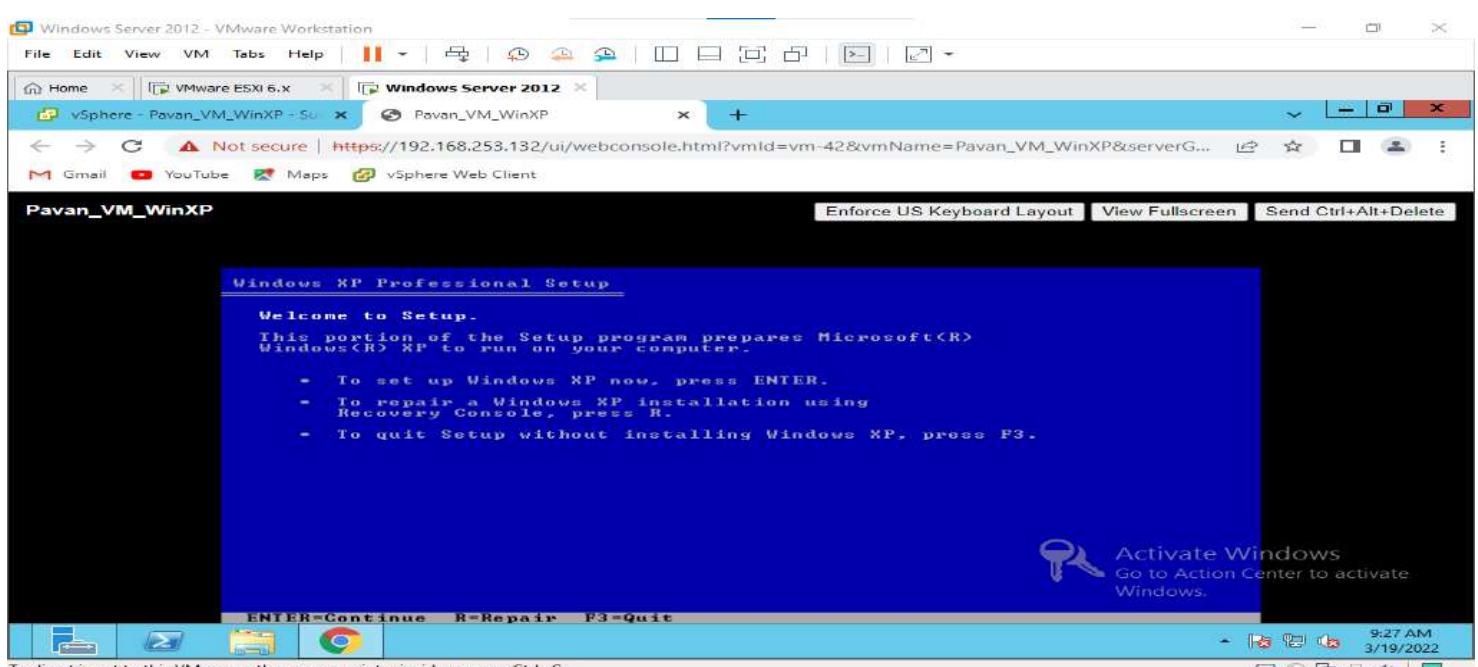
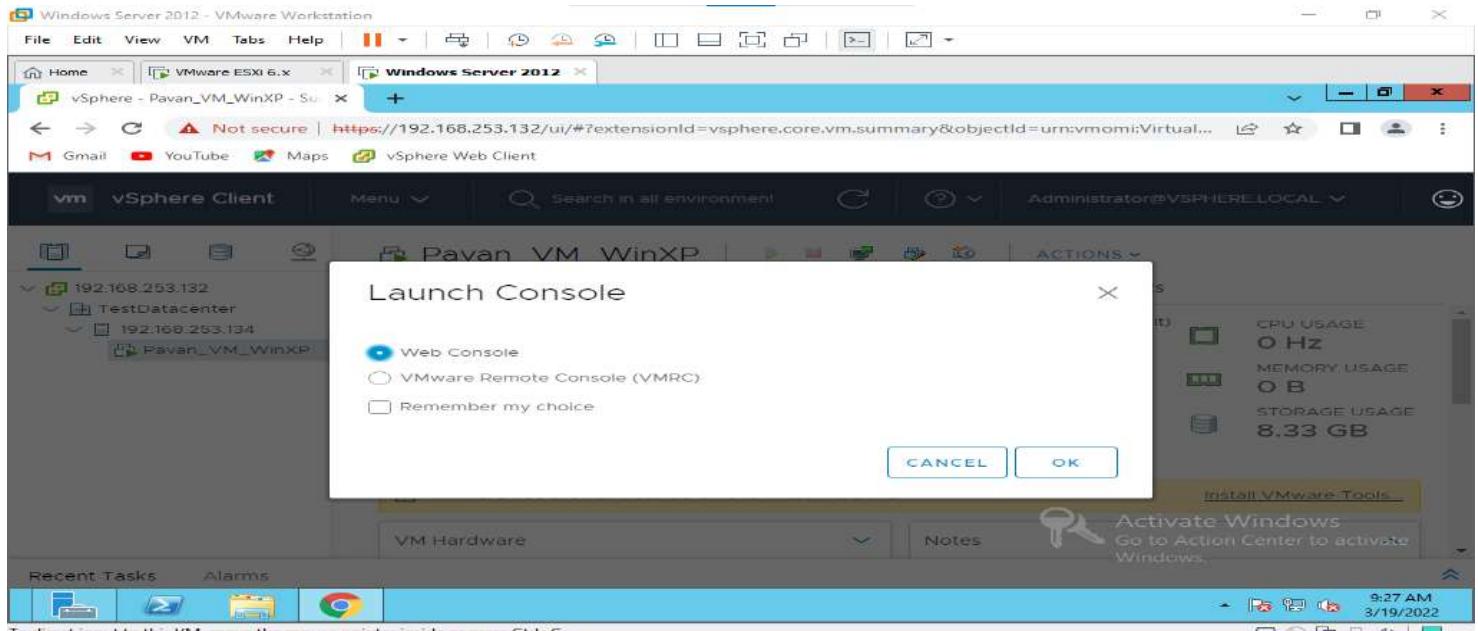
Virtual Machine created. First refresh the Host and Start the VM

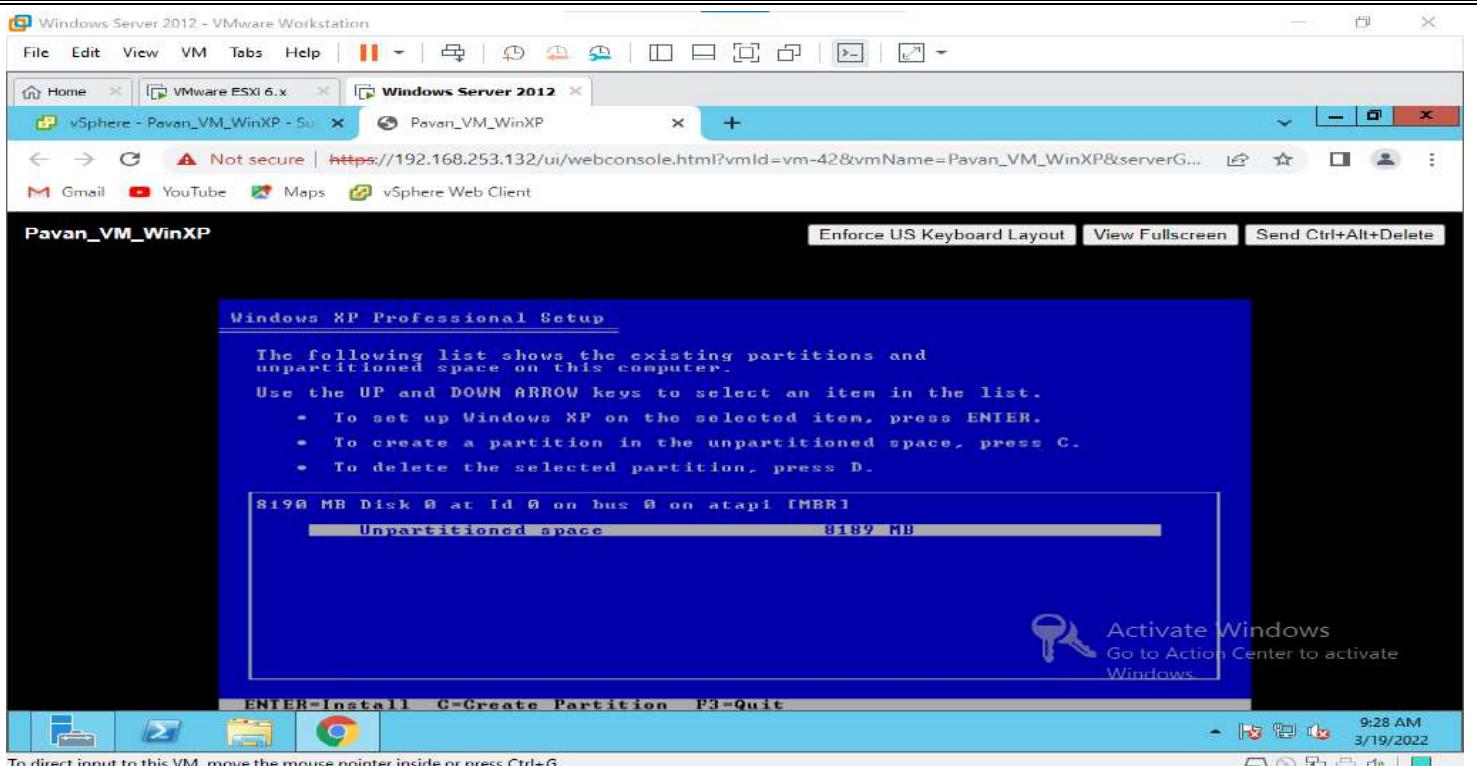


## Click on the Launch Web Console

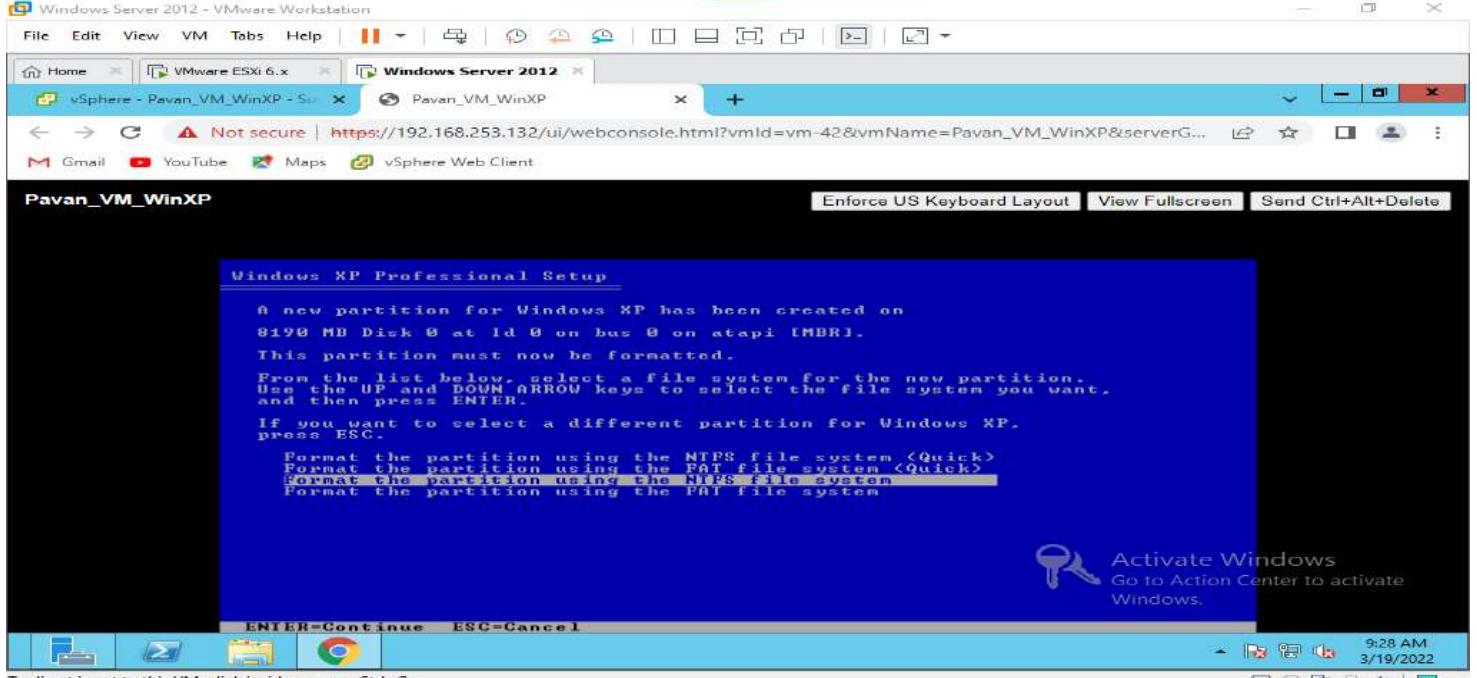


## Select the Web Console and Click on the OK button

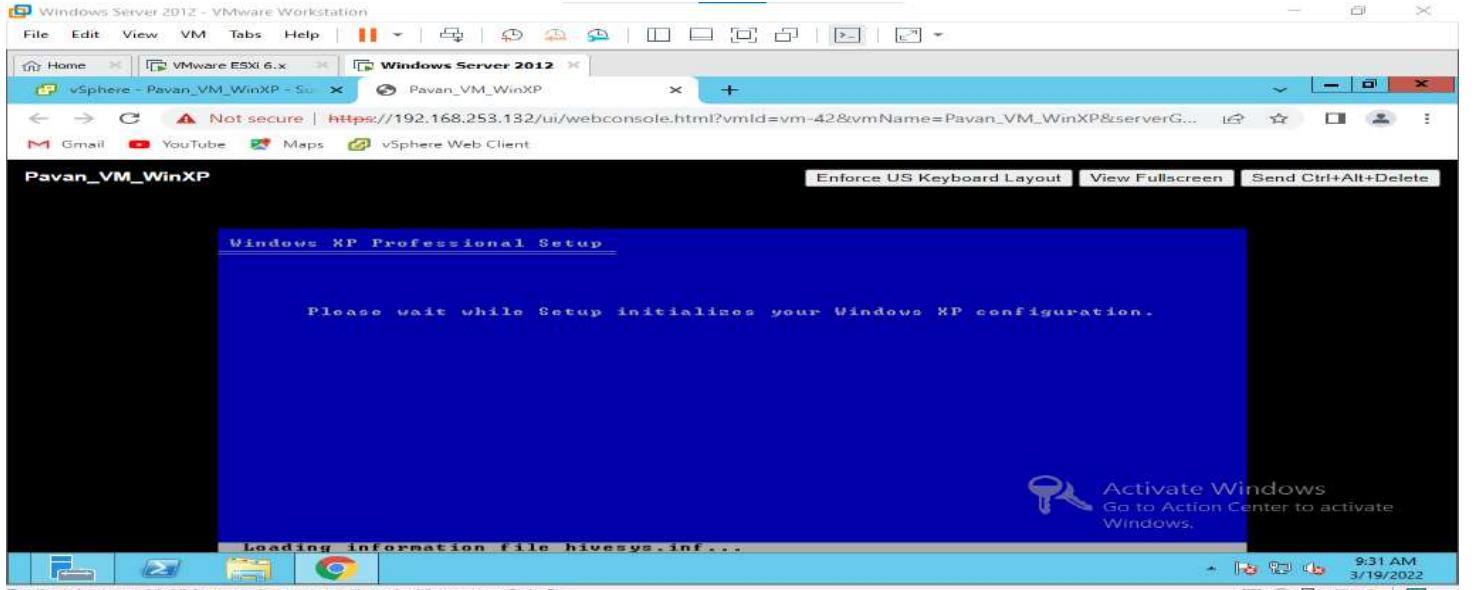




To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

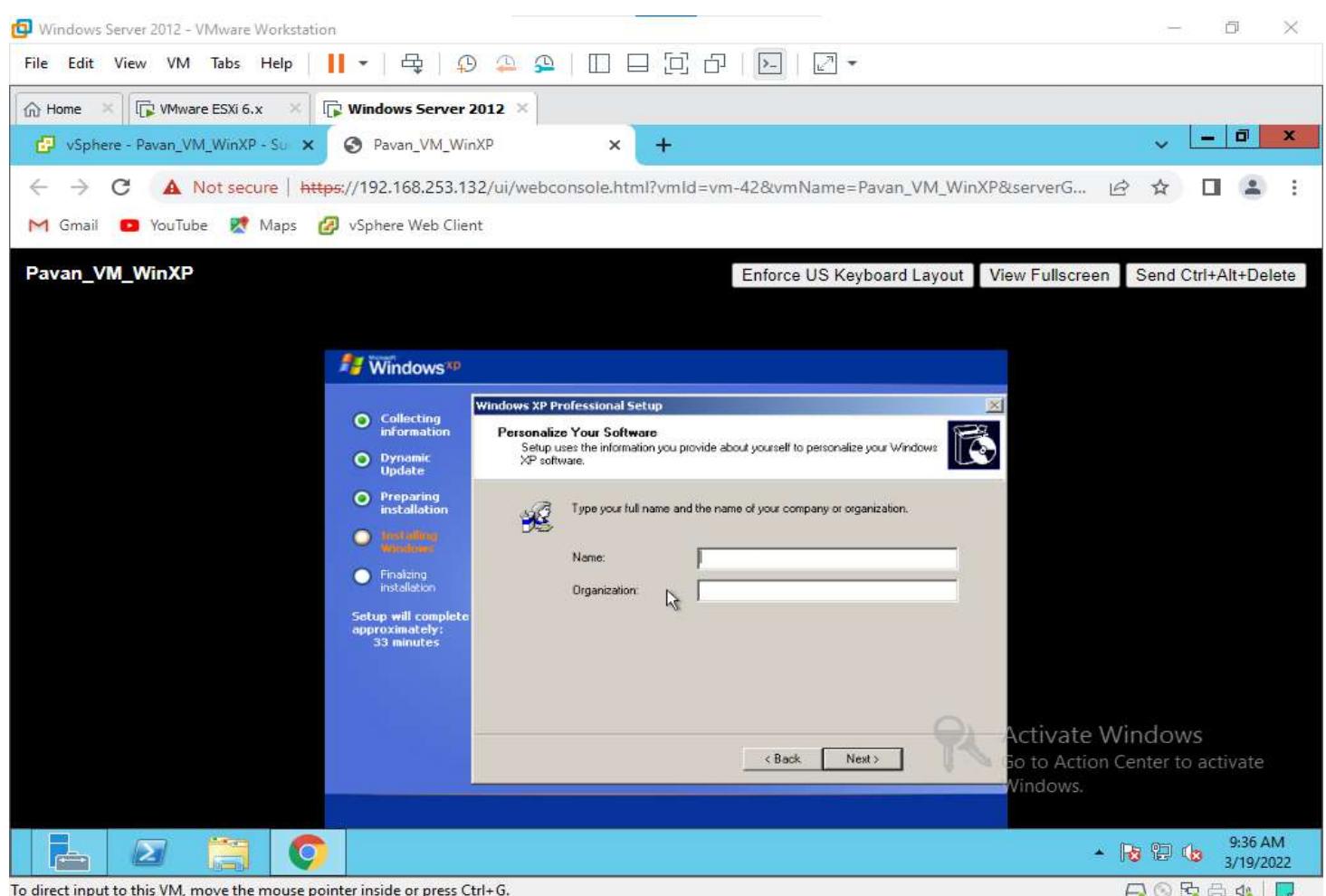
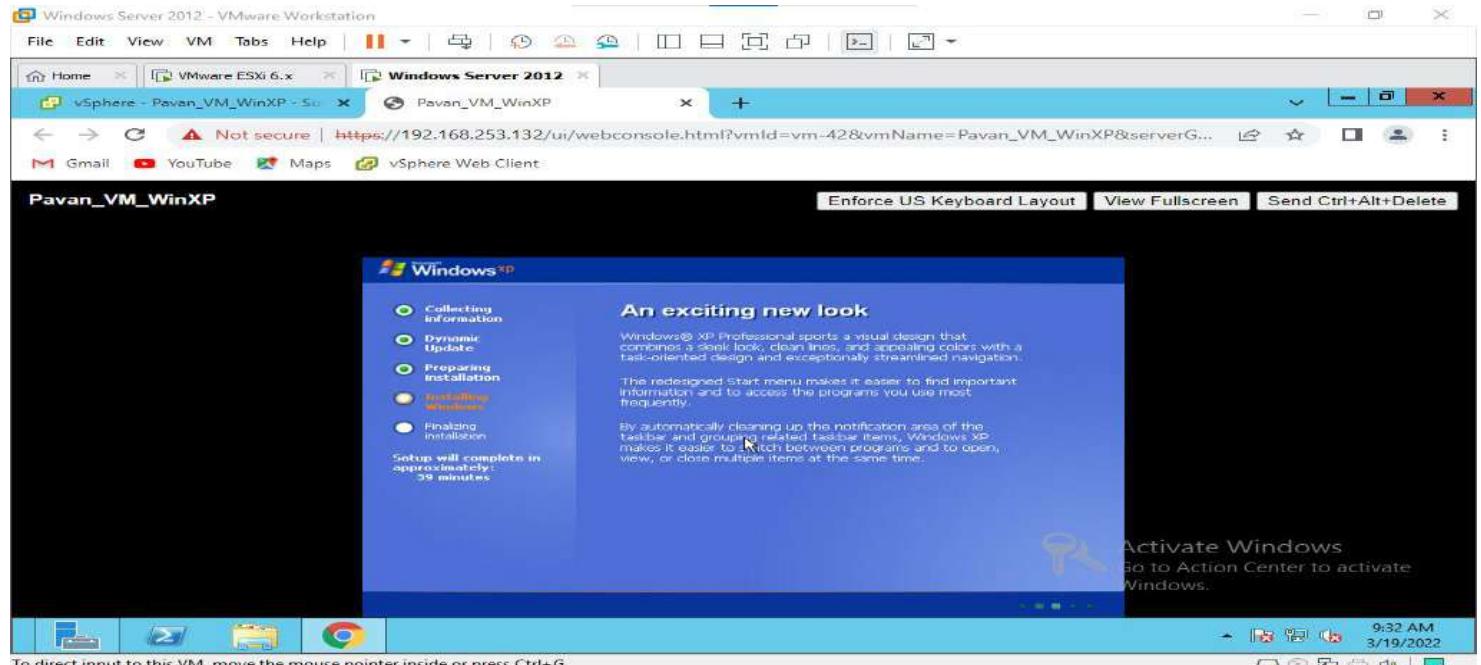


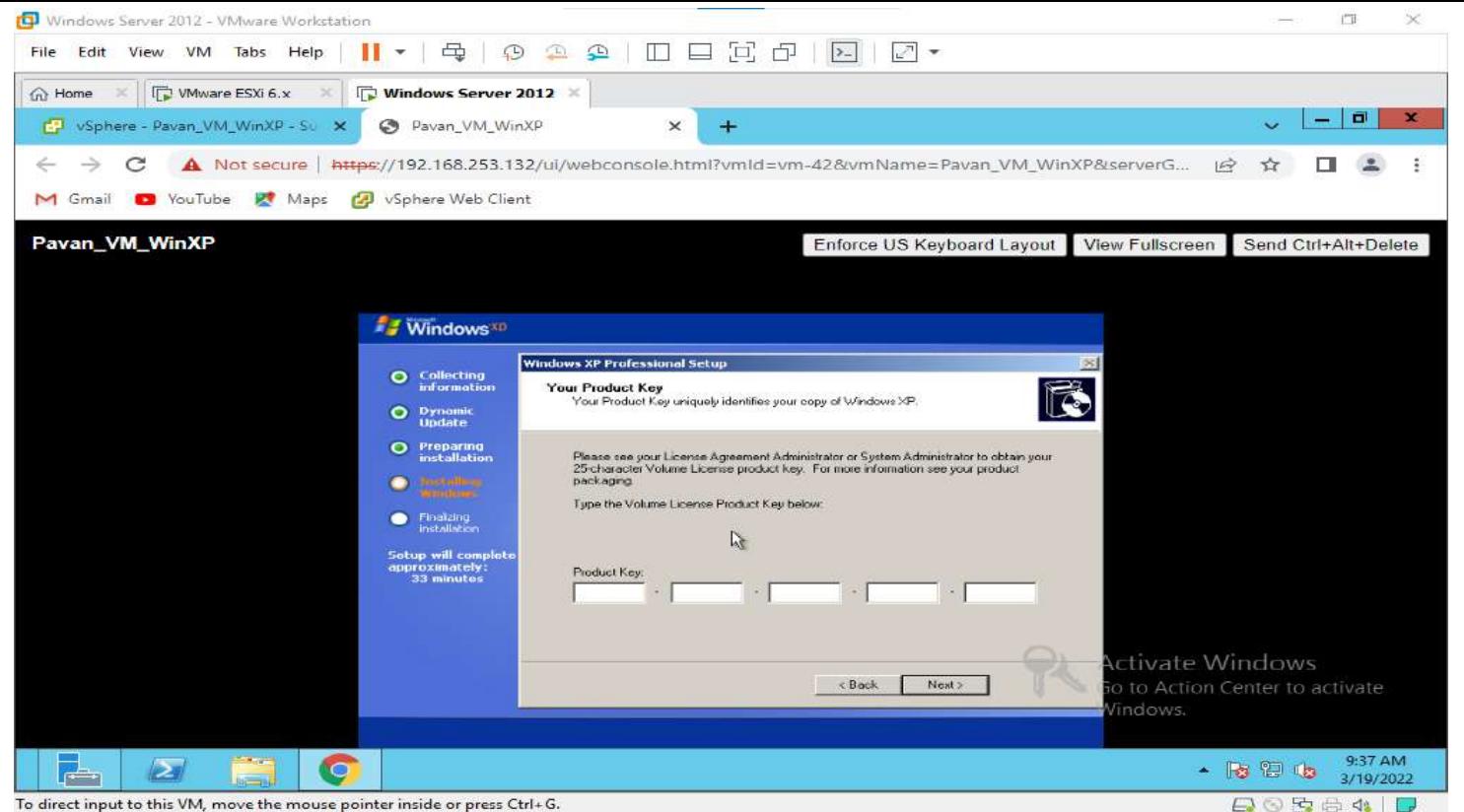
To direct input to this VM, click inside or press Ctrl+G.



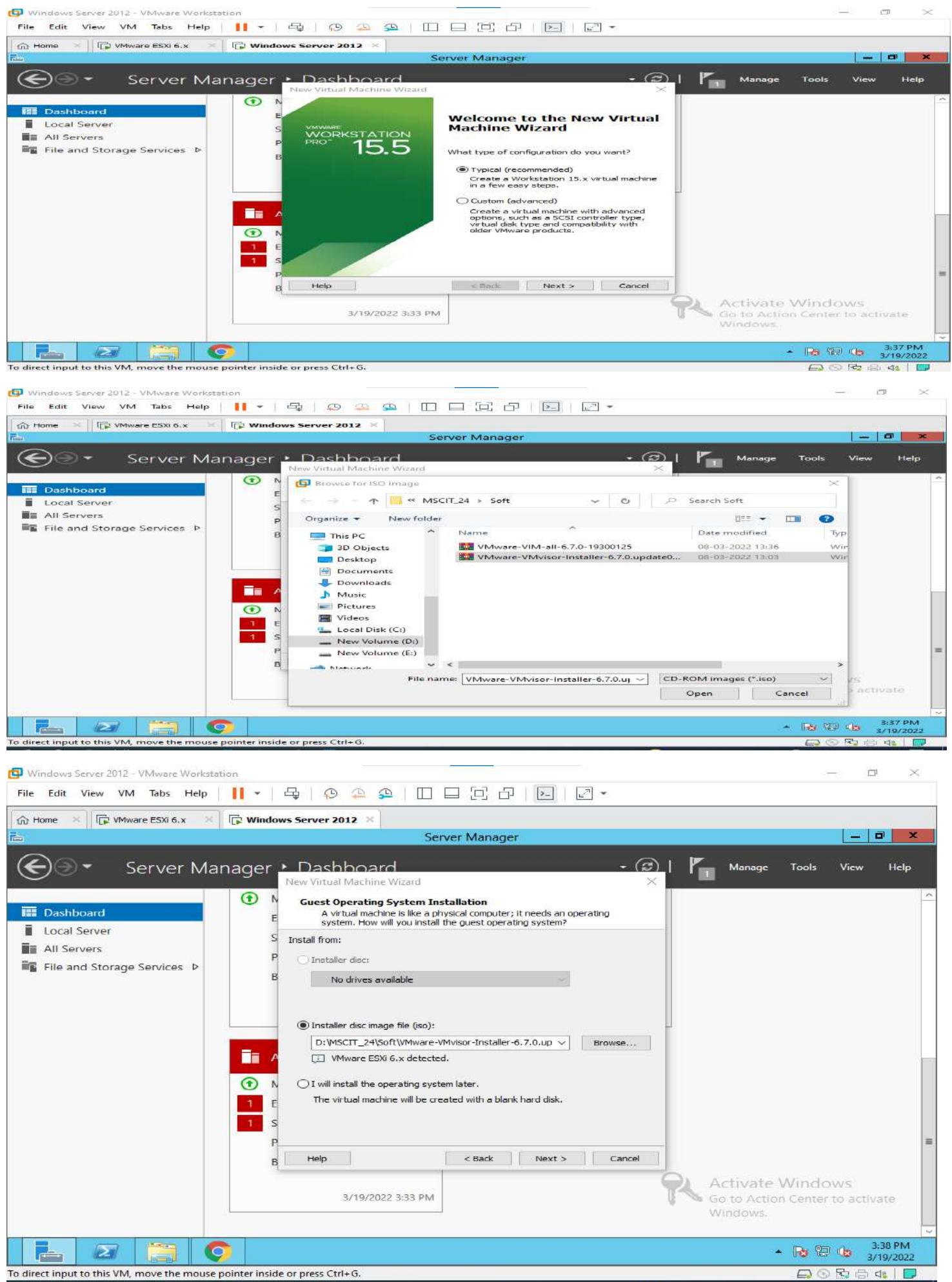
To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

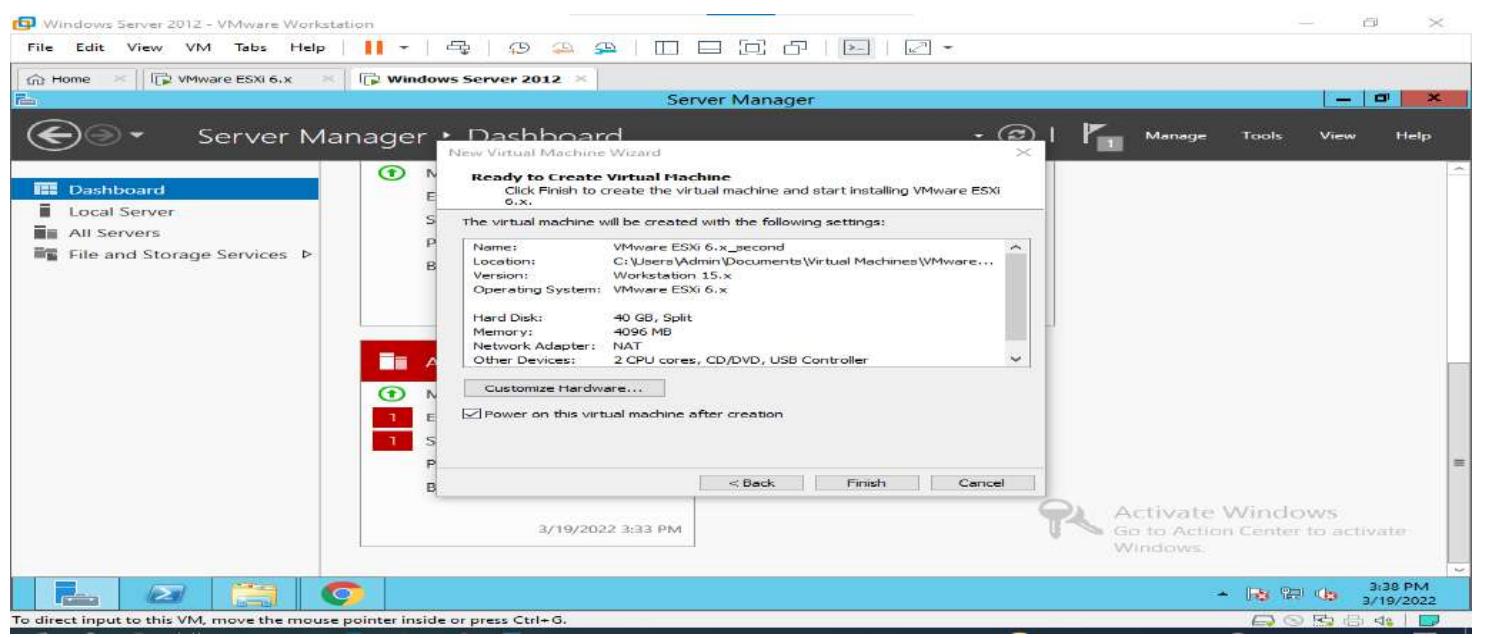
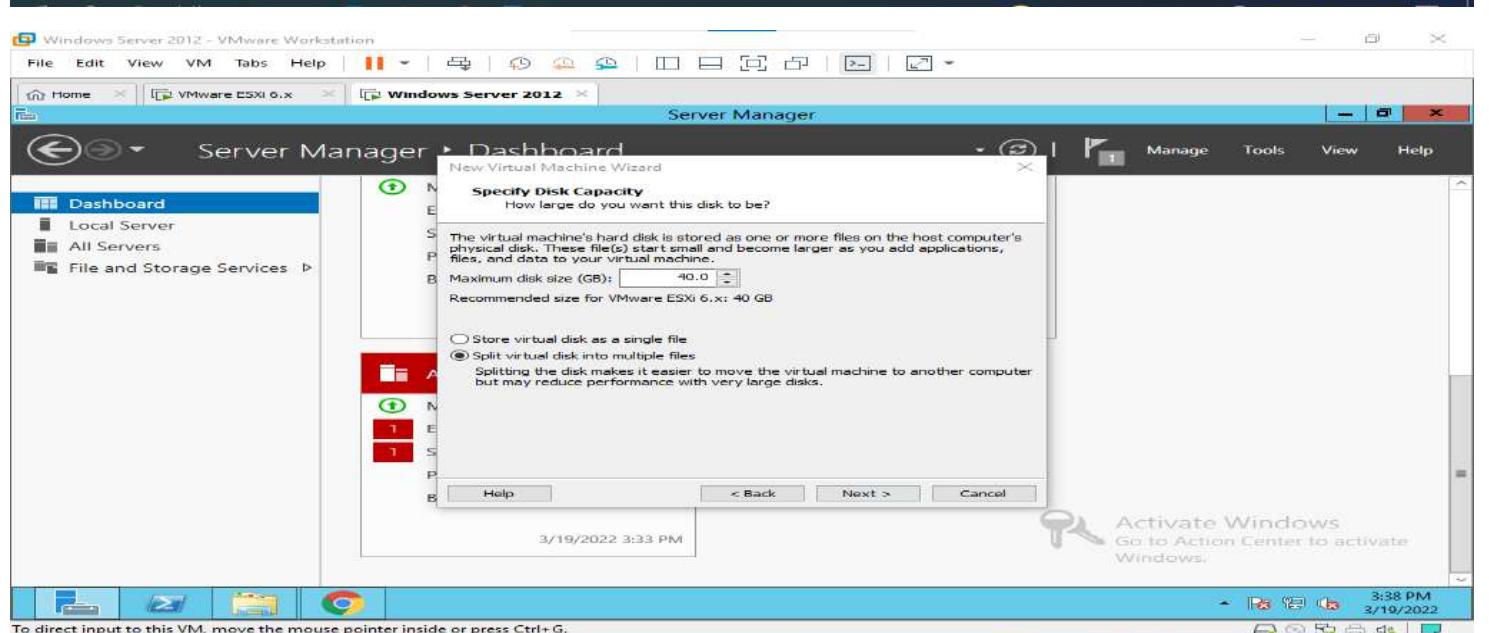
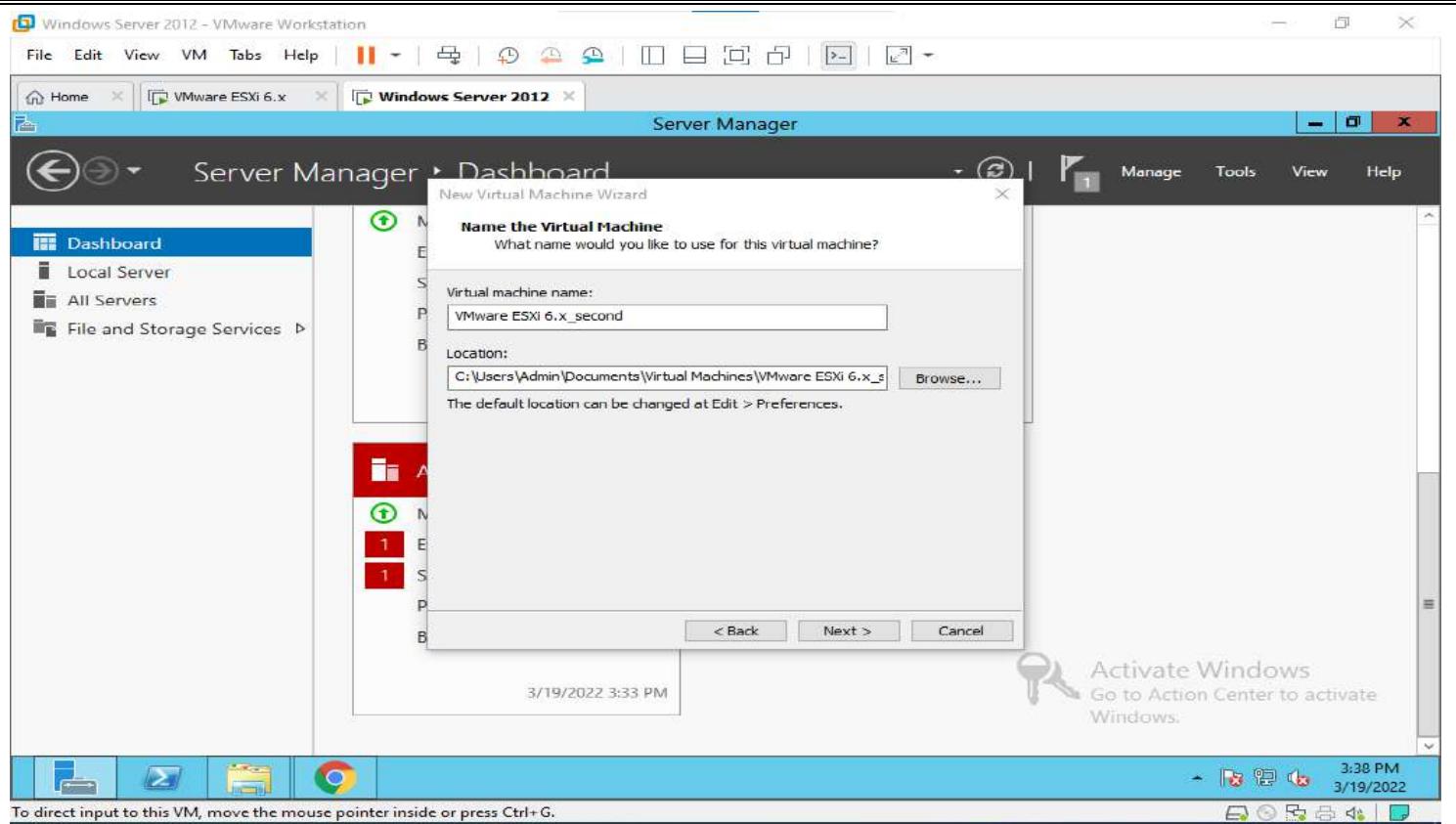
We can see the below image which shows that our virtual machine is running.

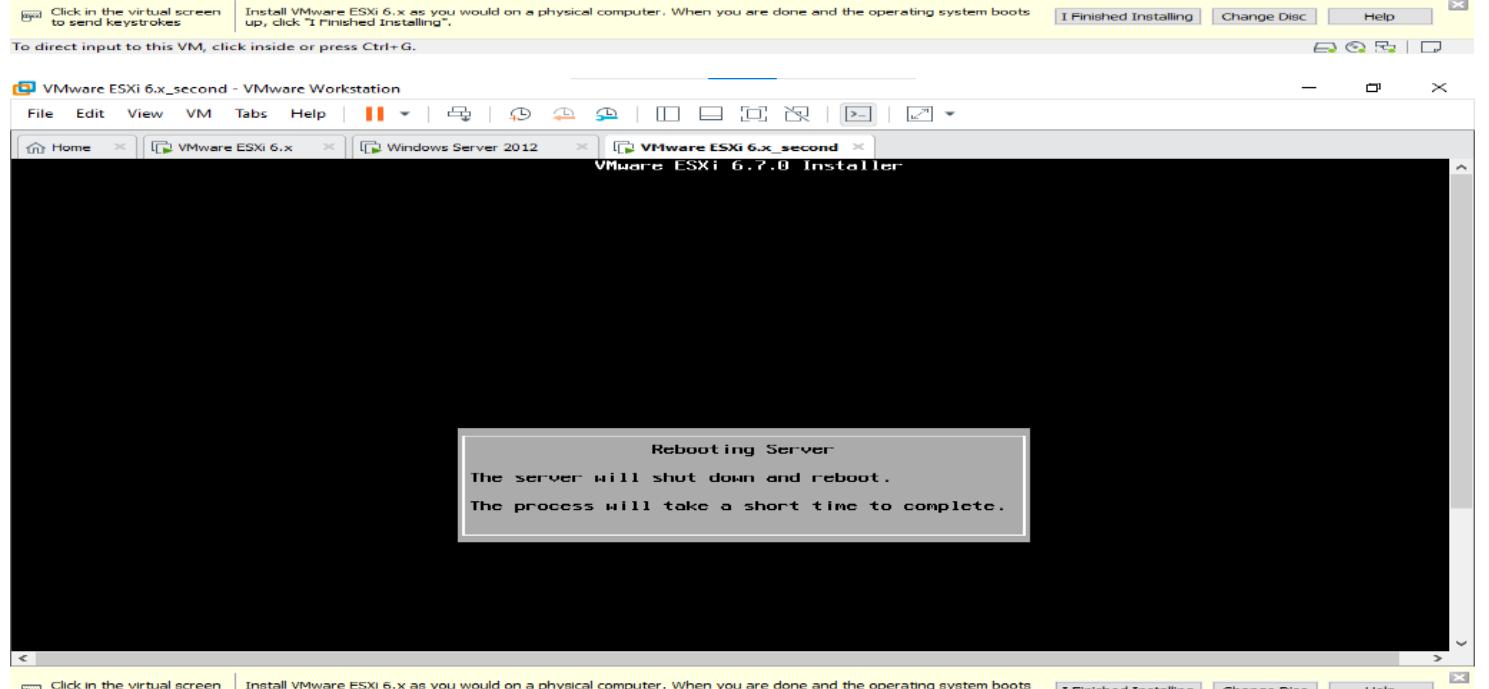
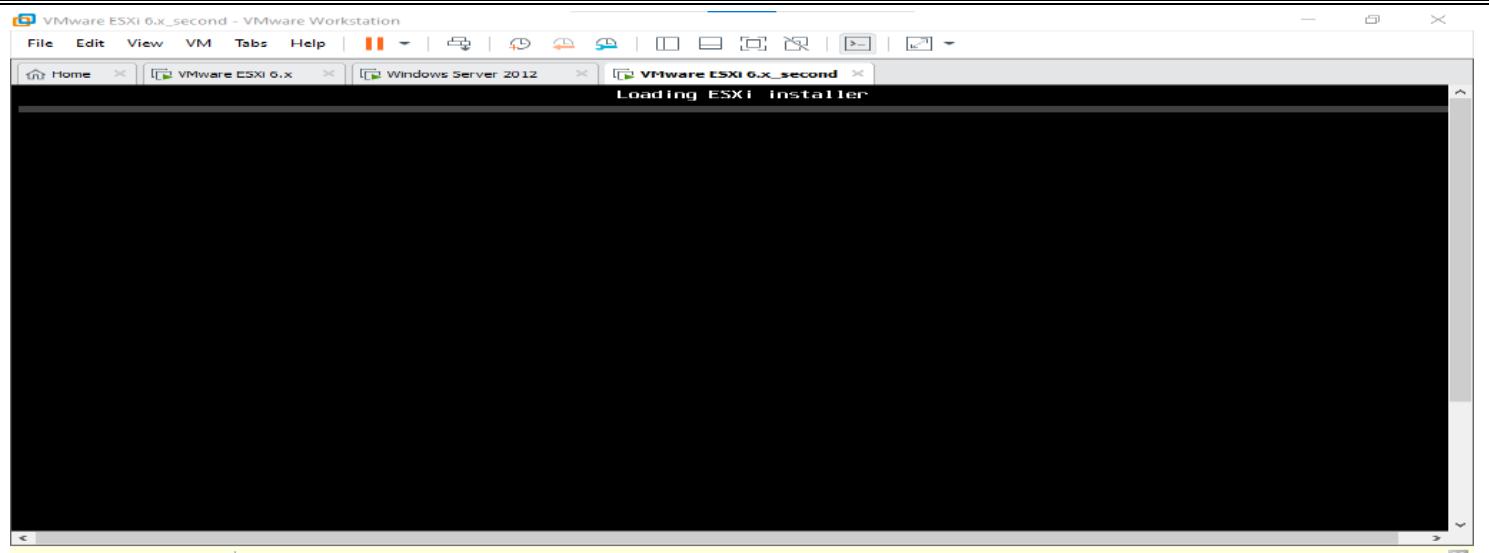




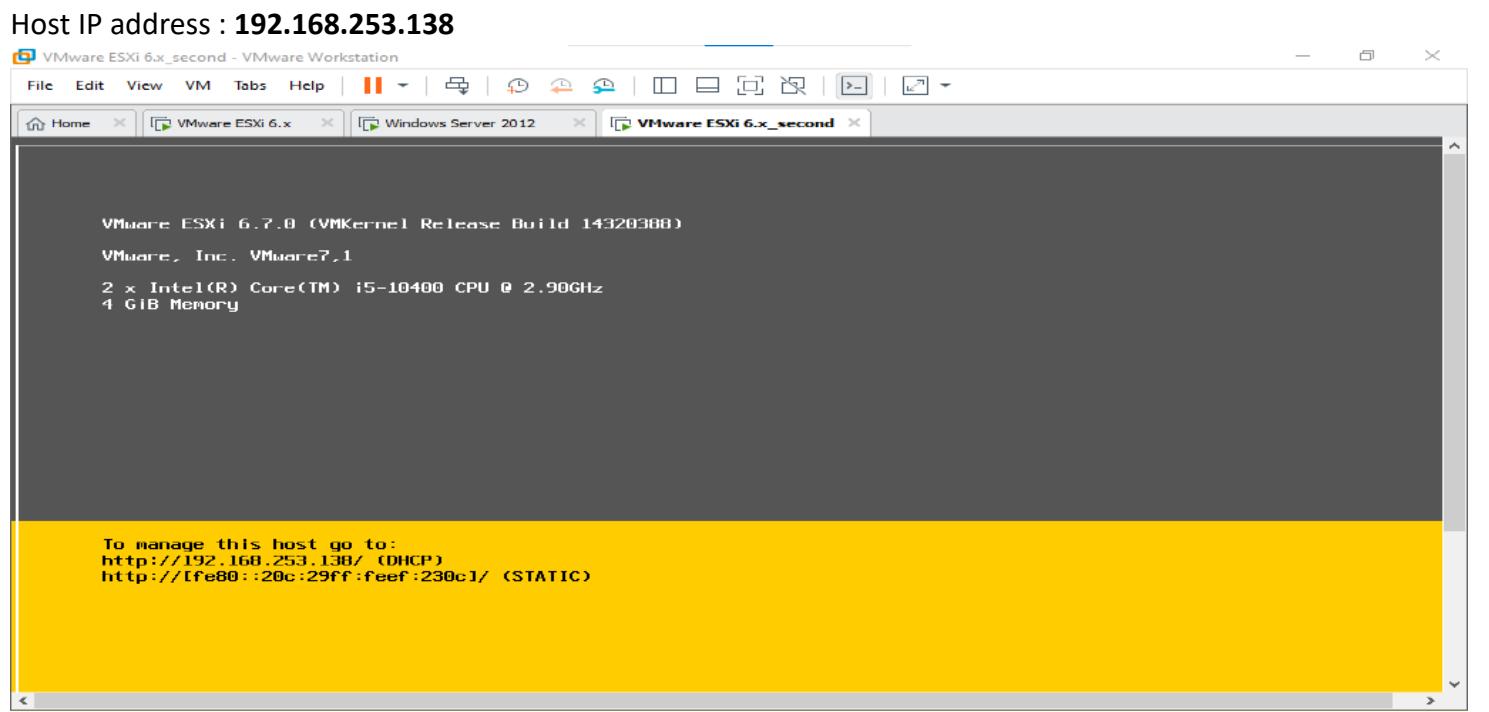
## B- Migrate the virtual machine from one ESXi server to another ESXi server.







Host IP address : 192.168.253.138



To direct input to this VM, click inside or press Ctrl+G.

## Add Second Host to VMware vSphere Server, To add the host click on Add Host

vSphere - TestDatacenter - Datastores > Pavan\_Template\_VM

Not secure | https://192.168.253.132/ui/#?extensionId=vsphere.core.datacenter.relatedDatastoresTab&obj...

Gmail YouTube Maps vSphere Web Client

vm vSphere Client Menu Search in all environments

Action: Add Host...

Datacenter | ACTIONS

Monitor Configure Permissions Hosts & Clusters VMs Datastores Networks

Datastore Clusters Datastore Folders

	Status	Type	Datastore Cluster	Capacity	Free
	Normal	VMFS 6		32.5 GB	13.76 GB
	Normal	NFS 3		100 GB	67.63 GB
	Normal	VMFS 6		475 GB	3.34 GB

Activate Windows Go to Action Center to activate Windows.

Recent Task

3:43 PM 3/19/2022

Windows Server 2012 - VMware Workstation

File Edit View VM Tabs Help

vSphere - TestDatacenter - Datastores > Pavan\_Template\_VM

Not secure | https://192.168.253.132/ui/#?extensionId=vsphere.core.datacenter.relatedDatastoresTab&obj...

Home VMware ESXi 6.x Windows Server 2012 VMware ESXi 6.x\_second

vm vSphere Client Menu Search in all environments

Add Host

1 Name and location

2 Connection settings

3 Host summary

4 Assign license

5 Lockdown mode

6 VM location

7 Ready to complete

Name and location  
Enter the name or IP address of the host to add to vCenter Server.

Host name or IP address: 192.168.253.138

Location: TestDatacenter

CANCEL BACK NEXT Activate Windows Go to Action Center to activate Windows.

Recent Tasks Alarms

3:44 PM 3/19/2022

Windows Server 2012 - VMware Workstation

File Edit View VM Tabs Help

vSphere - TestDatacenter - Datastores > Pavan\_Template\_VM

Not secure | https://192.168.253.132/ui/#?extensionId=vsphere.core.datacenter.relatedDatastoresTab&obj...

Home VMware ESXi 6.x Windows Server 2012 VMware ESXi 6.x\_second

vm vSphere Client Menu Search in all environments

Add Host

✓ 1 Name and location

2 Connection settings

3 Host summary

4 Assign license

5 Lockdown mode

6 VM location

7 Ready to complete

Connection settings  
Enter the host connection details

User name: root

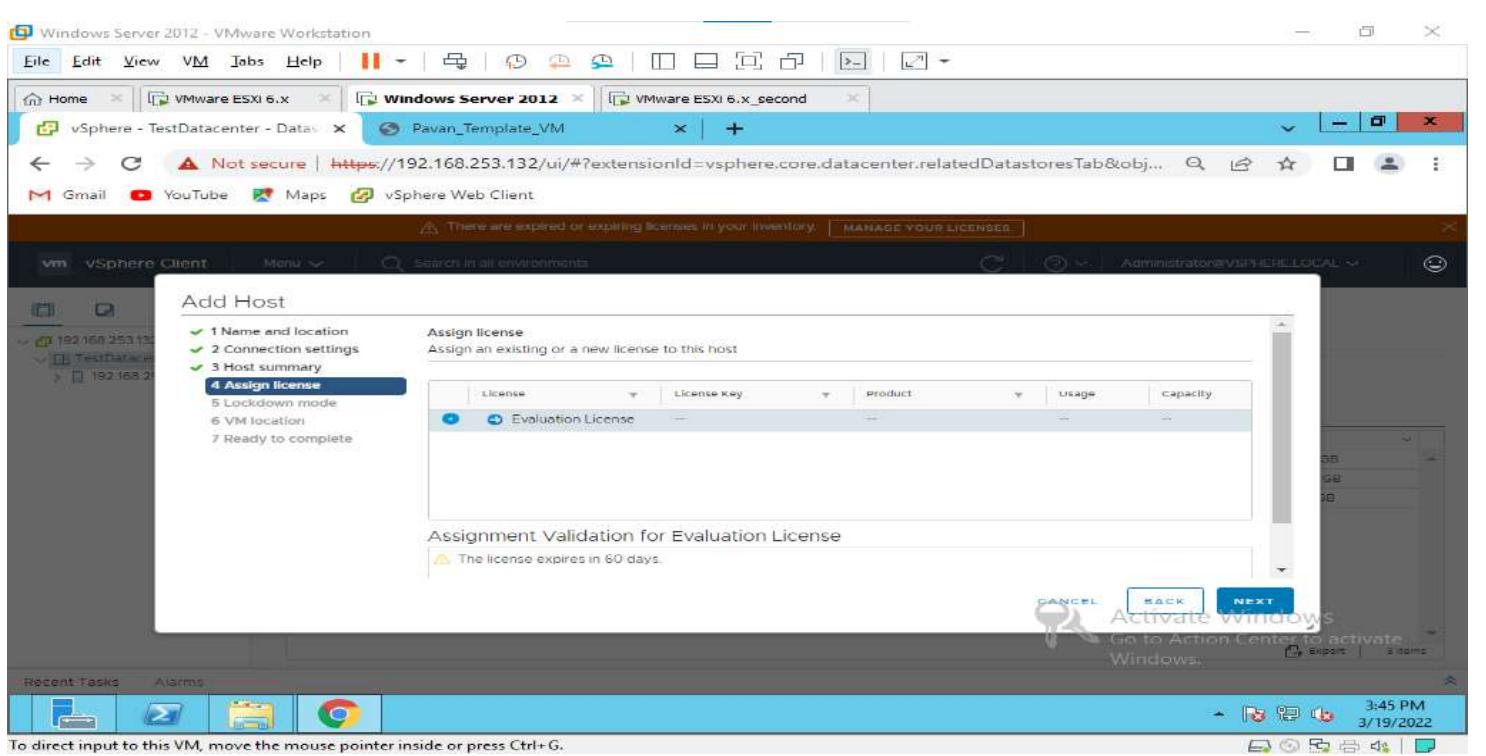
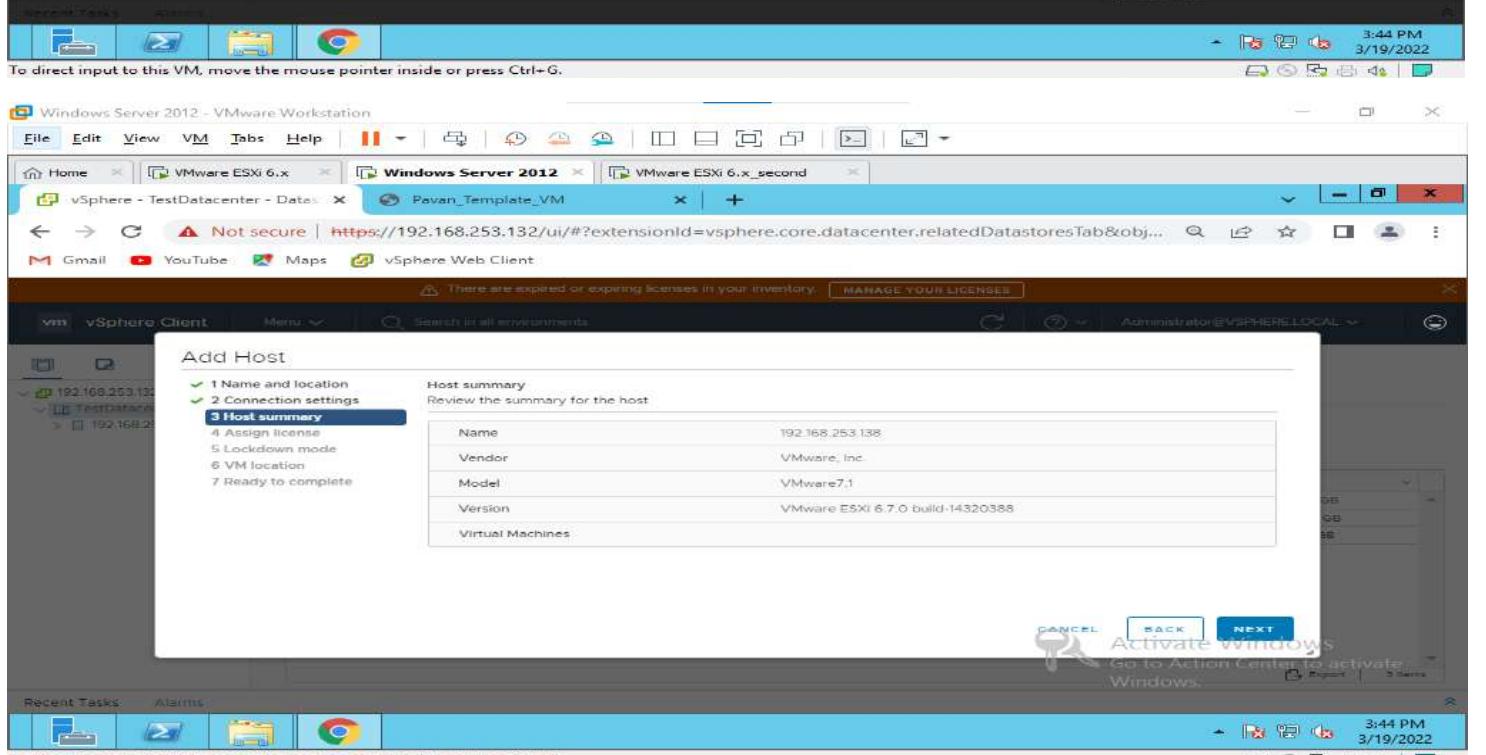
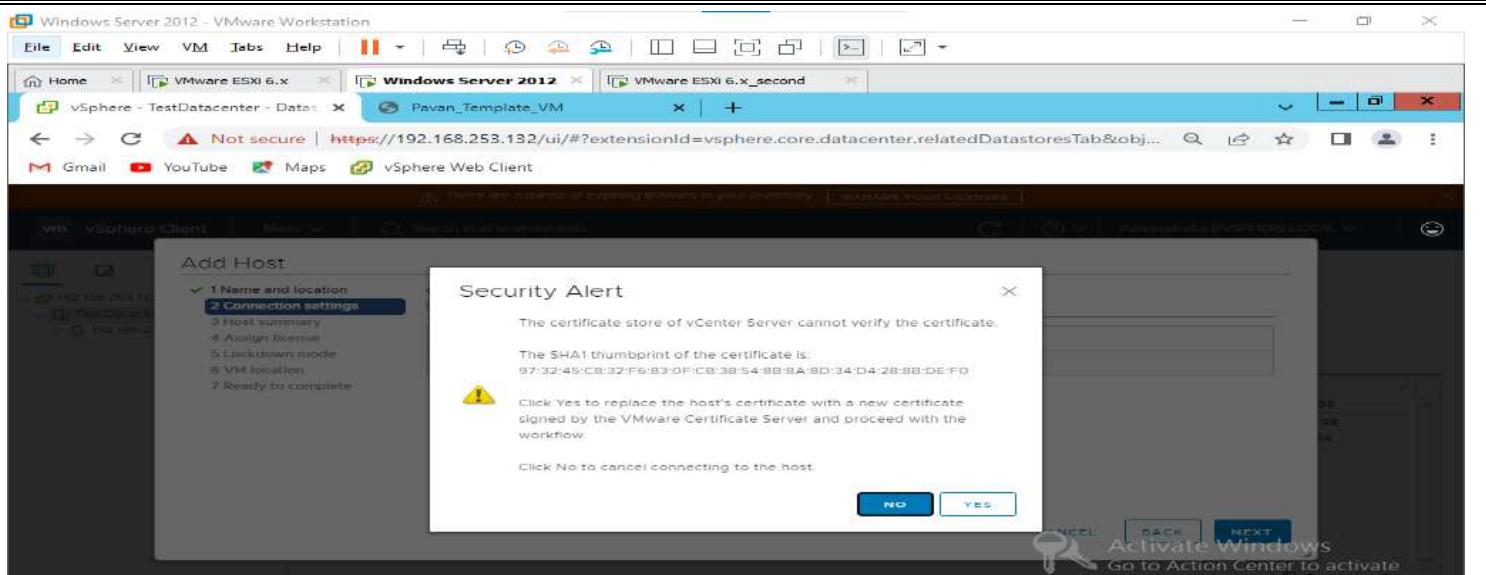
Password: .....|

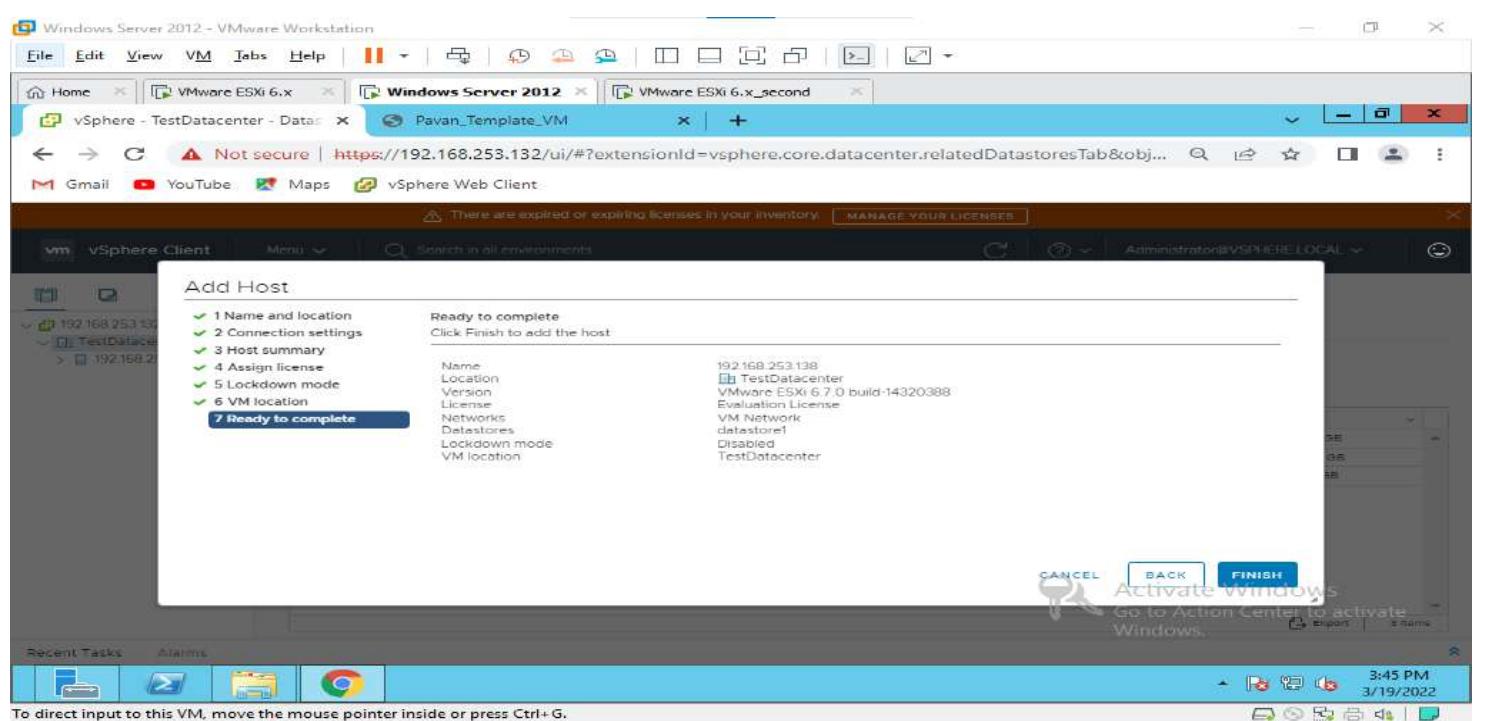
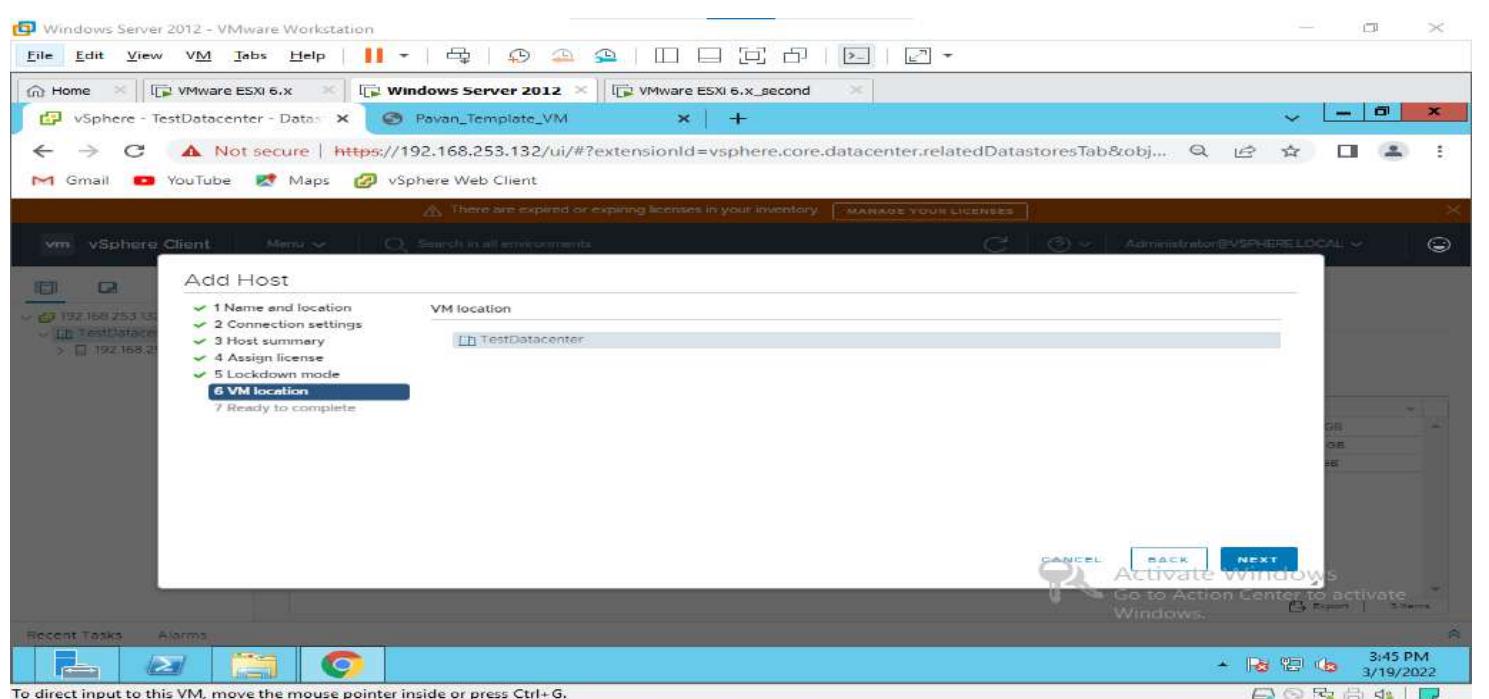
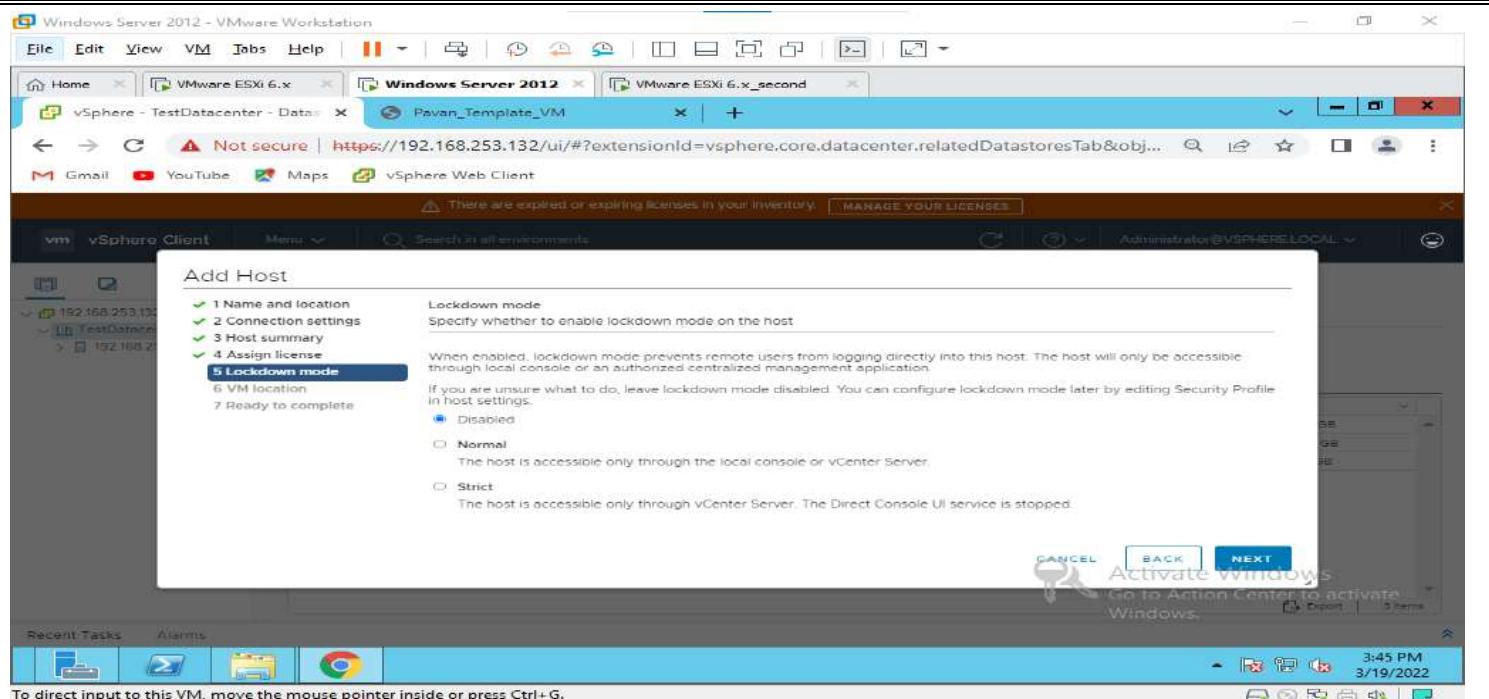
CANCEL BACK NEXT Activate Windows Go to Action Center to activate Windows.

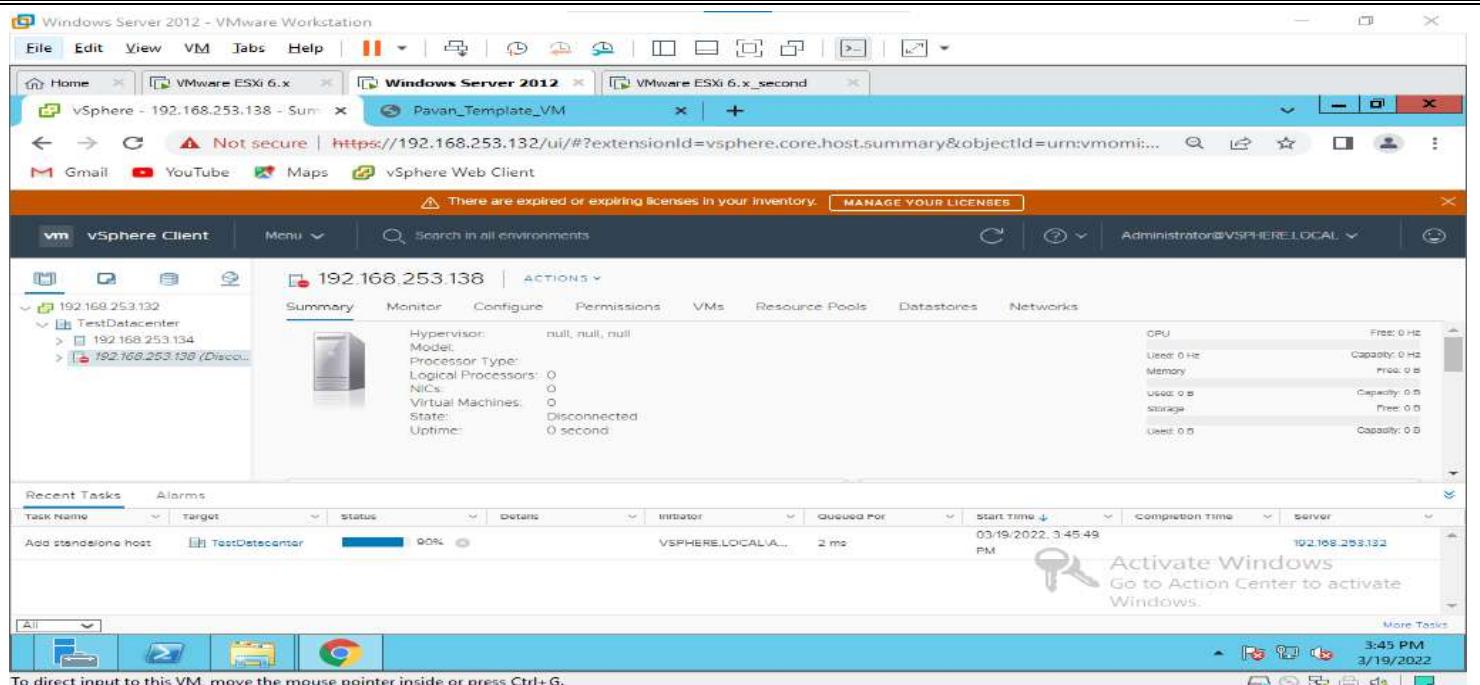
Recent Tasks Alarms

3:44 PM 3/19/2022

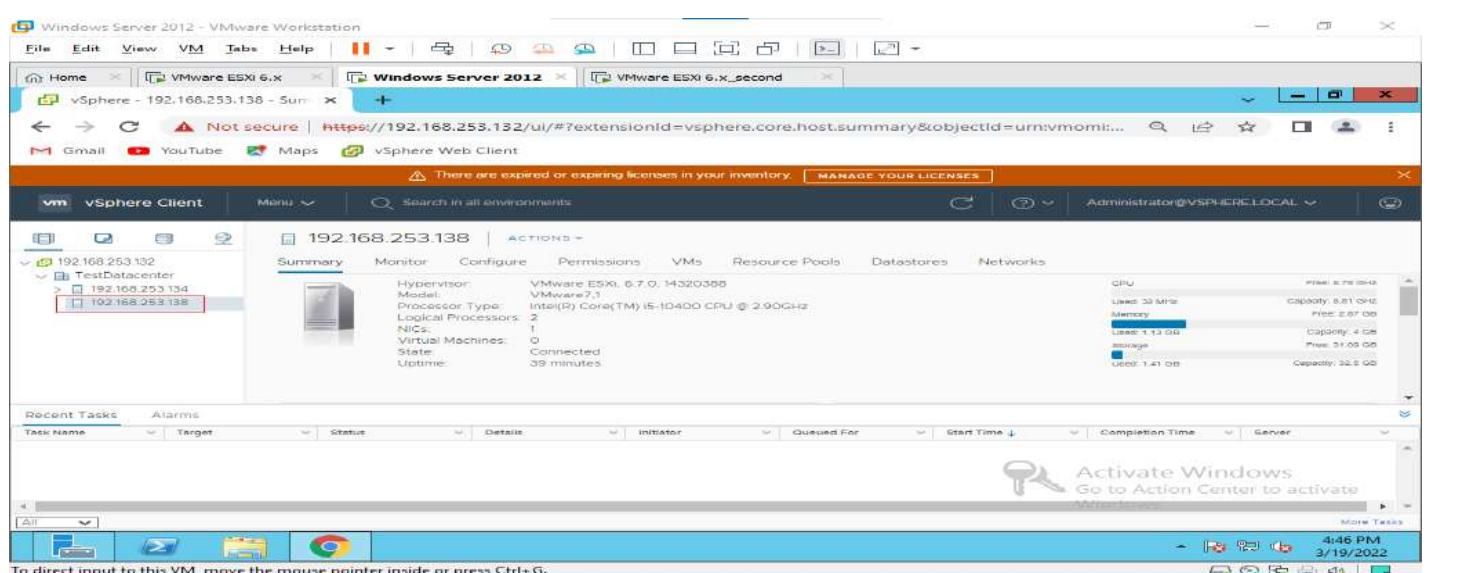
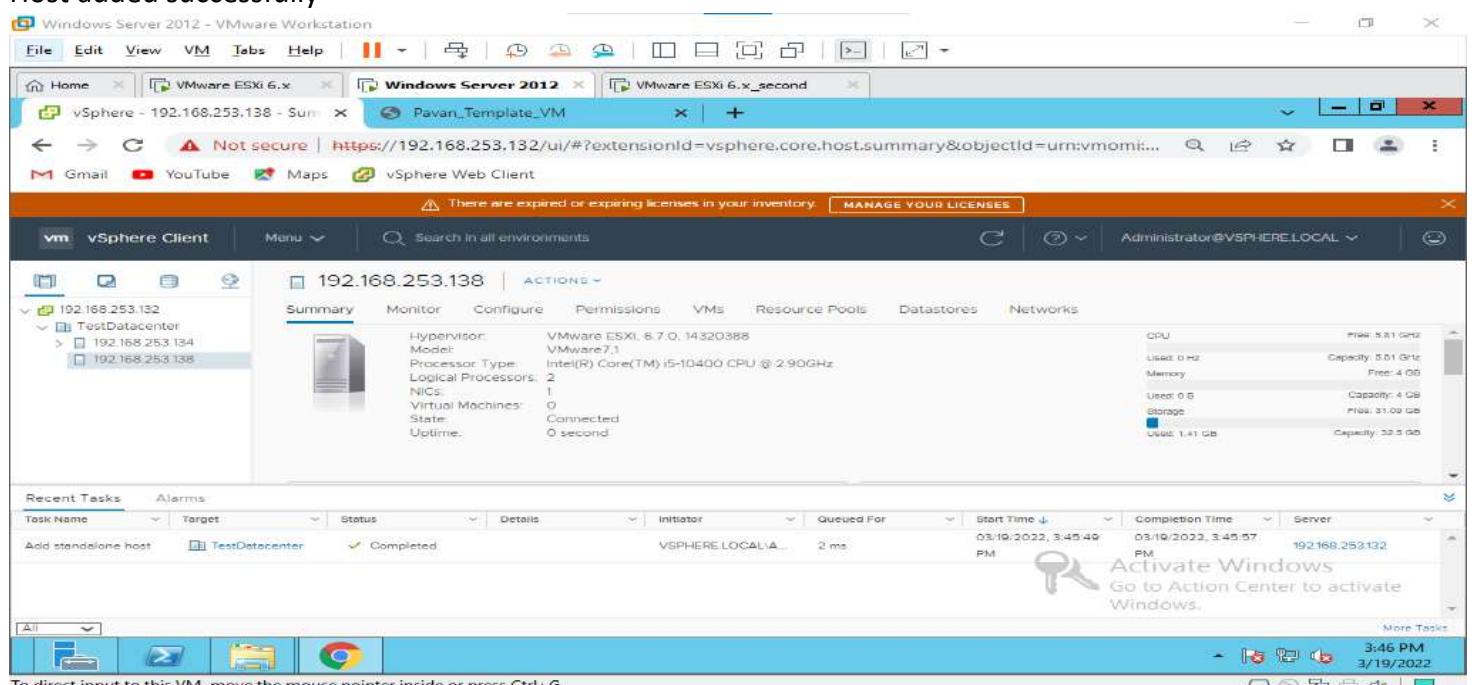
To direct input to this VM, move the mouse pointer inside or press Ctrl+G.





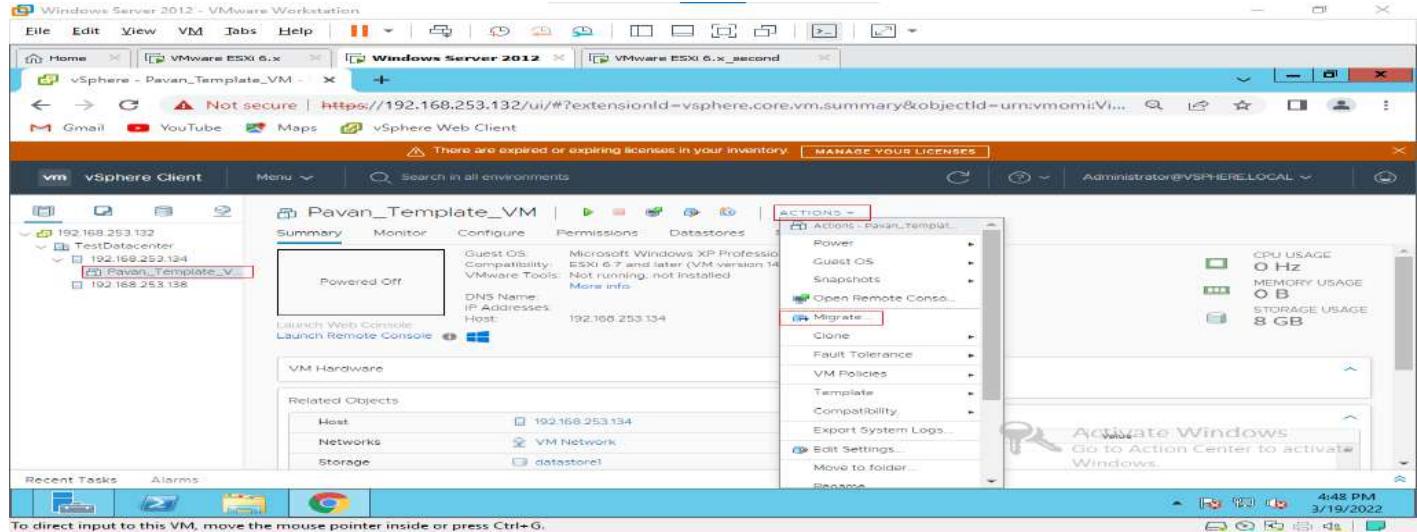


## Host added successfully

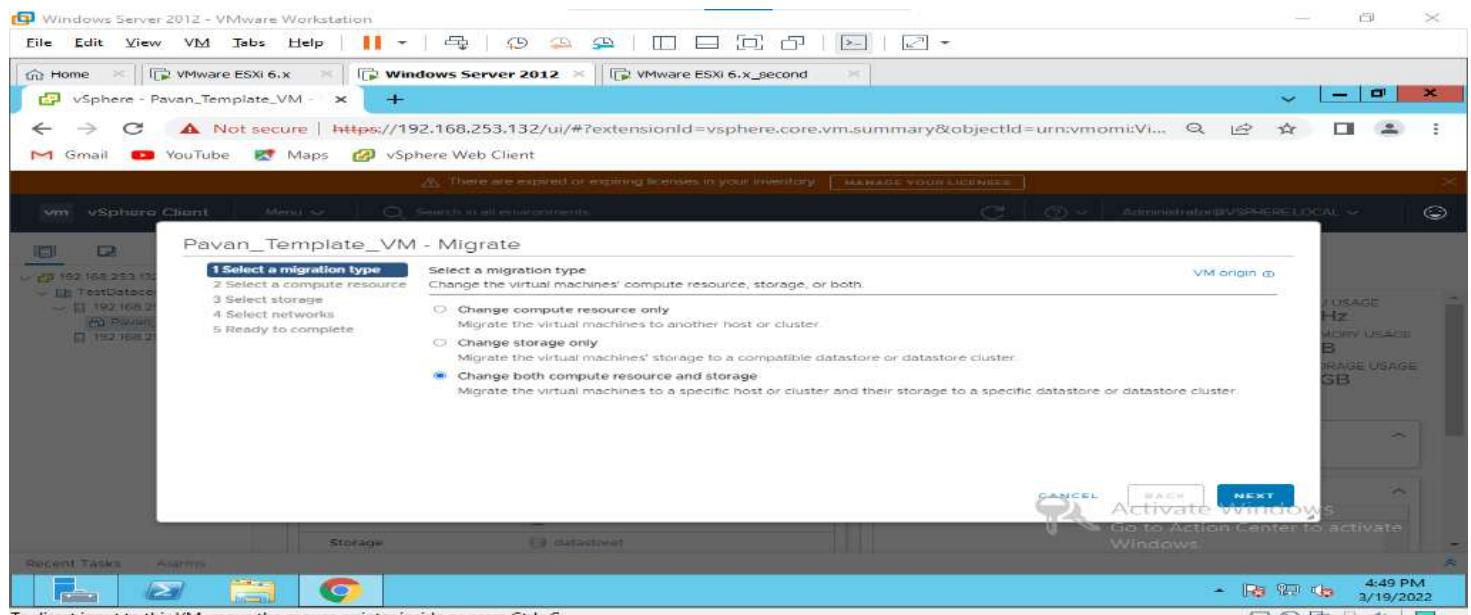


After adding the host go to the host and cluster tab and select the virtual machine which we deployed on the first host i.e VMware ESXI 6.x.

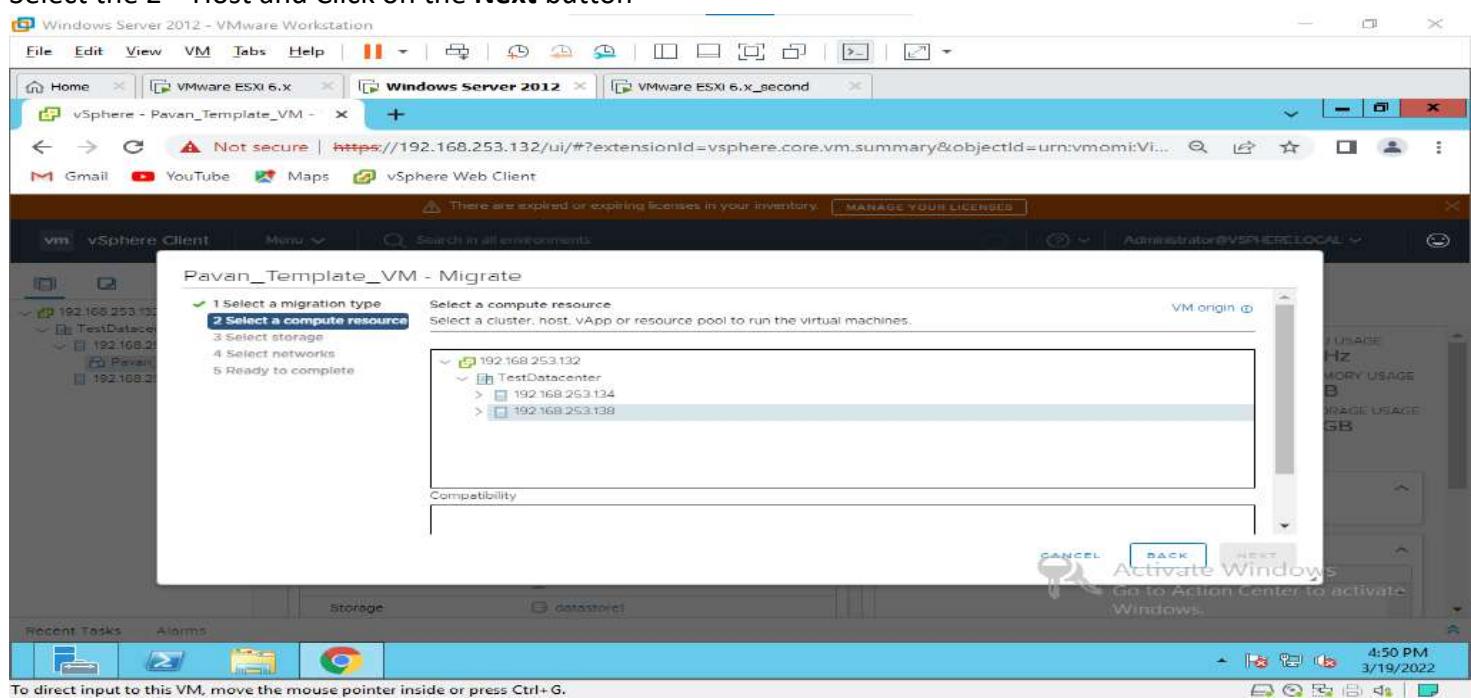
After that go to the action drop-down menu and select migrate and click on the Next button.



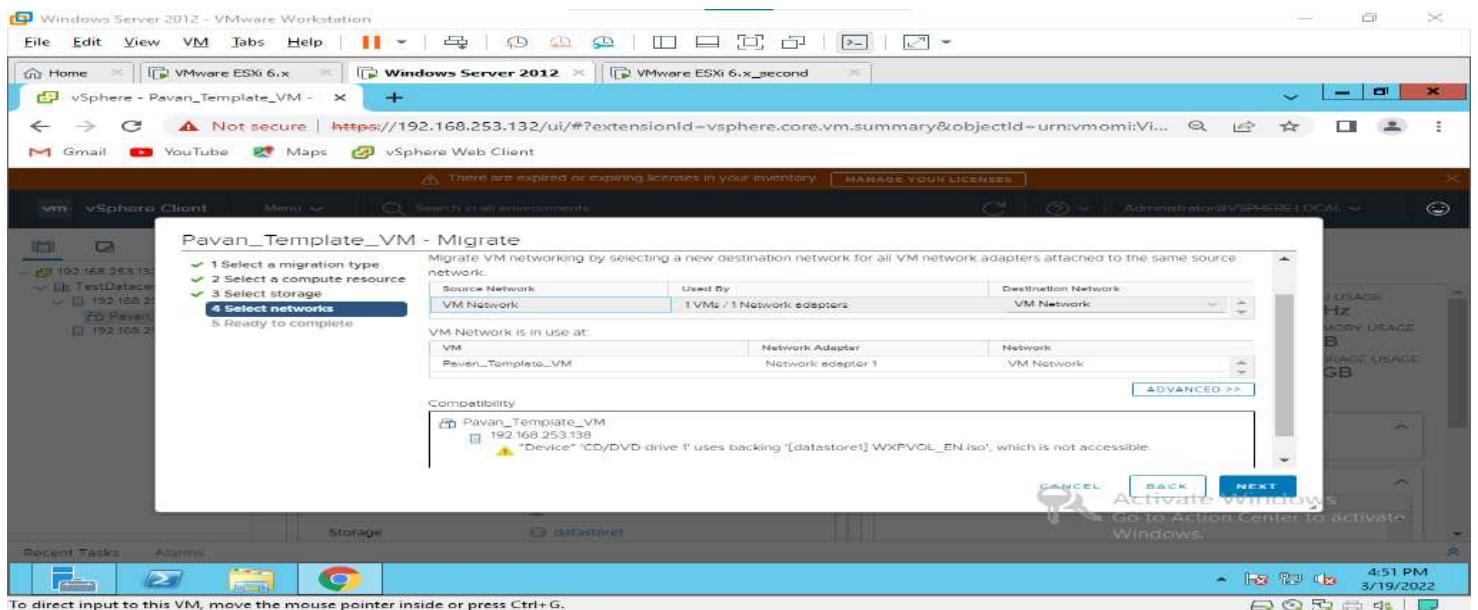
Select the Change both compute resource and storage and Click on the Next Button



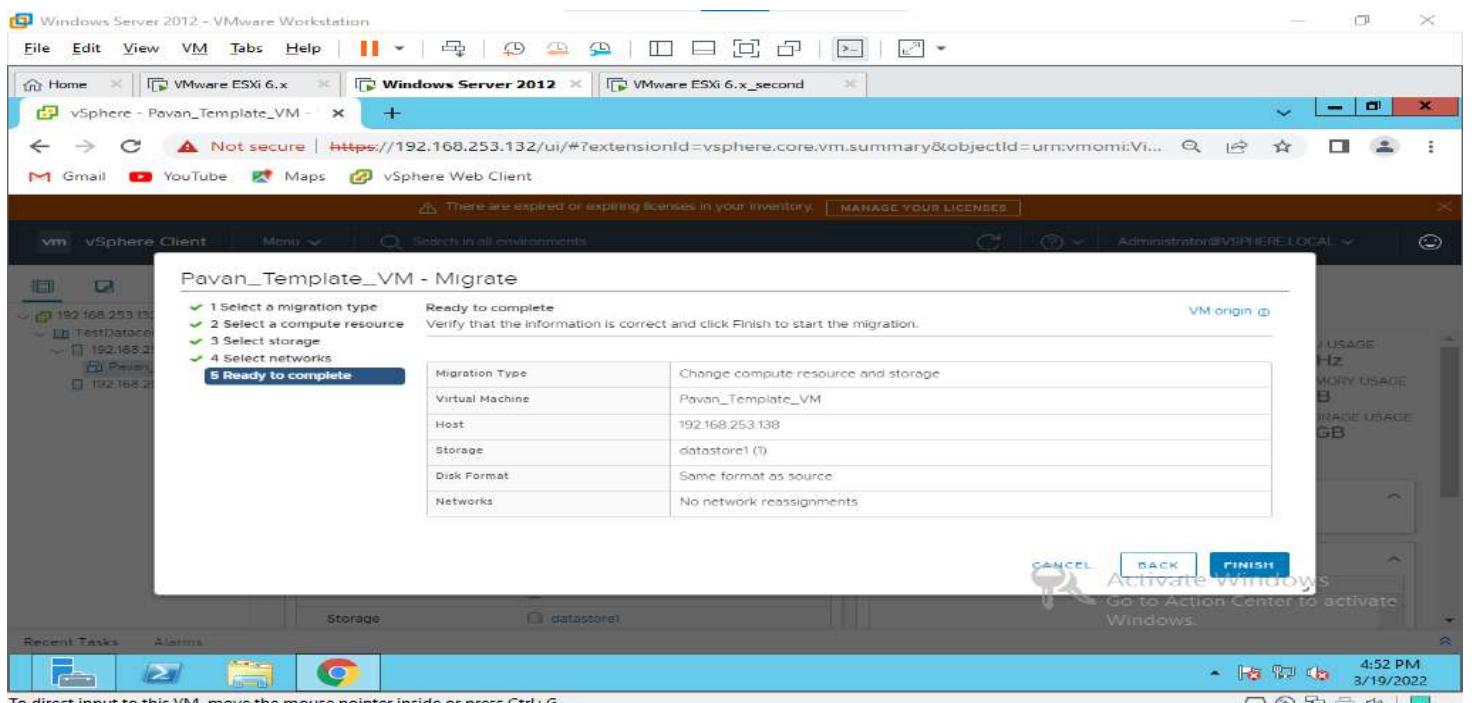
Select the 2<sup>nd</sup> Host and Click on the Next button



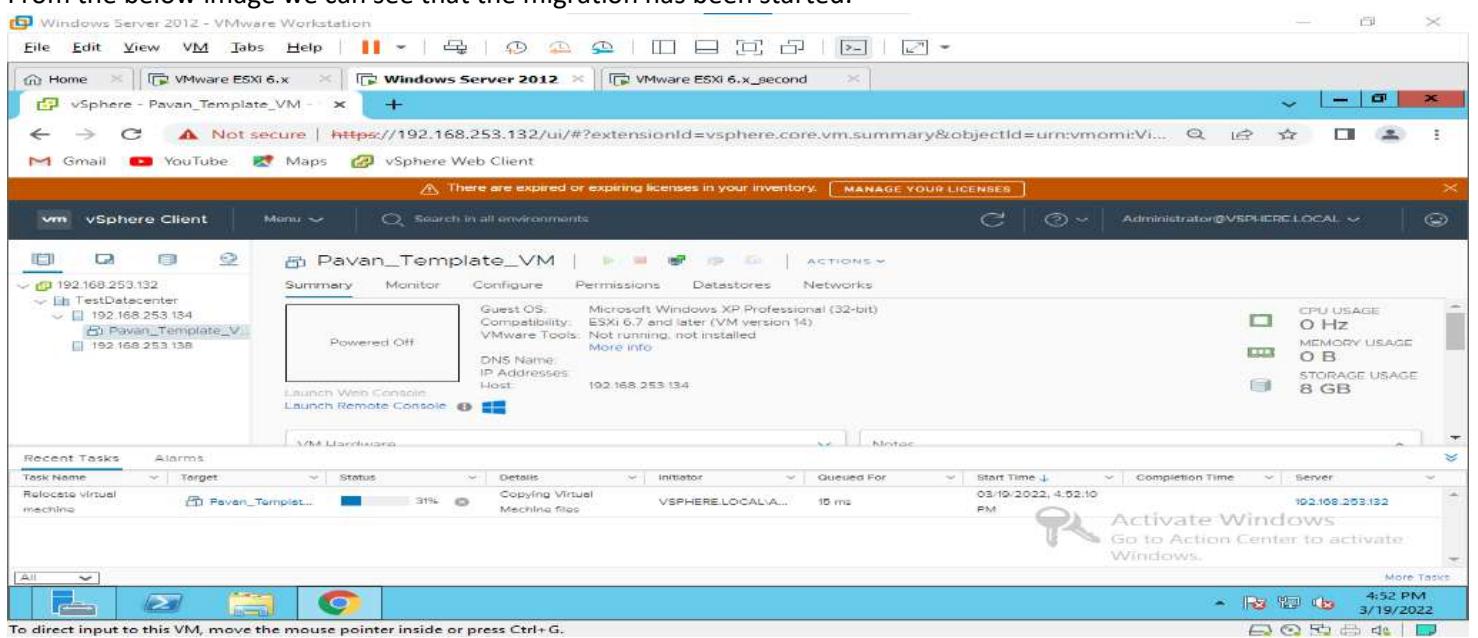
## Select the Datastore and Click on the Next button



## Click on the Finish Button



From the below image we can see that the migration has been started.



## Migration Completed

The screenshot shows the vSphere Client interface with the 'Pavan\_Template\_VM' configuration page selected. The summary tab displays the following details:

- Guest OS:** Microsoft Windows XP Professional (32-bit)
- Compatibility:** ESXi 6.7 and later (VM version 14)
- VMware Tools:** Not running, not installed
- DNS Name:** IP Addresses: Host: 192.168.253.138

On the right, resource usage is shown as follows:

- CPU USAGE: 0 Hz
- MEMORY USAGE: 0 B
- STORAGE USAGE: 8 GB

A message at the top right indicates: "There are expired or expiring licenses in your inventory." A link to "MANAGE YOUR LICENSES" is provided.

Recent Tasks table:

Task Name	Target	Status	Details	Initiator	Queued For	Start Time	Completion Time	Server
Relocate virtual machine	Pavan_Template...	✓ Completed	Copying Virtual Machine files	VSHERE.LOCAL...	16 ms	03/19/2022, 4:52:10 PM	03/19/2022, 4:53:02 PM	192.168.253.132

To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

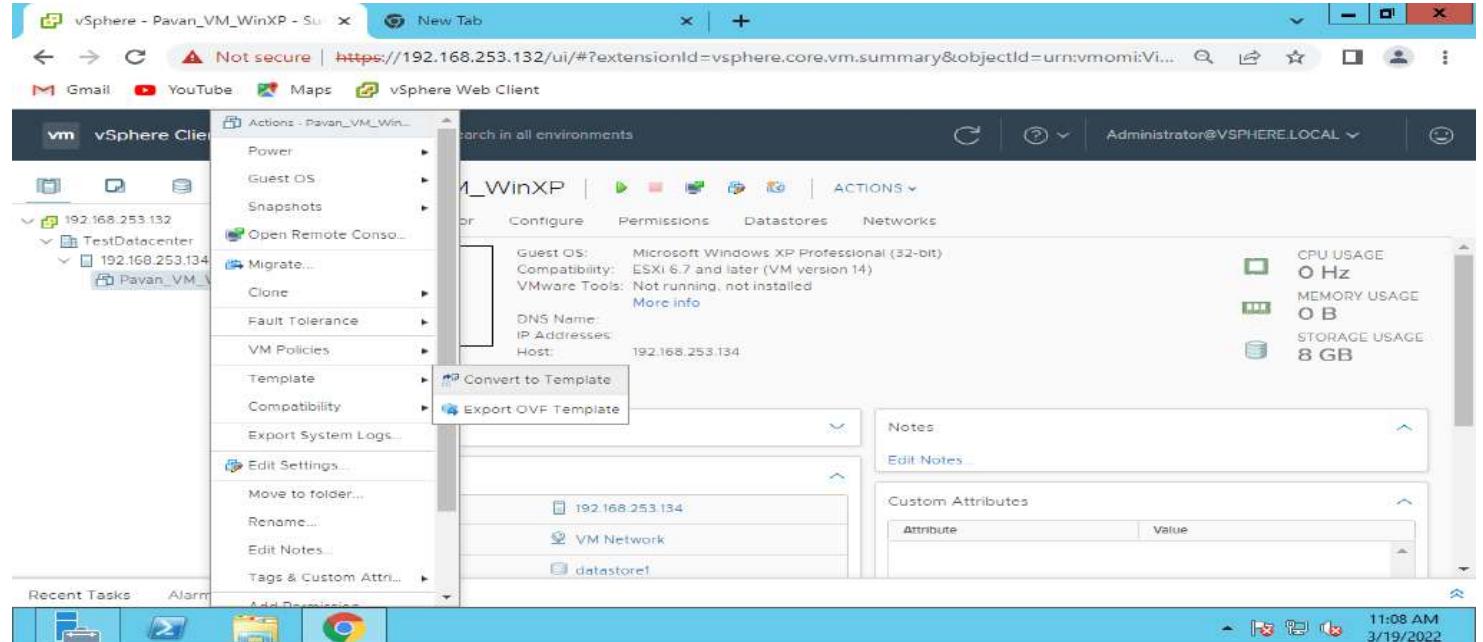
The screenshot shows the Windows Server 2012 desktop environment. The desktop background is the classic Windows XP wallpaper. A tooltip window is visible in the bottom right corner with the text: "Take a tour of Windows 8! To learn about the exciting new features in Windows 8, click here. To take the tour later, click All Programs on the Start menu, and then click Accessories." A cursor arrow points towards this tooltip. The taskbar at the bottom includes icons for File Explorer, Mail, Photos, and Google Chrome, along with the Start button. A system tray icon for VMware is also present. The status bar at the bottom right shows the date and time: "4:54 PM 3/19/2022".

# Practical No. 3

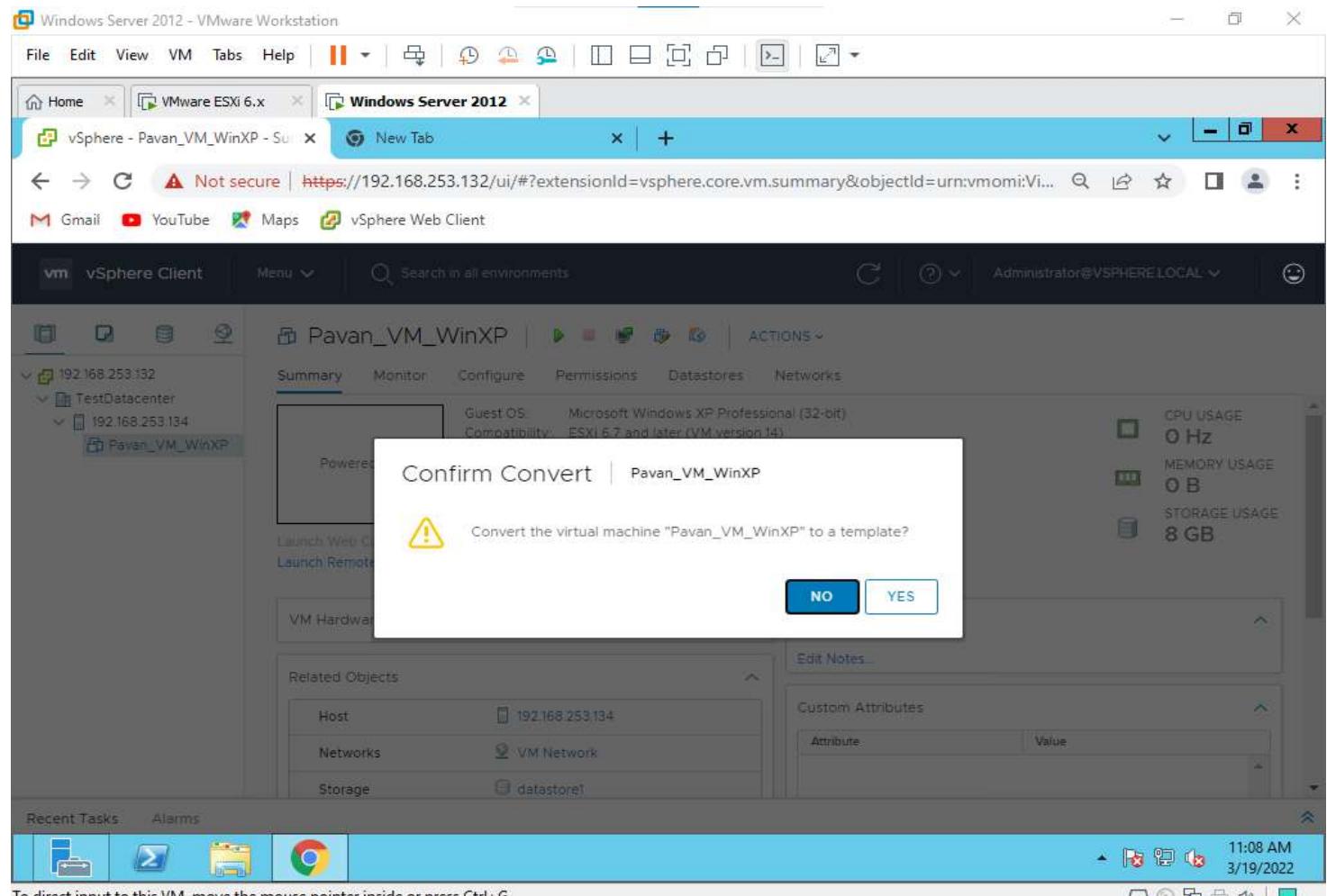
**AIM:** Create a Template in the vSphere Client

## A- Clone a Virtual Machine to a Template in the vSphere Client

Right-click on the virtual machine then go to the **Template** option and choose **Convert to the template**.



Click on the **Next** button



Please wait for successfully creation

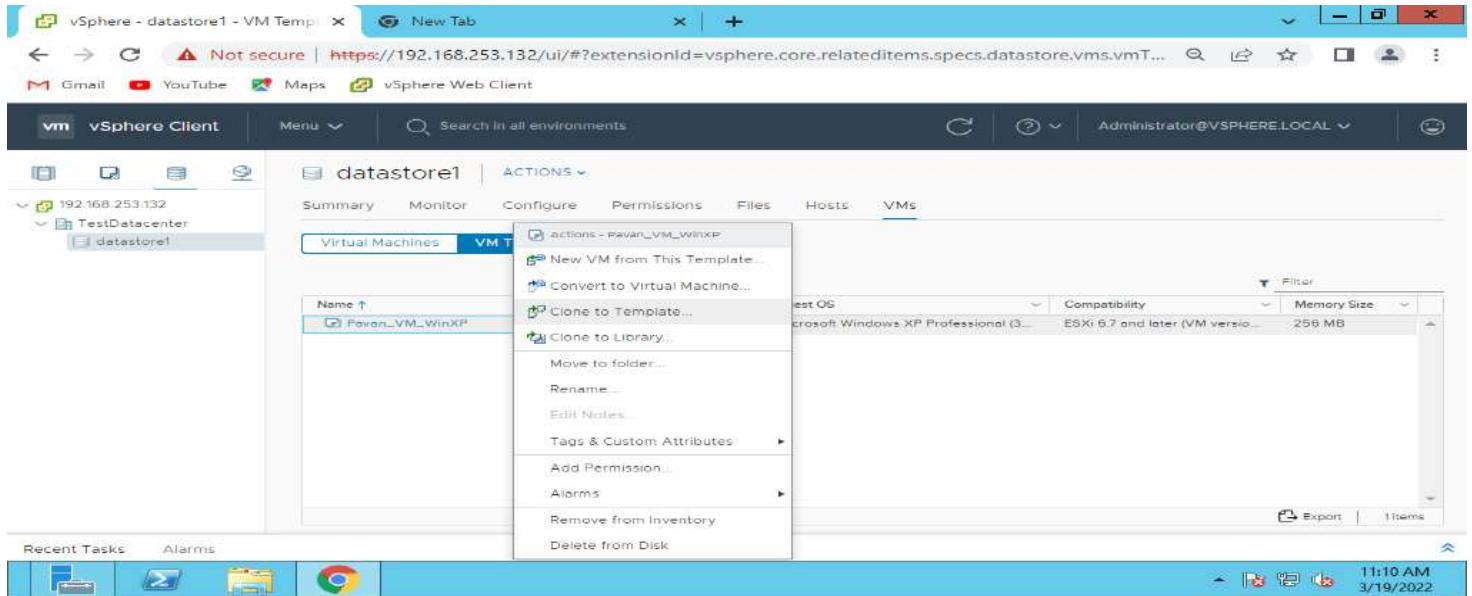
The screenshot shows the vSphere Client interface. The left sidebar shows a tree view with '192.168.253.132' and 'TestDatacenter'. Under 'TestDatacenter', there is a folder named '192.168.253.134'. The main pane displays a VM named 'Pavan\_VM\_WinXP'. The status bar indicates 'Powered Off'. Below the status bar, there are tabs for 'VM Hardware', 'Related Objects', 'Notes', and 'Custom Attributes'. The 'Notes' section has a placeholder 'Edit Notes...'. The 'Custom Attributes' section is empty. At the bottom, there are icons for recent tasks and alarms, and a status bar showing '11:08 AM 3/19/2022'.

Go to the **Datastore Tab** and Click on the **VMs tab** and tab on the **VM Template in Folders**. Here VM Template created successfully.

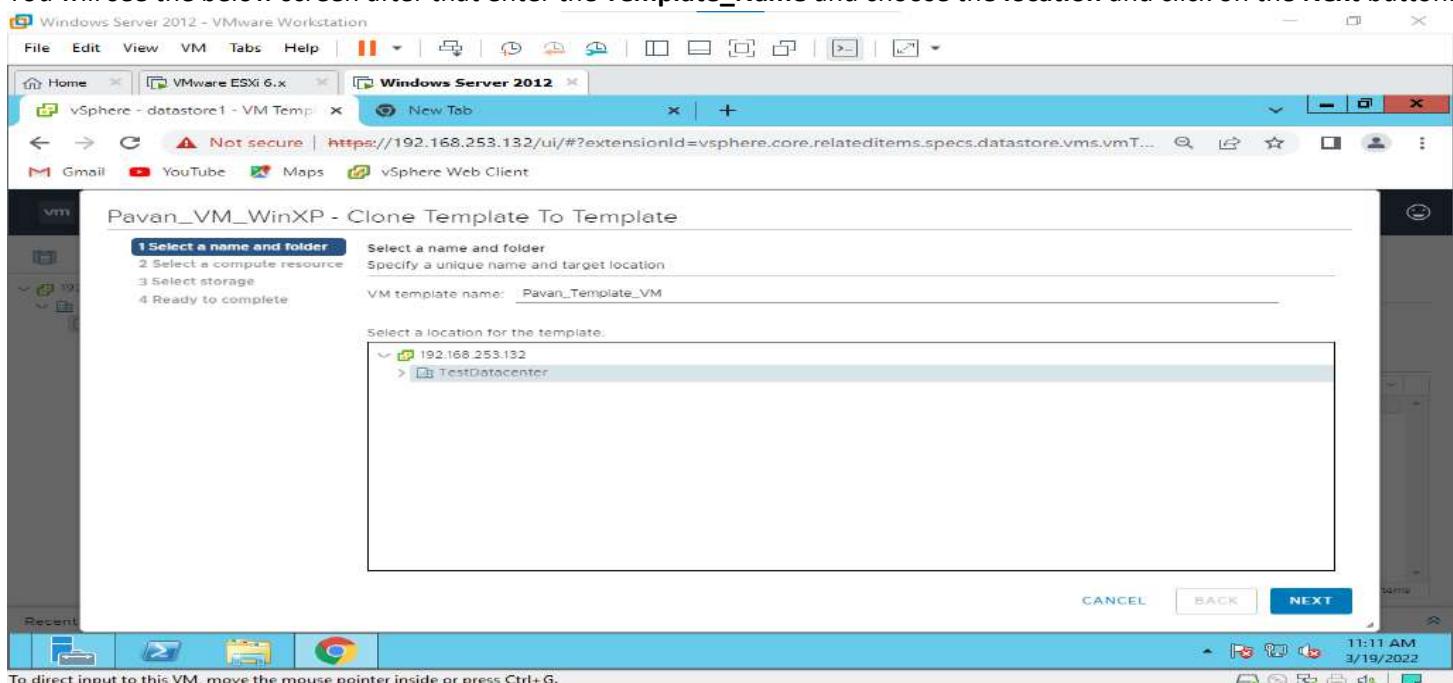
The screenshot shows the vSphere Client interface. The left sidebar shows a tree view with '192.168.253.132' and 'TestDatacenter'. Under 'TestDatacenter', there is a folder named 'datastore1'. The main pane displays a table titled 'VM Templates in Folders'. The table has columns for Name, Provisioned Space, Guest OS, Compatibility, and Memory Size. One row is visible, showing 'Pavan\_VM\_WinXP', '8.44 GB', 'Microsoft Windows XP Professional (3...', 'ESXi 6.7 and later (VM versio...', and '256 MB'. The 'VMs' tab is selected in the top navigation bar. The status bar at the bottom shows '11:08 AM 3/19/2022'.

## B- Clone a Template in the vSphere Client

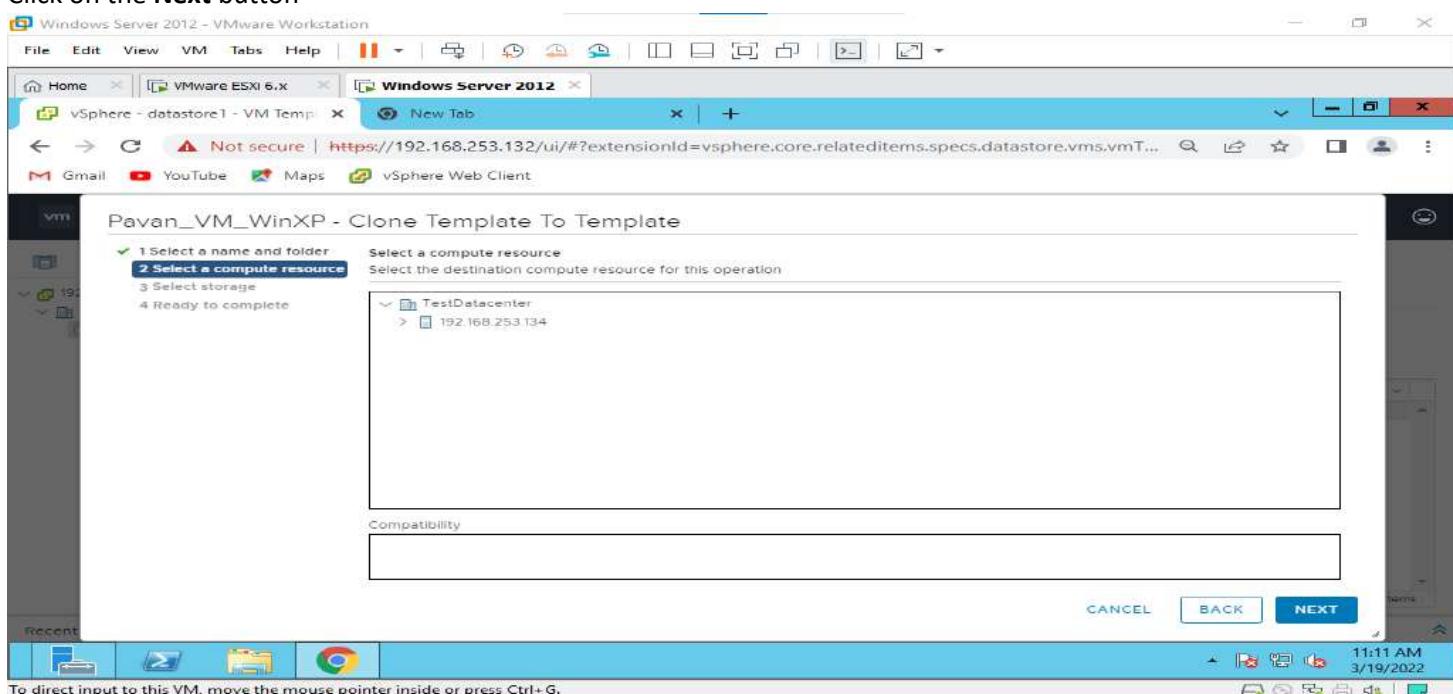
**Right-click on template and click on Clone to Template option.**



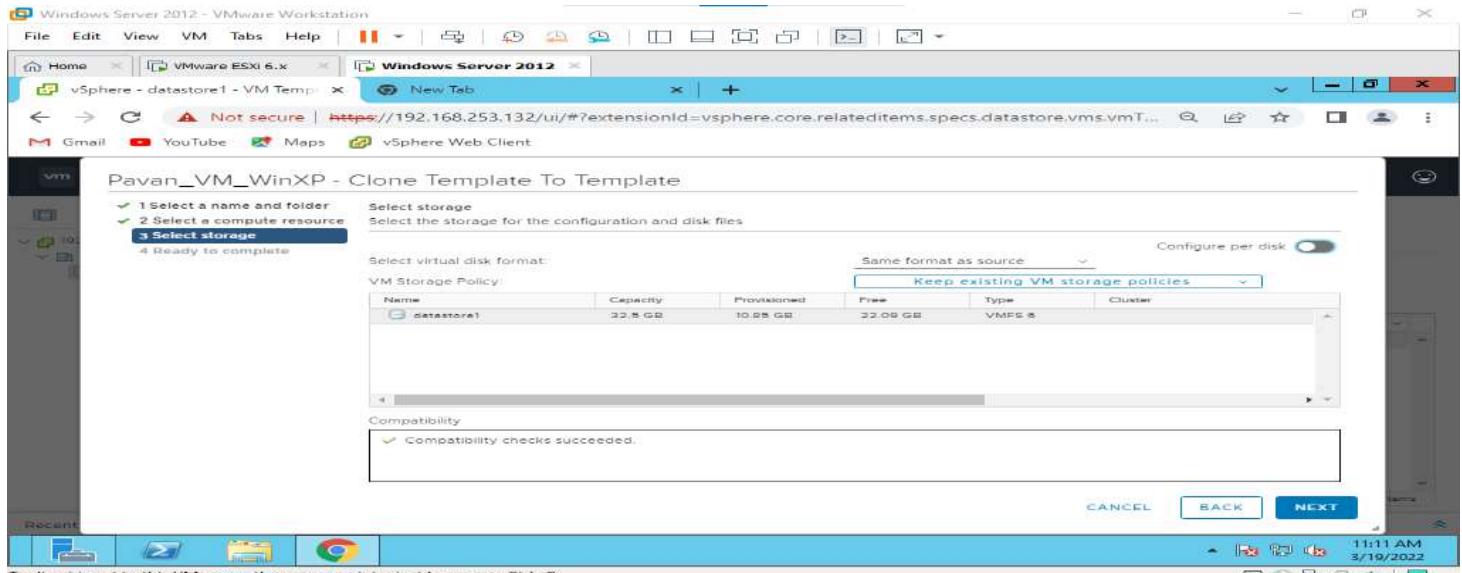
You will see the below screen after that enter the **Template\_Name** and choose the **location** and click on the **Next button**.



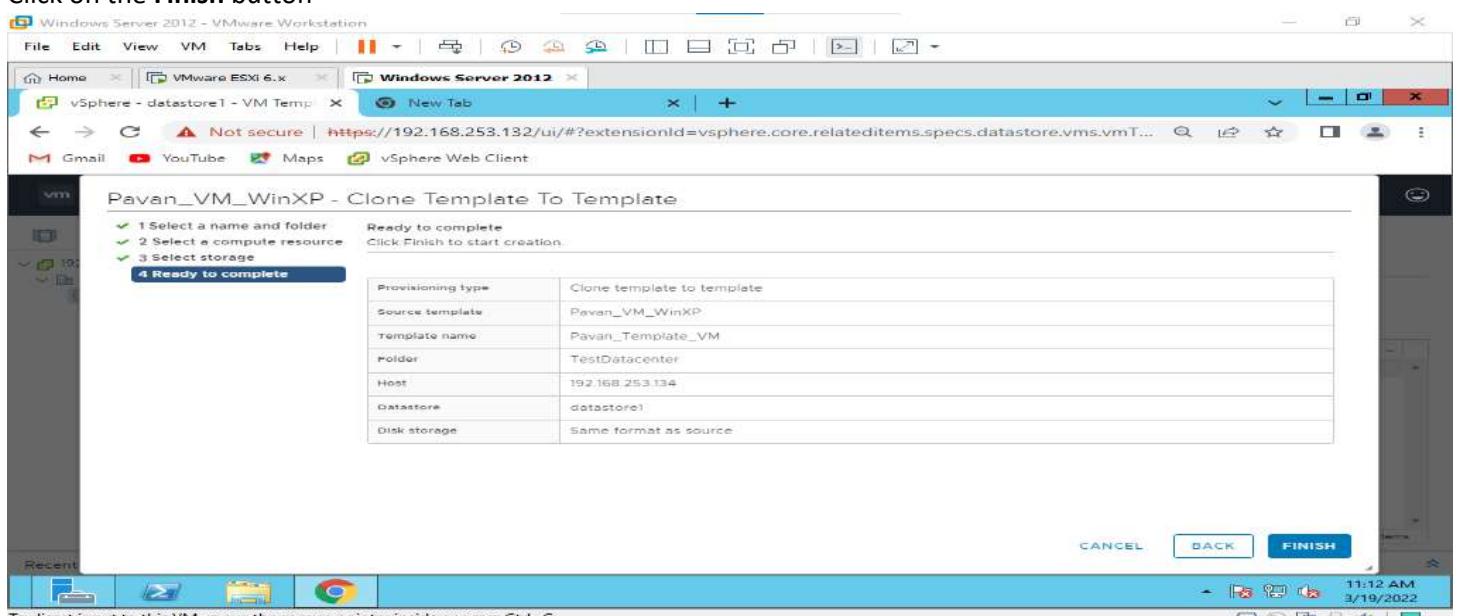
**Click on the Next button**



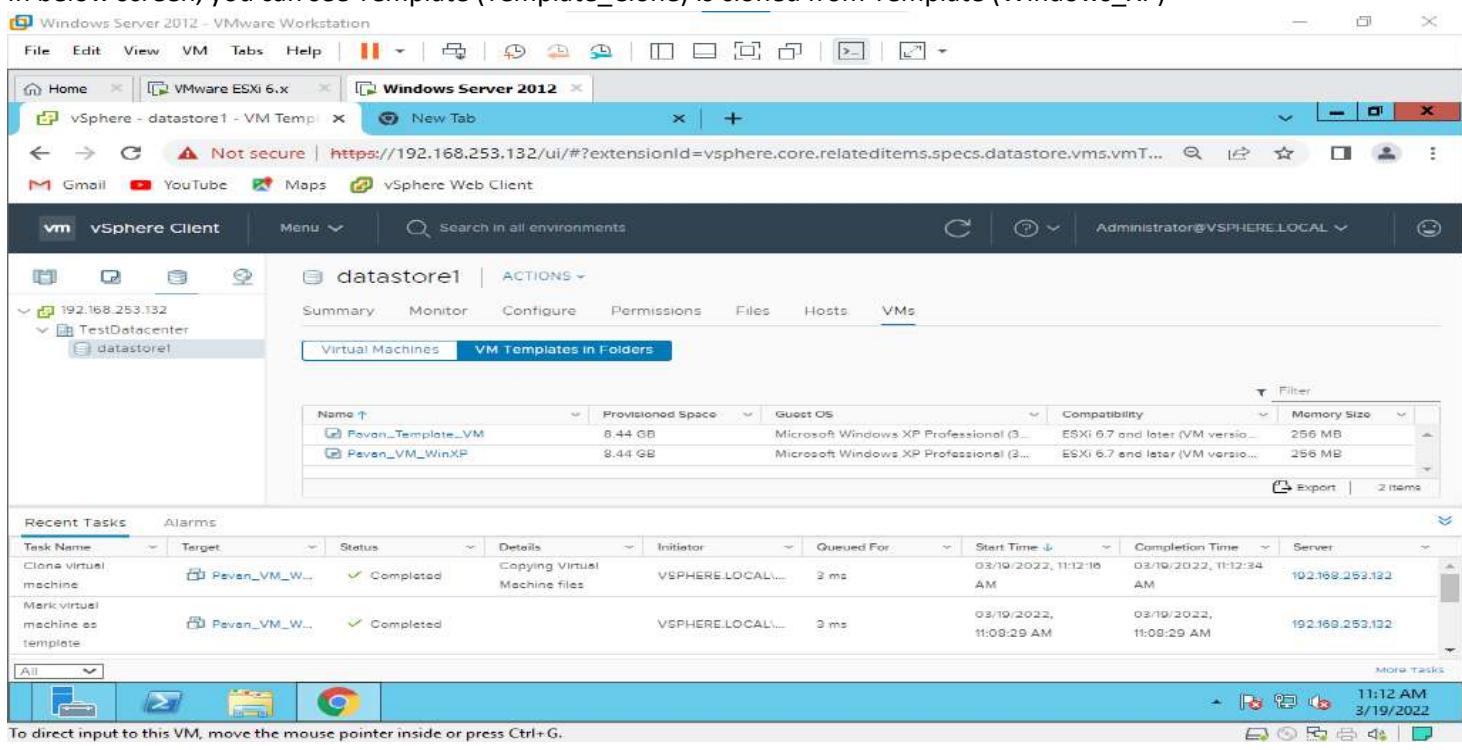
## Click on the Next button



## Click on the Finish button

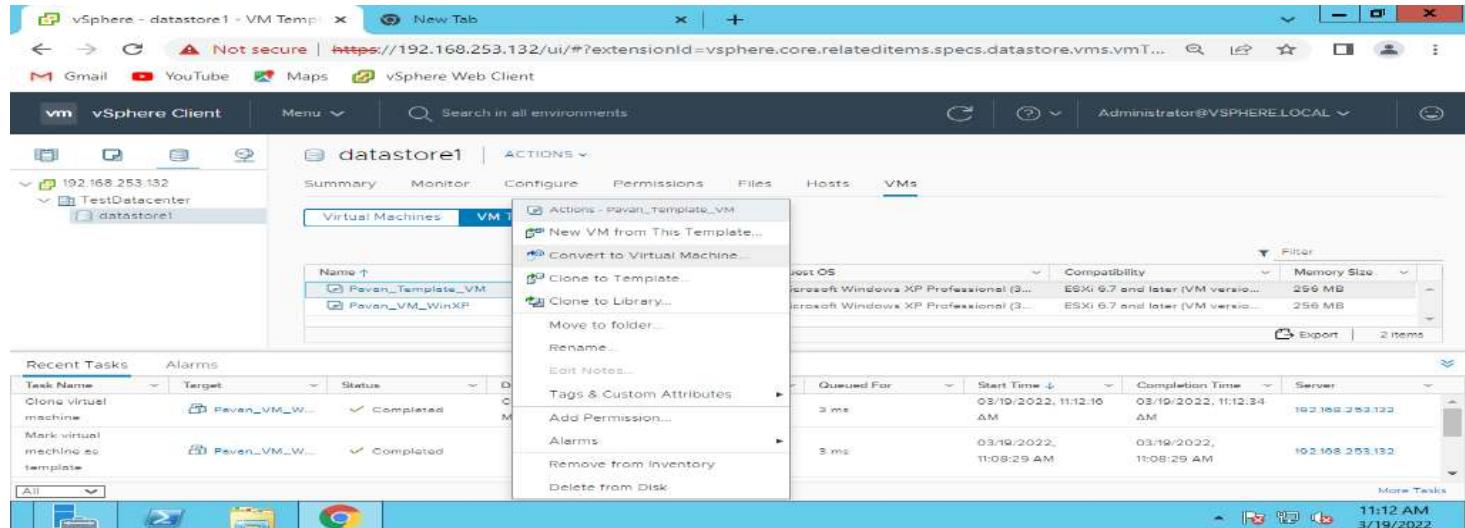


In below screen, you can see Template (Template\_Clone) is cloned from Template (Windows\_XP)

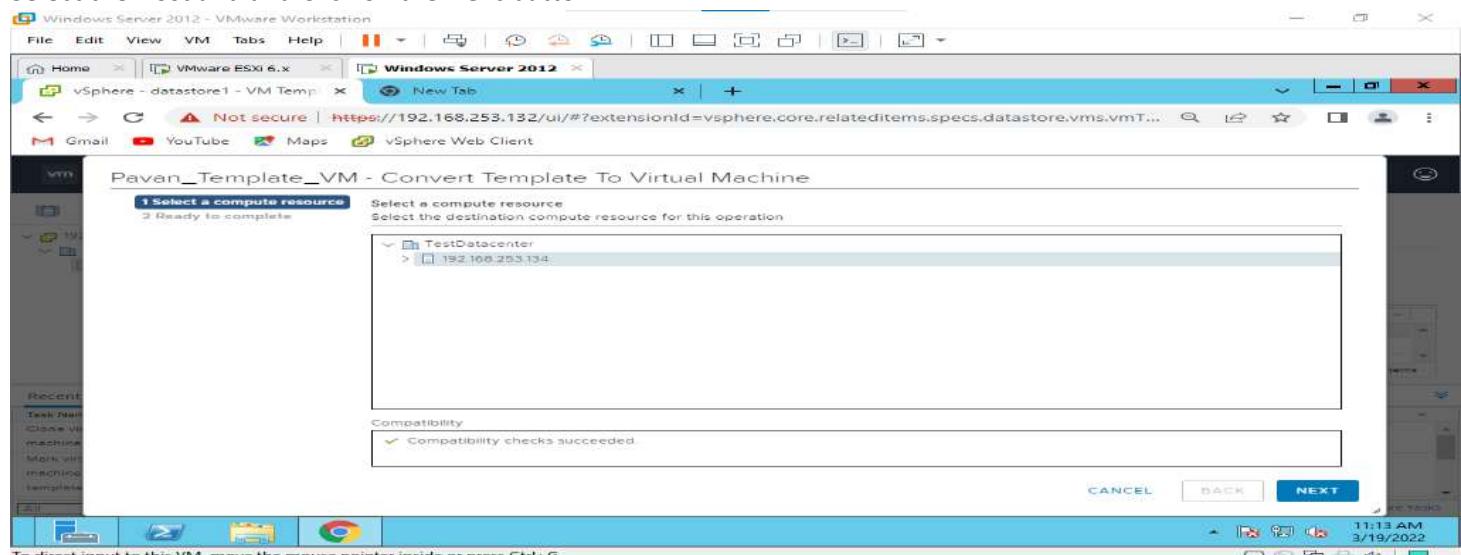


## C- Convert a Virtual Machine from a Template in the vSphere Client

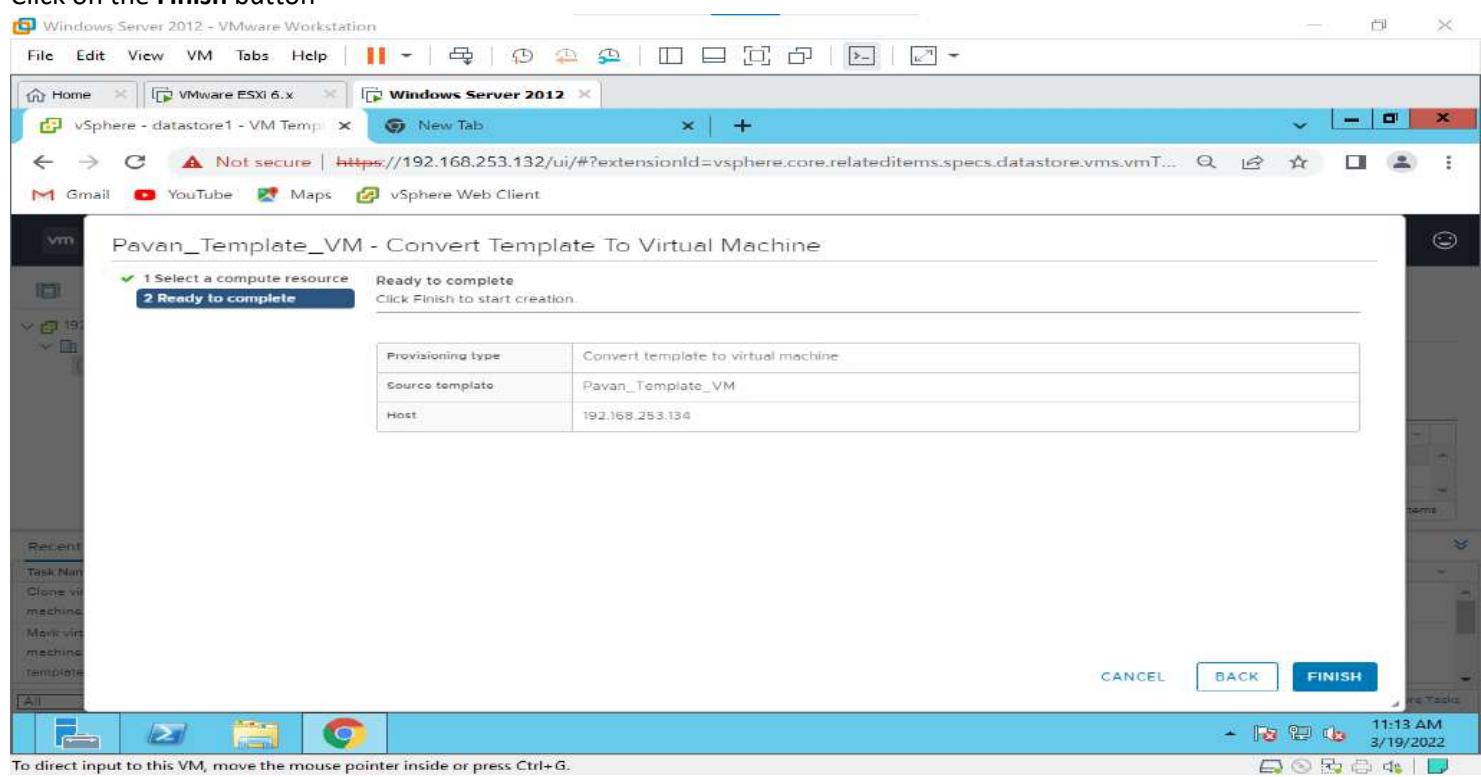
Right-click on the template then click on the “Convert to Virtual Machine” option.



Select the Host and Click on the Next button



Click on the Finish button



We can see that the virtual machine got generated in the virtual machine tab.

The screenshot shows the VMware vSphere Client interface. At the top, there's a browser window titled "Windows Server 2012 - VMware Workstation" displaying a summary page for host 192.168.253.132. The summary table provides the following information:

Category	Value	Capacity
CPU	Used: 36 MHz	Free: 2.77 GHz
Memory	Used: 1.13 GB	Free: 2.87 GB
Storage	Used: 18.41 GB	Free: 14.00 GB
		Capacity: 32.5 GB

Below the summary table, the "Recent Tasks" section lists the following completed operations:

Task Name	Target	Status	Details	Initiator	Queued For	Start Time	Completion Time	Server
Mark as virtual machine	Pavan_Template_V...	Completed		VSPHERE LOCAL...	5 ms	03/19/2022, 11:13:29 AM	03/19/2022, 11:13:30 AM	192.168.253.132
Clone virtual machine	Pavan_VM_W...	Completed	Copying Virtual Machine files	VSPHERE LOCAL...	3 ms	03/19/2022, 11:12:10 AM	03/19/2022, 11:12:34 AM	192.168.253.132
Mark virtual						03/19/2022,	03/19/2022,	

To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

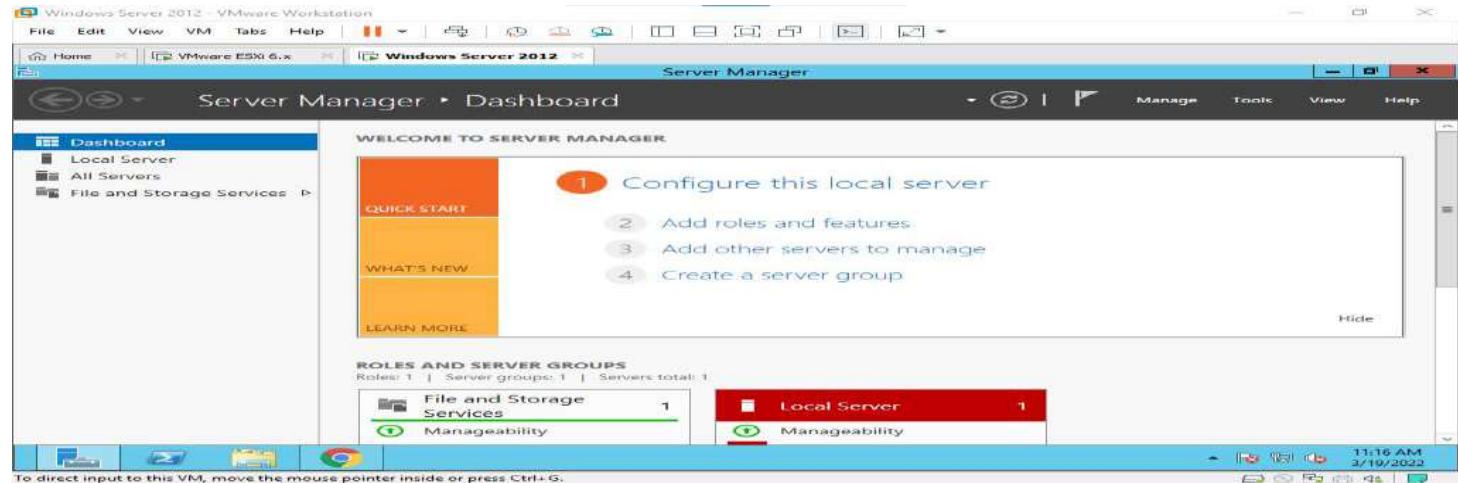
# Practical No. 4

**AIM:** Manage the storage and Security of VMware ESXi server.

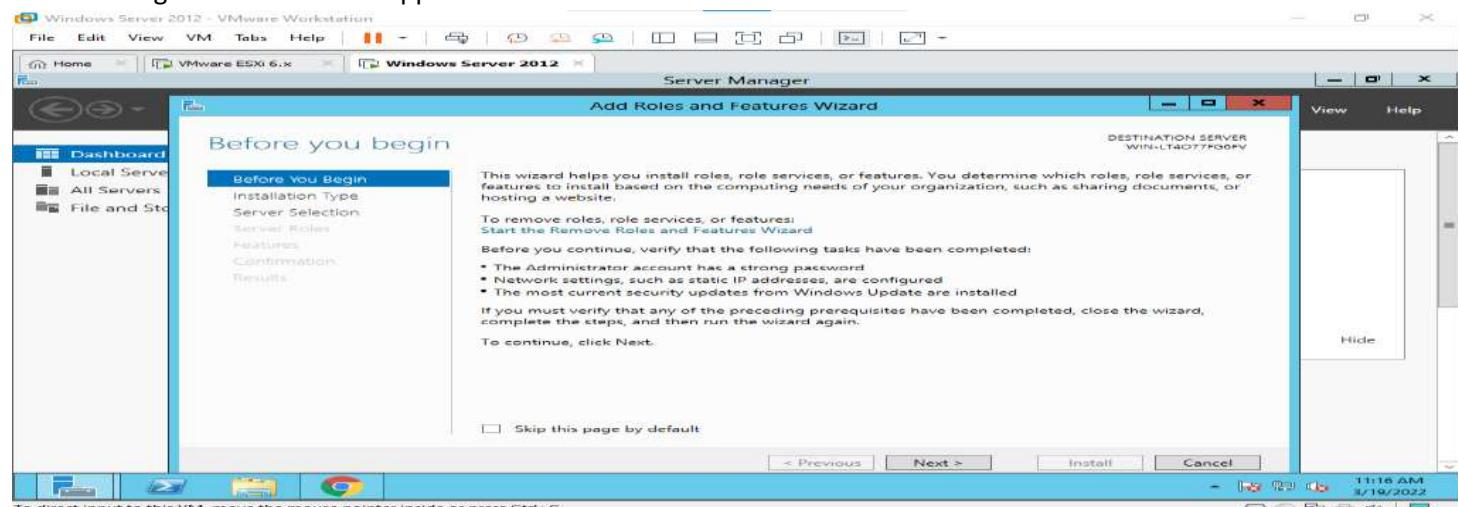
## A- Add Virtual storage in VMware ESXi Server with vSphere Client.

Note: For iSCSI required to Add roles and features of iSCSI Target Server and Provider.

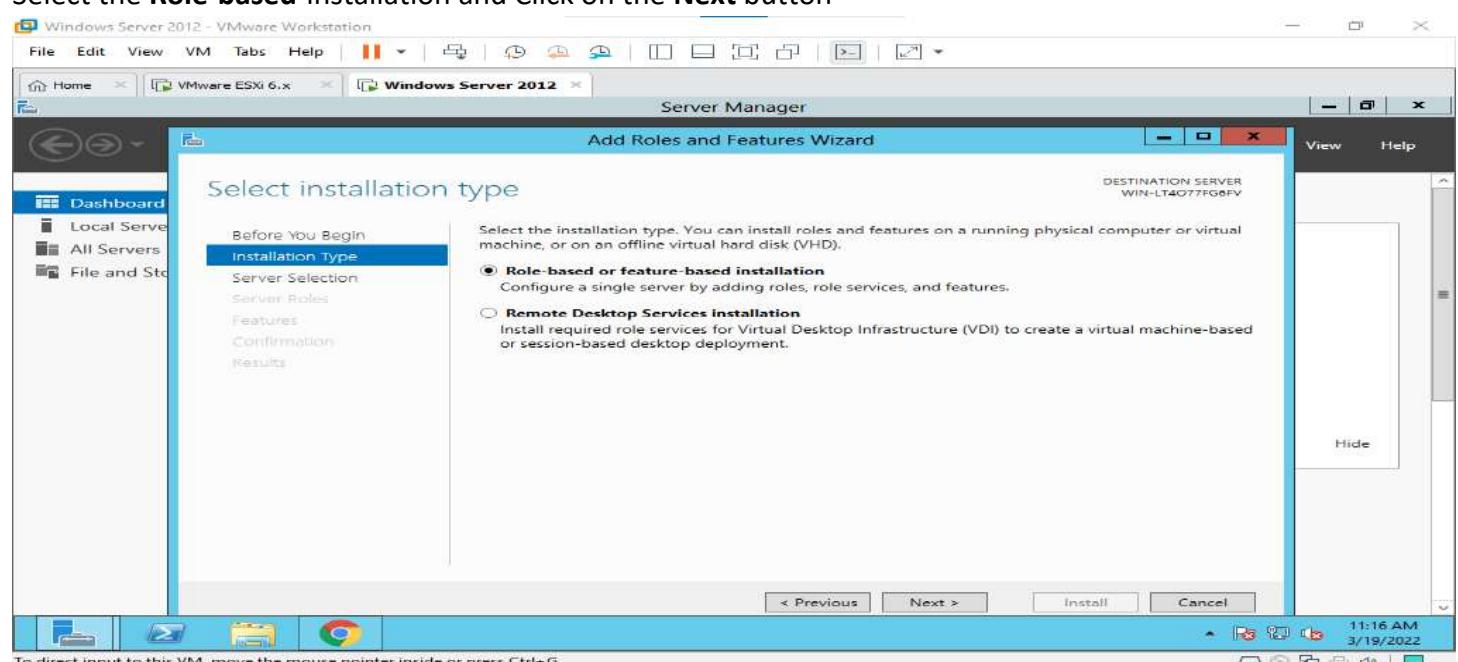
Click on **Add Roles and features.**



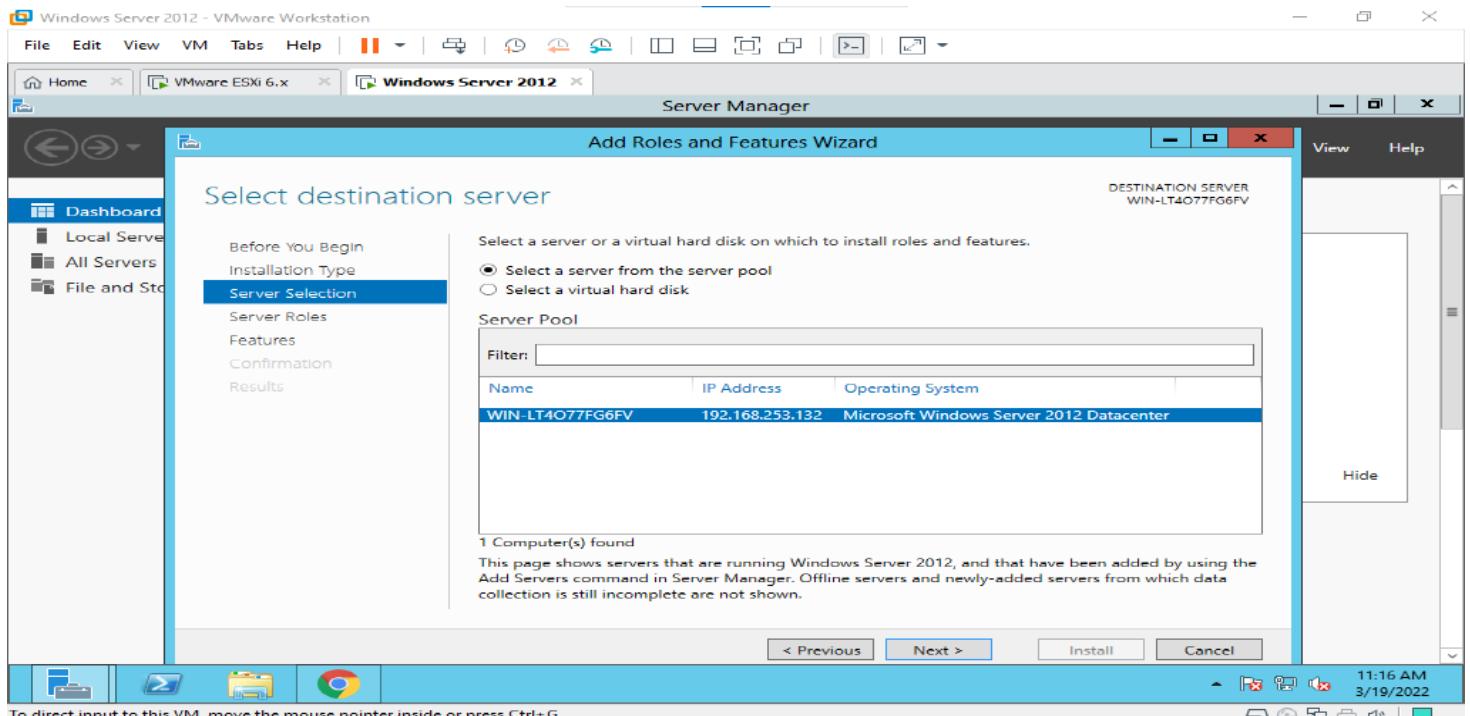
After clicking the below screen appear then Click on the **Next button**



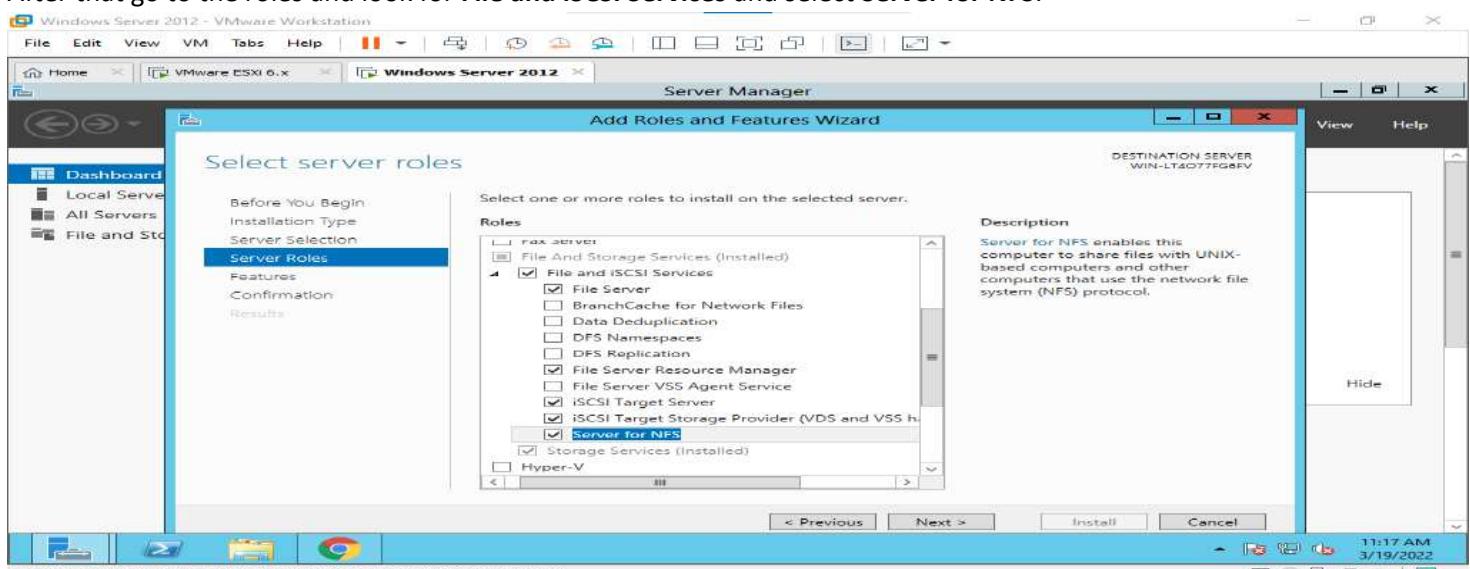
Select the **Role-based installation** and Click on the **Next button**



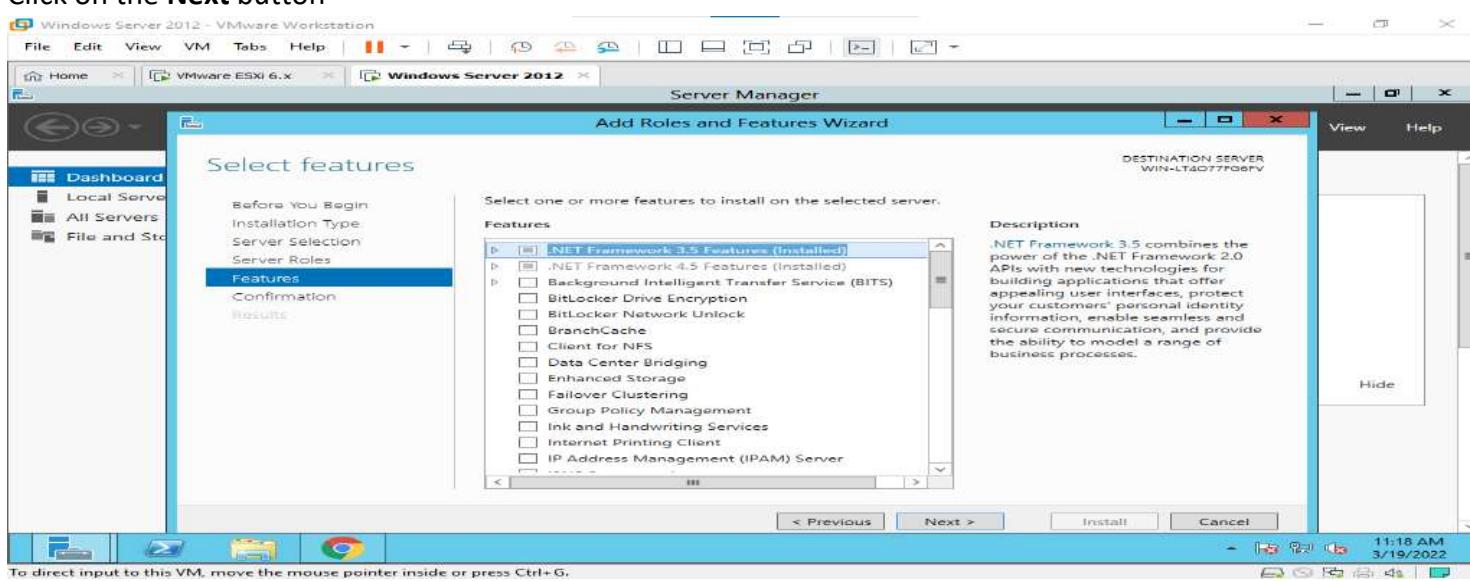
## Click on the Next button



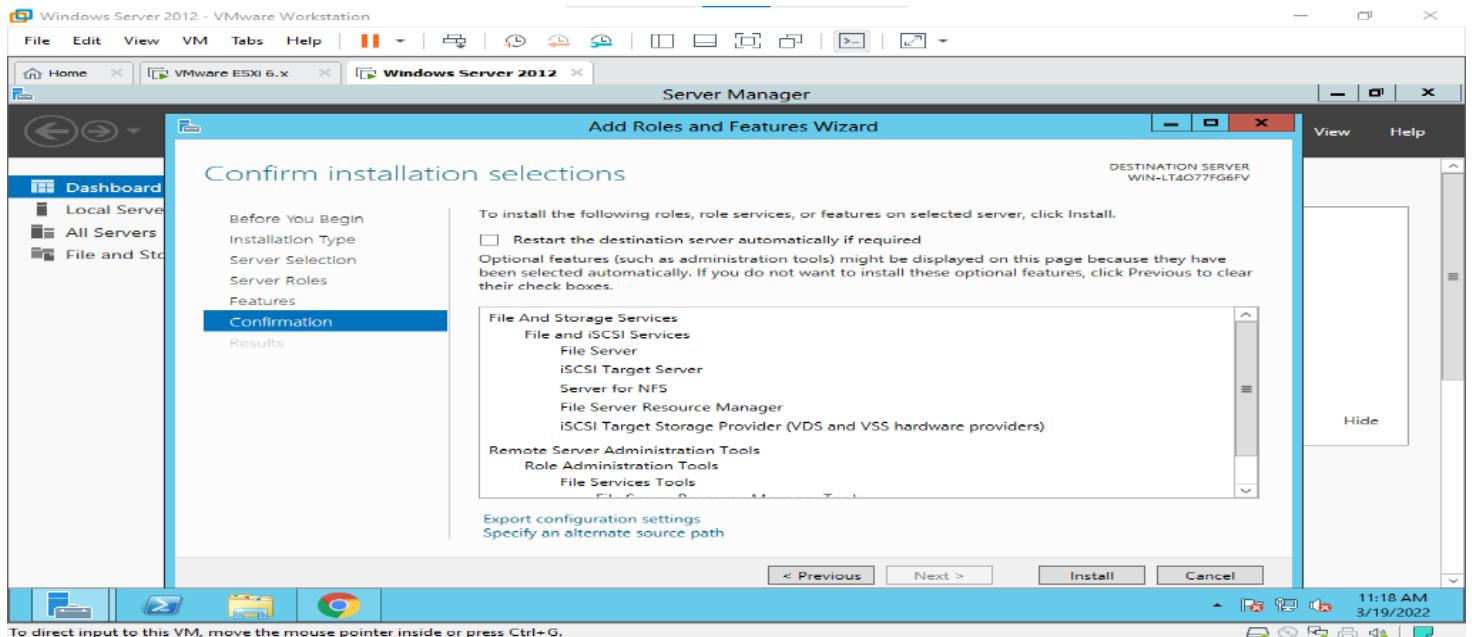
After that go to the roles and look for **File and iSCSI Services** and select **Server for NFS**.



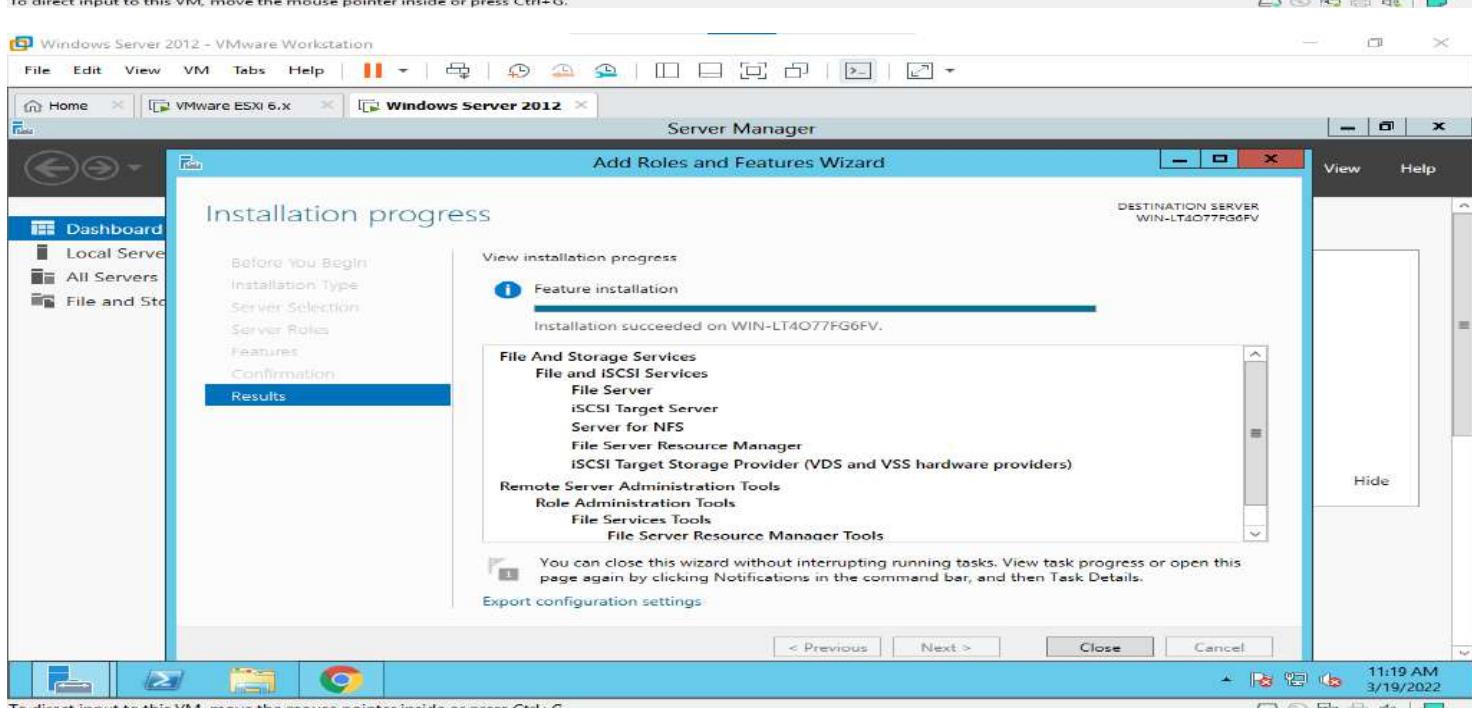
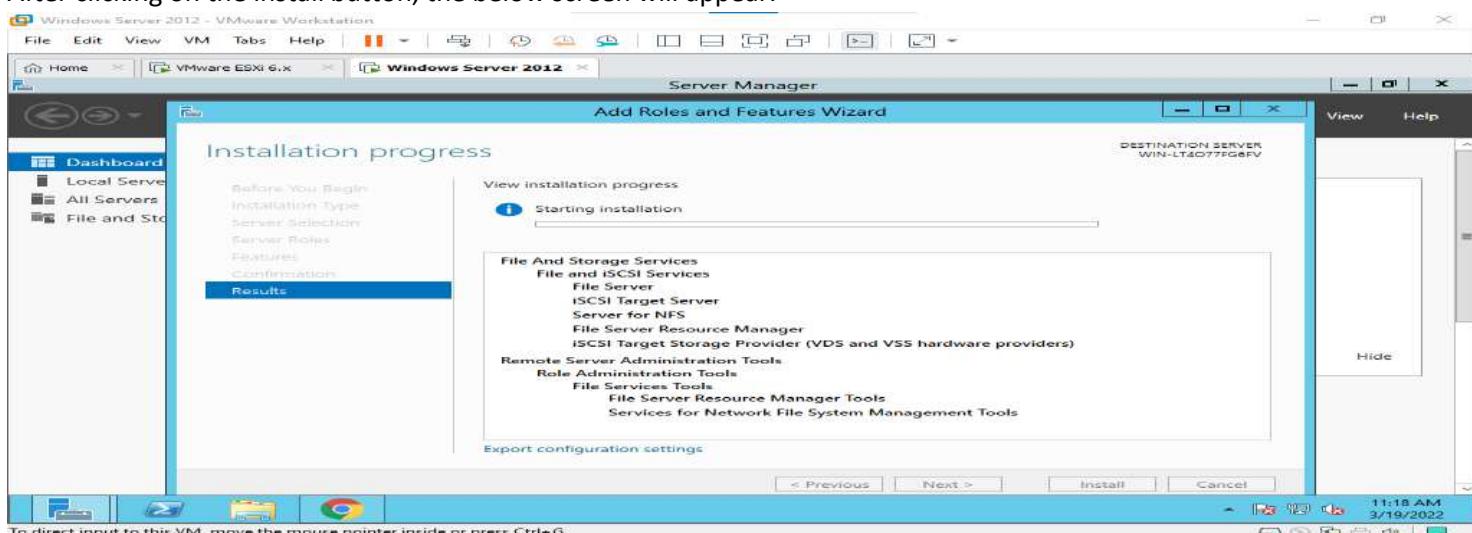
Click on the Next button



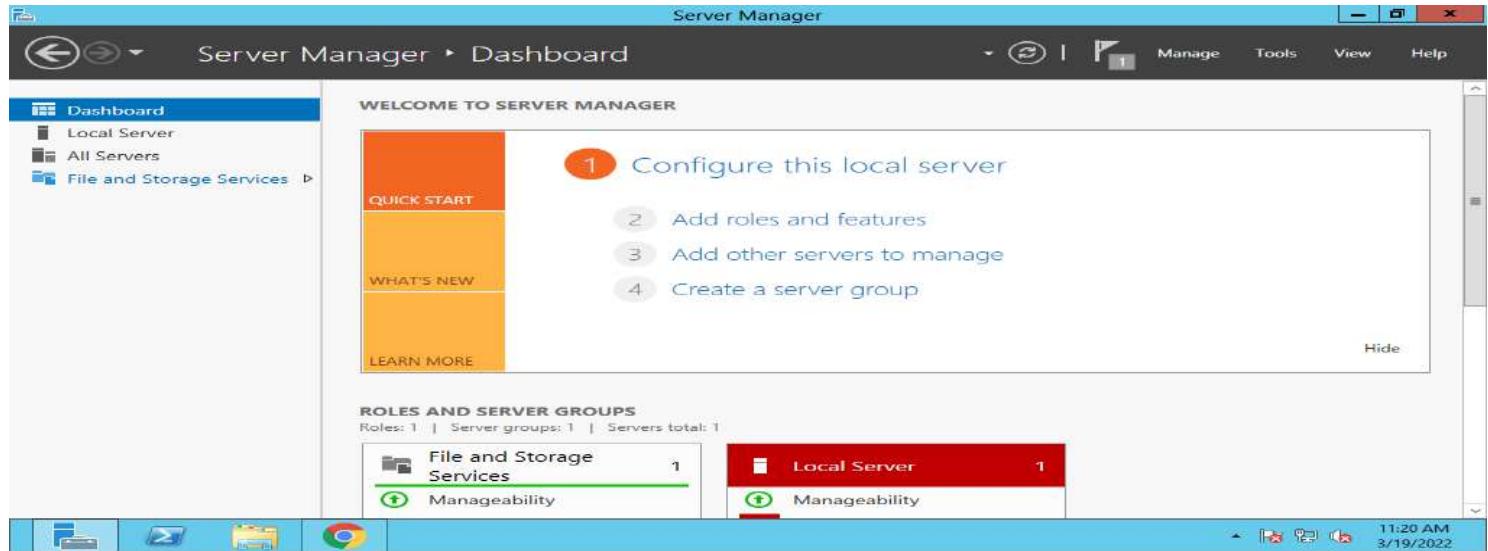
## Click on the Install button



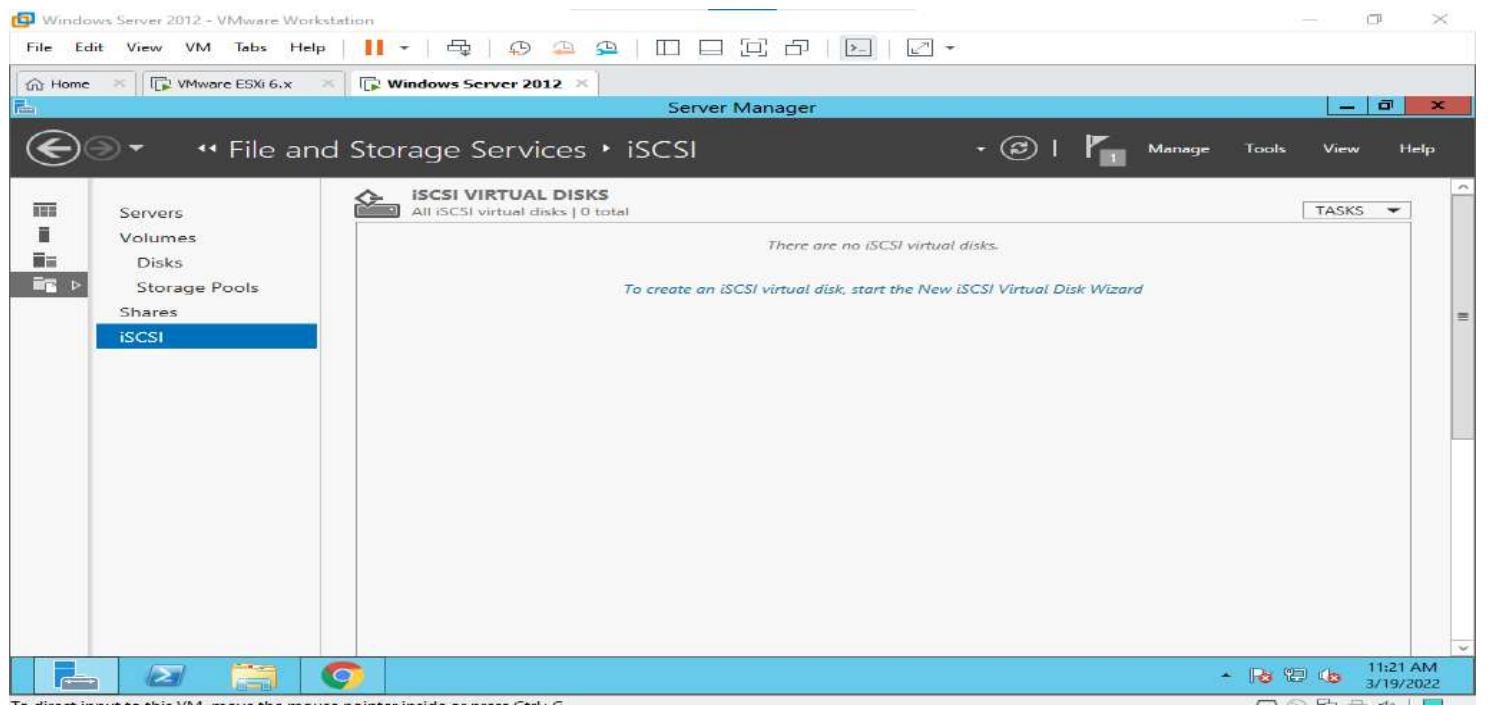
After clicking on the install button, the below screen will appear.



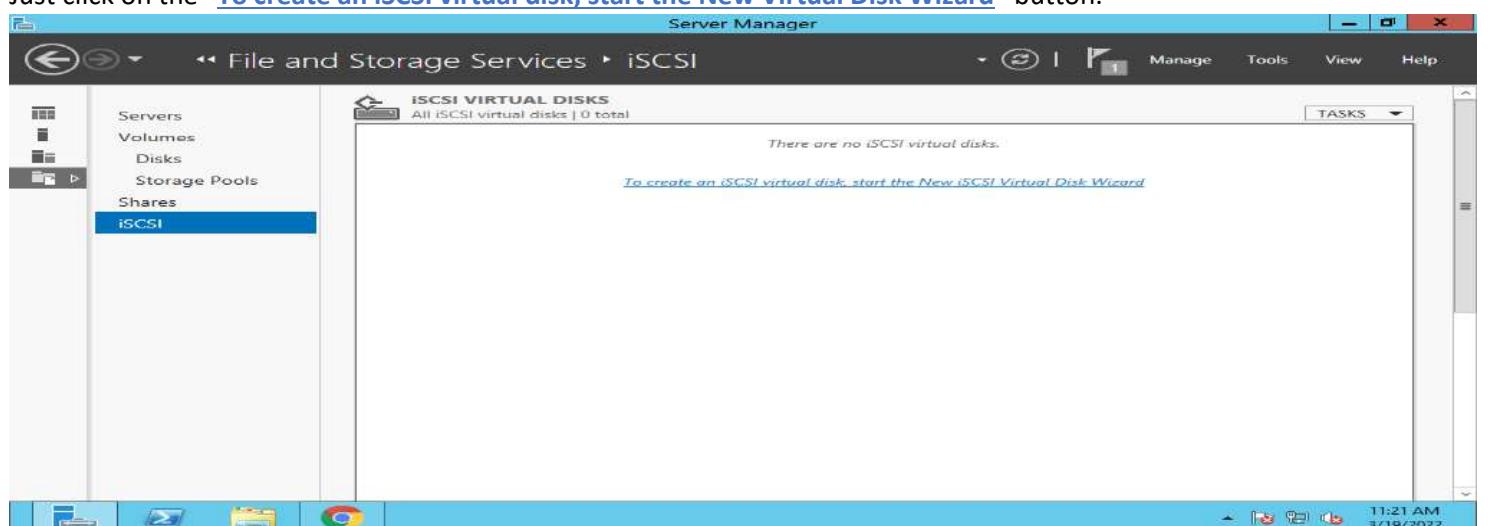
After adding the role of iSCSI go to the below path **Server Manager > File and Storage Services > iSCSI**



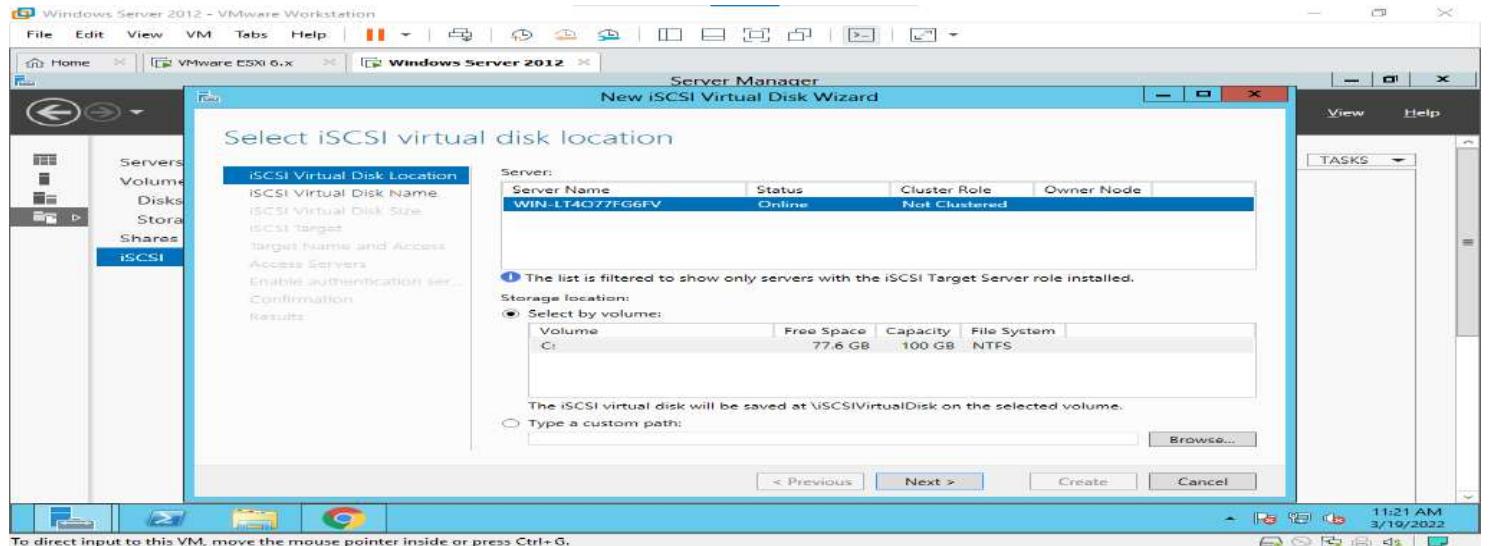
Create an iSCSI Virtual Disk.



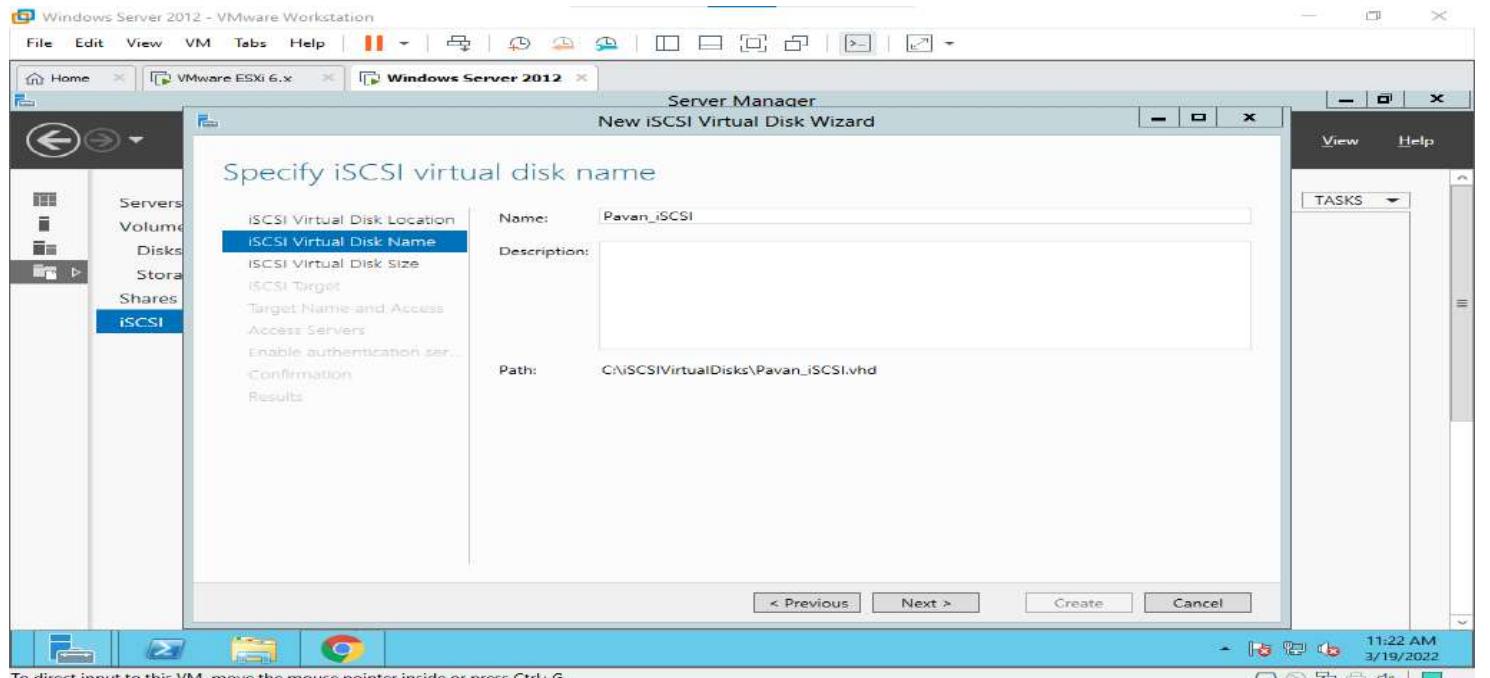
Just click on the "[To create an iSCSI virtual disk, start the New Virtual Disk Wizard](#)" button.



After that below screen will appear and Click on the **Next** button



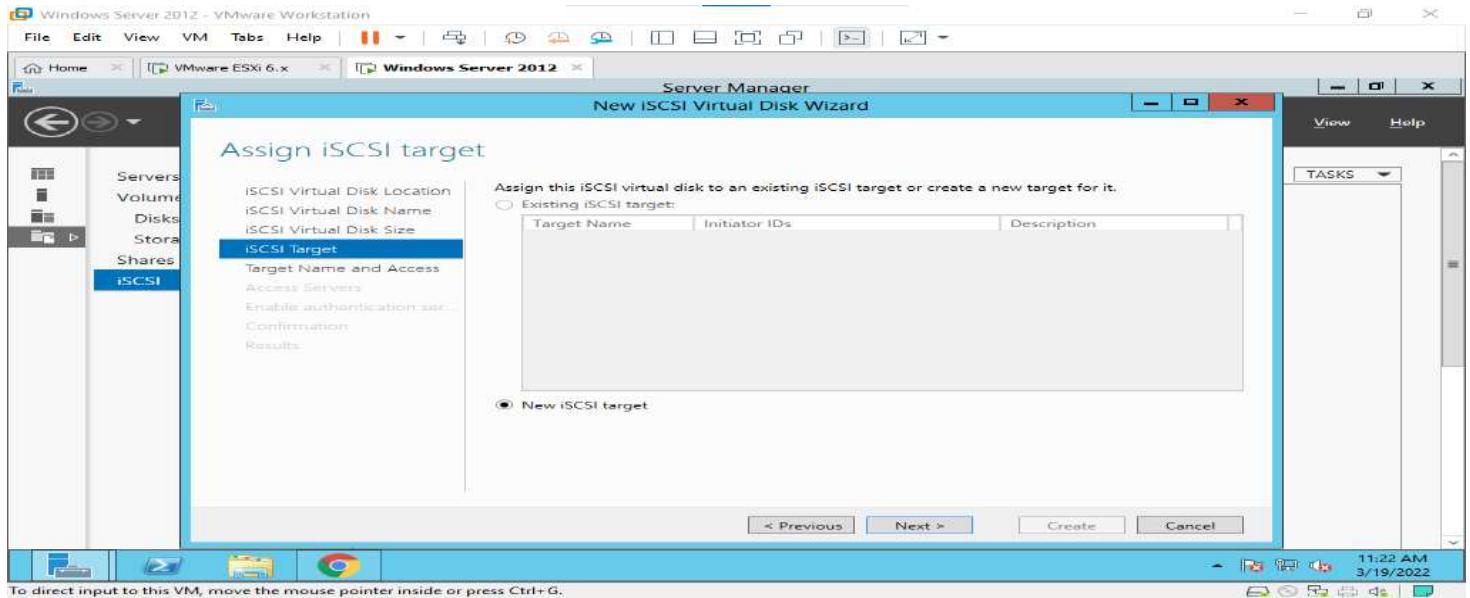
Enter iSCSI virtual disk name and click on the "Next" button



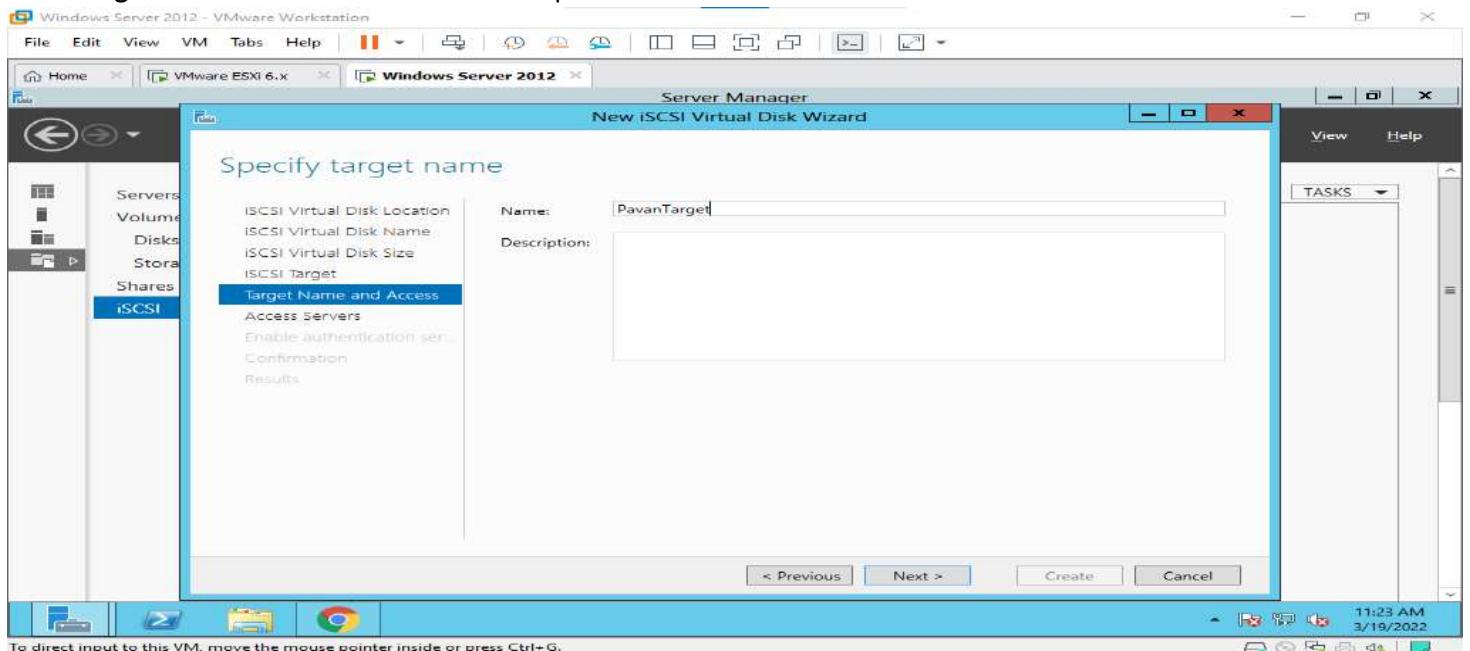
Enter iSCSI virtual disk size and click on the "Next" button.



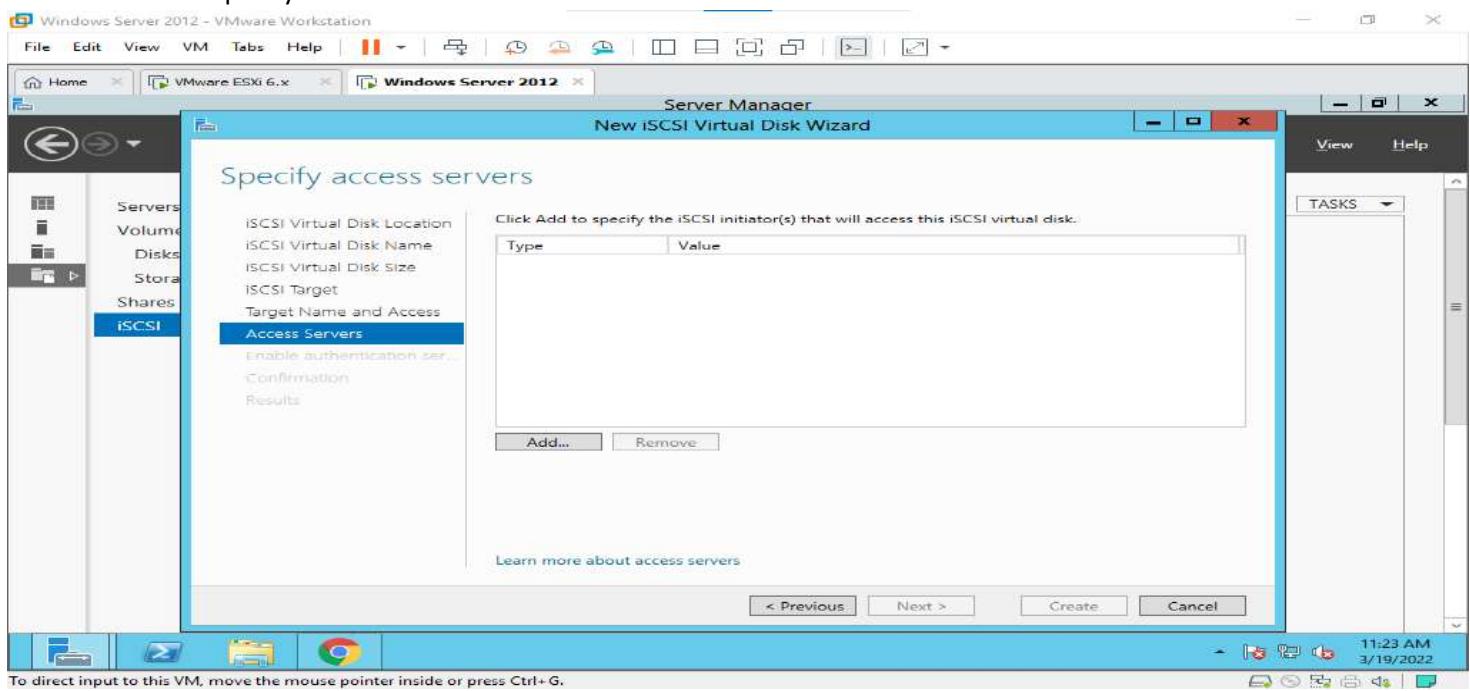
Choose the option “New iSCSI target” and click on the “Next” button.



Enter target name and click “Next” button to proceed



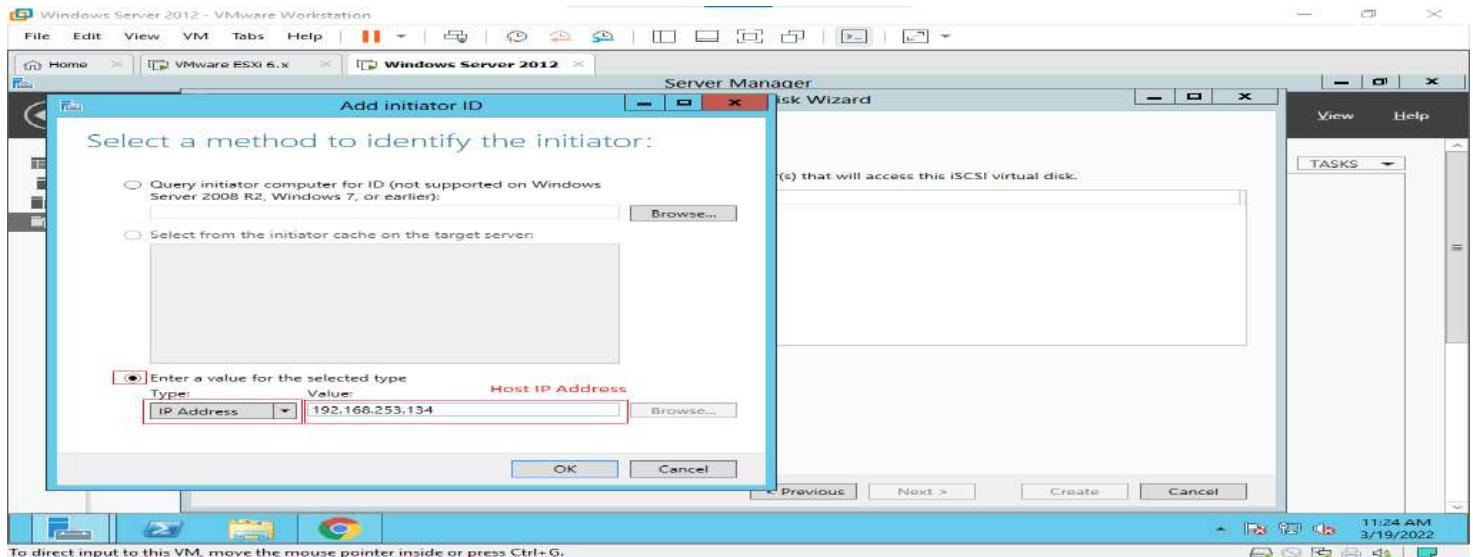
Here we need to specify which host can access this iSCSI virtual disk for this enter below details



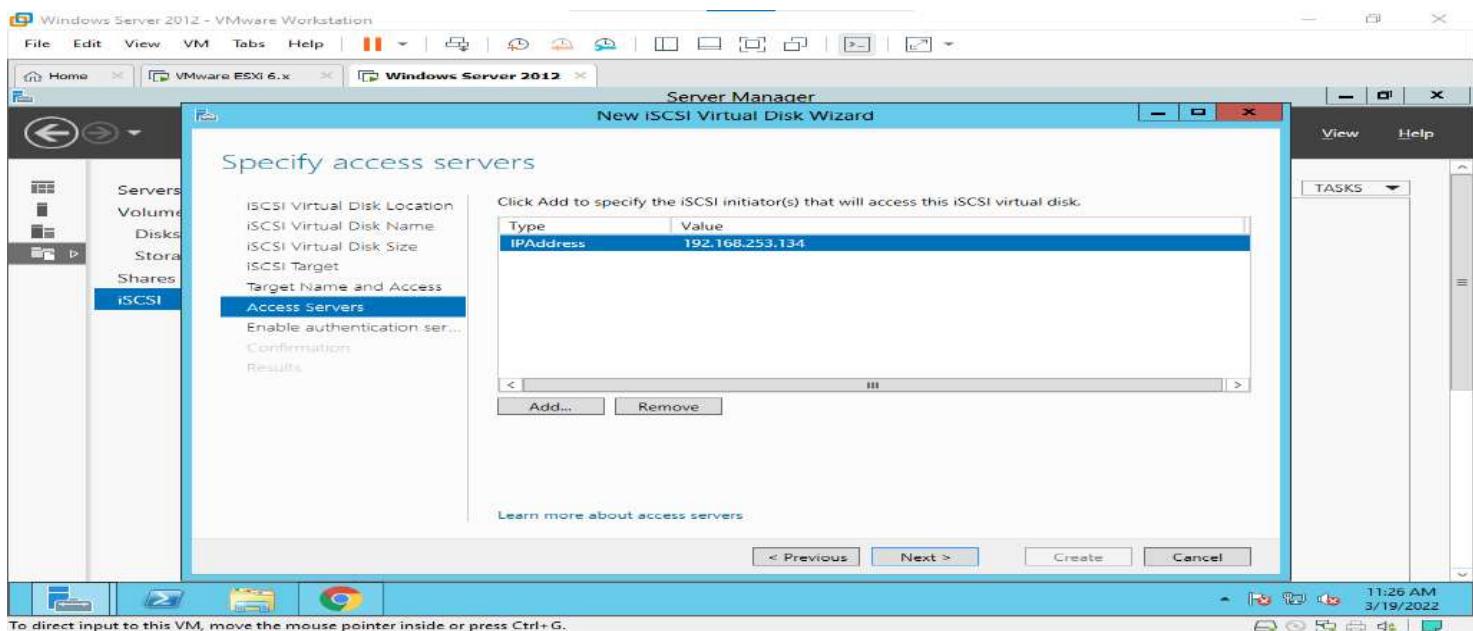
Choose the option “Enter a value for the selected type” and write below details

Type: Choose an option (IP Address)

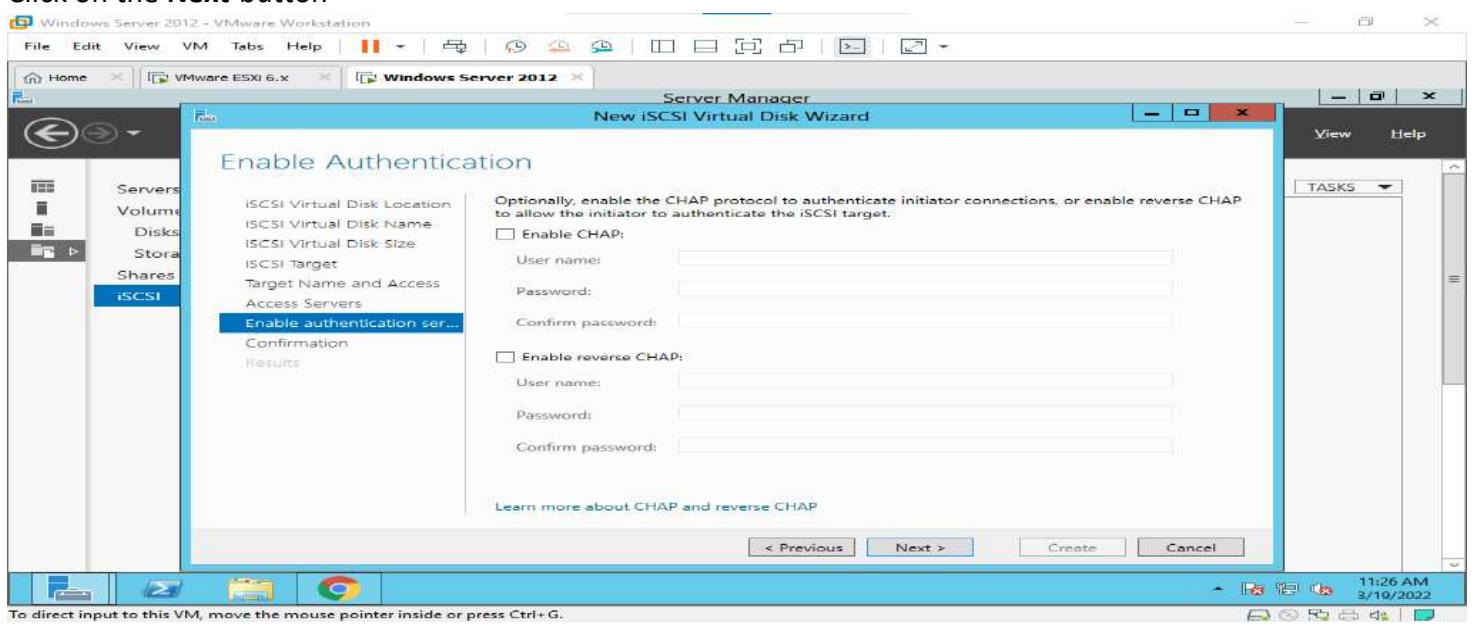
Value: Enter IP address of Host



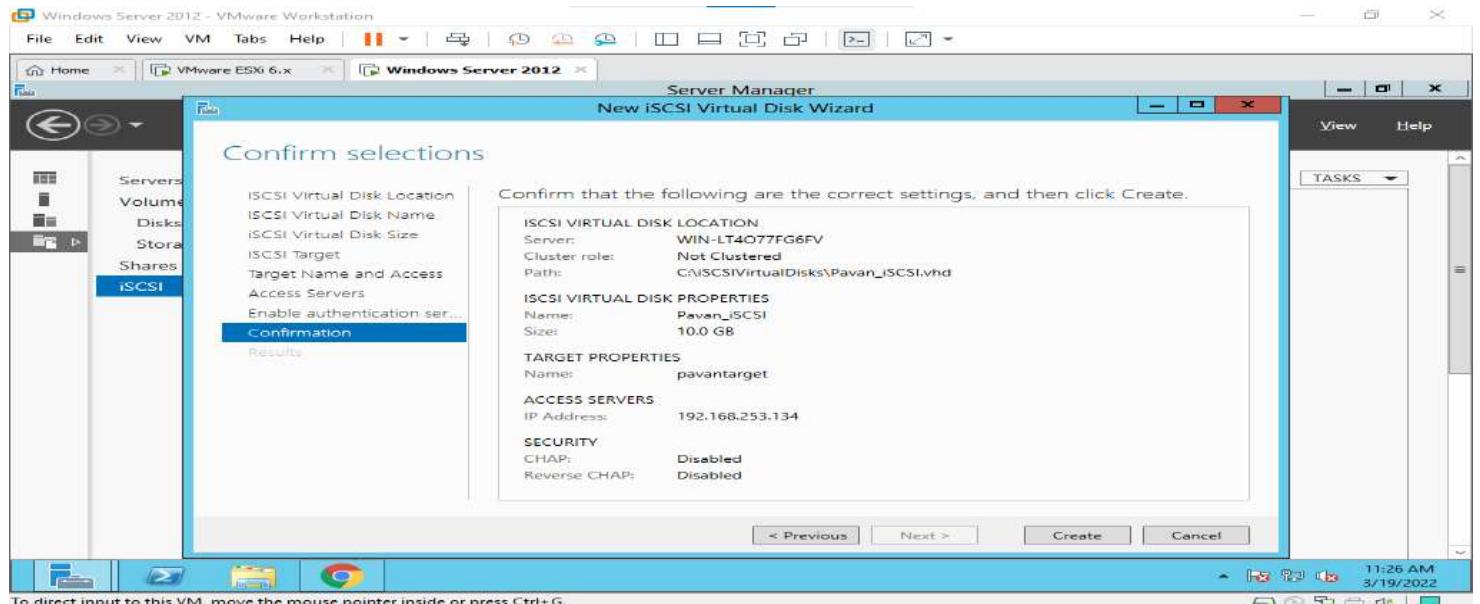
Click on the Next button



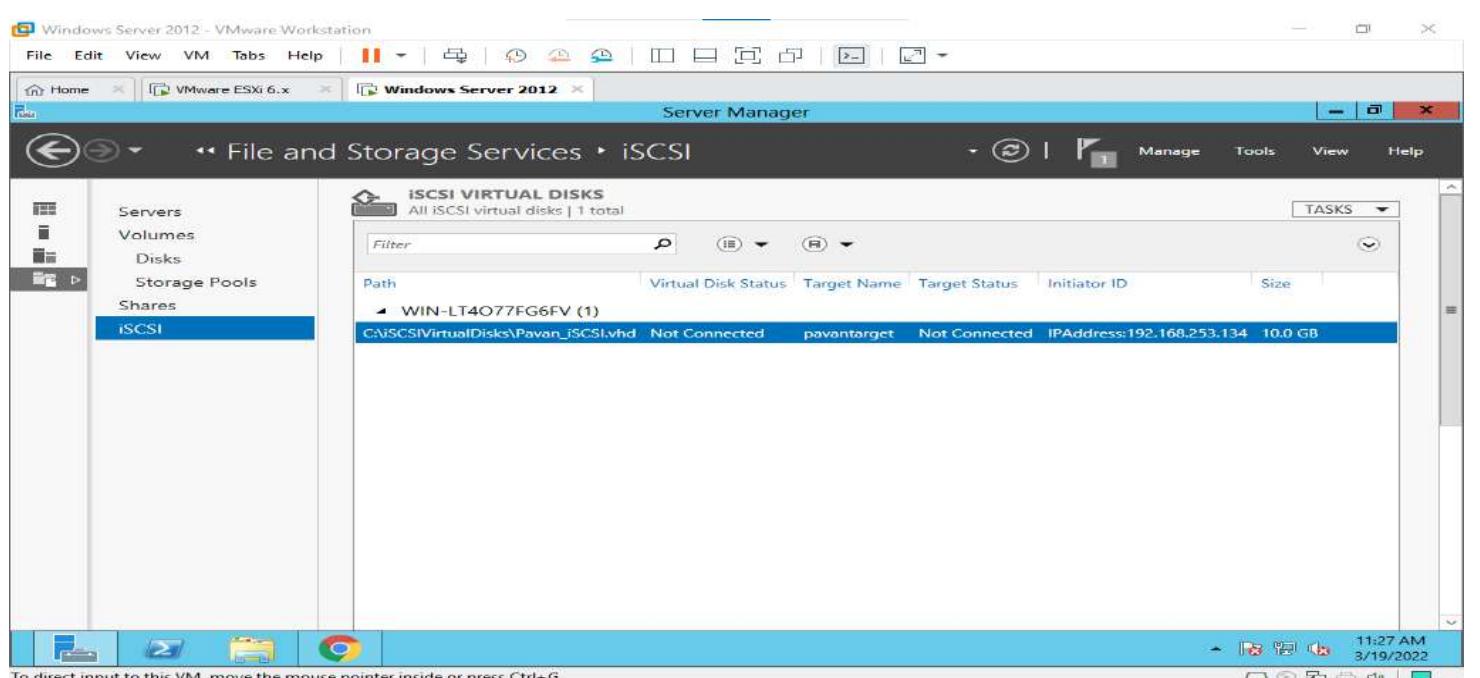
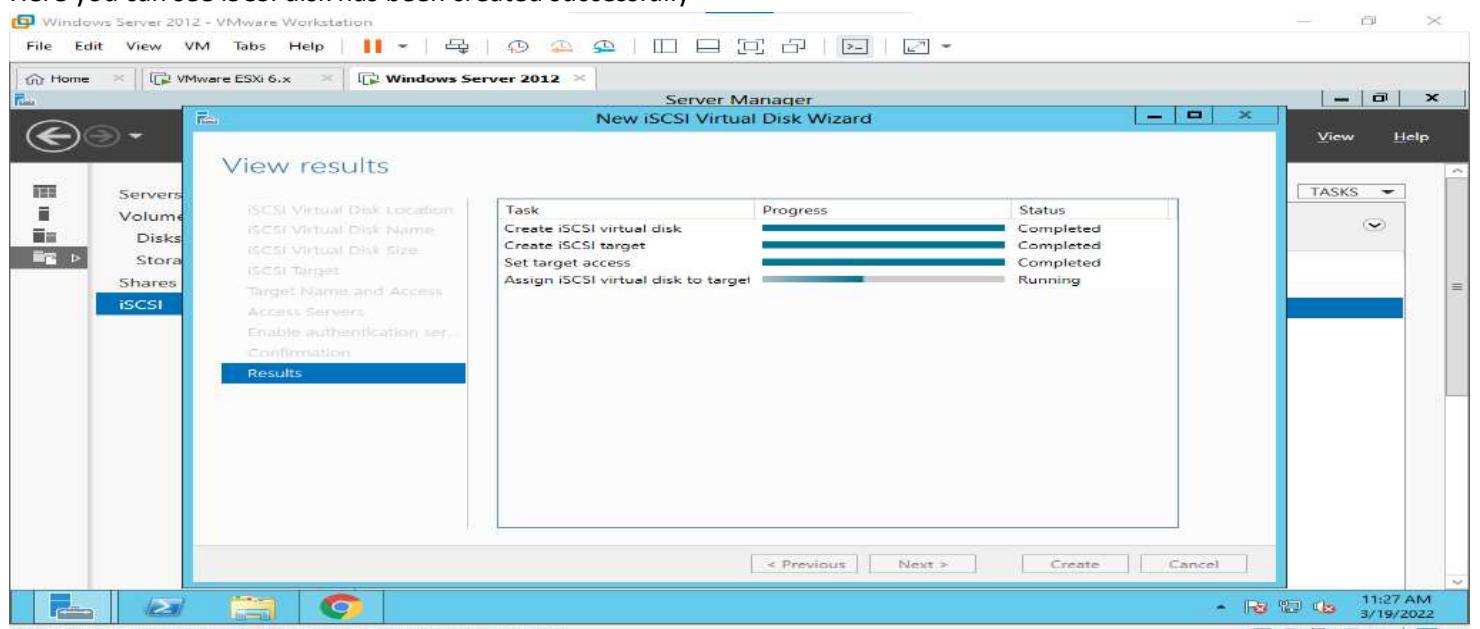
Click on the Next button



## Click on the Create button



Here you can see iSCSI disk has been created successfully



Create an iSCSI Adapter and configure an iSCSI adapter with the server

Login into vSphere client and go to the **Configuration tab** of the host where you want to add an iSCSI virtual disk.

Now go to “**Storage Adapters**” then choose “**Add Software Adapter**”

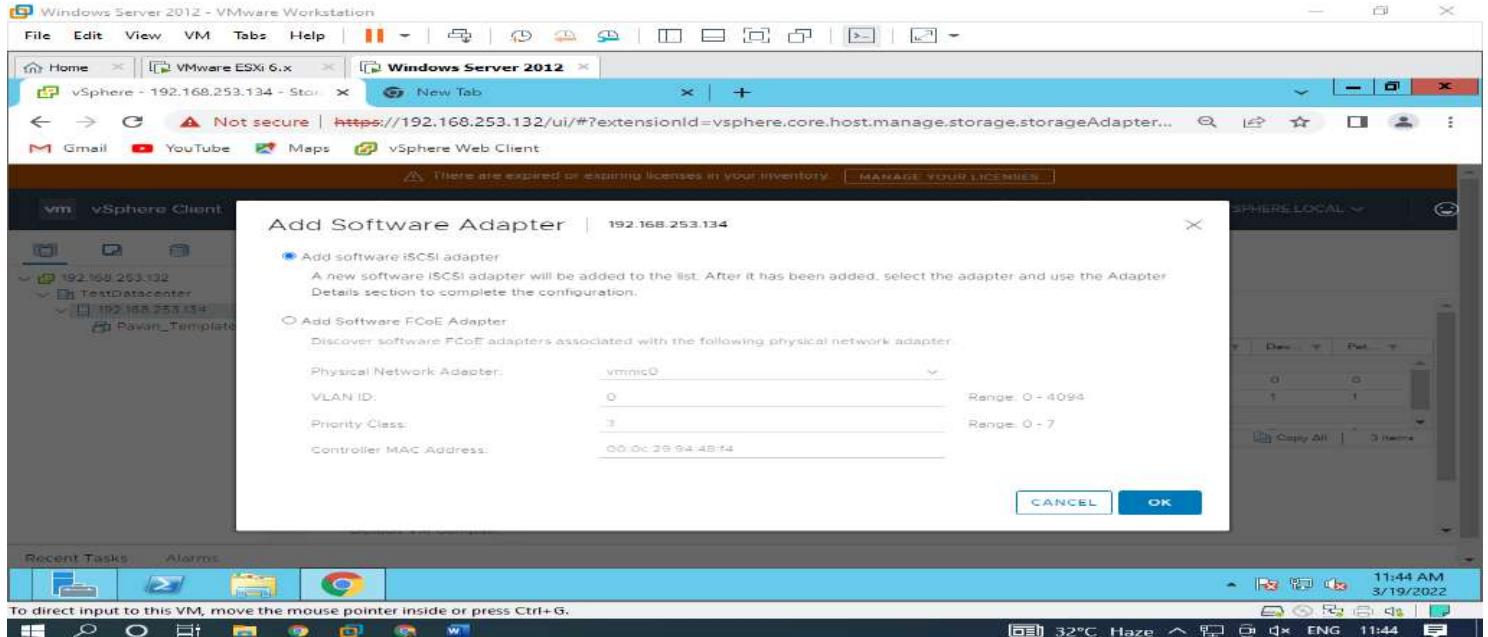
The screenshot shows the vSphere Client interface for a host at 192.168.253.134. The left sidebar shows a tree view with '192.168.253.134' selected under 'TestDatacenter'. The main pane is titled 'Storage Adapters' and lists two adapters: 'vmhba1' and 'vmhba04', both of which are 'Unknown' status. There is a button labeled '+ Add Software Adapter' at the top of the list.

The screenshot shows the 'Add Software Adapter' dialog box overlaid on the vSphere Client interface. The dialog has a title 'Add Software Adapter' and two buttons: 'CANCEL' and 'OK'. The background shows the same host configuration screen as the previous screenshot.

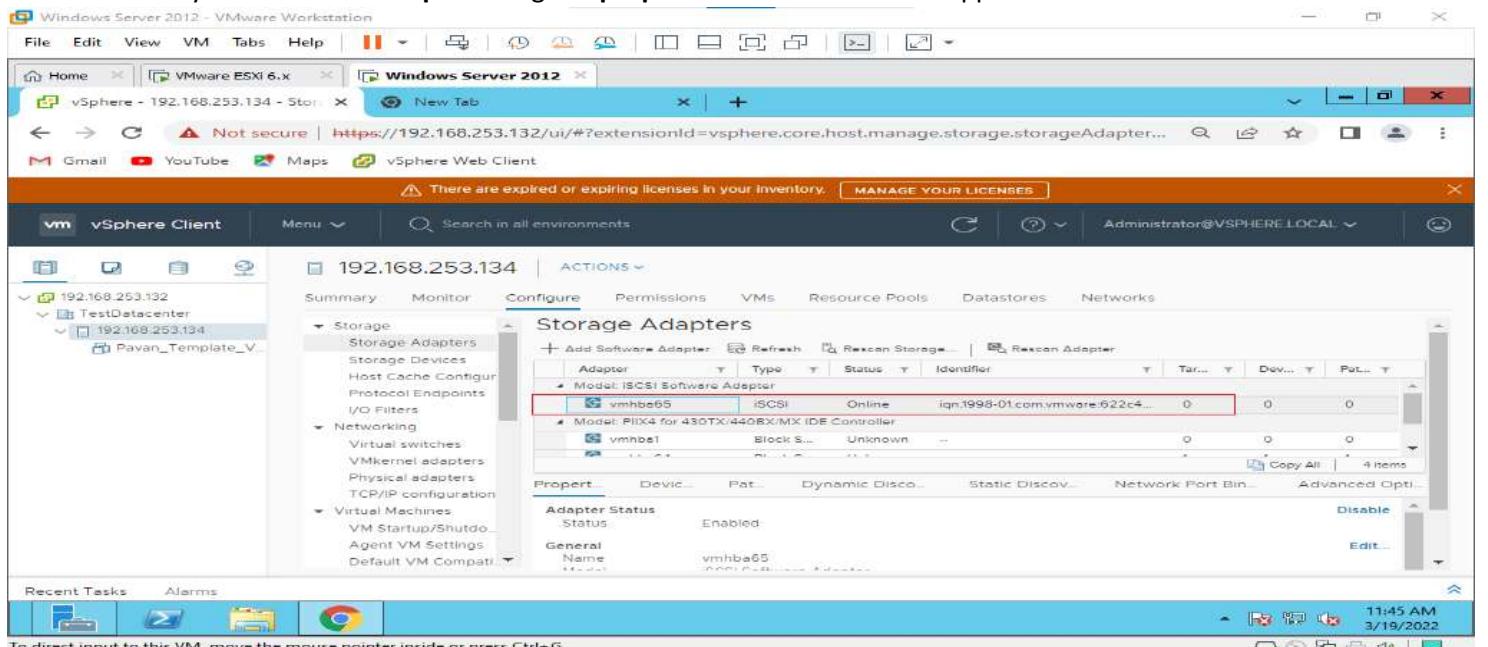
Showing the above popup then first **refresh** the entire link

The screenshot shows the vSphere Client interface after refreshing. The 'Storage Adapters' list now shows three entries: 'vmhba1', 'vmhba04', and 'Model: PVSCSI SCSI Controller'. The 'PVSCSI SCSI Controller' entry has a small red exclamation mark icon next to it, indicating a warning or error. The status for all adapters is still 'Unknown'.

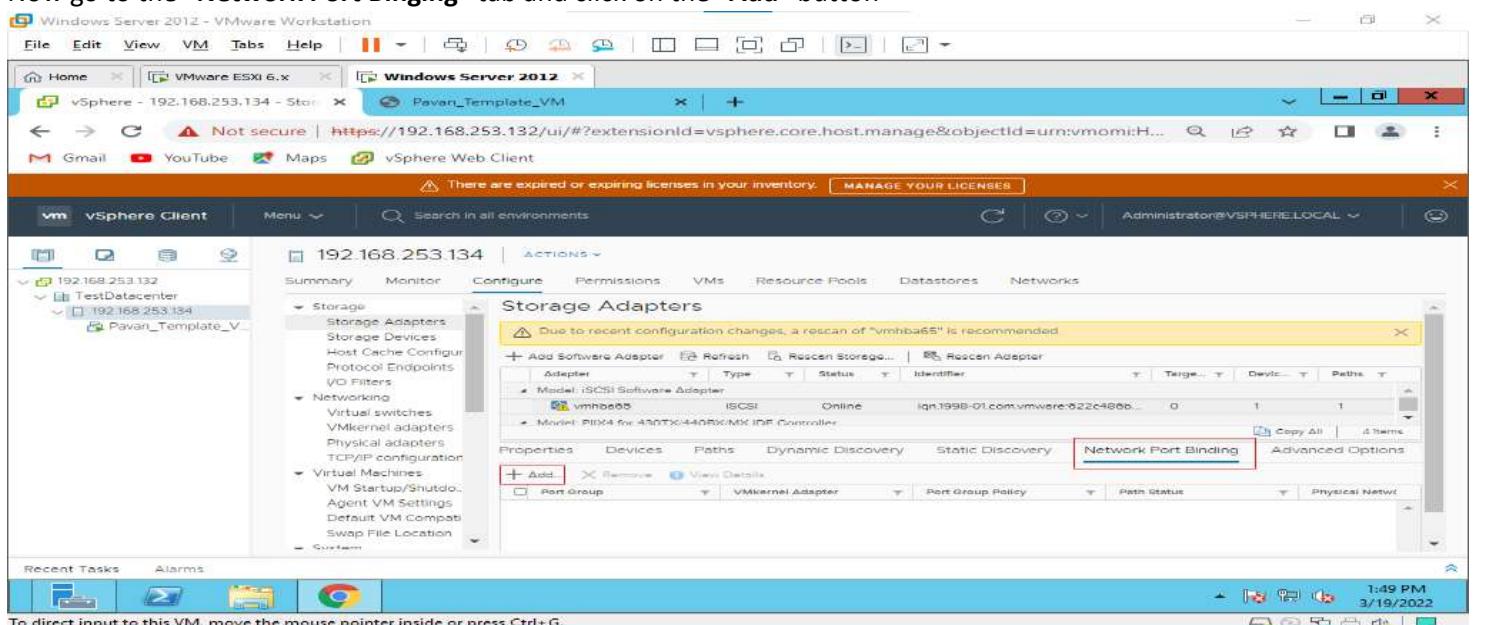
Select the **Add Software iSCSI Adapter** and click on the **OK** button



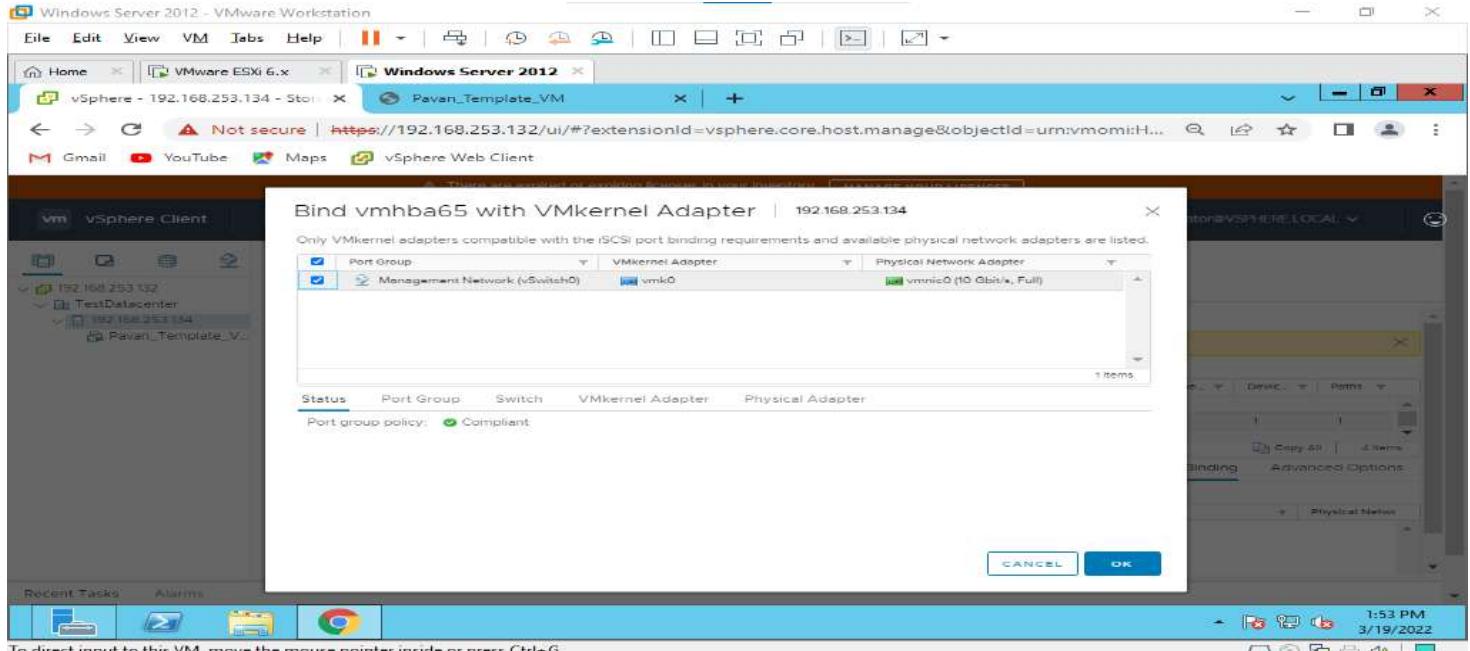
Select the newly created iSCSI Adapter and go to **properties** below wizard will appear.



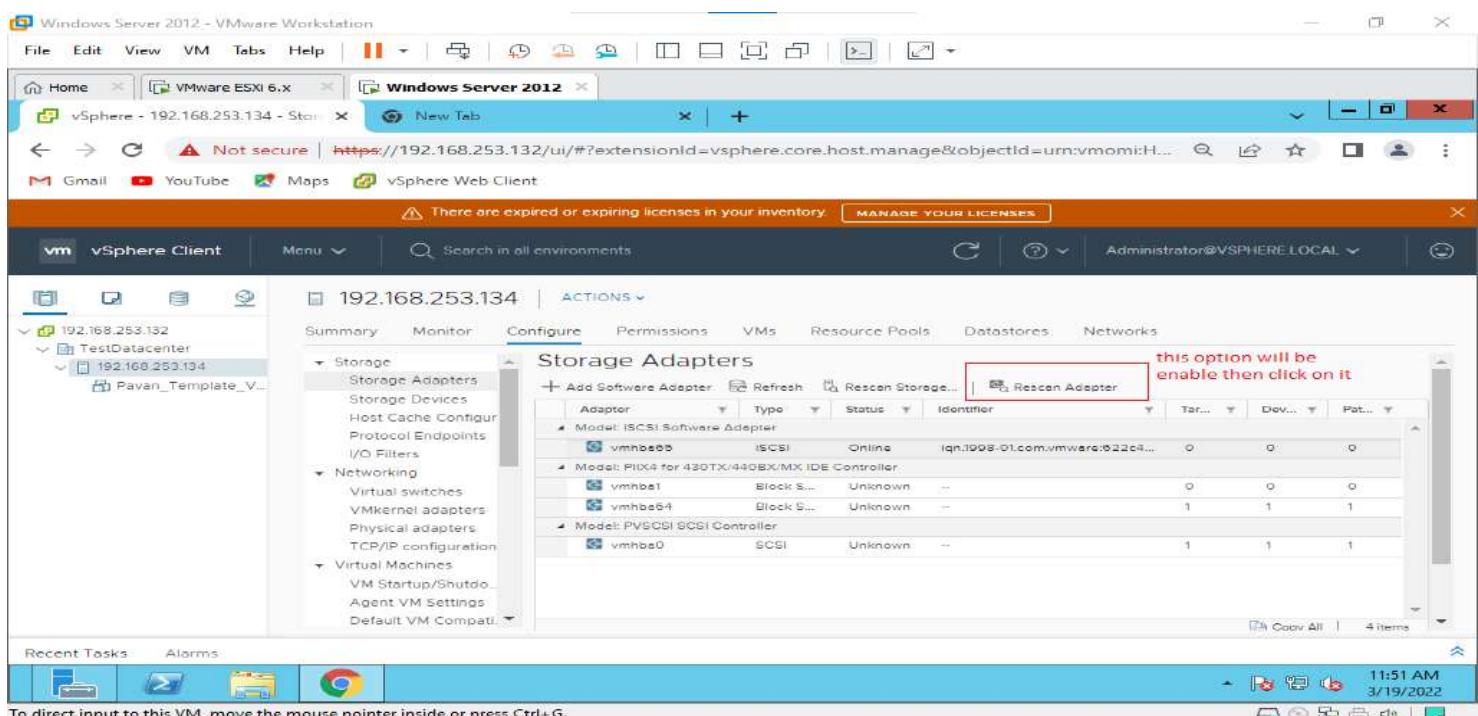
Now go to the "Network Port Binging" tab and click on the "Add" button



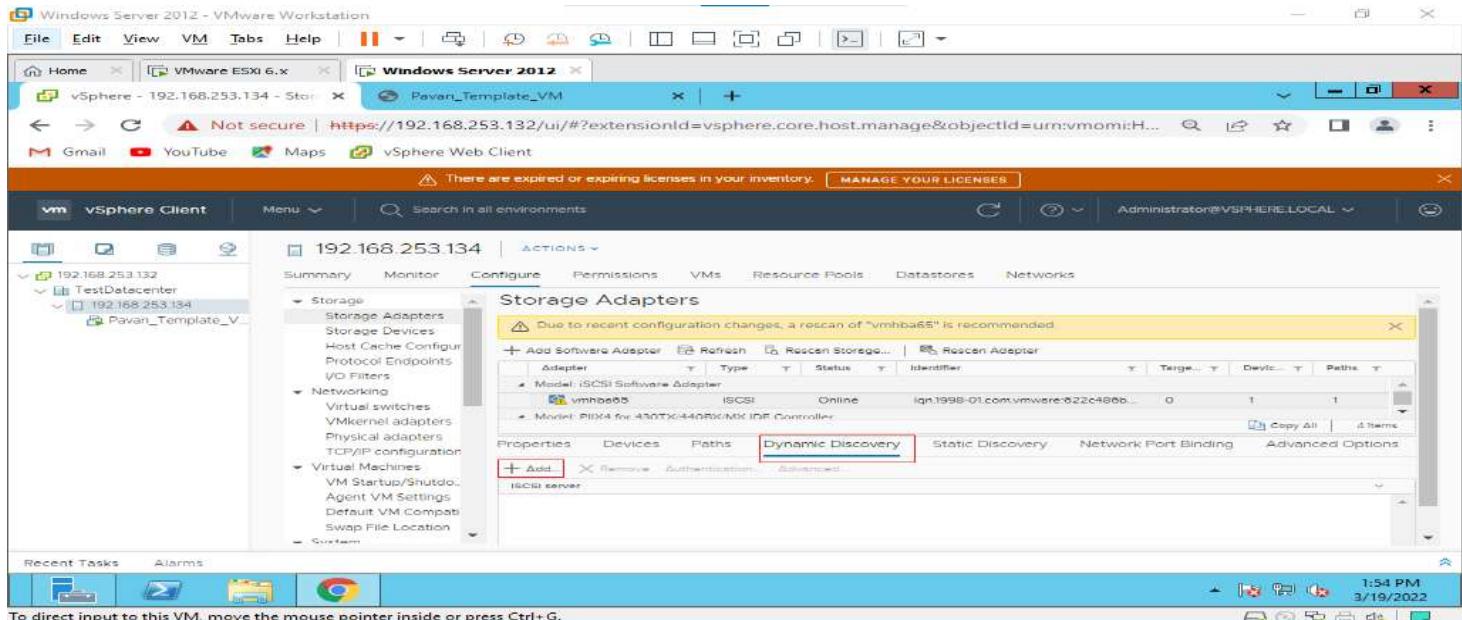
## Check the option and Click on OK button



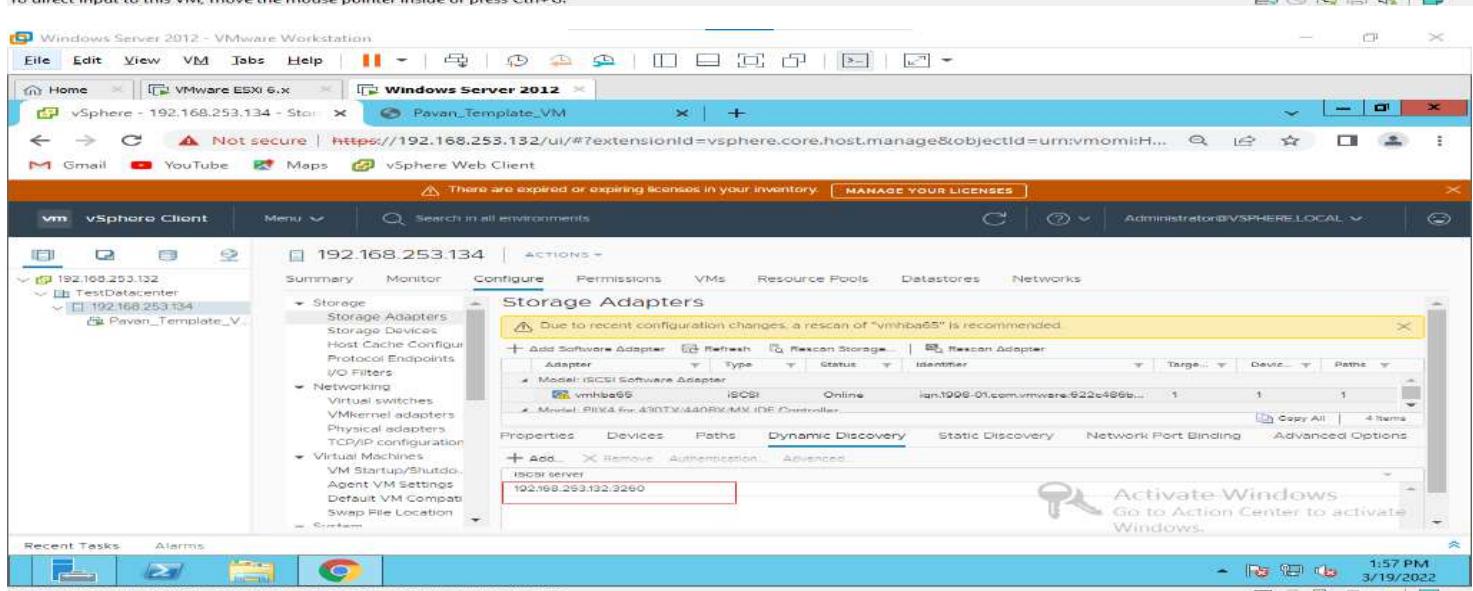
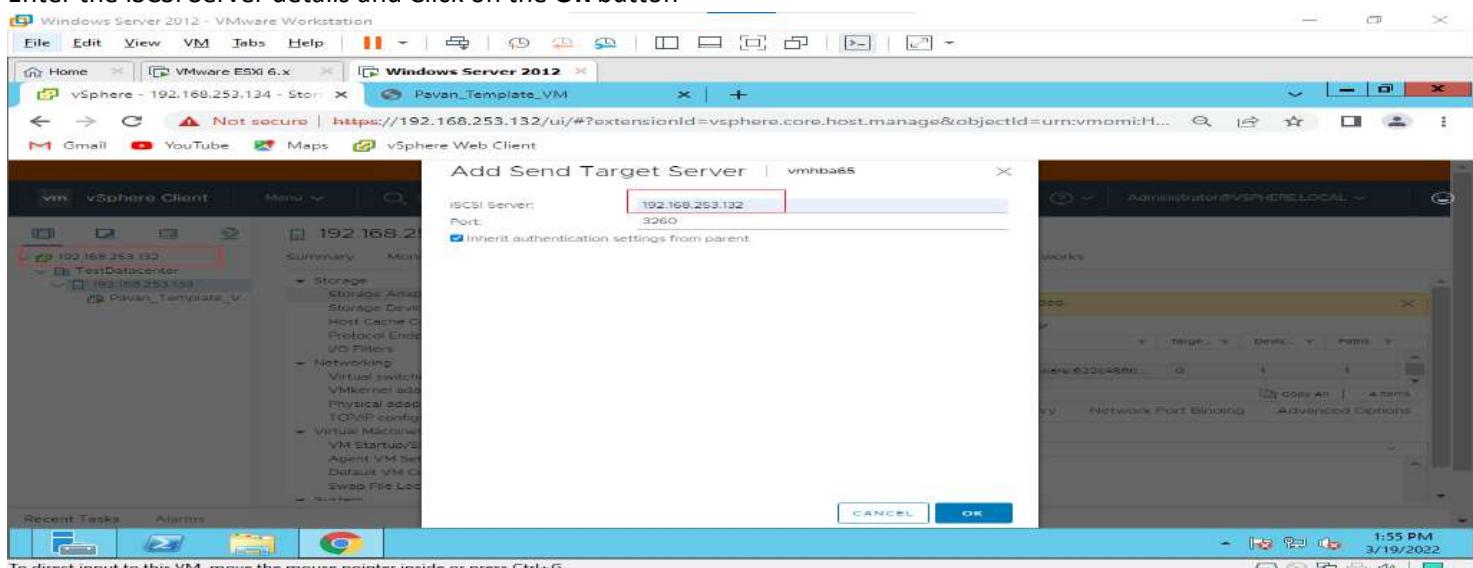
After Click on OK then refresh the Host and Here enable the Rescan Adapter



Now go to the “Dynamic Discovery” tab and Add button.



Enter the iSCSI Server details and Click on the OK button



Create iSCSI Storage to Host. Right Click on Host > Storage > New Database

The screenshot shows the vSphere Web Client interface. In the left sidebar, under '192.168.253.134' > 'TestDatacenter' > '192.168.253.134' > 'Pavan\_Template\_VM', there is a 'Storage' section with options like 'Add Networking...', 'Host Profiles', 'Export System Logs...', 'Reconfigure for vSphere...', 'Assign License...', 'Settings', 'Move To...', and 'Tags & Custom Attrib...'. The main content area is titled 'Storage Adapters' and shows a table with two entries:

Adapter	Type	Status	Identifier	Target	Device	Paths
vmhba66	iSCSI	Online	iqn.1999-01.com.vmware-62c486b...	1	1	1
vmhba1	Block SCSI	Unknown	—	0	0	0

A message at the top right says 'There are expired or expiring licenses in your inventory.' with a 'MANAGE YOUR LICENSES' button. A watermark for 'Activate Windows' is visible.

## Select type as VMFS.

The screenshot shows the 'New Datastore' wizard in progress. Step 2, 'Name and device selection', is selected. The 'Type' section shows:

- VMFS  
Create a VMFS datastore on a disk/LUN.
- NFS  
Create an NFS datastore on an NFS share over the network.
- VVol  
Create a Virtual Volumes datastore on a storage container connected to a storage provider.

The main content area shows a table with one entry:

Name	LUN	Capacity	Hardware	Drive Type
MSPT iSCSI Disk (hds.00...)	0	10.00 GB	Not supported	HDD

A watermark for 'Activate Windows' is visible.

In Name and device selection, give the name to the datastore

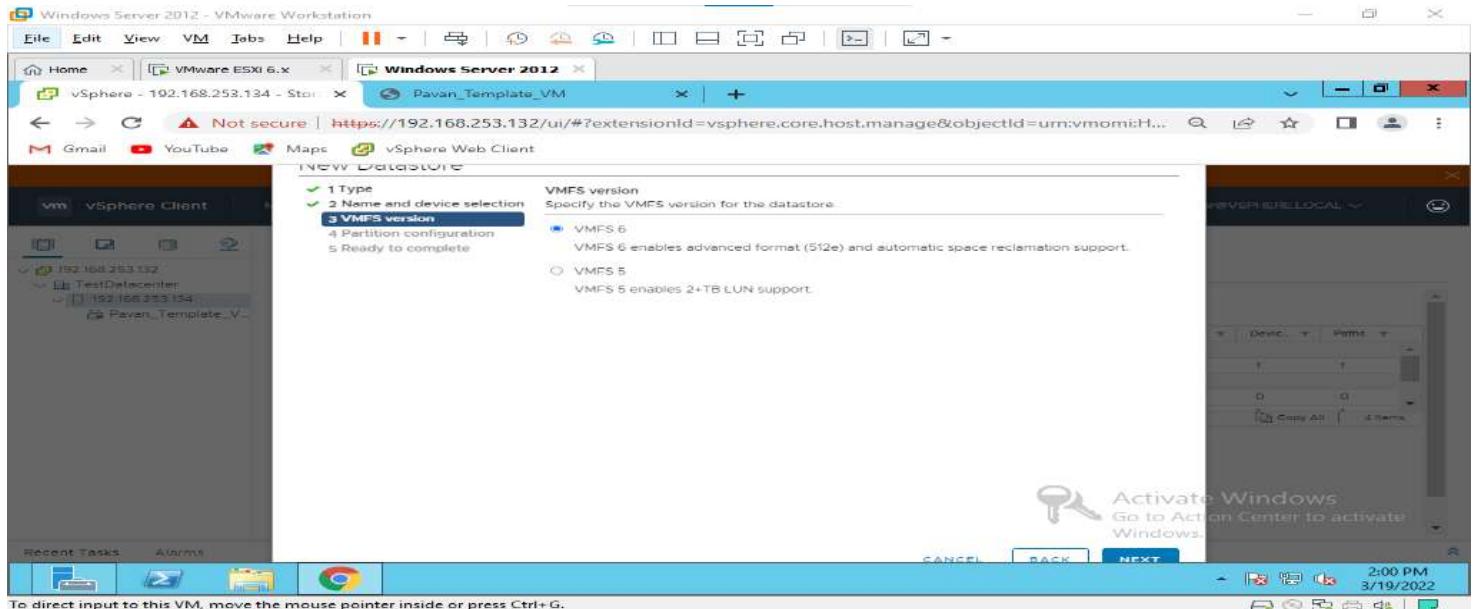
The screenshot shows the 'New Datastore' wizard in progress. Step 2, 'Name and device selection', is selected. The 'Name and device selection' section shows:

Datastore name: PavanDatastore

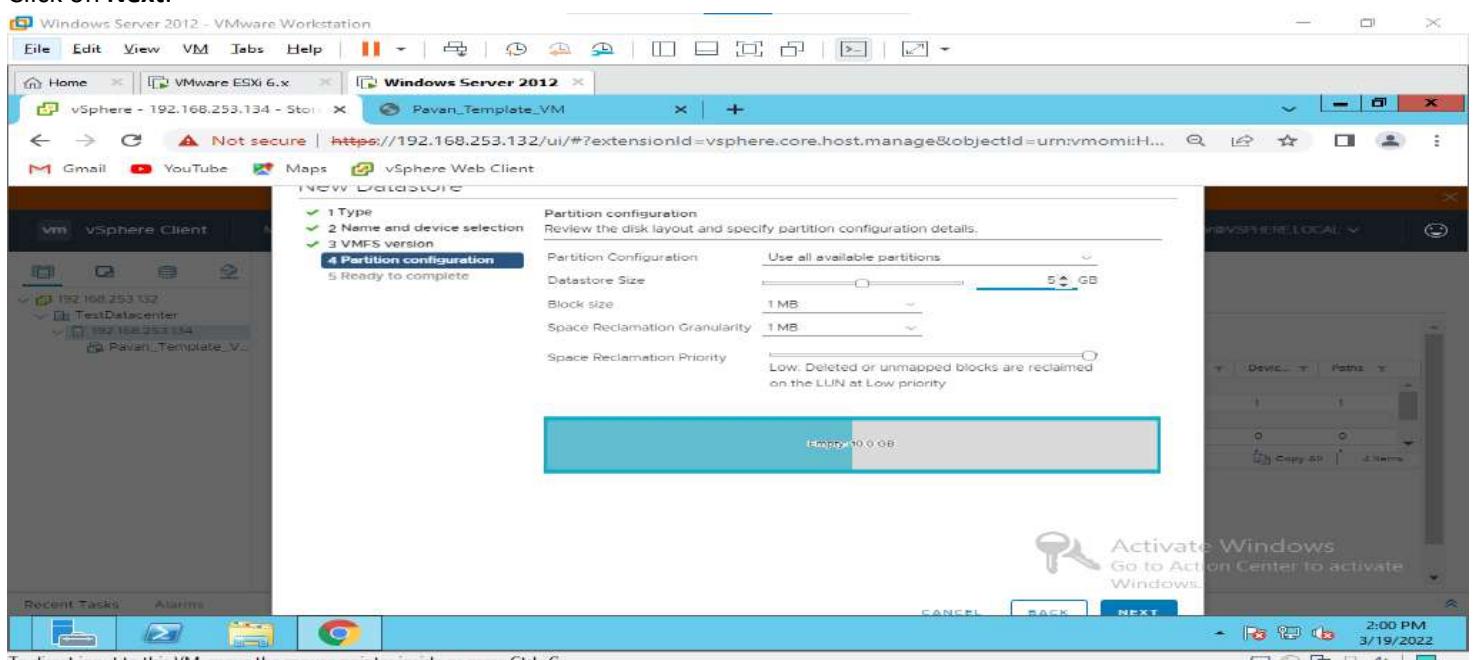
Name	LUN	Capacity	Hardware	Drive Type
MSPT iSCSI Disk (hds.00...)	0	10.00 GB	Not supported	HDD

A watermark for 'Activate Windows' is visible.

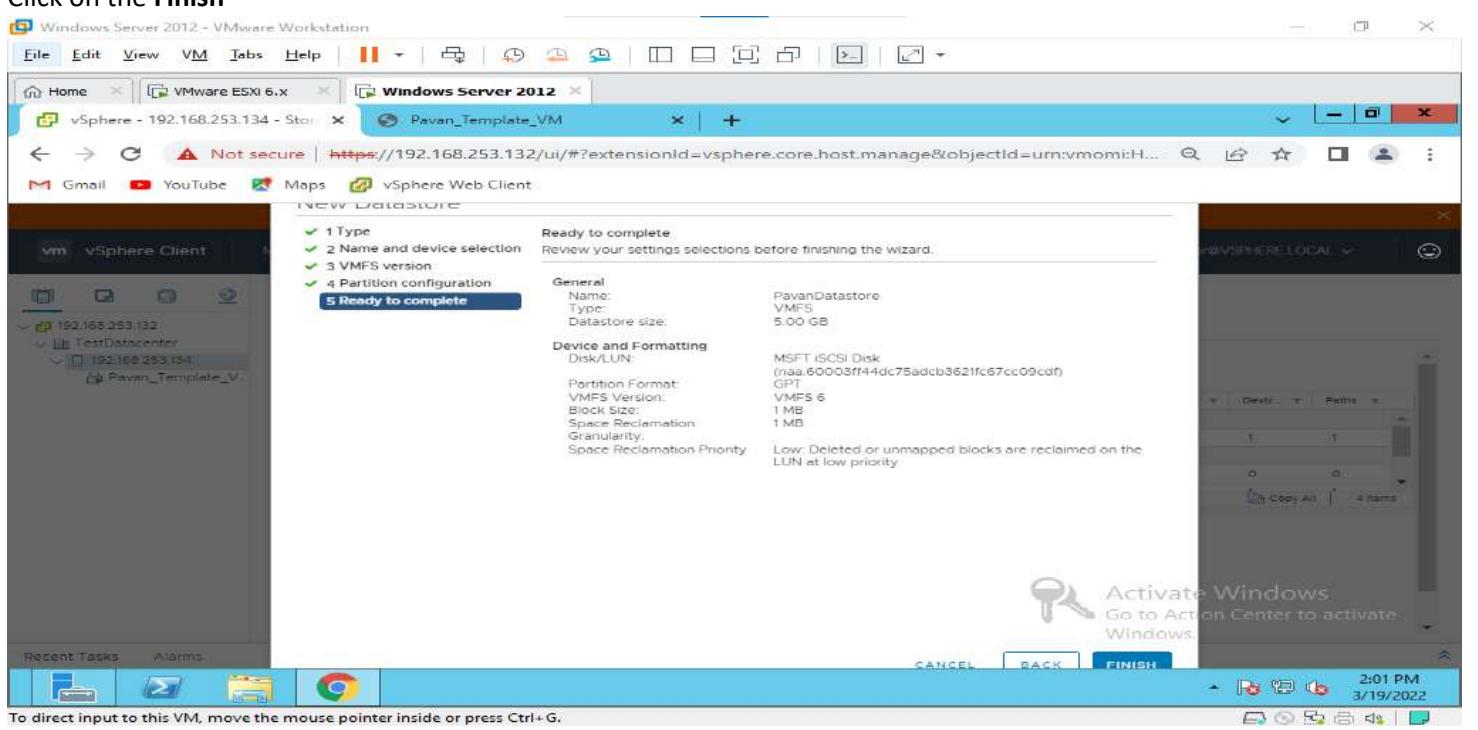
Select the first option in the VMFS version menu.



Click on Next.



Click on the Finish



Here you can see iSCSI storage has been created into the ESXi host.

The screenshot shows the vSphere Client interface. In the left sidebar, under 'datastore1', there is a folder named 'PavanDatastore' which contains a VM named 'Pavan\_Template\_VM'. The main pane displays the details of this VM, including its name, provisioned space (2.44 GB), guest OS (Microsoft Windows XP Professional (32-bit)), compatibility (ESXi 6.7 and later (VM version 14)), and memory size (256 MB). A message at the top right says 'Activate Windows'.

## B- Create a one user account of VMware ESXi server using vSphere WebClient Application.

Login into vSphere server from Web Client application.

Click on the vSphere Client like below image

The screenshot shows the vSphere Client interface with the 'summary' tab selected for the host '192.168.253.132'. It displays basic information such as the number of virtual machines (1) and hosts (1). On the right side, resource usage is shown for CPU, Memory, and Storage. A message at the top right says 'Activate Windows'.

Go to "Home" and click on the "Administration" tab

The screenshot shows the vSphere Client interface with the 'Administration' tab selected in the navigation bar. The left sidebar includes sections for Hosts and Clusters, VMs and Templates, Storage, Networking, Content Libraries, Global Inventory Lists, Policies and Profiles, Auto Deploy, Developer Center, and Virtualize Operations. The main pane shows various administration tools like Task Console, Event Console, VM Customization Specifications, VM Storage Policies, and Host Profiles. A message at the top right says 'Activate Windows'.

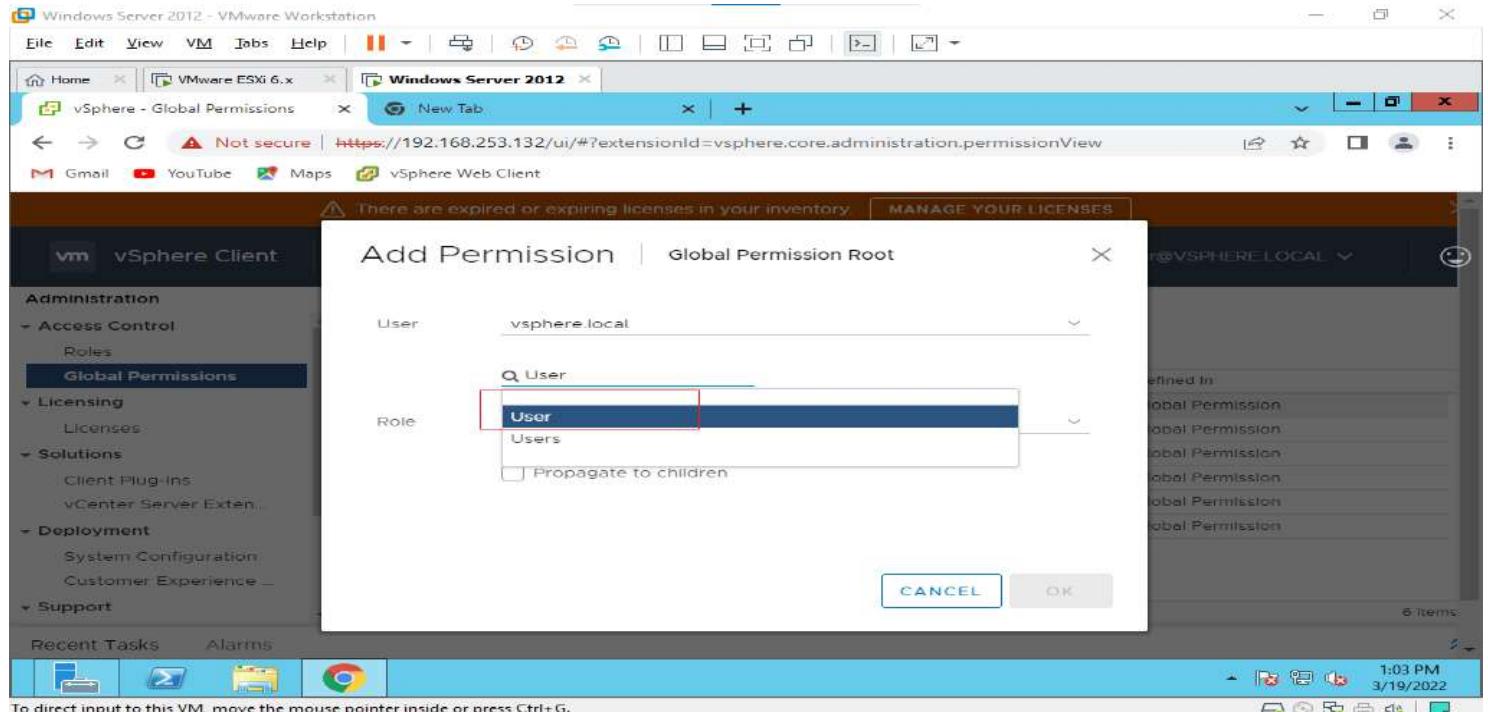
Go to the “User and Groups” tab select domain as vsphere.local and click on add button.

Add User details like Username & Password and Click on the ADD button

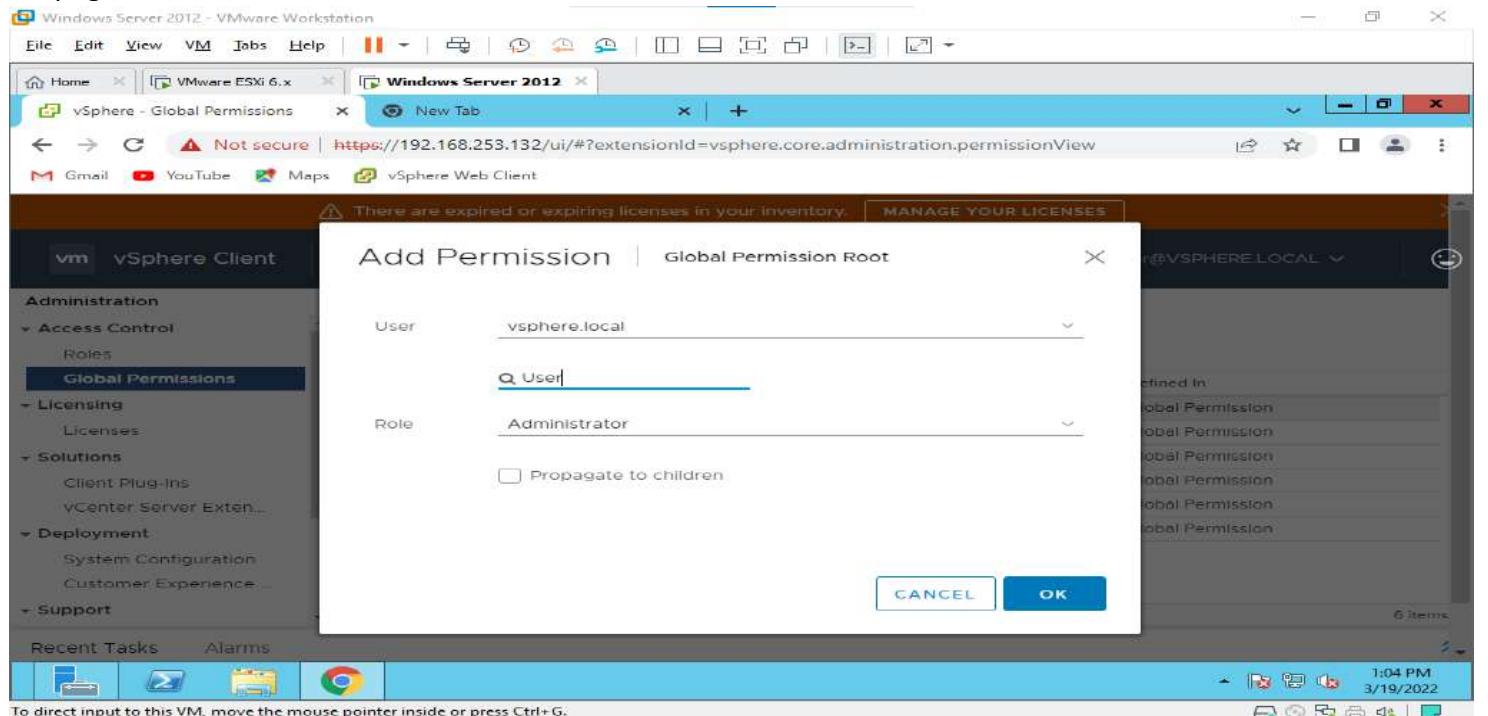
Now it's required to give permission to the newly created user

Go to “Global Permissions” and click on add button

Select the user and click on the “OK” button. Choose a role for the user and click on the **OK** button



Here we are selected as the **Administrator** role to the **User** (Which we are created). Note: Here we not check the Propagate to children



The screenshot shows the vSphere Client interface with the 'Global Permissions' section selected in the left sidebar. The main pane displays a table of global permissions for various users and groups. One row, 'VSPHERE.LOCAL\User', is highlighted with a red border.

User/Group	Role	Defined In
VSPHERE.LOCAL\Administrator	Administrator	Global Permission
VSPHERE.LOCAL\Administrators	Administrator	Global Permission
VSPHERE.LOCAL\AutoUpdateUser	AutoUpdateUser	Global Permission
VSPHERE.LOCAL\User	Administrator	Global Permission
VSPHERE.LOCAL\vxpxd-68ed05d0-a112-11ec-8... VSPHERE.LOCAL\vxpxd-extension-68ed05d0-a112-11ec-8...	Administrator	Global Permission
VSPHERE.LOCAL\vsphere-webclient-68ed05d0-a112-11ec-8...	vSphere Client Solution User	Global Permission

## C- Prevent Users from Spying on Remote Console Sessions.

Login into vSphere server from Web Client application.

The screenshot shows the vSphere Client interface with the host '192.168.253.132' selected in the inventory tree. The summary screen provides details about the host's resources and performance.

Virtual Machines:	1
Hosts:	1
CPU	
Used:	38 MHz
Capacity:	5.81 GHz
Free:	5.77 GHz
Memory	
Used:	1.14 GB
Capacity:	2.88 GB
Free:	2.74 GB
Storage	
Used:	18.41 GB
Capacity:	14.09 GB
Free:	32.5 GB

Select the virtual machine template and click on the action button.

The screenshot shows the vSphere Client interface with the virtual machine template 'Pavan\_Template\_V...' selected in the inventory tree. The summary screen displays the template's configuration and status.

**Summary** tab details:

- Guest OS: Microsoft Windows XP Professional (32-bit)
- Compatibility: ESXi 6.7 and later (VM version 14)
- VMware Tools: Not running, not installed
- DNS Name: (not specified)
- IP Addresses: (not specified)
- Host: 192.168.253.134

**ACTIONS** button is highlighted in red.

Click on the **Edit Settings** option.

The screenshot shows the vSphere Client interface. On the left, there's a tree view of datacenters and hosts. In the center, a summary card for 'Pavan\_Template\_VM' is displayed, showing it's powered off. On the right, a context menu is open under the 'ACTIONS' dropdown, with 'Edit Settings...' highlighted. The status bar at the bottom right shows the time as 1:07 PM and the date as 3/19/2022.

Click on **VM Options**, then go to **advanced**

The screenshot shows the 'Edit Settings' dialog box for 'Pavan\_Template\_VM'. The 'VM Options' tab is selected. Under the 'Advanced' section, the 'Swap file location' settings are visible. The 'Default' radio button is selected, with a note explaining it uses cluster/host settings. Other options include 'Virtual machine directory' (store swap files in same dir as VM) and 'Datastore specified by host' (store swap files in same dir as VM, or in a specific datastore if not possible). The status bar at the bottom right shows the time as 1:07 PM and the date as 3/19/2022.

Click on **edit configurations**.

The screenshot shows the 'Edit Settings' dialog box for 'Pavan\_Template\_VM'. The 'VM Options' tab is selected. Under 'Configuration Parameters', there's a 'Fibre Channel NPIV' section with a 'Normal' dropdown. The status bar at the bottom right shows the time as 1:08 PM and the date as 3/19/2022.

Click on the “Add Configuration Params” button and enter below details and **no of connections** you required and then click on the “OK” button. Add row with Name as **RemoteDisplay.MaxConnections = 1**

The screenshots illustrate the configuration of a virtual machine's settings. The first two windows show the 'Edit Configuration Parameters' dialog, which lists various system properties. The third window shows the 'Edit Settings' dialog for 'VM Options', specifically the 'Latency Sensitivity' setting. The fourth window shows the 'Configuration Parameters' dialog where a new parameter 'RemoteDisplay.MaxConnections' is being added with a value of '1'.

Now power-on of the virtual machine

Here you can see virtual machine has been started

The screenshot shows a Windows Server 2012 desktop environment where a Windows XP setup is running. The setup screen indicates the progress of the installation, from 'Collecting information' to 'Finalizing installation', with an estimated completion time of 39 minutes. The taskbar at the bottom of the screen includes icons for File Explorer, Mail, YouTube, Maps, and vSphere Web Client.

Now login from the different user and try to connect the same virtual machine, but we will get below error of max connection has been reached.

The screenshot shows the vSphere Web Client interface. In the center, there is a summary card for a virtual machine named "Pavan\_Template\_VM". The card displays the following information:

- Guest OS: Microsoft Windows XP Professional (32-bit)
- Compatibility: ESXi 6.7 and later (VM version 14)
- VMware Tools: Not running, not installed
- DNS Name: 192.168.253.134
- IP Addresses: 192.168.253.134
- Host: 192.168.253.132

A yellow warning box at the bottom left states: "VMware Tools is not installed on this virtual machine." On the right side of the card, there are links for "Change Password", "My Preferences", "Switch Theme", and a red "Logout" button. Below the card, there are sections for "VM Hardware", "Related Objects" (listing "Host" and "Networks"), and "Custom Attributes". At the bottom of the card, there is a "Notes" section with a "Edit Notes" link. The status bar at the bottom right shows the date and time as "1:29 PM 3/19/2022".

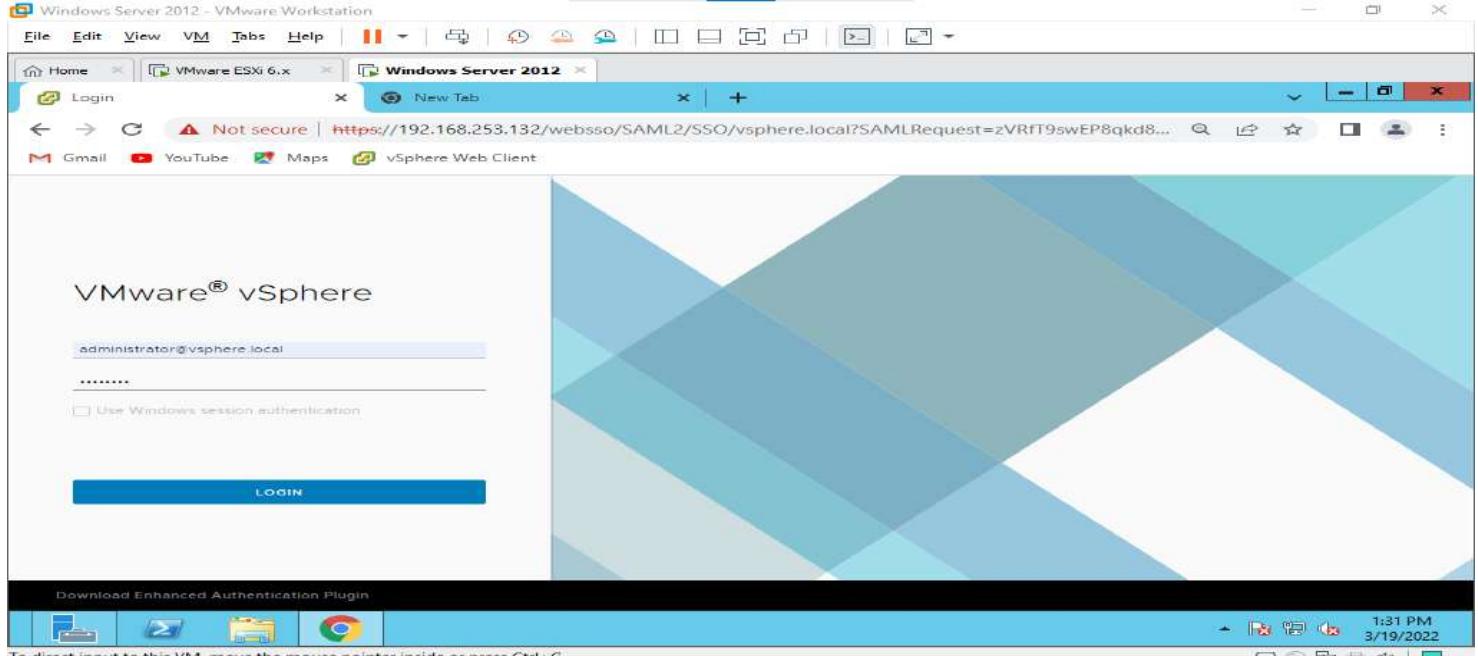
## Now we login with user

The screenshot shows a login screen for a user named "user@vsphere.local". The screen has fields for "user@vsphere.local" and a password, and a checkbox for "Use Windows session authentication". A blue "LOGIN" button is at the bottom. The background features a large, abstract blue and white geometric pattern. The status bar at the bottom right shows the date and time as "1:31 PM 3/19/2022".

## Show error then go to the permission and edit the user permission

The screenshot shows an error message displayed on the screen. The message reads: "Unable to login because you do not have permission on any vCenter Server systems connected to this client. Back to login screen". The status bar at the bottom right shows the date and time as "1:31 PM 3/19/2022".

## Administrator change the Permission of the User then first login by administrator



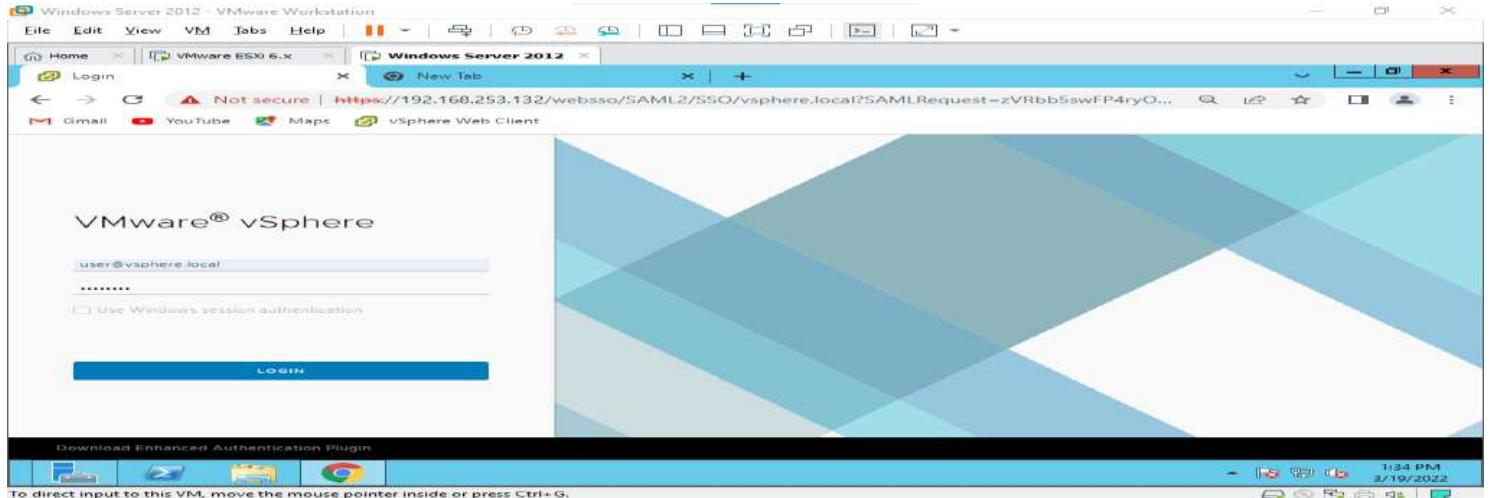
Go to the vSphere Client > Global Permission then select the user and Click on the Edit button icon

The left screenshot shows the vSphere Client interface with a summary view of a virtual machine named "Pavan\_Template\_VM". The right screenshot shows the "Global Permissions" section, where the user "VSPPERELOCAL\administrator" is selected.

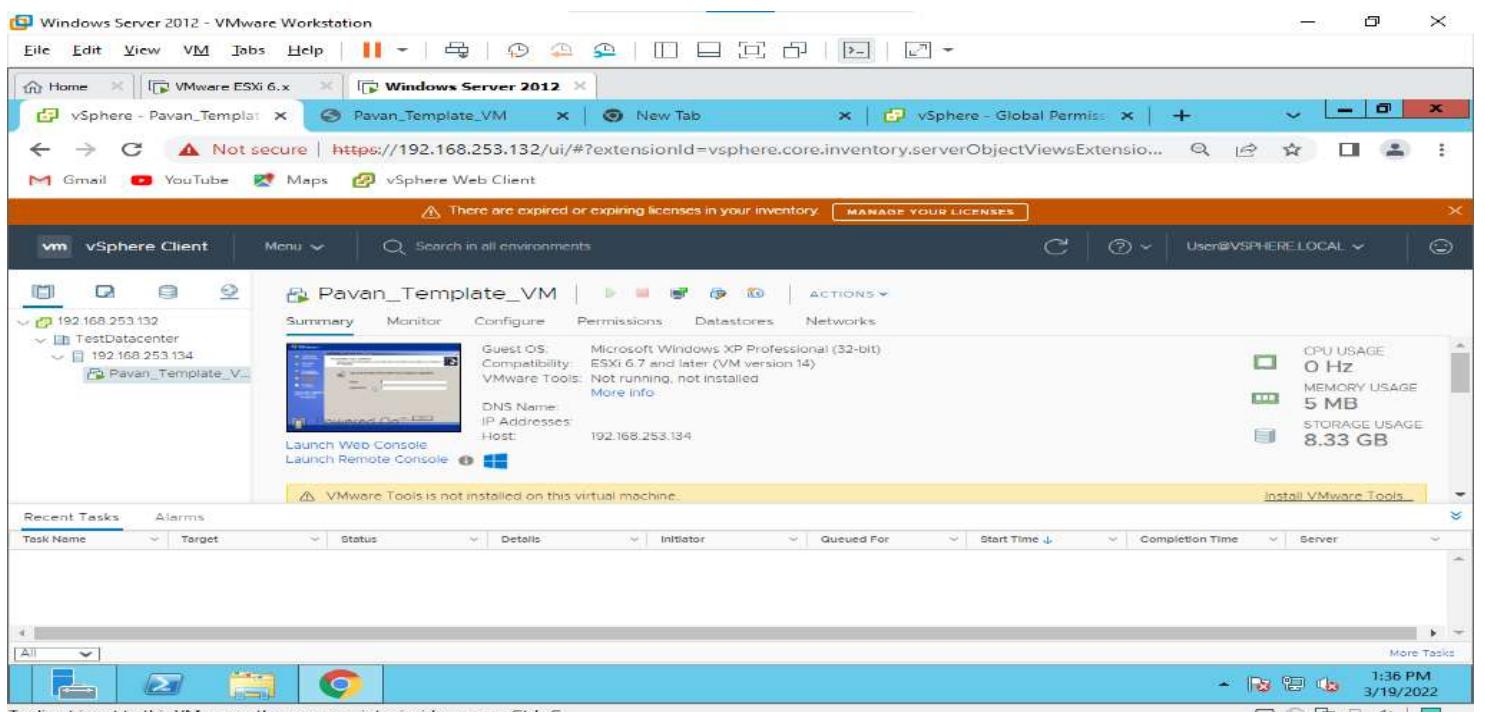
Check the Propagate to Children and Click on the OK button

The screenshot shows the "Change Role" dialog box. The "Propagate to children" checkbox is checked. The "OK" button is highlighted.

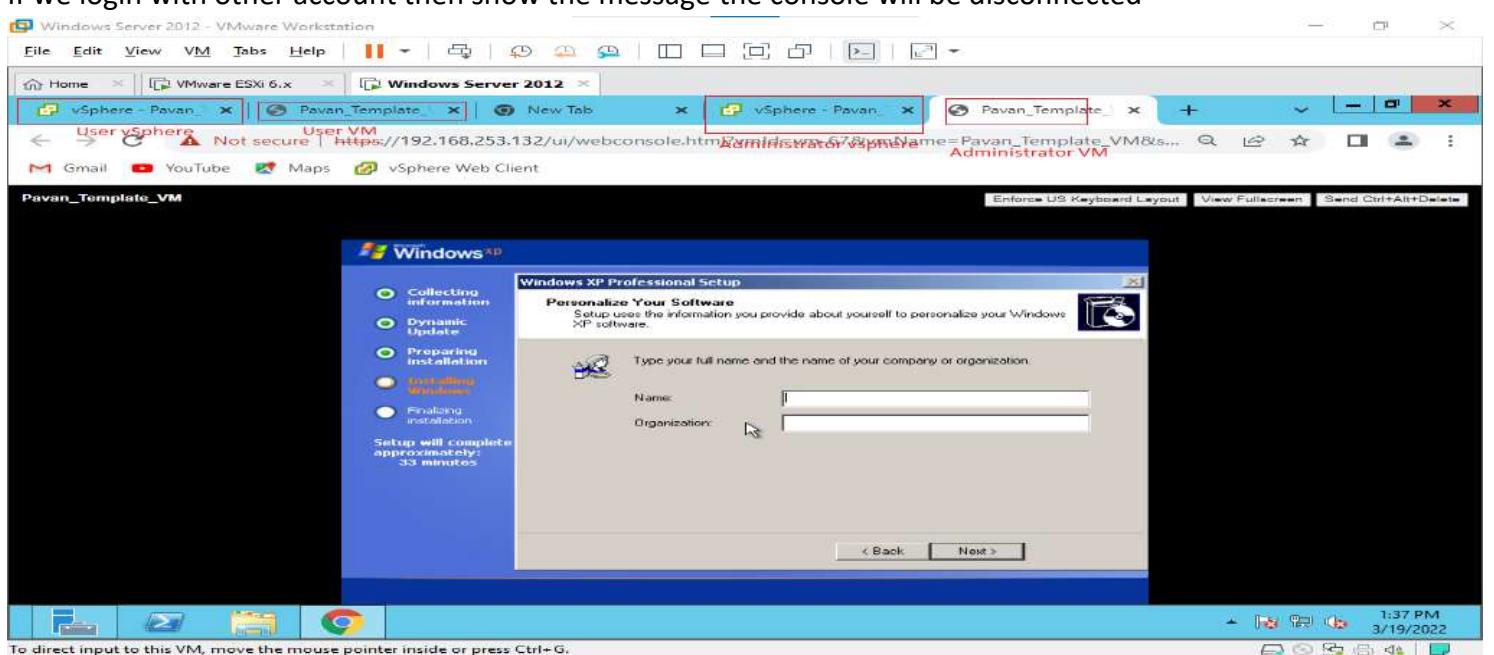
Now login from the different user and try to connect the same virtual machine, but we will get below error of max connection has been reached.

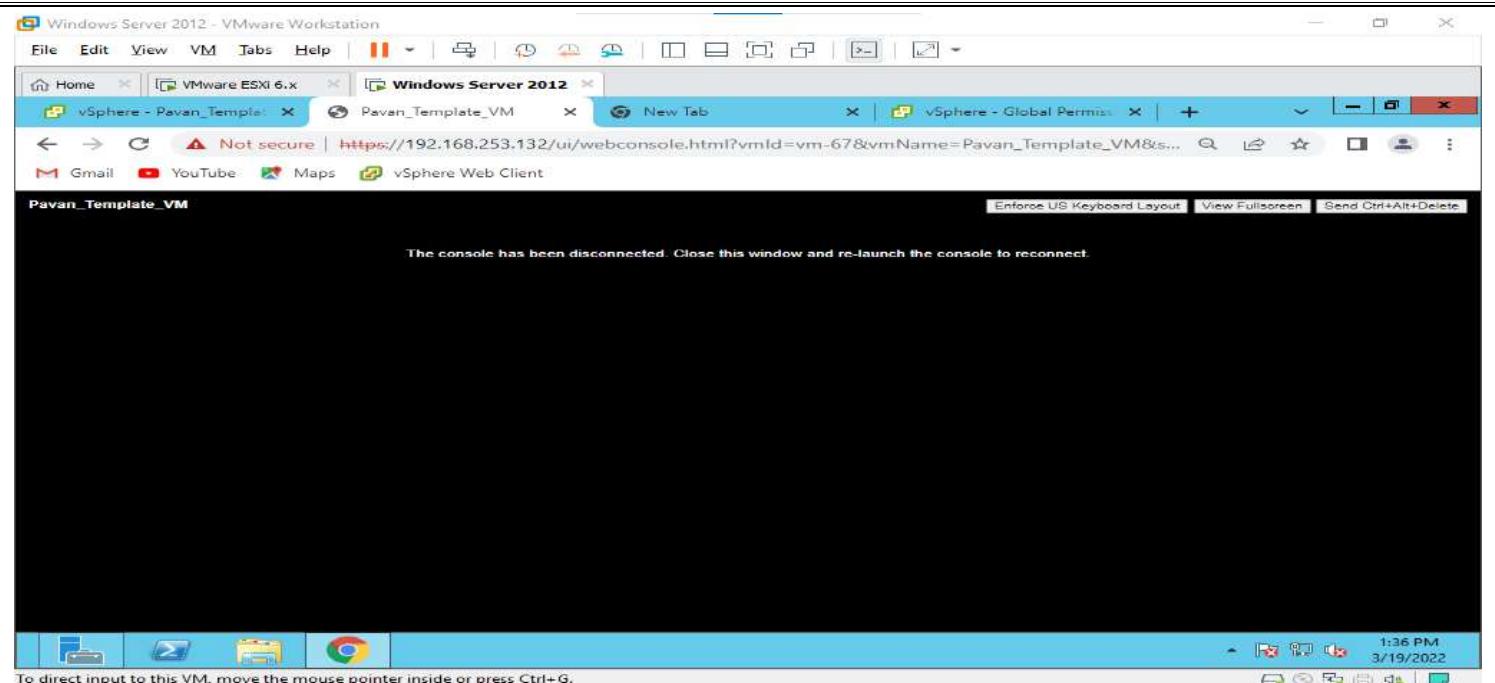


## Start the VM and Launch Web Console



If we login with other account then show the message the console will be disconnected





# Practical No. 5

Aim: Upgrade the VMware ESXi server 6.7 to 7.0 using simple installation.

Go to the VMware website [labs.hol.vmware.com/hol/catalog](https://labs.hol.vmware.com/hol/catalog)

The screenshot shows the VMware Hands-on Labs catalog page. On the left, there's a sidebar with navigation links: Enrollments, Labs, Transcript, and Powered by VMware Learning Platform. The main content area has a search bar at the top with the placeholder "Search all catalogs". Below it, there's a section titled "NEW LABS!" featuring a "Using VMware Cloud Director and VMware Cloud Foundation on VxRail (HOL-2260-01-ISM)" lab. This lab is marked as "NEW" and has options to "INVITE A FRIEND", "DEPLOYED ON DEMAND", and "ENROLL". Below this, another lab titled "Virtualization 101 (HOL-2210-01-SDC)" is listed as "Enrolled", with similar enrollment options. To the right, there's an "ANNOUNCEMENTS" section with a link to the new content catalog and a "What is VMware Hands-on Labs" section with a video thumbnail. At the bottom, there's an "Extreme Performance - VMworld 2021 Behind the Scenes" section.

Search the 2211 on the search panel

This screenshot shows the same catalog page after searching for "2211". The search results now include two labs: "VMware vSphere 7 - Lightning Lab (HOL-2211-91-SDC)" and "VMware vSphere - Advanced Topics (HOL-2211-02-SDC)". Both labs are marked as "NEW" and have "INVITE A FRIEND", "Available Now", and "ENROLL" buttons. The rest of the page layout remains the same, including the sidebar and the "ANNOUNCEMENTS" and "Extreme Performance" sections.

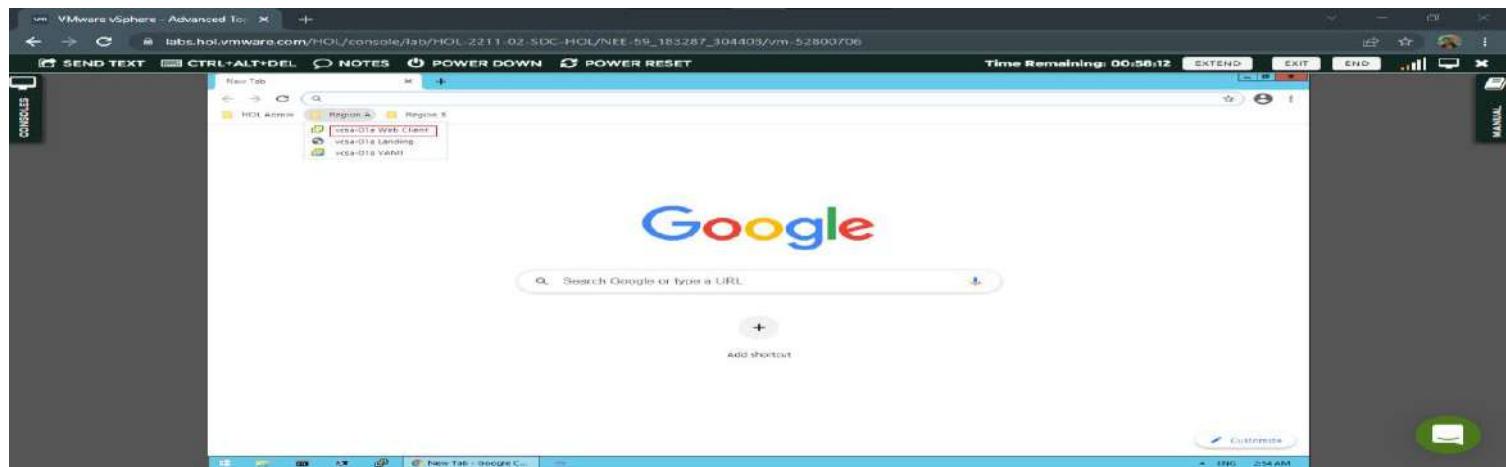
Start the lab of vSphere Advanced Topic (2211-02-SDC)

This screenshot shows the lab details for "VMware vSphere - Advanced Topics (HOL-2211-02-SDC)". The progress bar shows "PROGRESS: 0%" and "TIME REMAINING: 1 hour". There are "INVITE A FRIEND", "UNENROLL", and a large "START THIS LAB" button. Below it, another lab, "Virtualization 101 (HOL-2210-01-SDC)", is listed with "PROGRESS: 0%" and "TIME REMAINING: 3 hours 26 minutes", along with "INVITE A FRIEND", "END LAB", and a "RESUME THIS LAB" button. At the bottom, a message says "All enrollments displayed." To the right, there's an "ANNOUNCEMENTS" section and an "Extreme Performance - VMworld 2021 Behind the Scenes" section.

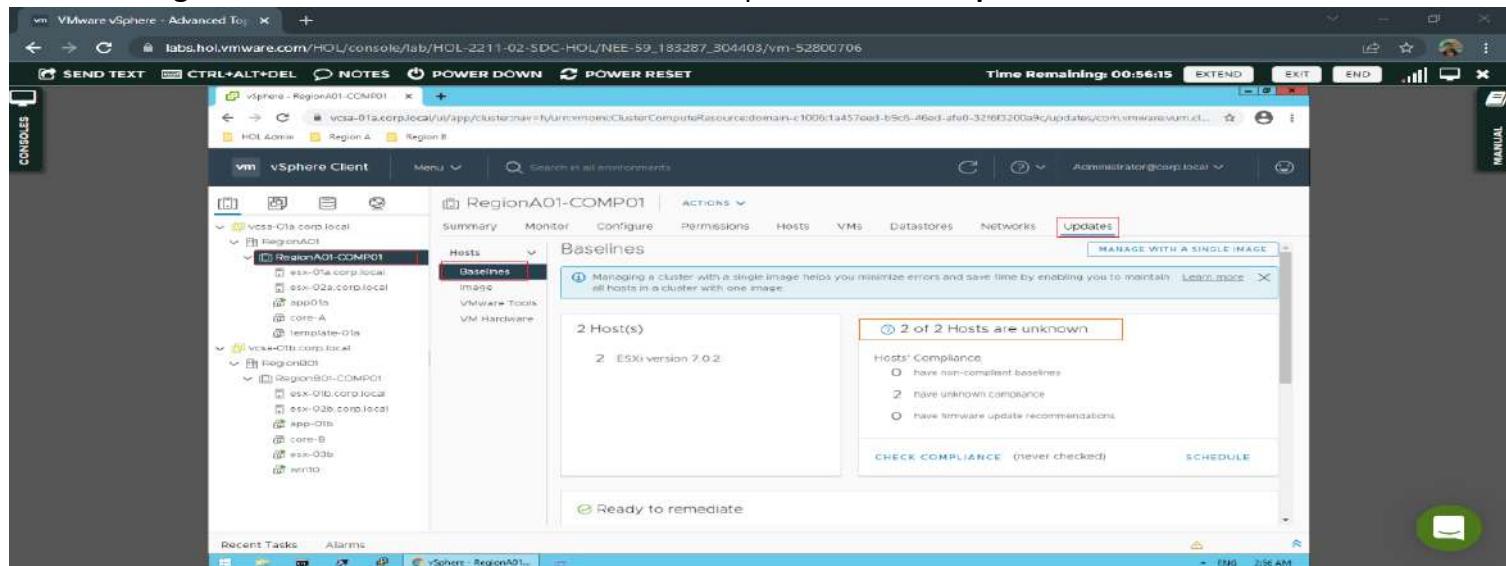
## Open the Chrome Browser



## Select the vcsa-01a Web Client



## Go to the RegionA01-COMP01 and Select the Baseline option inside the Update Tab



## Go to Menu and click on the Lifecycle Manager

The screenshot shows the vSphere Client interface. In the top navigation bar, there is a 'Menu' button. Below it, under 'vSphere Client', the 'Lifecycle Manager' option is highlighted with a red box.

Click on the Update Tab and filter the Name i.e. esxi 7.0

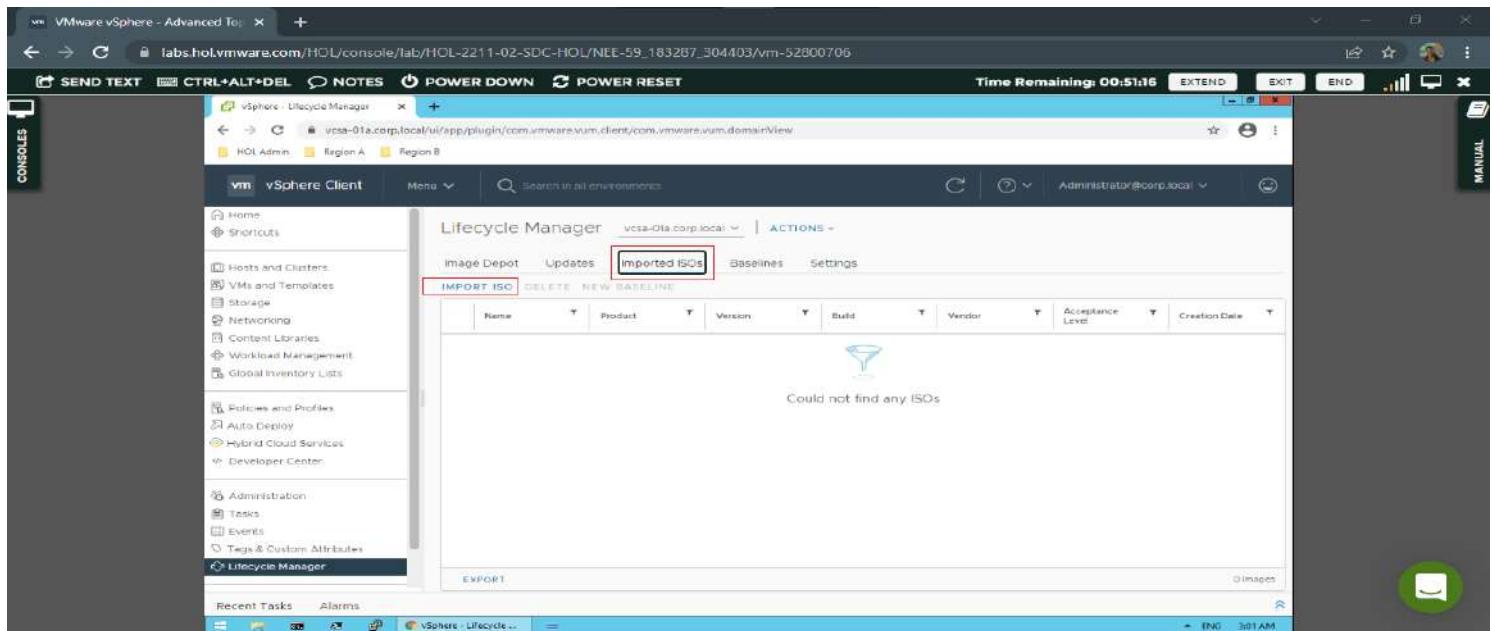
The screenshot shows the 'Lifecycle Manager' section of the vSphere Client. The 'Updates' tab is selected. A search bar at the top right is set to 'esxi 7.0'. The main table lists several update entries, with one entry for 'esxi 7.0' highlighted by a red box.

Name	ID	Severity	Type	Category	ESXi Version	Impact	Vendor
esxi 7.0	BS0804	Critical	Rollup	BugFix	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0.1...	T19837	Critical	Rollup	Security	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0.1...	ESX70U1c-17325551	Critical	Rollup	BugFix	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0.1...	ESX70U1d-175510	Critical	Rollup	BugFix	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0...	ESX70-16228842	Critical	Rollup	BugFix	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0...	ESX70U2a-178073	Important	Rollup	Enhance...	7.0	Reboot, Maintenance Mo...	VMware

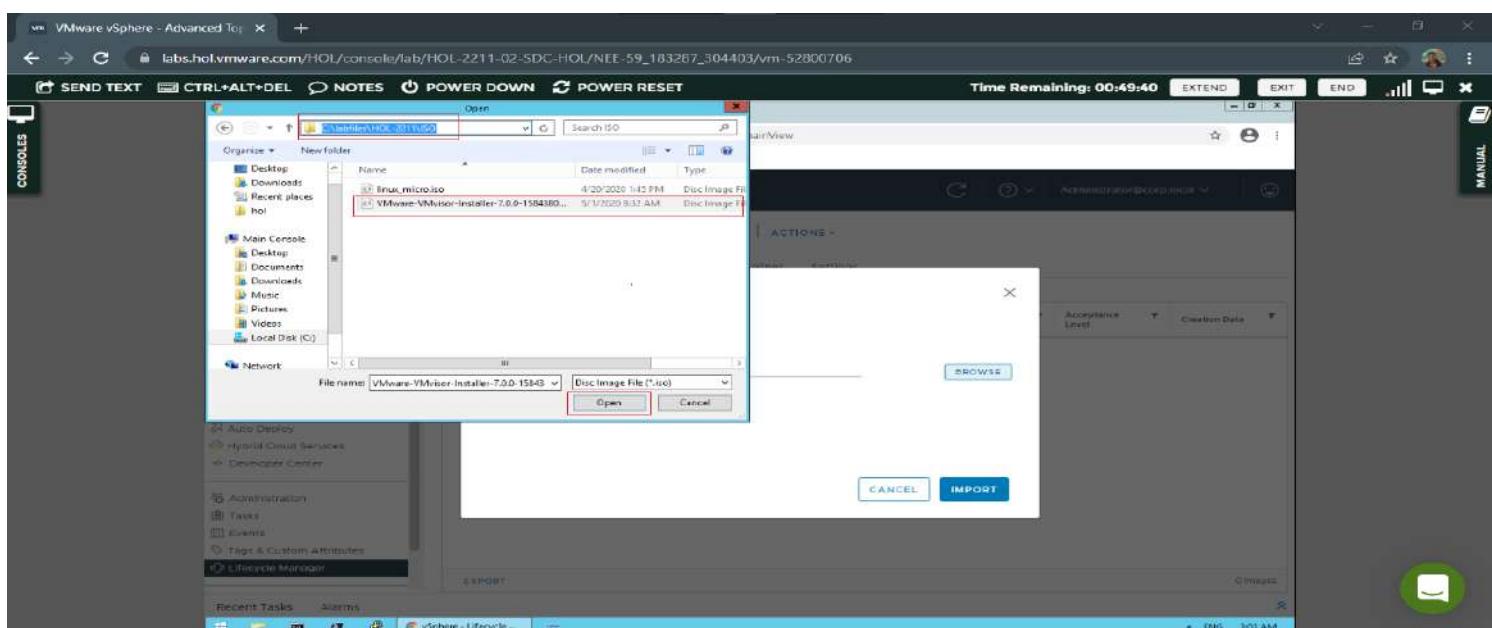
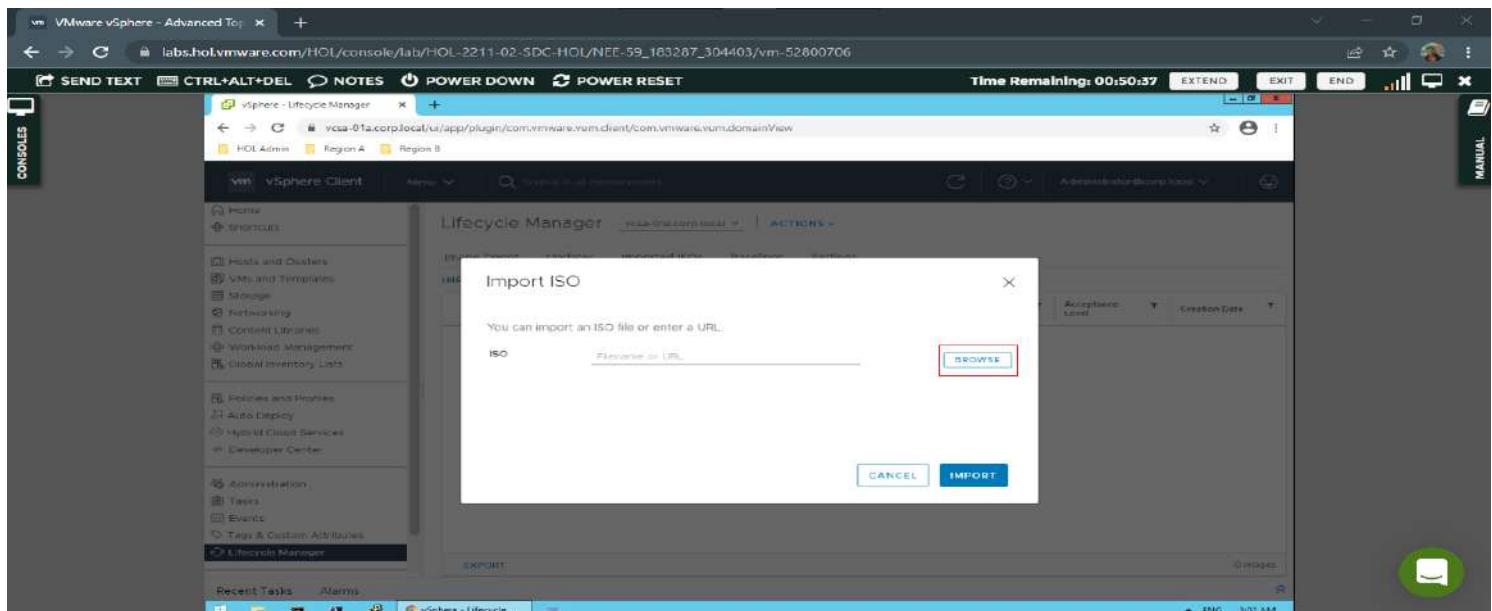
The screenshot shows the 'Lifecycle Manager' section of the vSphere Client. The 'Updates' tab is selected. A search bar at the top right is set to 'esxi 7.0'. The main table lists several update entries, with one entry for 'VMware ESXi 7.0.1...' highlighted by a red box.

Name	ID	Severity	Type	Category	ESXi Version	Impact	Vendor
VMware ESXi 7.0.1...	ESX70U1-10850804	Critical	Rollup	BugFix	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0.1...	ESX70U1a-1719527	Critical	Rollup	Security	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0.1...	ESX70U1b-171662...	Critical	Rollup	Security	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0.1...	ESX70U1c-17325551	Critical	Rollup	BugFix	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0.1...	ESX70U1d-175510	Critical	Rollup	BugFix	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0...	ESX70-16228842	Critical	Rollup	BugFix	7.0	Reboot, Maintenance Mo...	VMware
VMware ESXi 7.0...	ESX70U2a-178073	Important	Rollup	Enhance...	7.0	Reboot, Maintenance Mo...	VMware

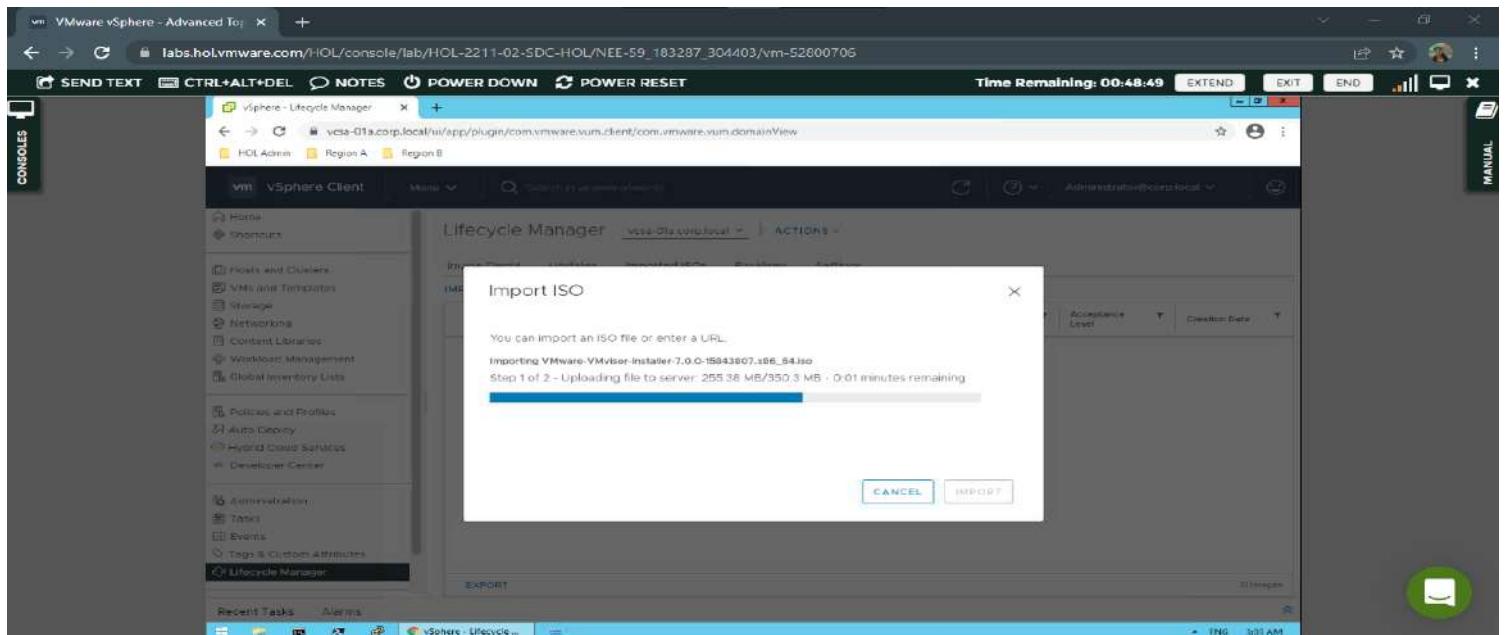
## Go to the Imported ISOs Tab and Click on the Import ISO button



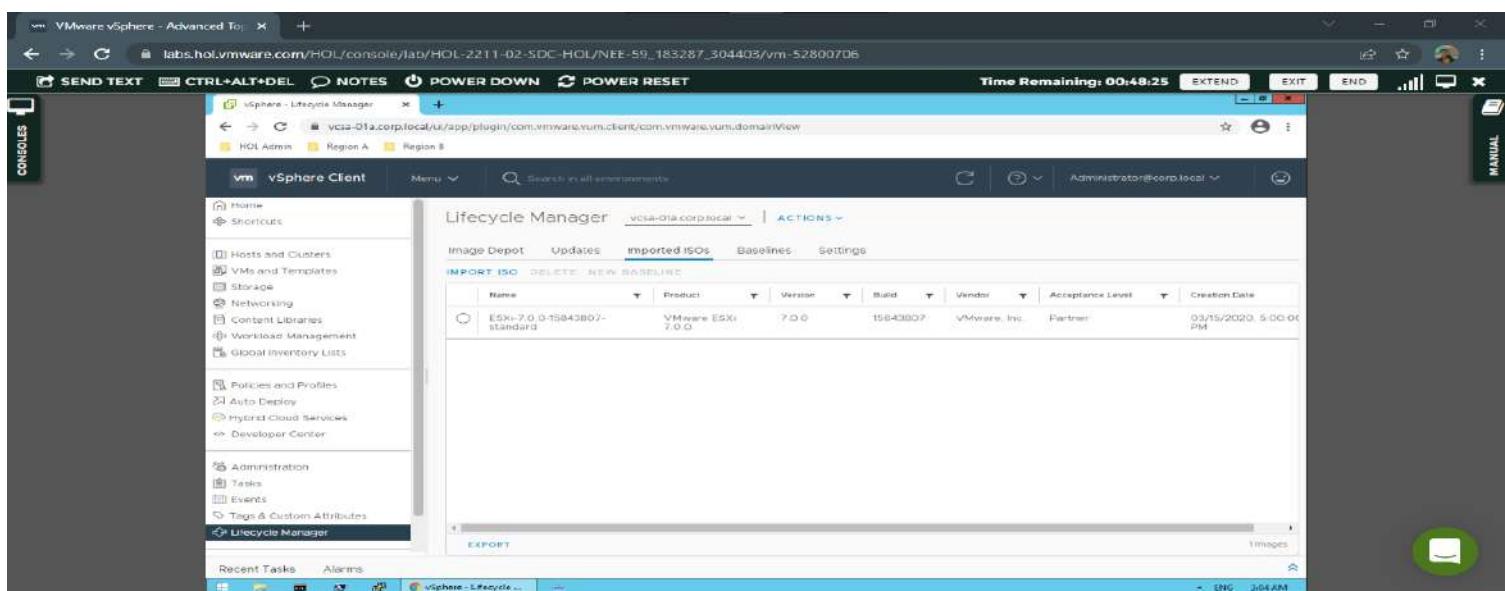
Click on the **Browse** button and browse the ISO file of VMvisor-installer respected path mention into the image and open it. After select the iso file then click on the **Import** button



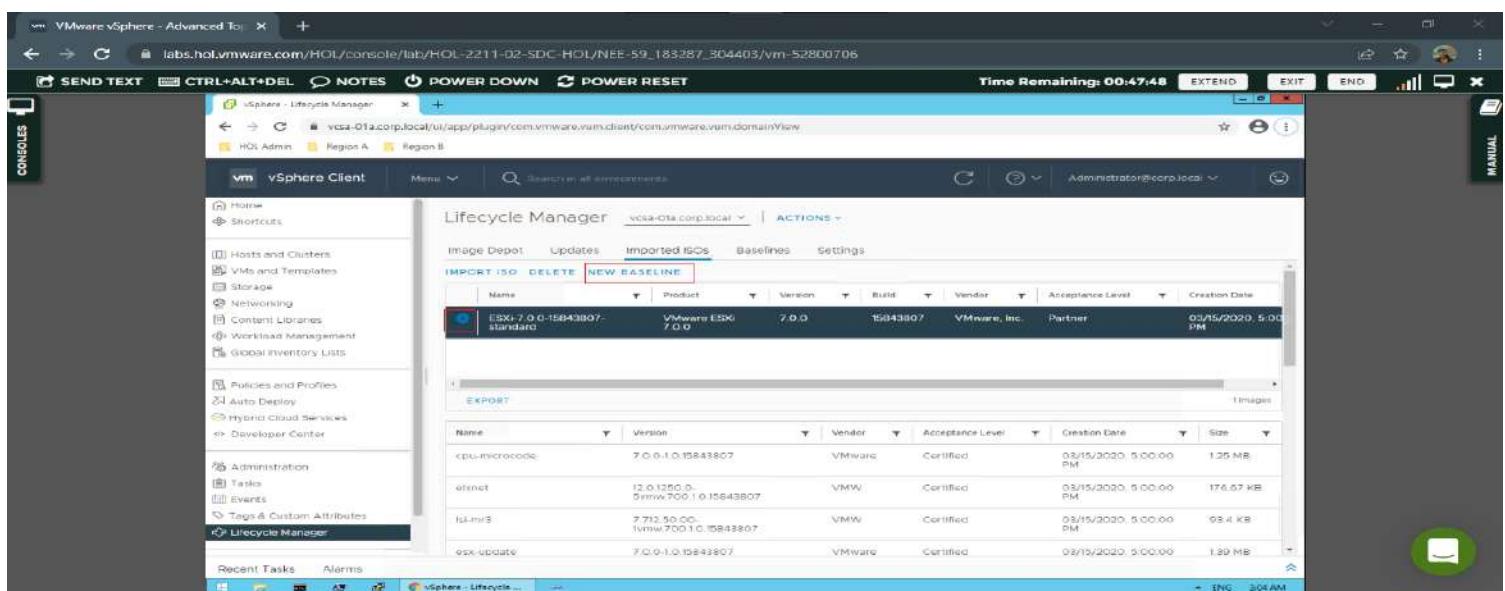
Wait few seconds for uploading the iso file



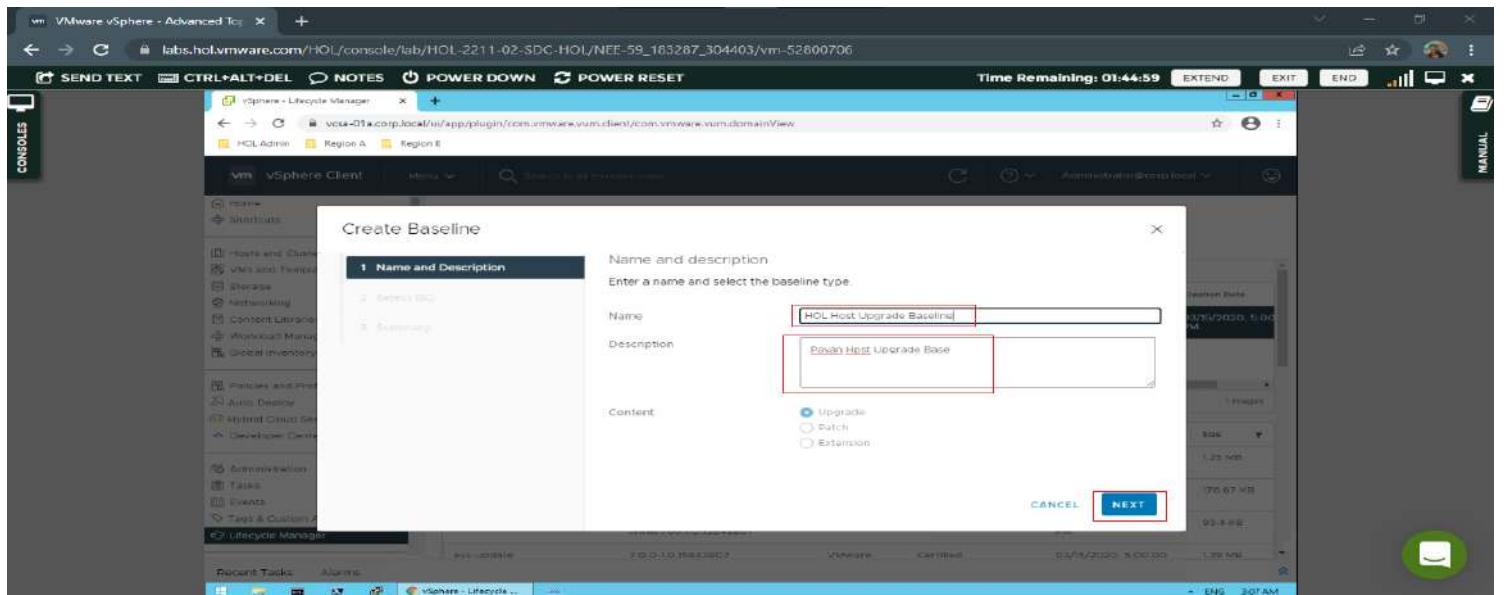
Go to an **Imported ISOs** Tab then view the uploaded iso file present



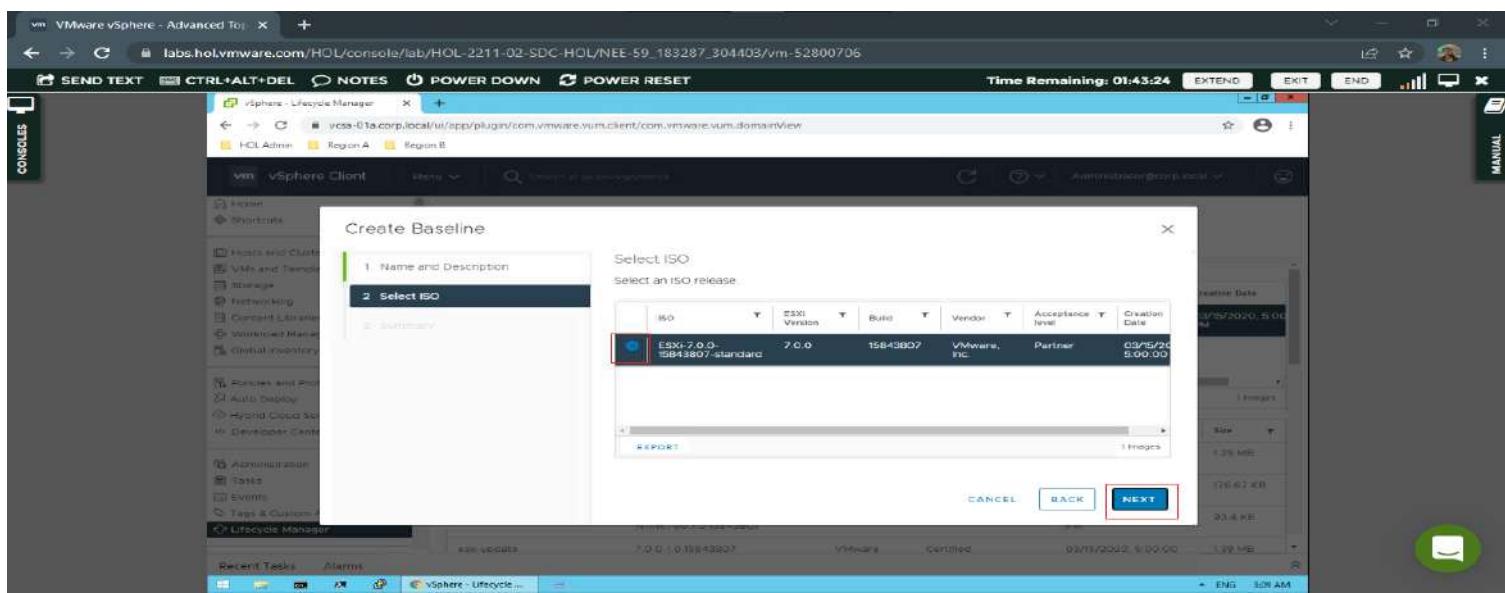
Select on the particular iso file mention on the image and Click on the **New Baseline**



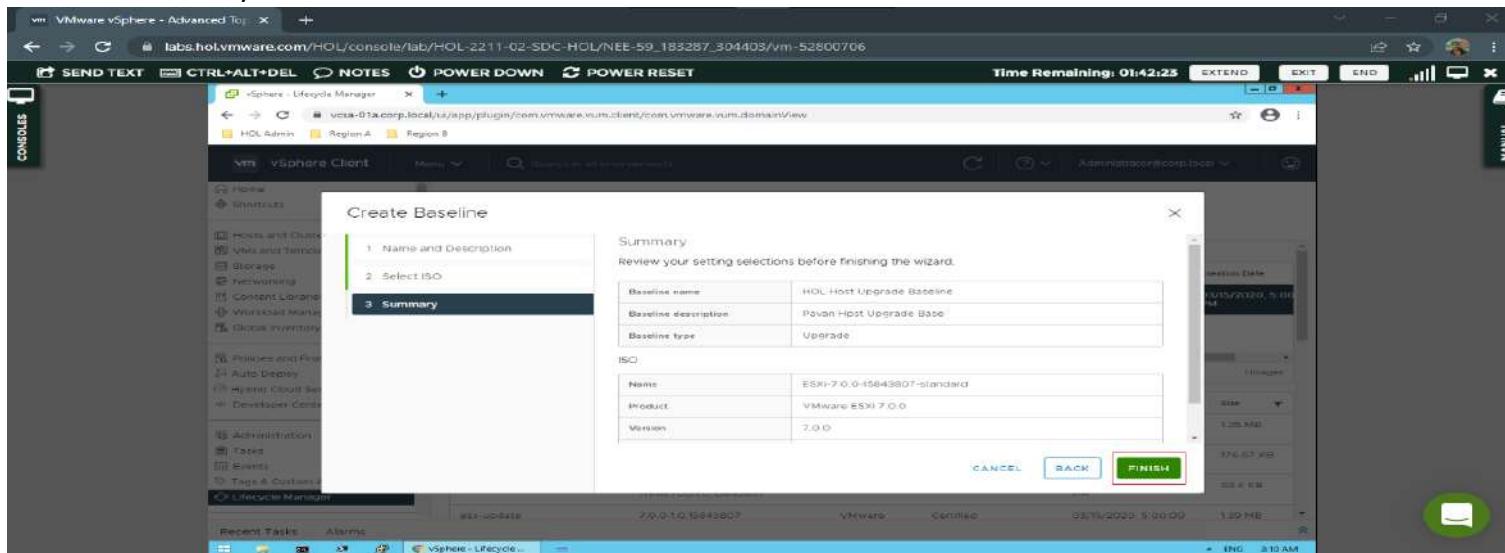
Enter the required field to fill it then click on the **Next** button



Select ISO file and click on the **Next** button



View the summary of Create baseline and Click on **Finish** button



Tab on the **Baselines** tab and select the recently created Baseline option

The screenshot shows the vSphere Lifecycle Manager interface. The left sidebar includes options like Home, Shortcuts, Hosts and Clusters, VMs and Templates, Storage, Networking, Content Libraries, Workload Management, Policies and Profiles, Auto Deploy, Hybrid Cloud Services, and Developer Center. The main content area has tabs for Image Depot, Updates, Imported ISOs, Baselines (which is highlighted with a red box), and Settings. Below these tabs is a table titled 'Baselines' with columns for Name, Content, Type, ESDI version, and Last Modified. A row for 'HOL Host Upgrade Baseline' is selected, indicated by a blue highlight. At the bottom of the table is an 'EXPORT' button.

Go to the **Menu** and Click on the **Hosts and Clusters** option

This screenshot is similar to the previous one but focuses on the 'Hosts and Clusters' menu item, which is highlighted with a red box in the left sidebar. The rest of the interface and table content are identical to the first screenshot.

Go to the **RegionA01-COMP01** and Tab on the **Update** tab and Click on the **Baselines**

The screenshot shows the RegionA01-COMP01 interface. The left sidebar lists regions and clusters: 'vcsa-01a.corp.local' (Region A01: RegionA01-COMP01, hosts: esxi-01a.corp.local, esxi-02a.corp.local, epo01a, core-A, template-01a) and 'vcsa-01b.corp.local' (Region B01: RegionB01-COMP01, hosts: esxi-01b.corp.local, esxi-02b.corp.local, epo-01b, core-B, esxi-03b, win10). The main content area has tabs for Summary, Monitor, Configure, Permissions, Hosts, VMs, Datastores, Networks, and Updates (which is highlighted with a red box). The 'Updates' tab displays information about host compliance and remediation status. It shows '2 Host(s)' and '2 ESDI version 7.0.2'. A message indicates '2 of 2 Hosts are unknown'. The 'HOSTS' COMPLIANCE' section lists three categories: 'have non-compliant baselines' (0), 'have unknown compliance' (2), and 'have firmware update recommendations' (0). A 'CHECK COMPLIANCE' button and a 'SCHEDULE' button are also present.

Scroll down the page. Select the **Attach Baselines or Baselines Group** on click an Attach button i.e. inside the Attached Baselines

The screenshot shows the vSphere Client interface for a cluster named 'RegionA01-COMP01'. In the left navigation pane, 'Hosts & Clusters' is selected, and 'Baselines' is chosen under 'Hosts'. The 'Attached Baselines' section is visible, showing a table with columns for 'Attached Baseline' (with a dropdown menu), 'Status', 'Content', 'Type', 'ESXi version', and 'Last Modified'. A red box highlights the 'ATTACH' button at the top of the table. Below the table, there are 'CREATE AND ATTACH' buttons for 'Baseline' and 'Baseline Group'.

Check the Created Baseline inside the Attach | RegionA01-COMPO1 and Click on Attach button

The screenshot shows the 'Attach | RegionA01-COMPO1' dialog box. It lists several baseline options: 'Name' (Content), 'Host Security Patches (Predefined)' (Patch), 'Critical Host Patches (Predefined)' (Patch), 'Non-Critical Host Patches (Predefined)' (Patch), and 'HOL Host Upgrade Baseline' (Upgrade). The 'HOL Host Upgrade Baseline' option is selected. At the bottom right of the dialog box, a red box highlights the 'ATTACH' button.

View the Attach Baseline inside the Attached Baseline section

The screenshot shows the 'Attached Baselines' section of the vSphere Client. The 'Attached Baseline' table has a single row selected, which is highlighted with a red box. The row contains the 'HOL Host Upgrade Baseline' name, a checkbox, and a link labeled 'Edit'. The table includes columns for 'Attached Baseline', 'Status', 'Content', 'Type', 'ESXi version', and 'Last Modified'.

Scroll up Click on the Check Compliance inside the Baseline section

The screenshot shows the vSphere Client interface for the cluster RegionA01-COMP01. In the left sidebar, under 'Hosts & Clusters', 'RegionA01' is expanded, showing 'RegionA01-COMP01'. The 'Baselines' tab is selected in the main content area. It shows '2 Host(s)' and '2 ESXi version 7.0.2'. On the right, there's a summary box stating '2 of 2 Hosts are compliant' with three options: 'have non-compliant baselines', 'have unknown compliance', and 'have firmware update recommendations'. Below this is a 'CHECK COMPLIANCE' button with a note '(checked 1 minute ago)'.

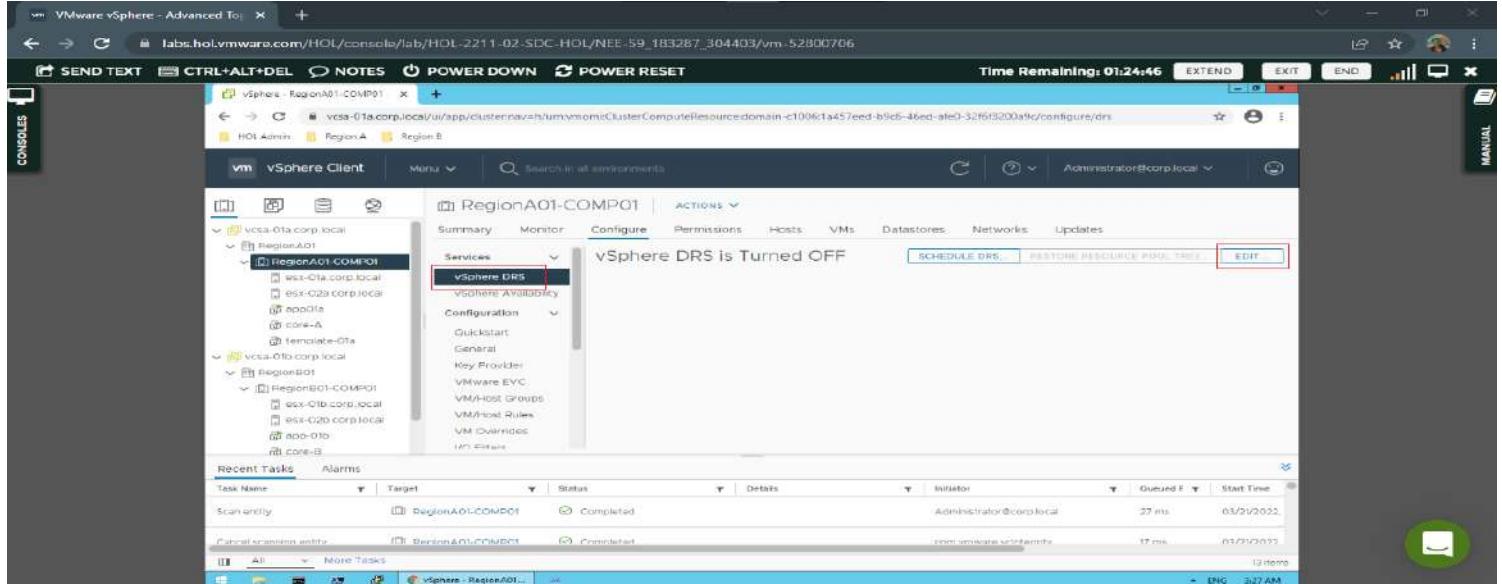
In Recent Task show the progress of recent activity

This screenshot shows the 'Recent Tasks' section in the vSphere Client for the same cluster. It lists a single task: 'Scan entity' which was completed by 'Administrator@corp.local' with a duration of '27 ms' at '03/21/2022 11:21 AM'. There are also tabs for 'Alarms' and 'More Tasks'.

Right click on the RegionA01-COMP01 and click on the Settings

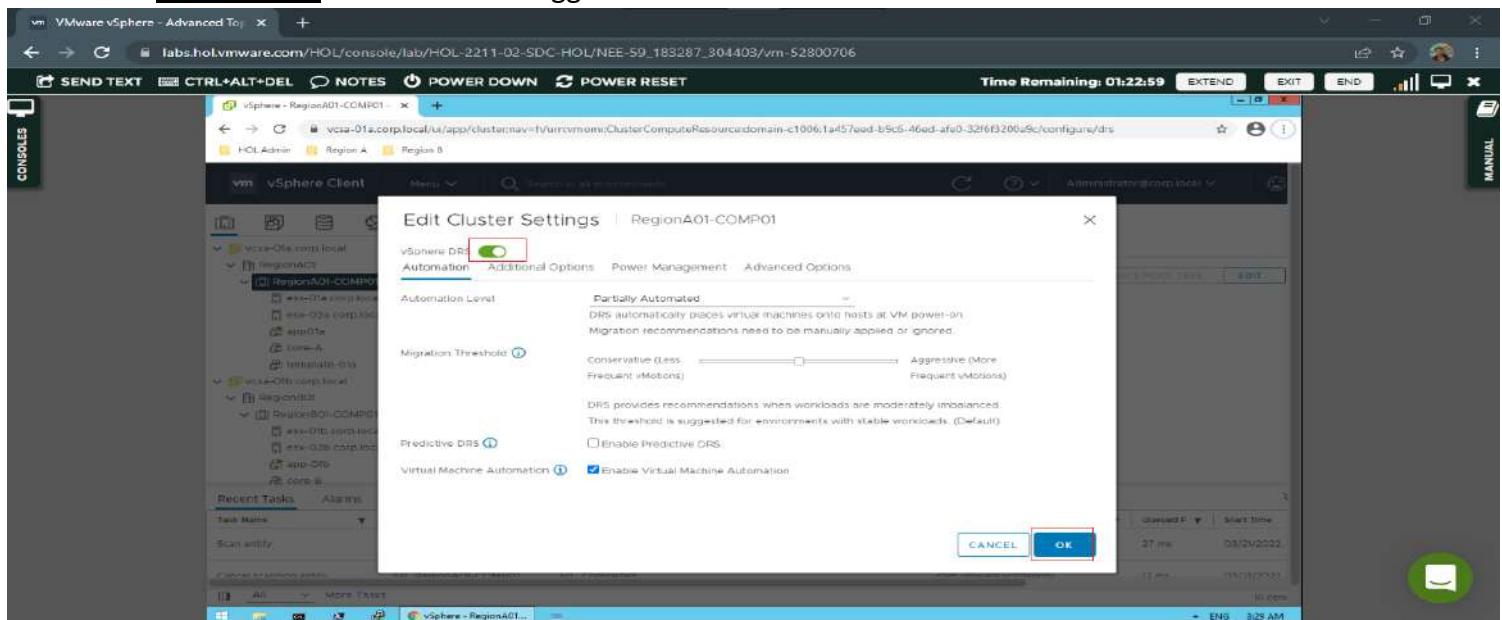
This screenshot shows the context menu for the cluster 'RegionA01-COMP01'. The 'Settings' option is highlighted. Other options include 'Add Hosts...', 'New Virtual Machine...', 'New Resource Pool...', 'New Namespace...', 'Deploy OVF Template...', 'Import VMs...', 'Storage...', 'Host Profiles...', 'Edit Default VM Compatib...', 'Licensing...', 'Move To...', 'Rename...', 'Tags & Custom Attributes...', 'Add Permission...', and 'Alarms...'. The main content area shows the cluster details and recent tasks.

Go to the **Configure** Tab and Click on the **vSphere DRS** option. Inside the vSphere DRS option have **Edit** button click on the button

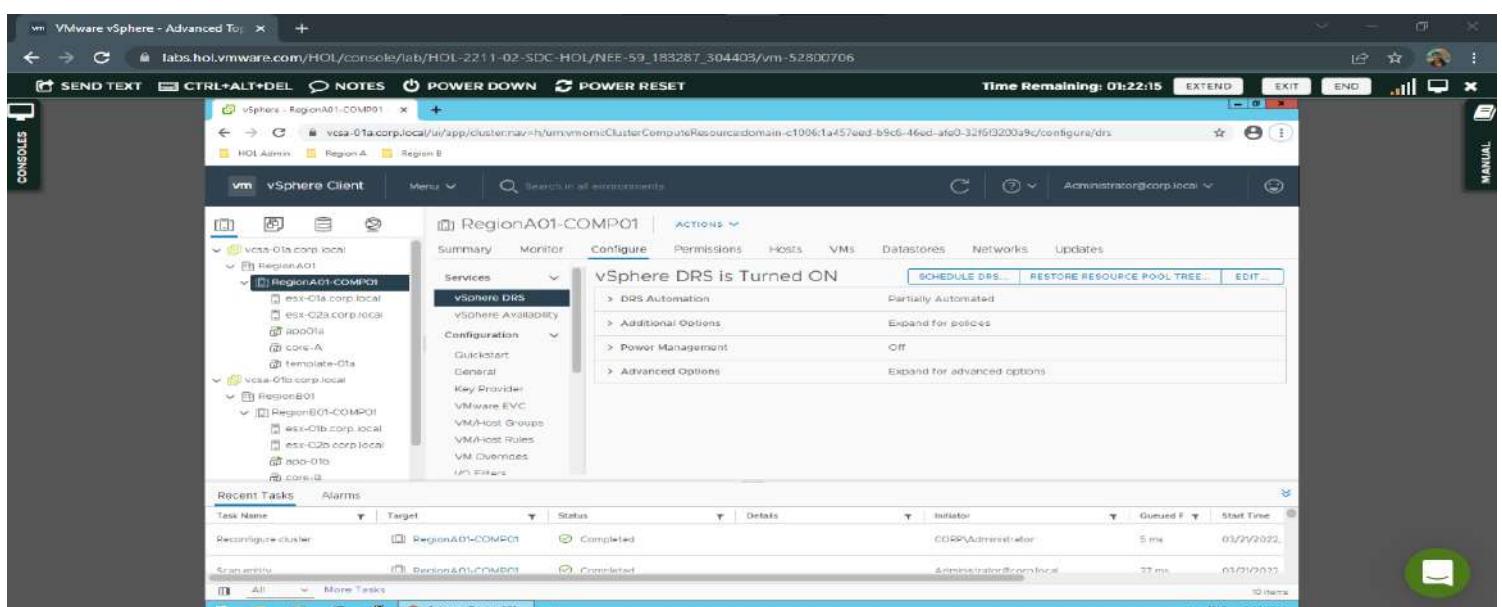


The screenshot shows the vSphere Client interface. In the center, it displays the status "vSphere DRS is Turned OFF". Below this, there are several tabs: Summary, Monitor, Configure, Permissions, Hosts, VMs, Datastores, Networks, and Updates. The "Configure" tab is selected. On the left, a tree view shows clusters: RegionA01-COMP01 and RegionB01-COMP01, each containing various hosts like esx-01a, esx-02a, etc. A context menu is open over RegionA01-COMP01, with "vSphere DRS" highlighted and a dropdown showing "vSphere DRS", "vSphere Availability", and "Configuration". At the bottom right of the main pane, there is a red box around the "EDIT" button.

Enable the vSphere DRS on click on the toggle and Click OK

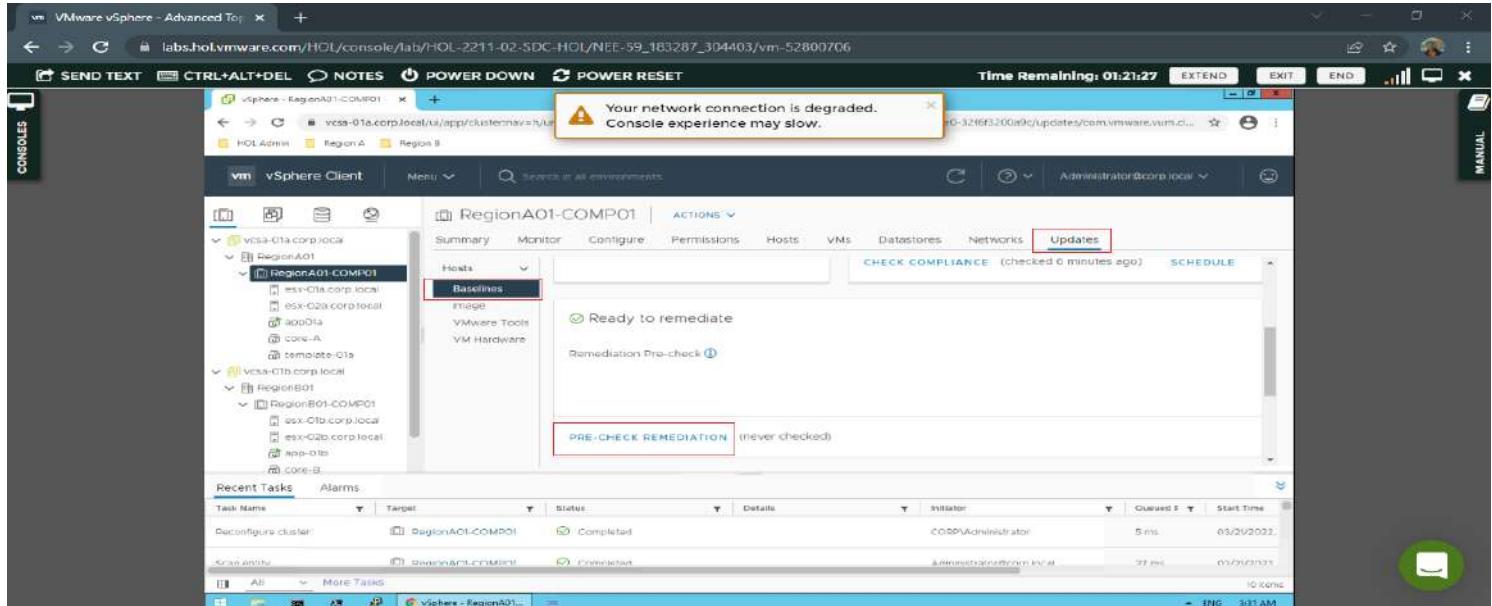


This screenshot shows the "Edit Cluster Settings" dialog box for the "RegionA01-COMP01" cluster. The "Automation" tab is active, displaying the "vSphere DRS Automation" section. It includes fields for "Automation Level" (set to "Partially Automated"), "Migration Threshold" (set to "Conservative (Less Frequent vMotion)"), and "Predictive DRS" (checkbox checked). At the bottom right of the dialog, there is a red box around the "OK" button.



The screenshot shows the vSphere Client interface again. The status now says "vSphere DRS is Turned ON". The "Configure" tab is still selected. The same context menu over RegionA01-COMP01 is shown, with "vSphere DRS" selected. The "Edit" button is visible at the top right of the configuration panel.

Now again go to the RegionA01-COMP01. Tab on the **Update** Tab and Click on the **Baselines** option. Inside the Ready to remediate section click on the **Pre-Check Remediation** button

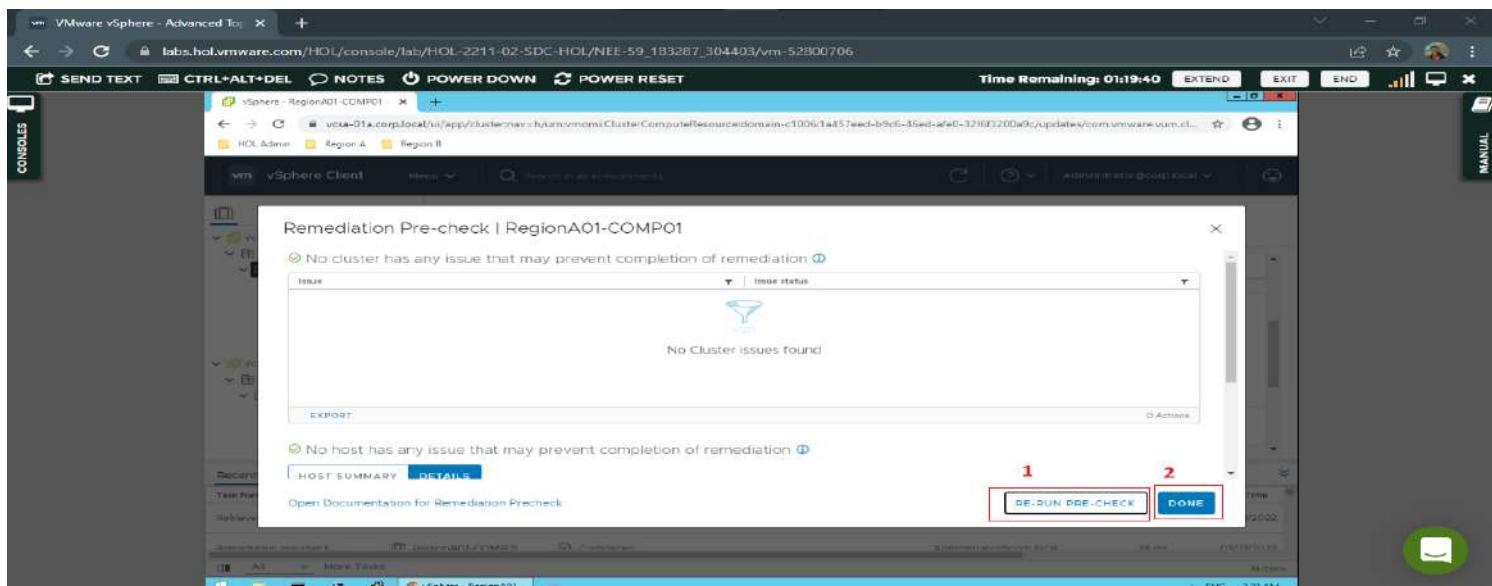


Your network connection is degraded.  
Console experience may slow.

Ready to remediate

PRE-CHECK REMEDIATION (never checked)

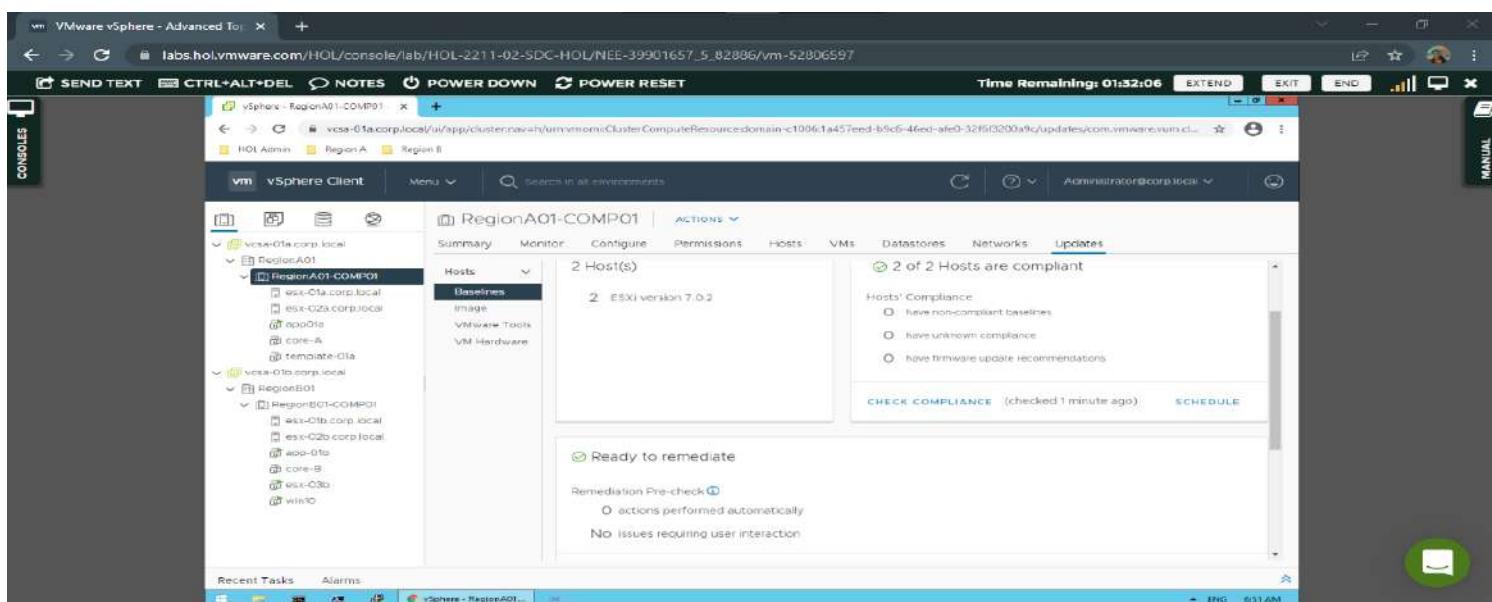
First click on the **Re-Run Pre-Check** button and after that click on the **Done** button



No cluster has any issue that may prevent completion of remediation ⓘ

No host has any issue that may prevent completion of remediation ⓘ

1 RE-RUN PRE-CHECK 2 DONE



2 Host(s)

2 ESXi version 7.0.2

2 of 2 Hosts are compliant

Hosts' Compliance

Ready to remediate

Remediation Pre-check ⓘ

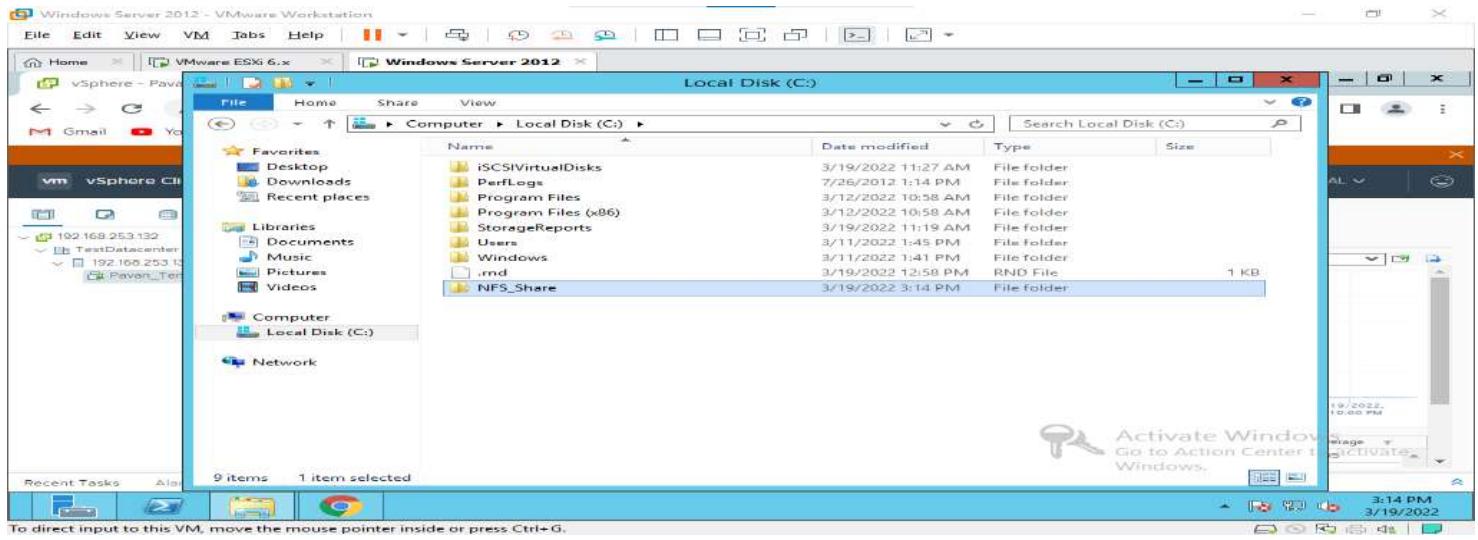
No issues requiring user interaction

# Practical No. 6

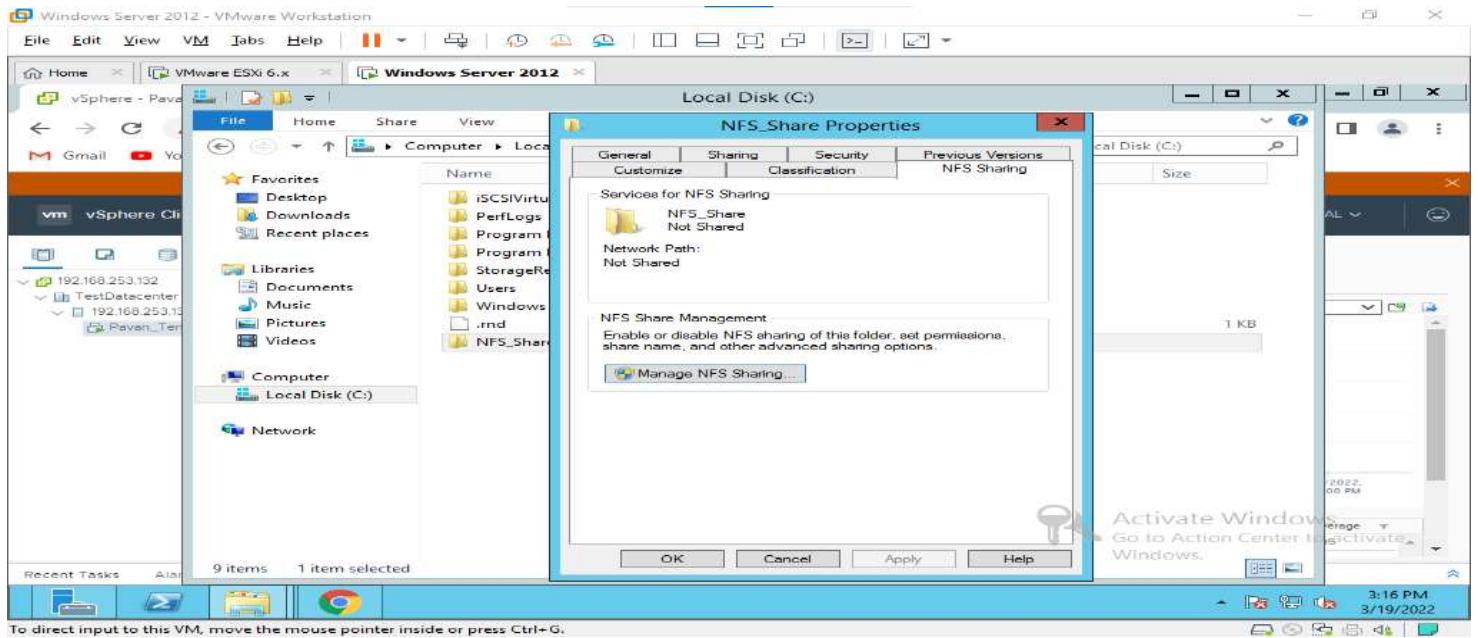
**Aim:** Implement the NFS with the vCenter Server.

This practical depends on the **Practical No. 4 A**

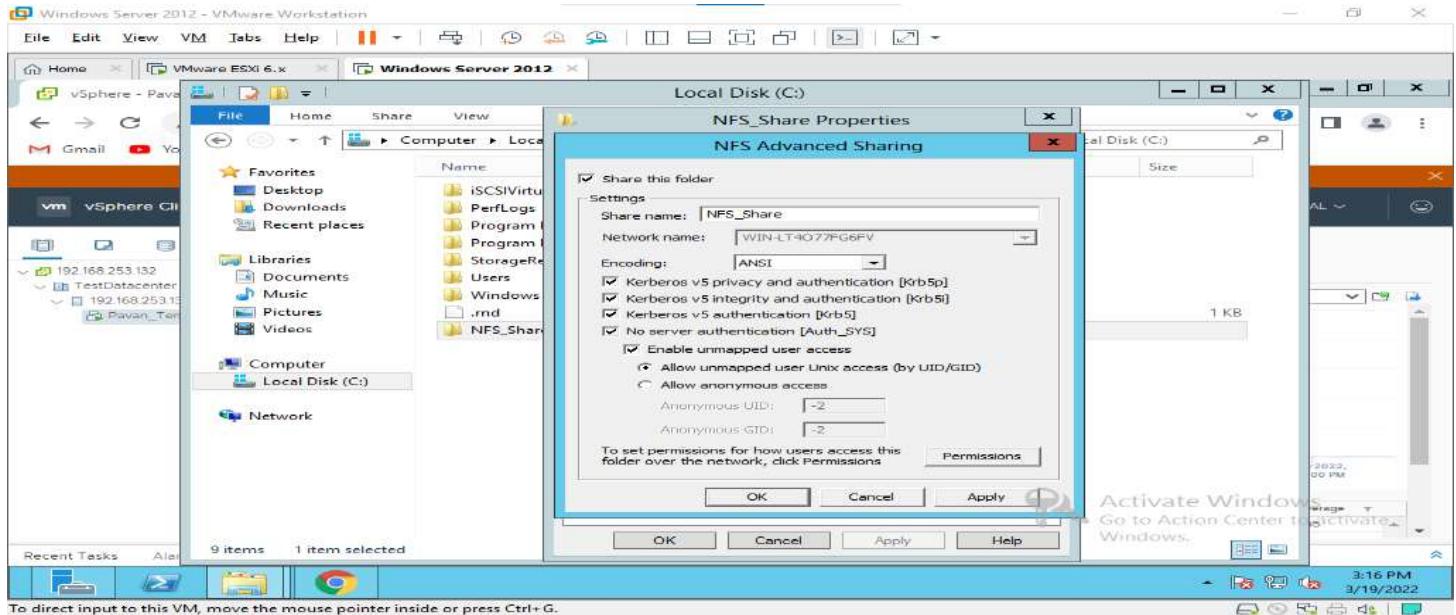
First go to the Disk C then Create a Folder (i.e. NFS\_Share)



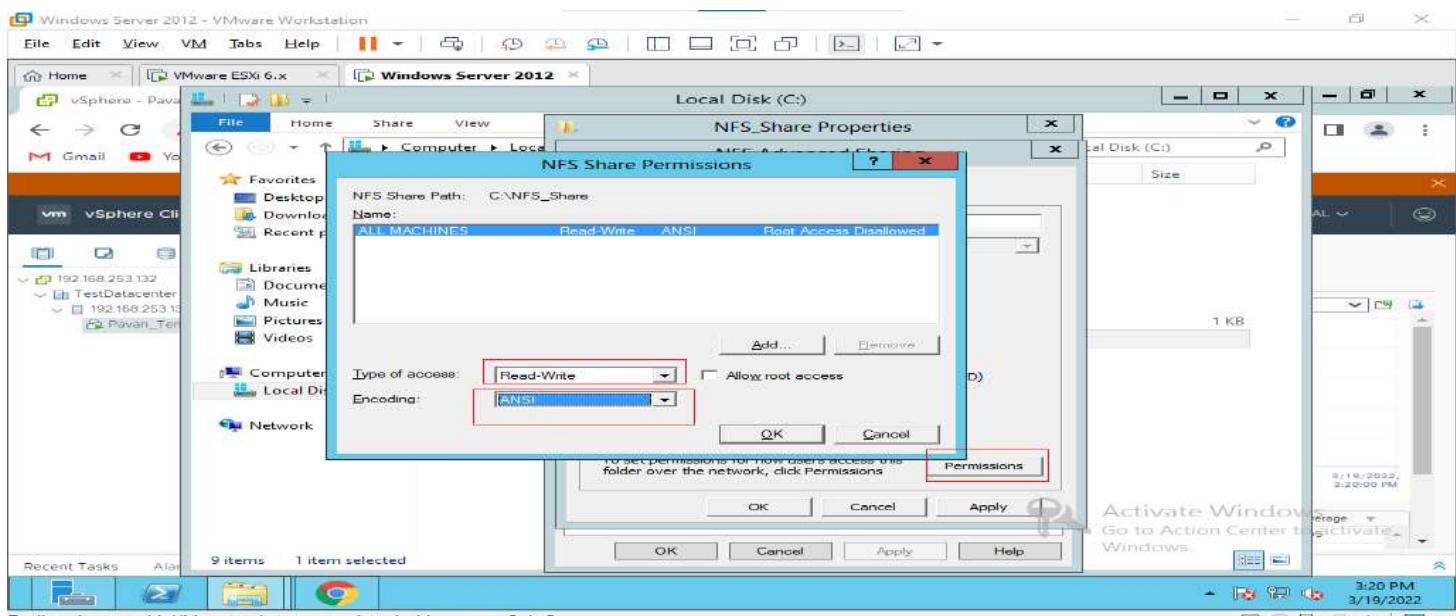
Go to the **folder properties** and after that click on the **NFS sharing tab**



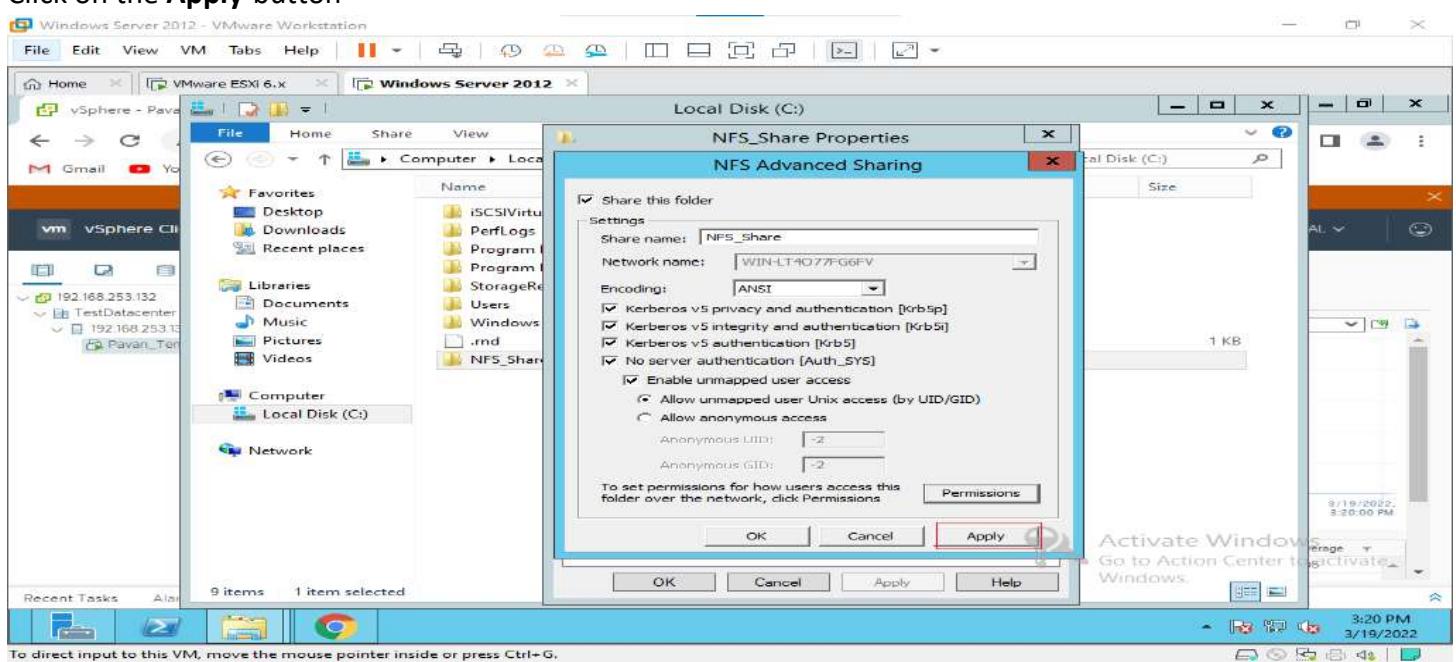
## Click on the Permissions



And select the **Read-Write** option into the Type of access and **ANSI** option into the Encoding and Click on the **OK** button



Click on the **Apply** button



Right click on the Host and Go to the Storage. Click on the New Datastore option

The screenshot shows the vSphere Web Client interface. On the left, there's a navigation tree with 'vm' and 'vSphere' sections. Under 'vSphere', '192.168.253.134' is expanded, showing 'TestDatacenter' and 'Pavan\_Template\_VM'. The 'Storage' menu item is highlighted. A context menu is open at the bottom of the 'Storage' section, with 'New Datastore...' being the selected option. The main pane displays the host summary for '192.168.253.134', including details like Hypervisor (VMware ESXi 6.7.0), Processor Type (Intel(R) Core(TM) i5-10400 CPU @ 2.90GHz), and various resource usage metrics. A banner at the top right says 'There are expired or expiring licenses in your inventory.' and 'MANAGE YOUR LICENSES'.

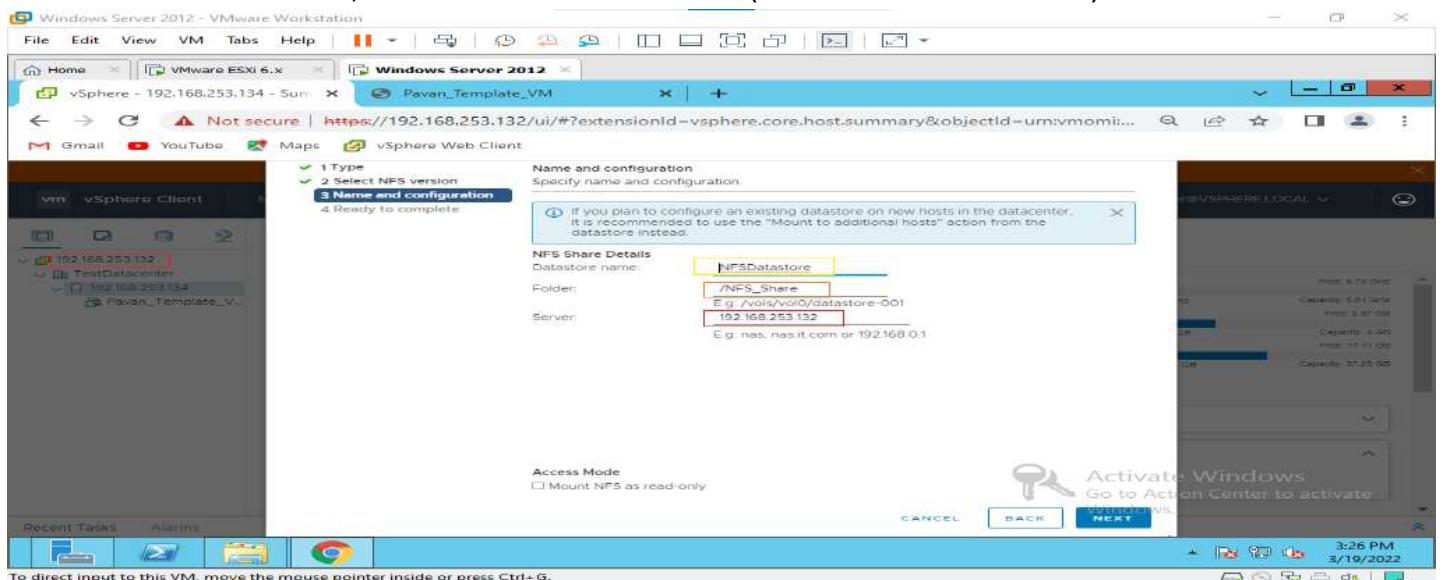
Choose the NFS option and Click on the Next button

This screenshot shows the 'NEW DATASTORE' wizard on a Windows Server 2012 VM. Step 1, 'Type', is active. It asks to 'Specify datastore type' and lists three options: 'VMFS' (Create a VMFS datastore on a disk/LUN), 'NFS' (Create an NFS datastore on an NFS share over the network, which is selected), and 'VVol' (Create a Virtual Volumes datastore on a storage container connected to a storage provider). The background shows the vSphere Client interface with '192.168.253.134' selected. A watermark for 'Activate Windows' is visible in the bottom right.

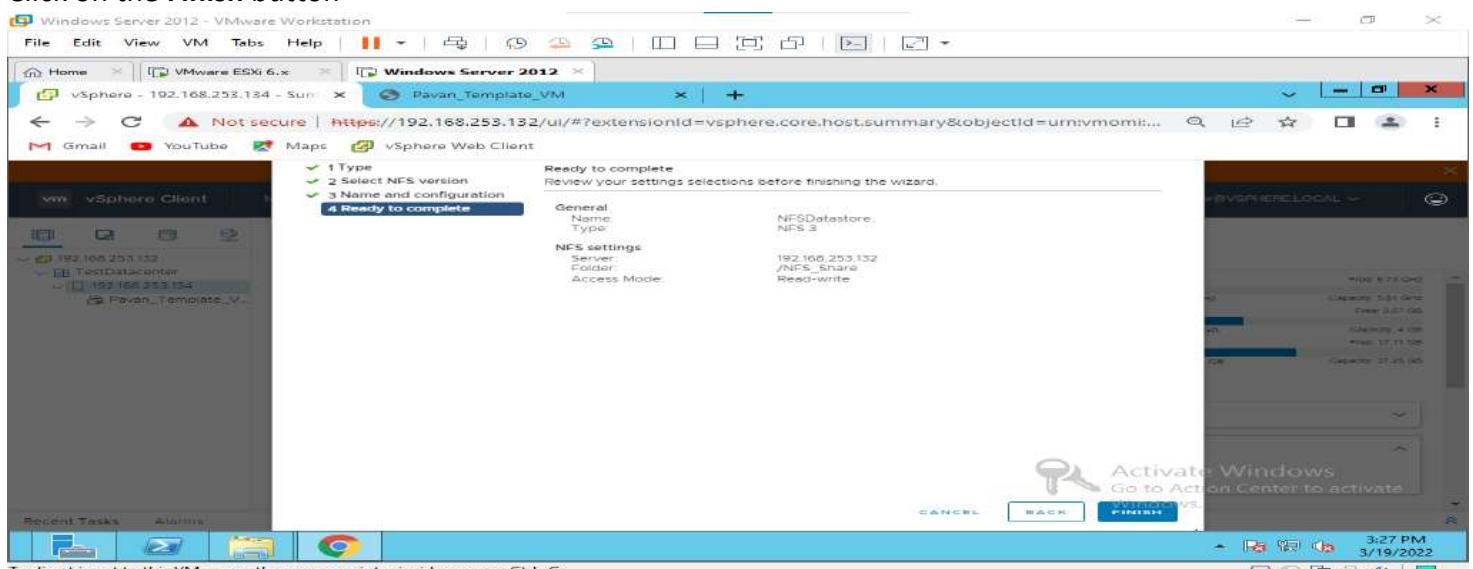
Select the NFS version and click on the Next button

This screenshot shows the 'NEW DATASTORE' wizard on the same Windows Server 2012 VM. Step 2, 'Select NFS version', is active. It shows two options: 'NFS 3' (selected) and 'NFS 4.1'. A note below says 'NFS 3 allows the datastore to be accessed by ESX/ESXi hosts of version earlier than 6.0' and 'NFS 4.1 provides multipathing for servers and supports the Kerberos authentication protocol'. The background and watermark are identical to the previous screenshot.

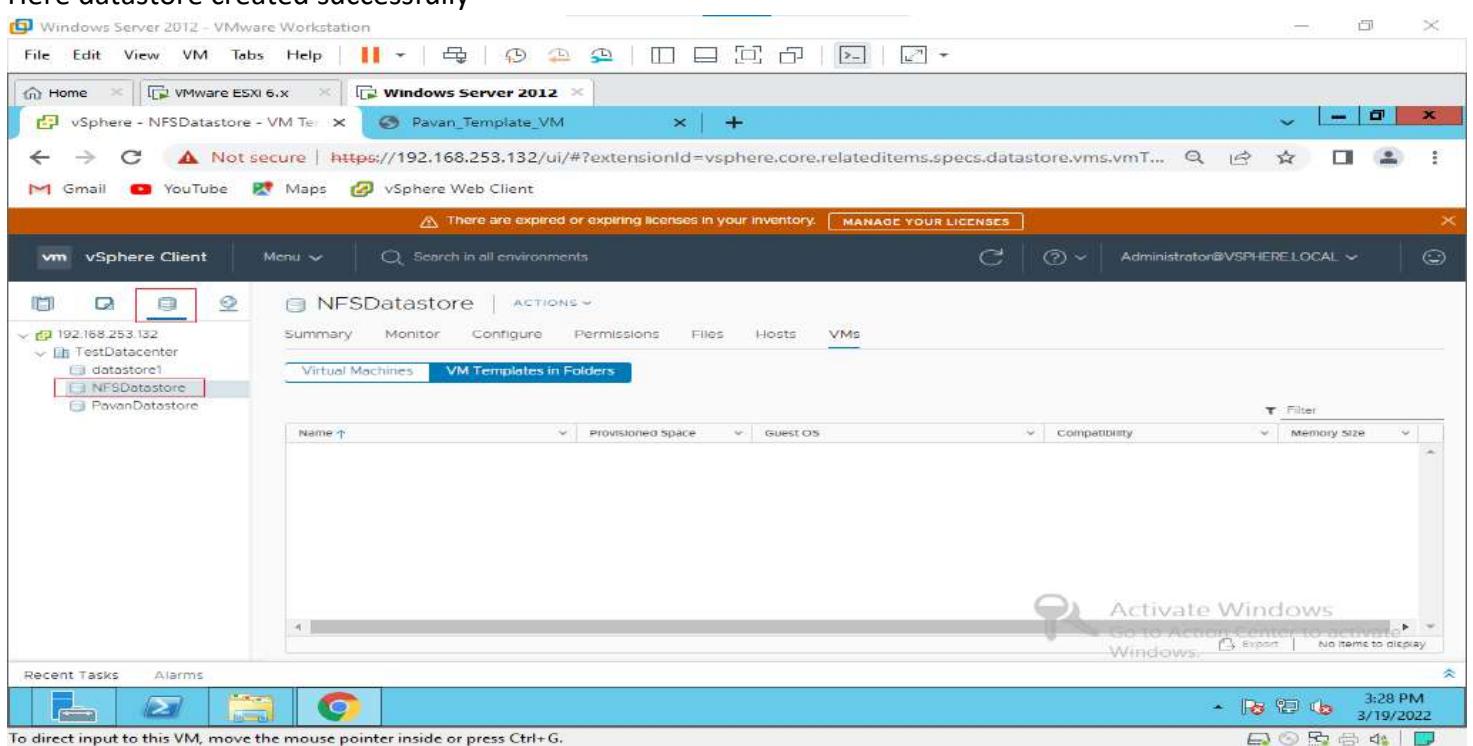
Enter the Datastore Name, Server IP address and **Folder** (Created folder into Disk C) and Click on the **Next** button



Click on the **Finish** button



Here datastore created successfully



# Practical No. 7

**Aim:** Implement and manage the network of VMware ESXi server

## A- Create vSphere Standard switch

The vSphere Standard Switch is a simple virtual switch configured and managed at the host level. This switch provides access, traffic aggregation, and fault tolerance by allowing multiple physical adapters to be bound to each virtual switch.

Adding and configuring vSphere standard switch.

Go to the browser and paste the [labs.hol.vmware/hol/catalog](https://labs.hol.vmware/hol/catalog) content and first link to open then show screen like below image

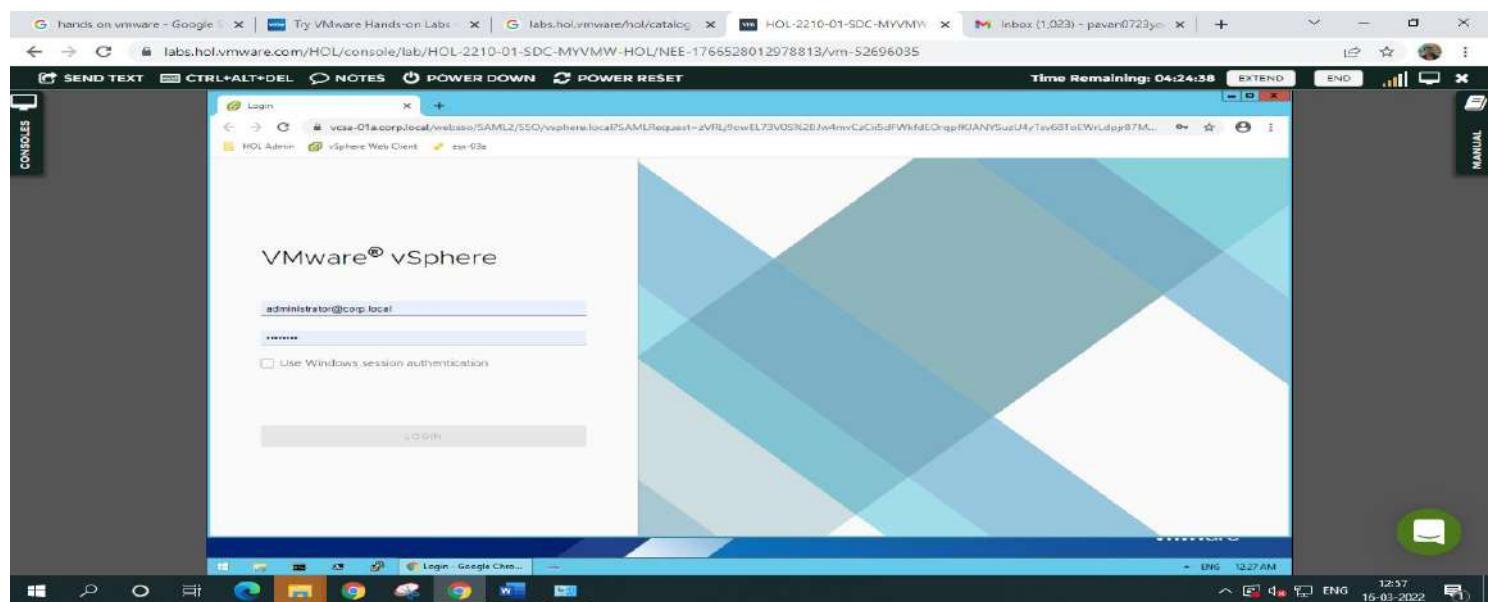
If you are not already logged in, launch the Chrome browser from the desktop and log in to the vSphere Web Client

### Enroll the Virtualization 101(HOL-2210-01-SDC)

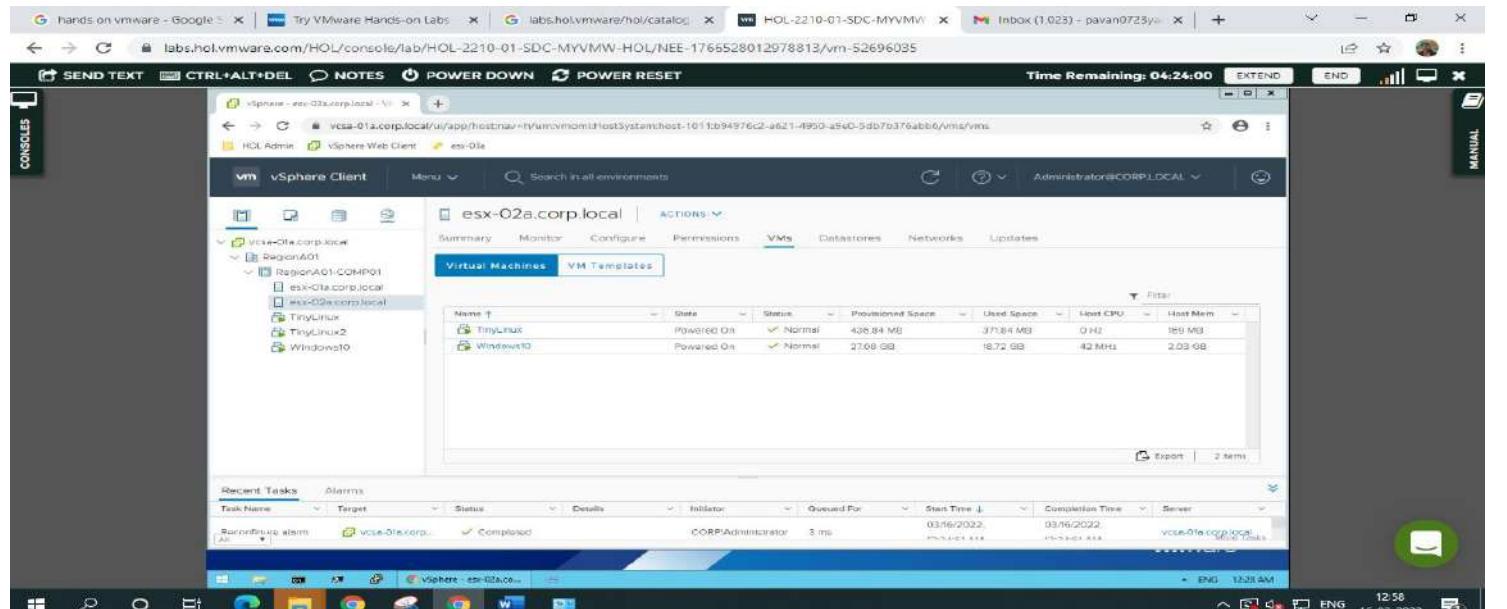
The screenshot shows the VMware Hands-on Labs catalog page. On the left sidebar, there are categories like Enrollments, Labs, and Transcript. The main content area displays the 'Virtualization 101 (HOL-2210-01-SDC)' lab. It has a 'NEW' badge, a cloud icon, and a brief description: 'This introductory lab demonstrates the core features and functions of vSphere and vCenter. This is an excellent place to begin your experience with VMware vSphere.' There are 'INVITE A FRIEND' and 'ENROLL' buttons. To the right, there's a section titled 'What is VMware Hands-on Labs' with a video thumbnail, and another section titled 'Extreme Performance - VMworld 2021 Behind the Scenes'.

### Start the Lab

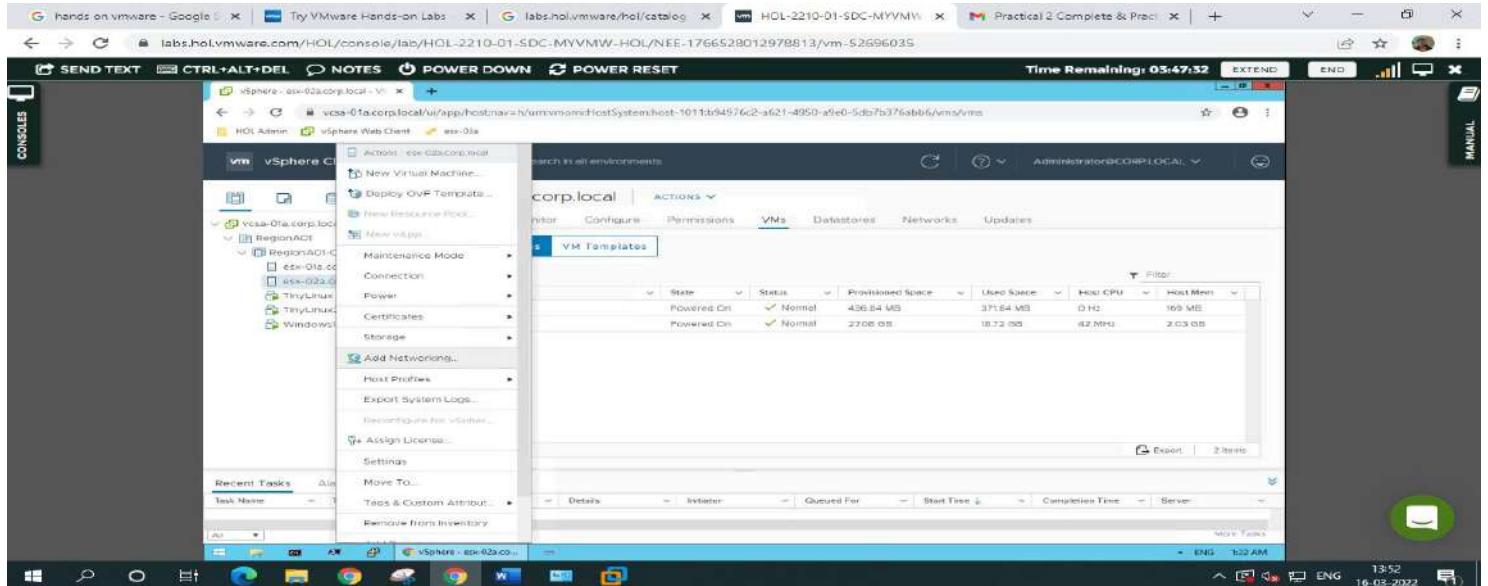
The screenshot shows the VMware Hands-on Labs enrollment page for the 'Virtualization 101 (HOL-2210-01-SDC)' lab. The progress bar is at 0% and the time remaining is 1 hour 30 minutes. Below the lab details, there's another entry for 'HOL-2210-01-SDC-MYVMW-HOL - Virtualization 101' with a progress bar at 0% and time remaining of 1 hour 26 minutes. There are 'START THIS LAB' and 'RESUME THIS LAB' buttons. On the right side, there's an alert about the new content catalog and a section titled 'What is VMware Hands-on Labs' with a video thumbnail, and another section titled 'Extreme Performance - VMworld 2021 Behind the Scenes'.



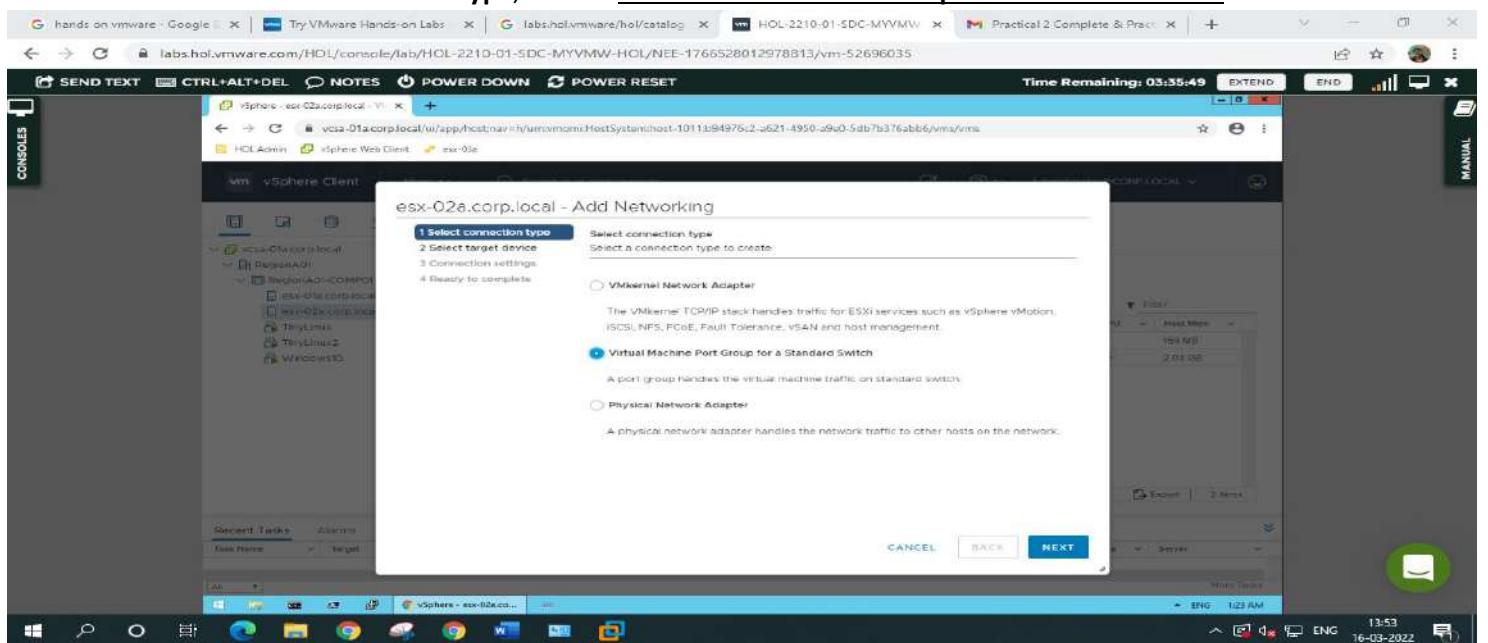
Then select host and clusters.



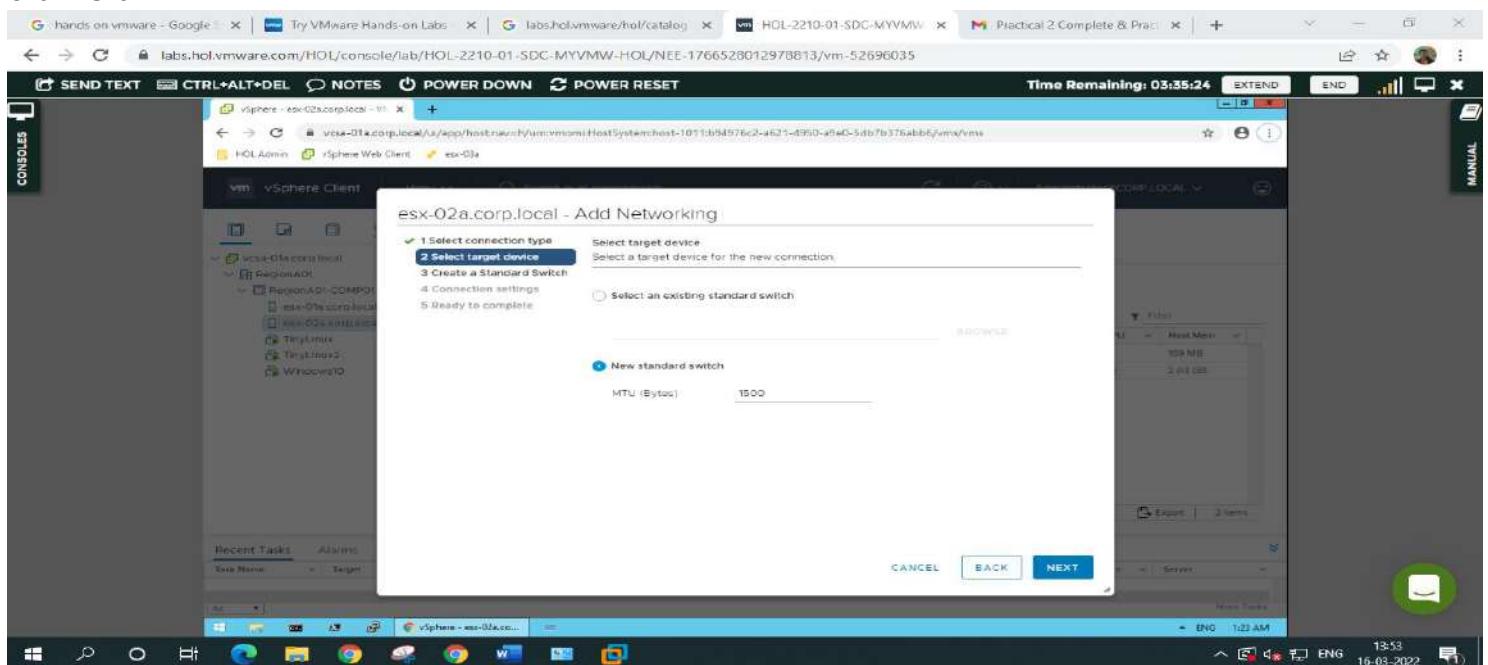
Under **vcsa-01a.corp.local**, expand **RegionA01** and then **RegionA01-COMP01**. Next, right-click on **esx-02a.corp.local** in the Navigator. Select **Add Networking...**



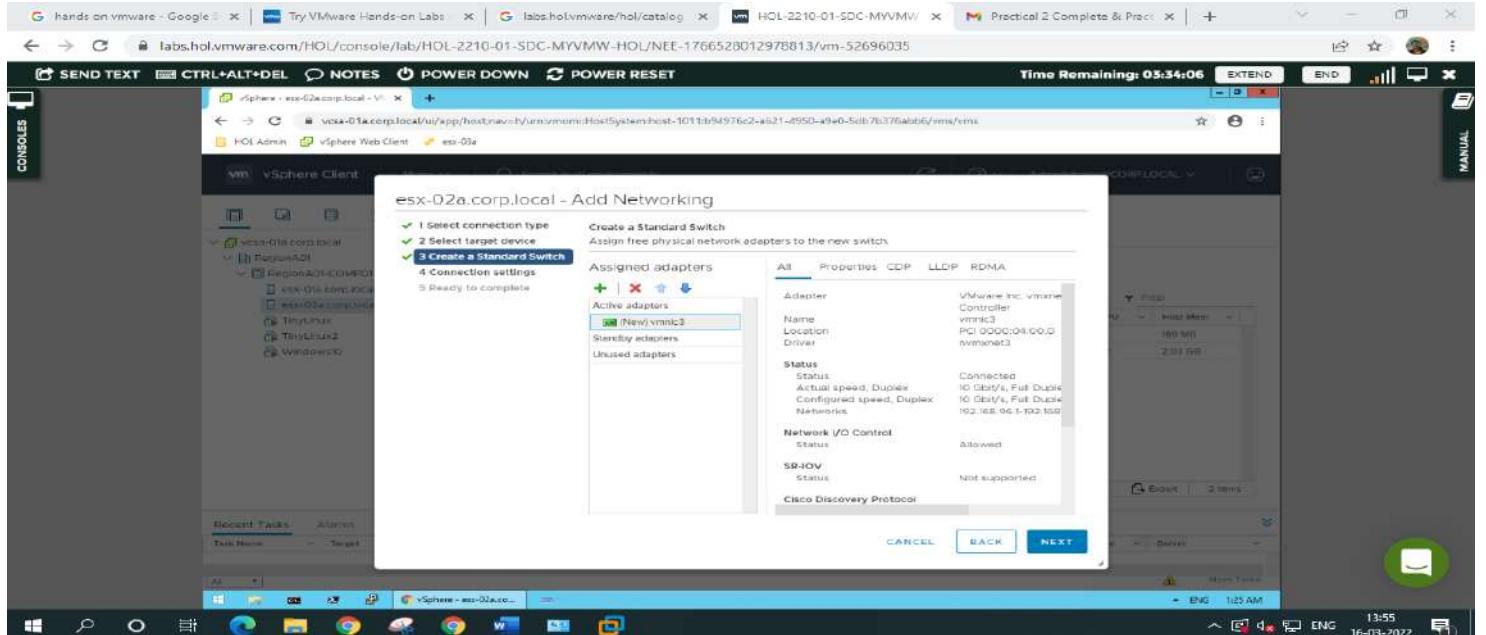
When asked to select the connection type, choose **Virtual Machine Port Group for a Standard Switch** & Click **Next**.



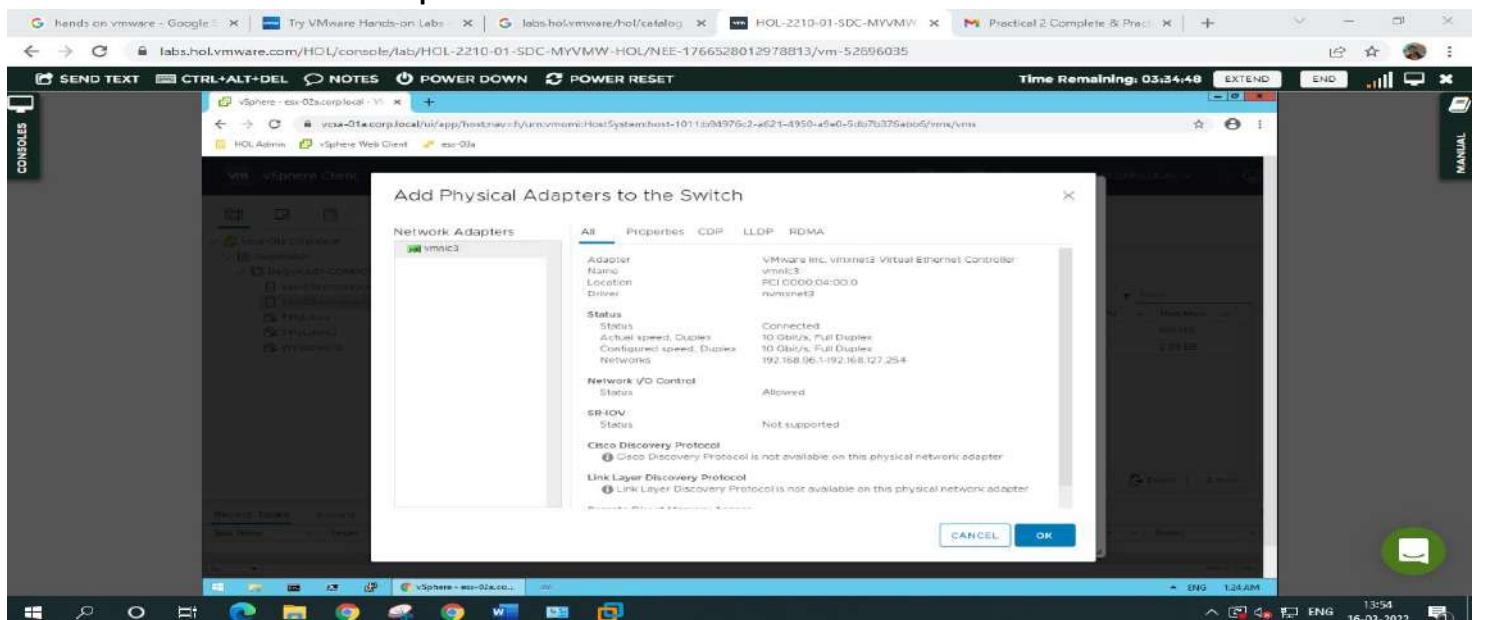
When asked to select a target device, choose **New Standard Switch**. Note that a larger MTU size can be specified if needed & Click **Next**.



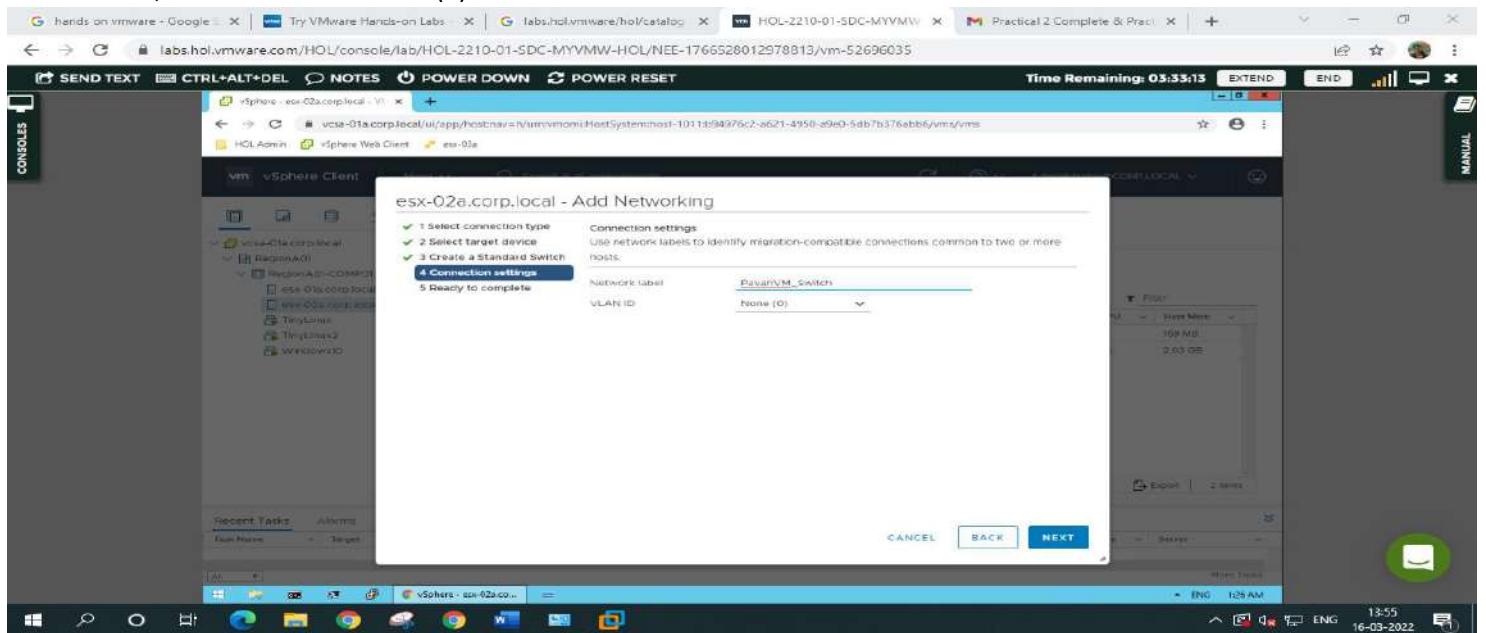
Click the '+' button.



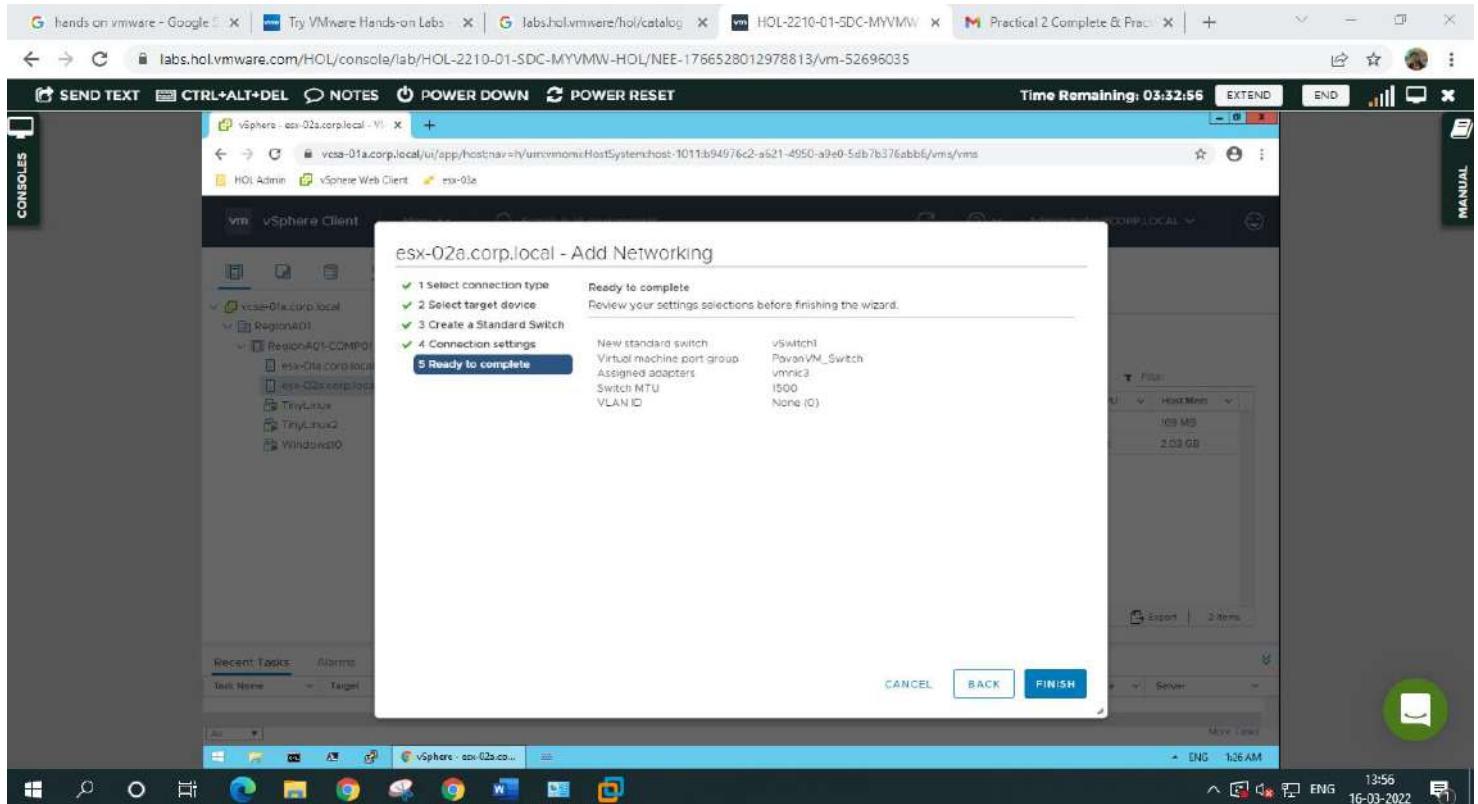
Select **vmnic3** under Network Adapters & Click **OK**. After Click **Next** to continue.



At the Connection settings step of the wizard, for the **Network label**, leave the default name of VM Network 2. **Do not change the VLAN ID**; leave this set to None (0).:



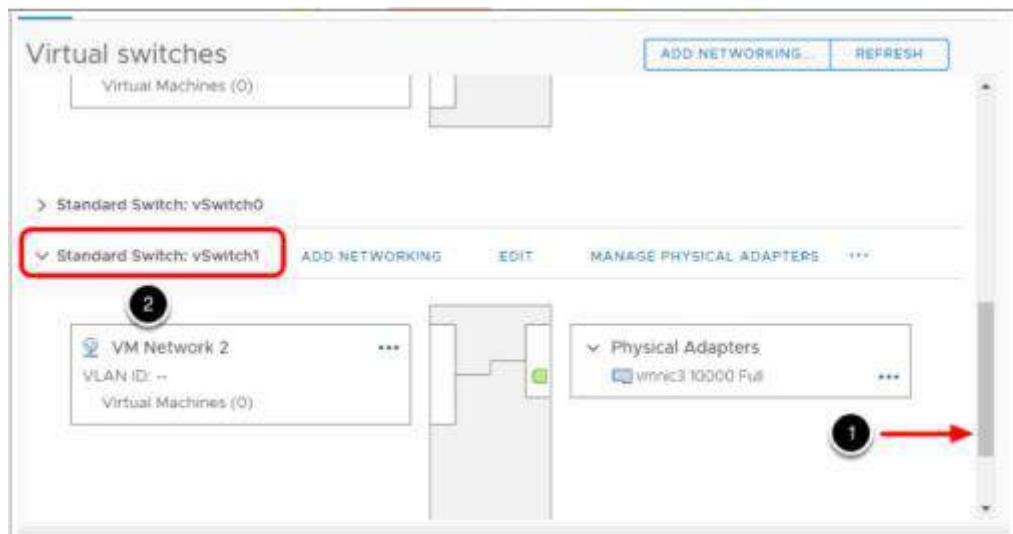
## Review the port group settings in Ready to complete and click **Finish**.



Click **Configure**. Click on **Virtual Switches**.



Scroll down until you see Standard Switch: vSwitch1. If needed, expand the section.



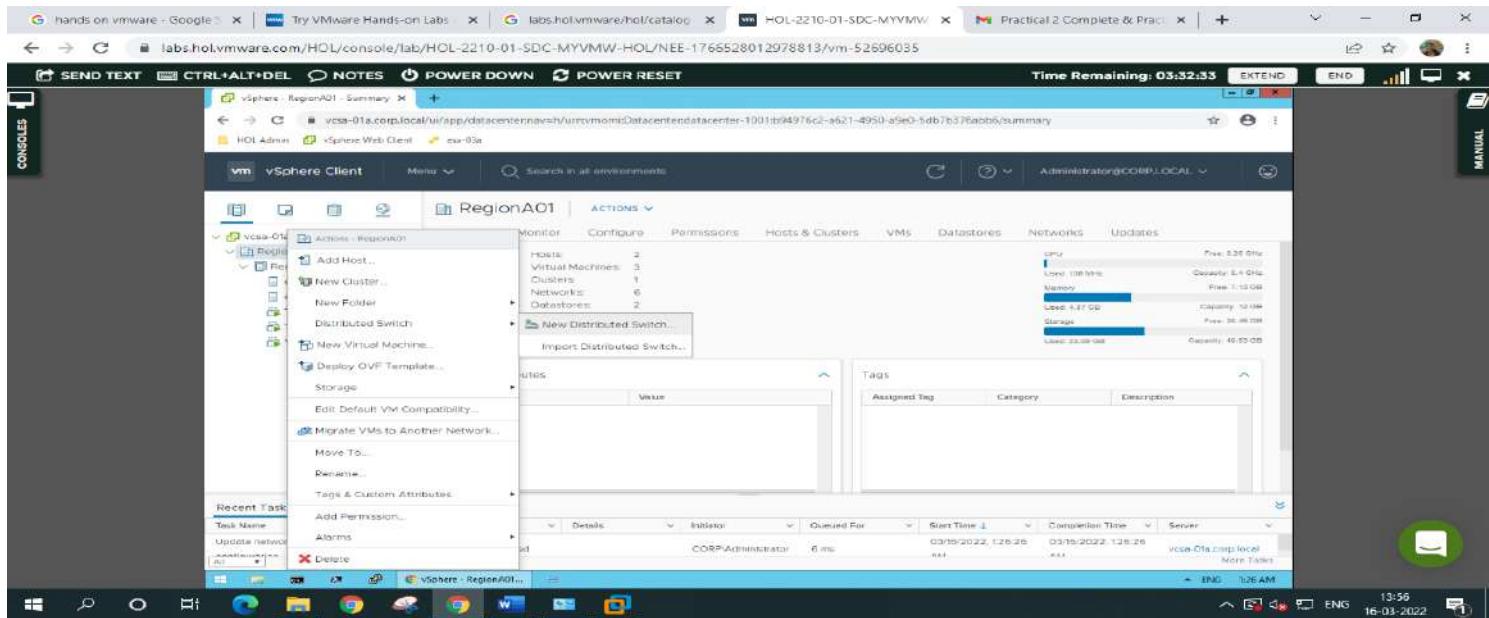
You should see the above diagram showing a virtual port group (VM Network 2) that is on vSwitch1 and it is using vmnic3 as an uplink.

## B- Create vSphere Distributed switch

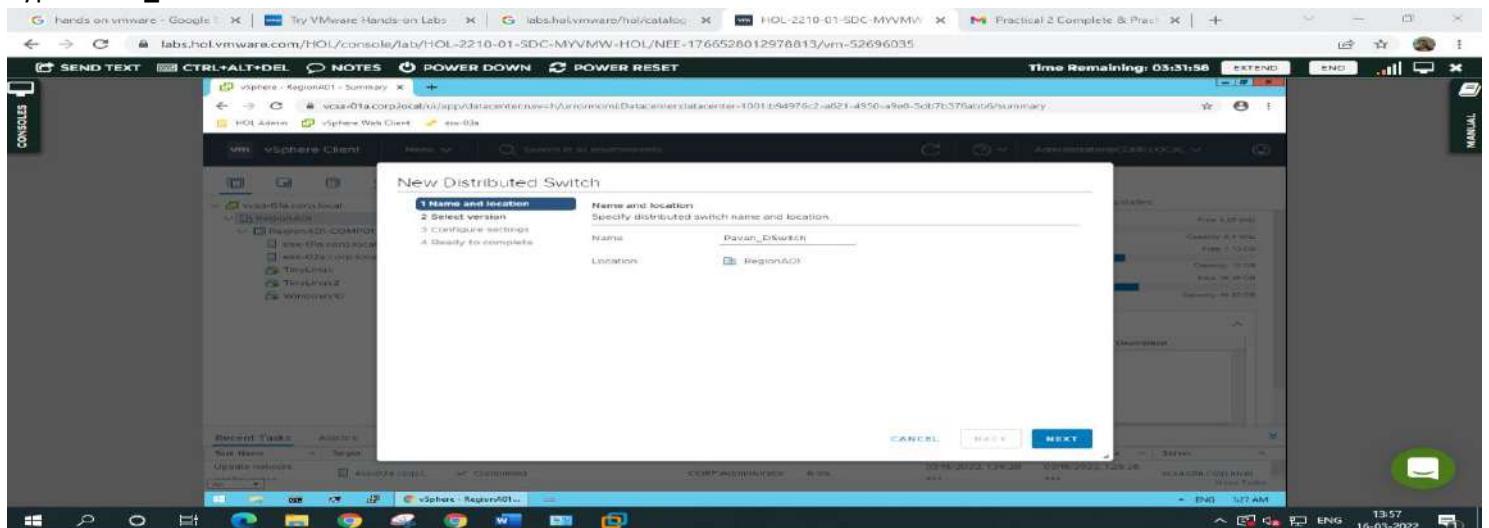
The VMware vSphere Distributed Switch builds on the capabilities of the vSS and simplifies management in large deployments by appearing as a single switch spanning multiple associated hosts. This allows changes to be made once and propagated to every host that is a member of the switch.

### Creating a new distributed switch.

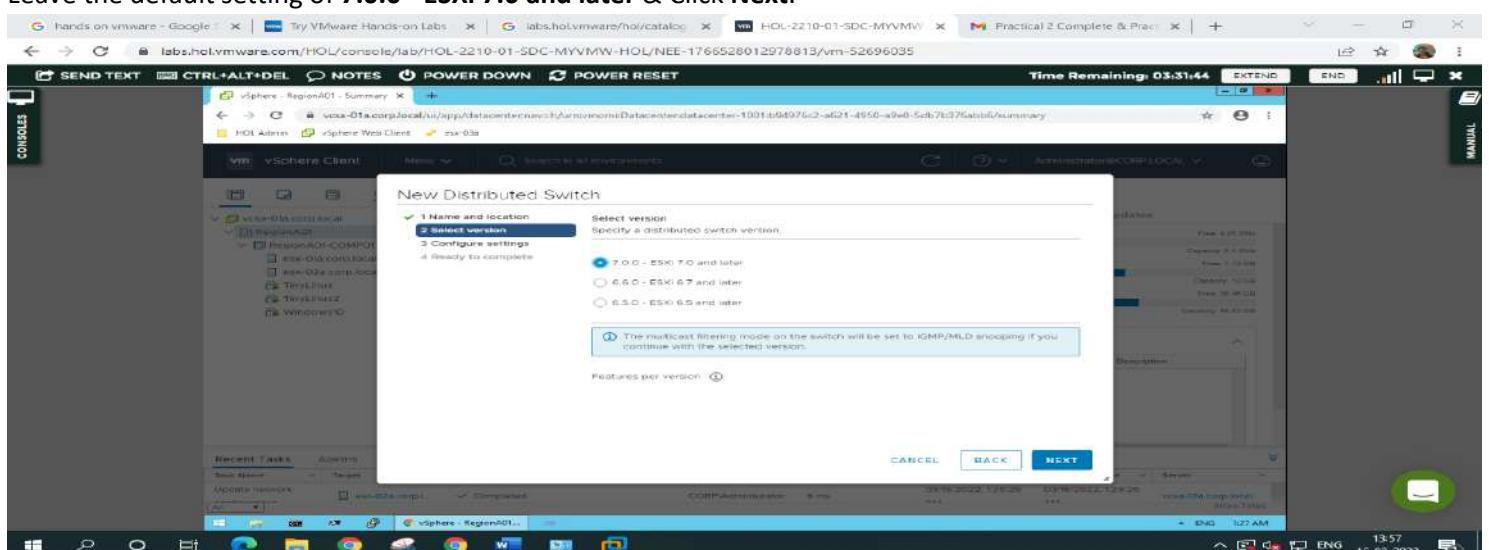
In the vSphere Web Client, click on RegionA01. And the navigator, right-click the RegionA01. Select **Distributed Switch** and then **New Distributed Switch**, This will open the New Distributed Switch wizard



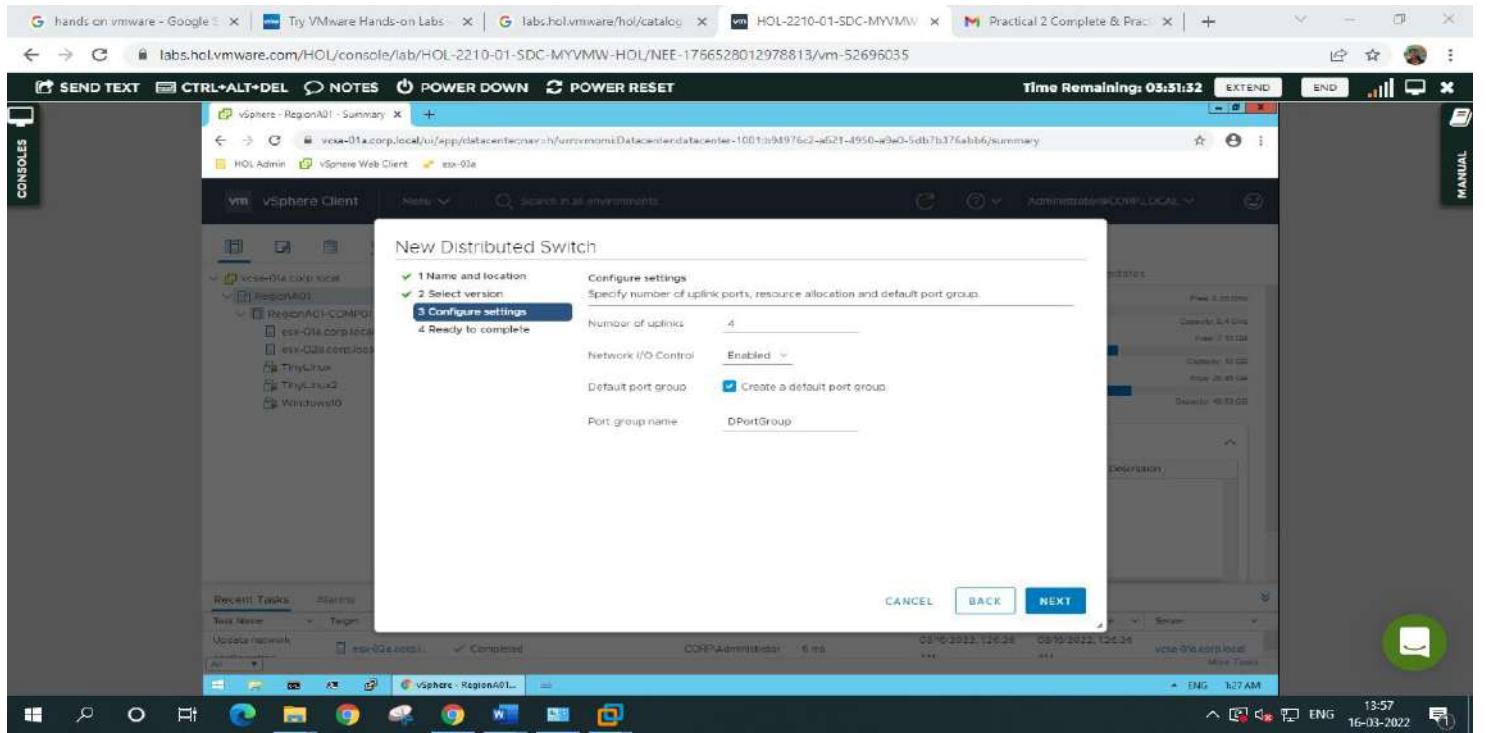
Type Name\_DS in the Name field & Click Next.



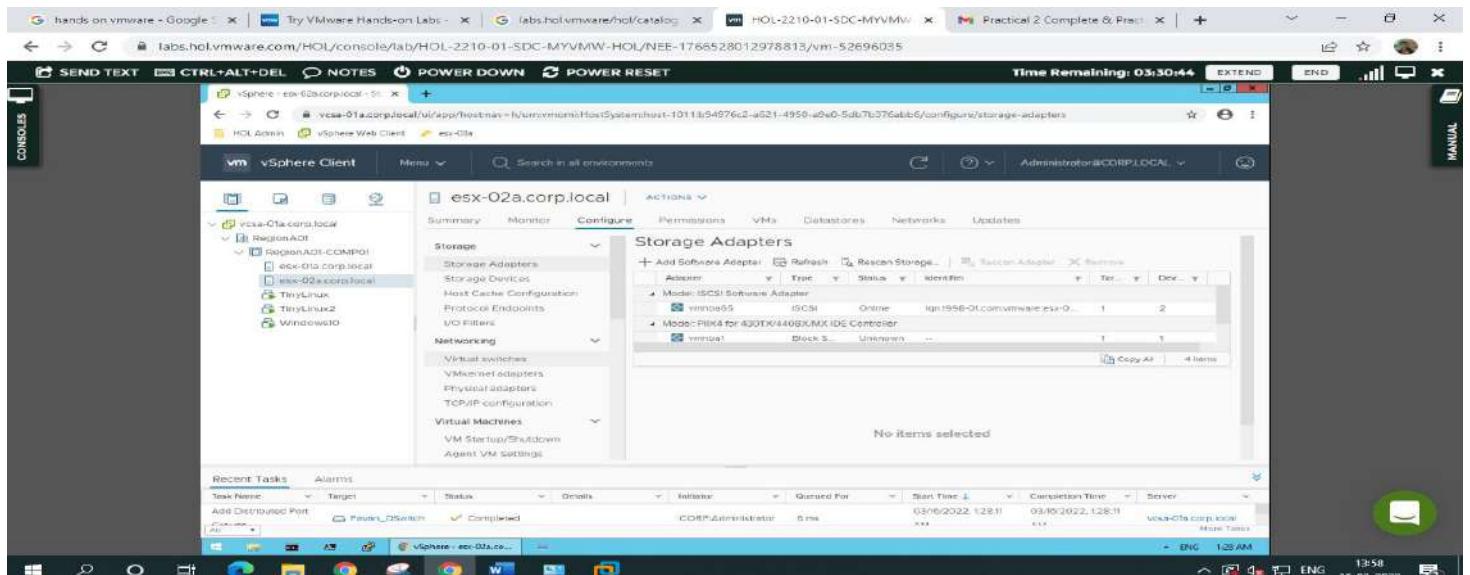
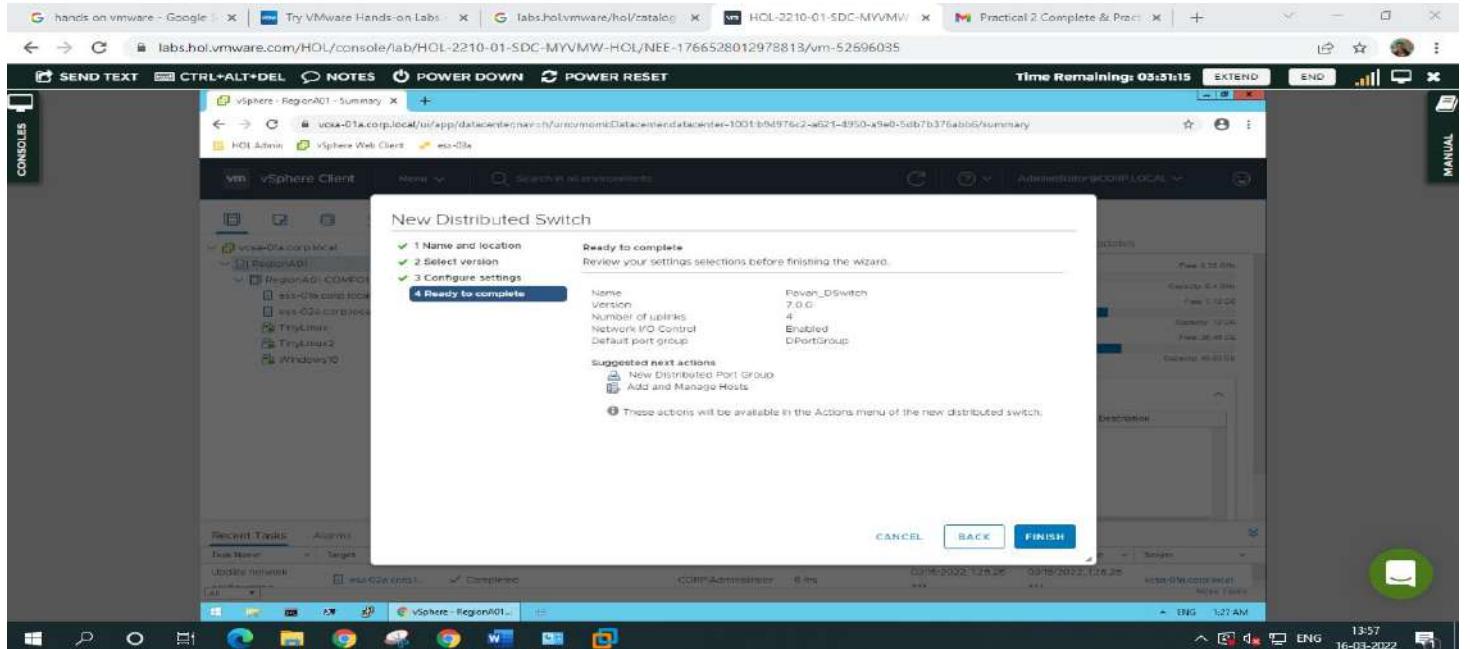
Leave the default setting of 7.0.0 - ESXi 7.0 and later & Click Next.



Leave the default options on the below screen and click **Next**.



Review your settings and click **Finish**.



## Add Hosts to a new distributed switch.

Right-click on the newly created switch, Name\_DS & Select Add and Manage Hosts.

The screenshot shows the vSphere Web Client interface. On the left, the navigation tree includes 'vcsa-Ota.corp.local' and 'Region01'. Under Region01, there are 'PavanVM\_Switch', 'VM Network', and 'Pavan\_DSwitch'. A context menu is open over 'Pavan\_DSwitch', with the 'Add and Manage Hosts...' option highlighted under 'Distributed Port Group'.

On the Select Task page, select Add hosts & Click Next.

The screenshot shows the 'Pavan\_DSwitch - Add and Manage Hosts' dialog box. In the 'Select Task' section, 'Add hosts' is selected. Below it, the 'Select hosts' section displays a table with columns 'Name' and 'Host Status'. The table is currently empty, showing 'No items to display'.

On the Select host's page, click New hosts.

The screenshot shows the 'Pavan\_DSwitch - Add and Manage Hosts' dialog box. In the 'Select hosts' section, 'New hosts' is selected. A sub-dialog titled 'New hosts' is open, showing a table with columns 'Name' and 'Host Status'. The table is currently empty, showing 'No items to display'.

Click the **check box** on the left to select both hosts in the datacenter & Click **OK**.

The screenshot shows the 'Select New Hosts' dialog box from the vSphere Web Client. It lists two hosts: 'esxi-01a.corp.local' and 'esxi-02a.corp.local', both of which are connected and part of the 'RegionA01-COMP01' cluster. The 'OK' button at the bottom right is highlighted.

Verify the two hosts are listed, then click **Next**

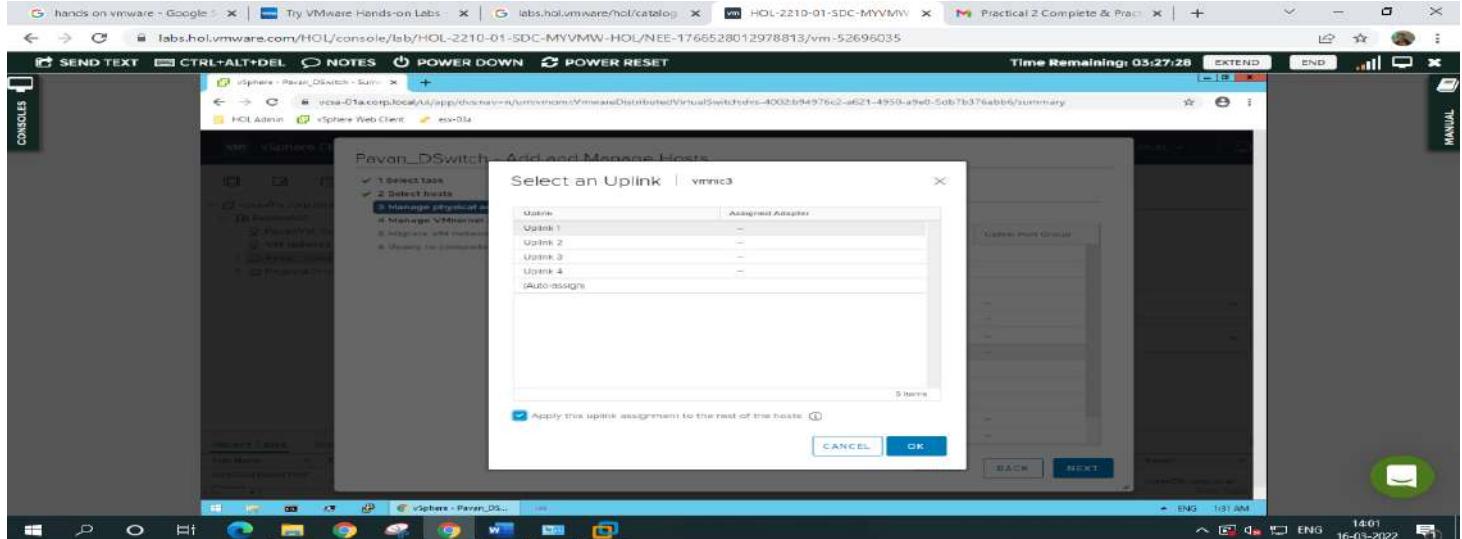
The screenshot shows the 'Pavan\_DSwitch - Add and Manage Hosts' dialog box. Step 2 'Select hosts' is active. It shows the two hosts 'esxi-01a.corp.local' and 'esxi-02a.corp.local' selected for the distributed switch. The 'NEXT' button at the bottom right is highlighted.

On the Manage physical network adapter's page, we want to configure which physical NICs will be used on the distributed switch.

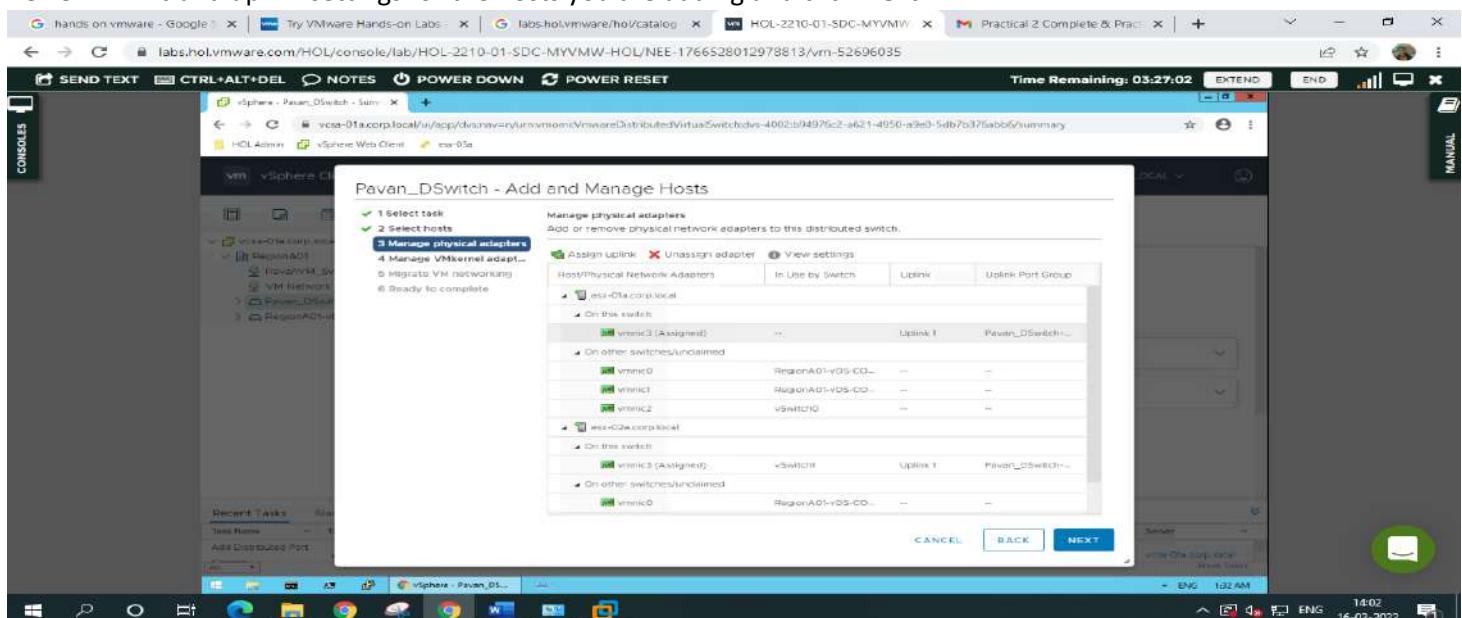
From the On other switches/unclaimed list, highlight vmnic3 & Click Assign uplink.

The screenshot shows the 'Manage physical adapters' dialog box. Step 3 'Manage physical adapters' is active. It shows the 'Assign uplink' section where 'vmnic3' is highlighted with a red box. The 'NEXT' button at the bottom right is highlighted.

From the Select an Uplink page, select **Uplink 1**. Check the box next to Apply this uplink assignment to the rest of the hosts & click OK.

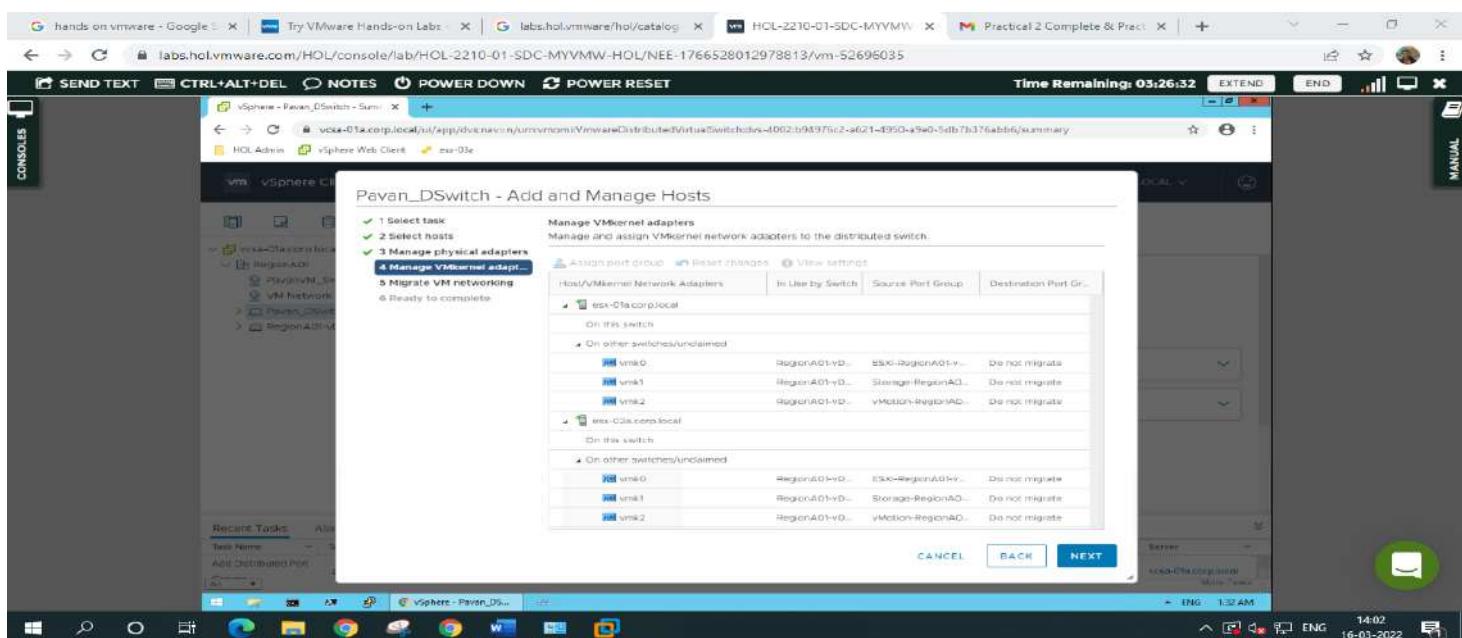


Review vmnic and uplink settings for the hosts you are adding and click **Next**

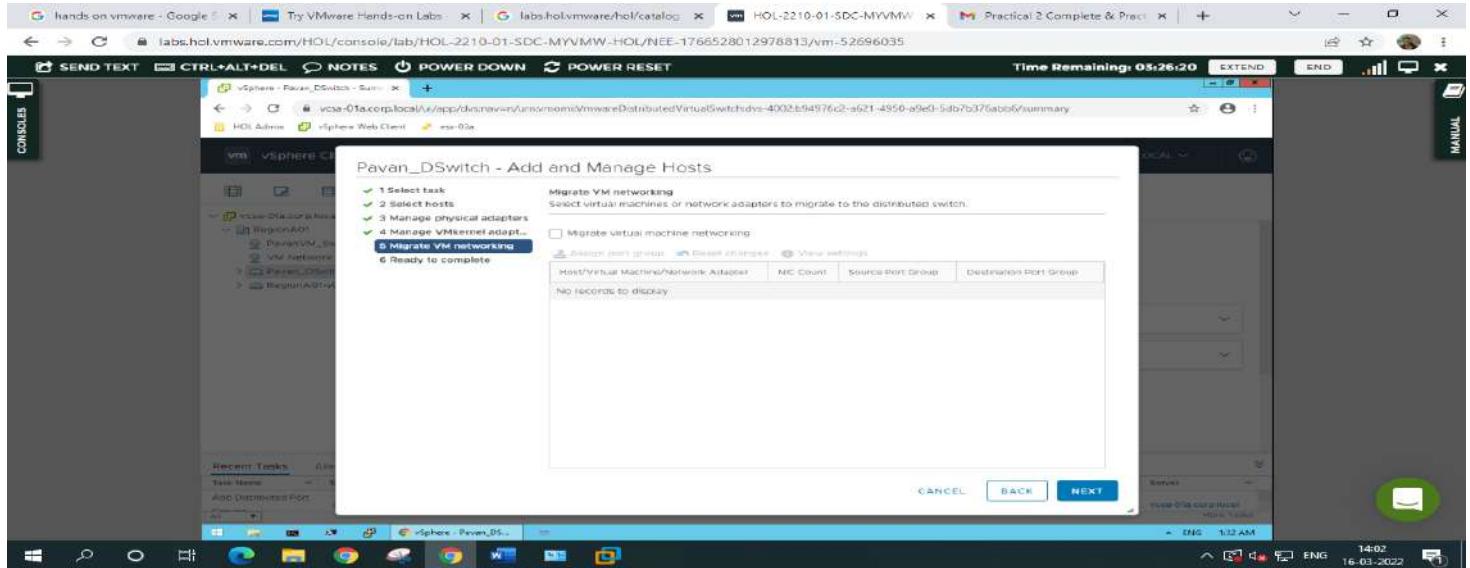


## Manage VMKernel Adapters.

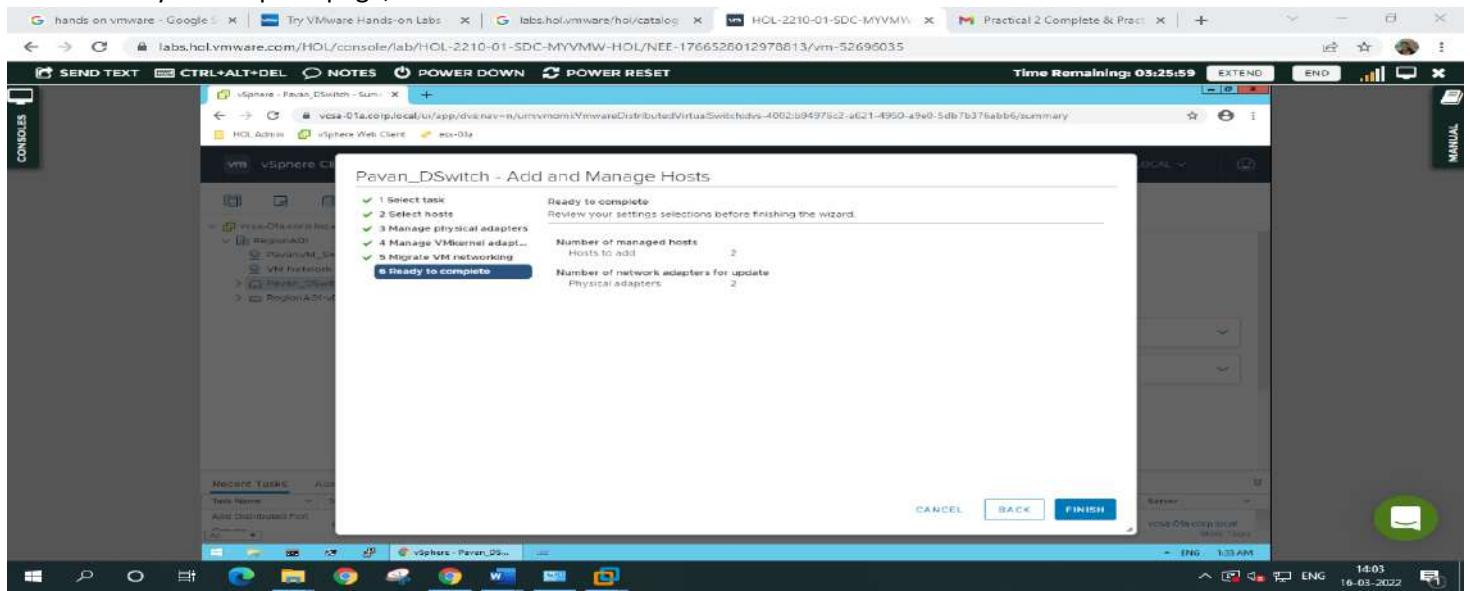
Since we will not be using this distributed switch for any VMKernel functions, click **Next**.



The add hosts wizard also gives us the ability to migrate VMs from one distributed switch to another on this page. While this action can be done here. Click **Next**

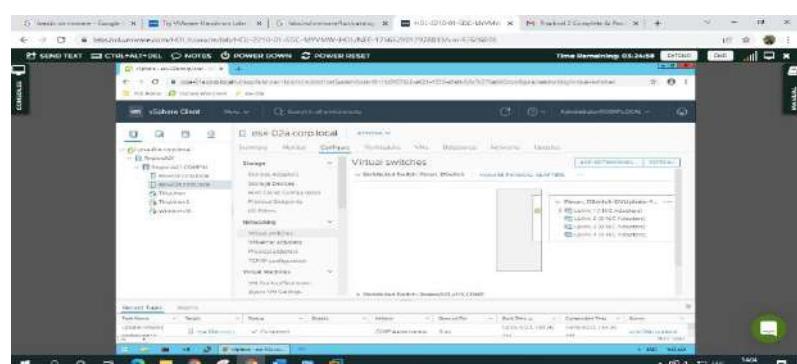


On the Ready to complete page, click **Finish**



Click on the Hosts tab to see the newly connected hosts.

Name	State	Status	Cluster
esx-01a.corp.local	Connected	✓ Normal	RegionA01-CO...
esx-02a.corp.local	Connected	✓ Normal	RegionA01-CO...

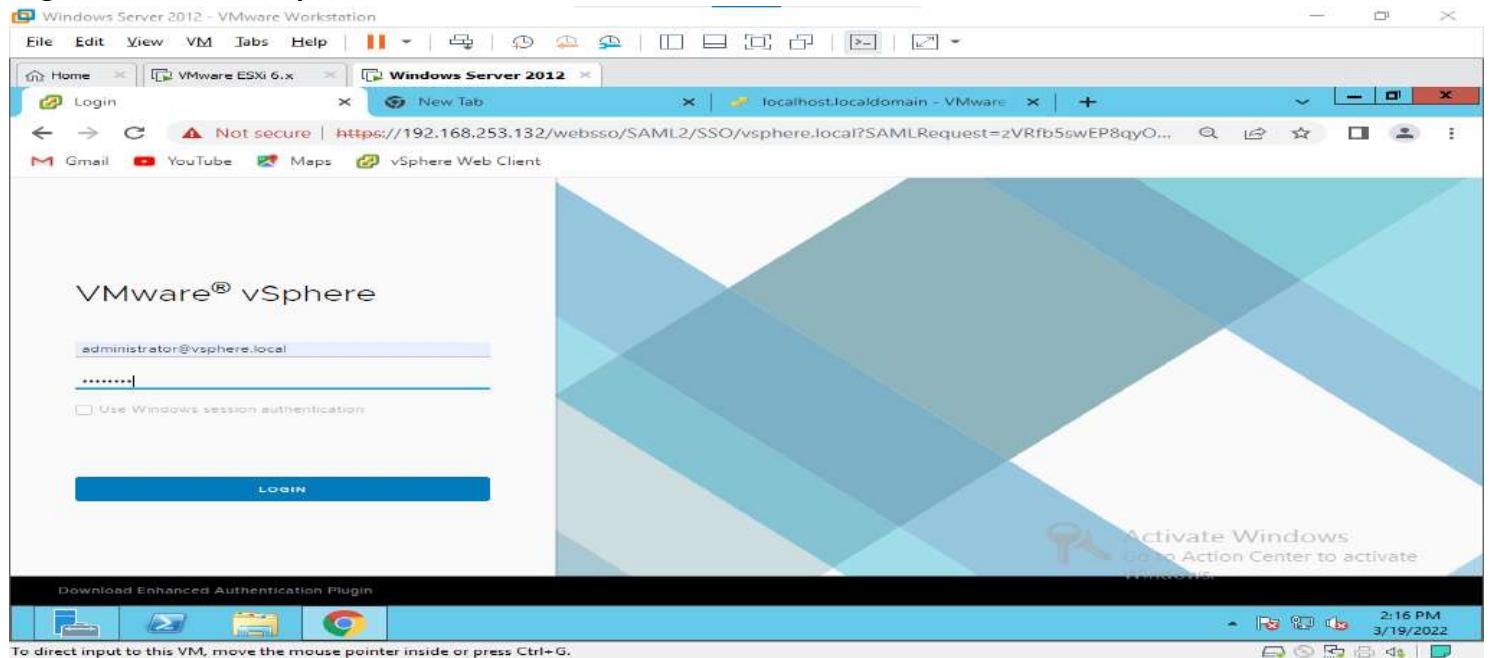


# Practical No. 8

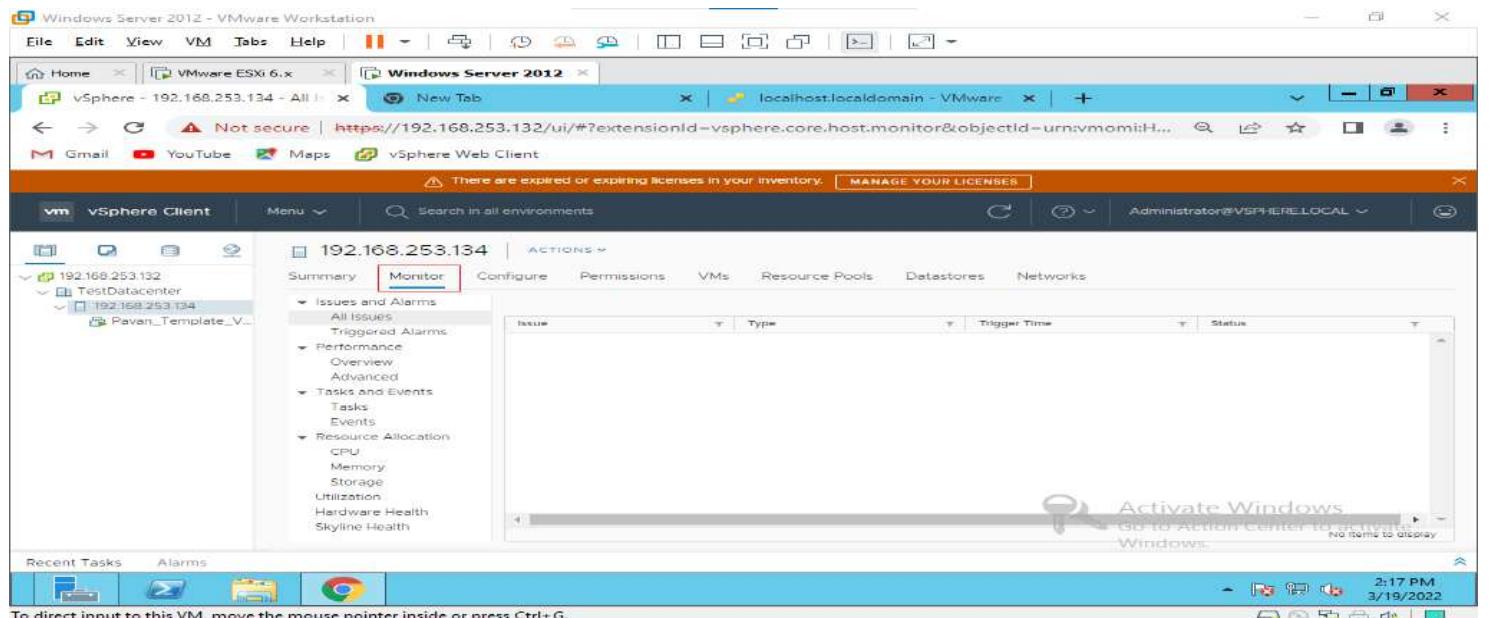
**Aim:** Perform vSphere Monitoring and Performance

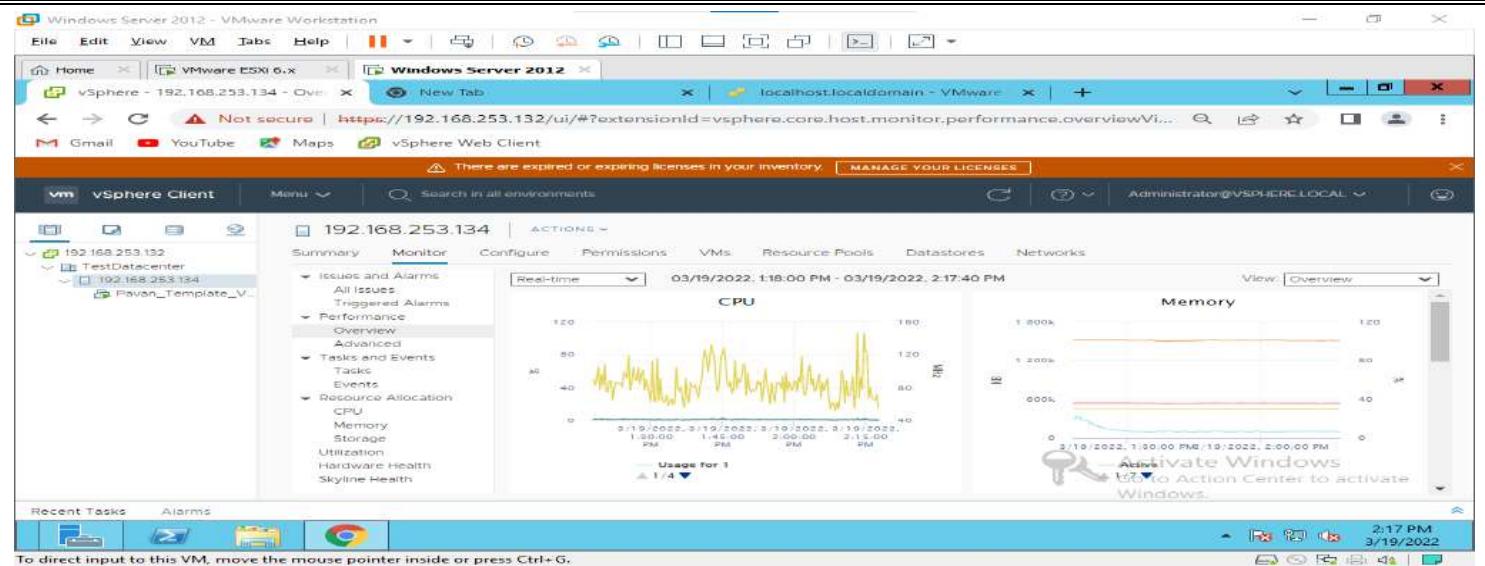
## A- Monitoring Guest Operating System Performance.

### Login the VMWare vSphere

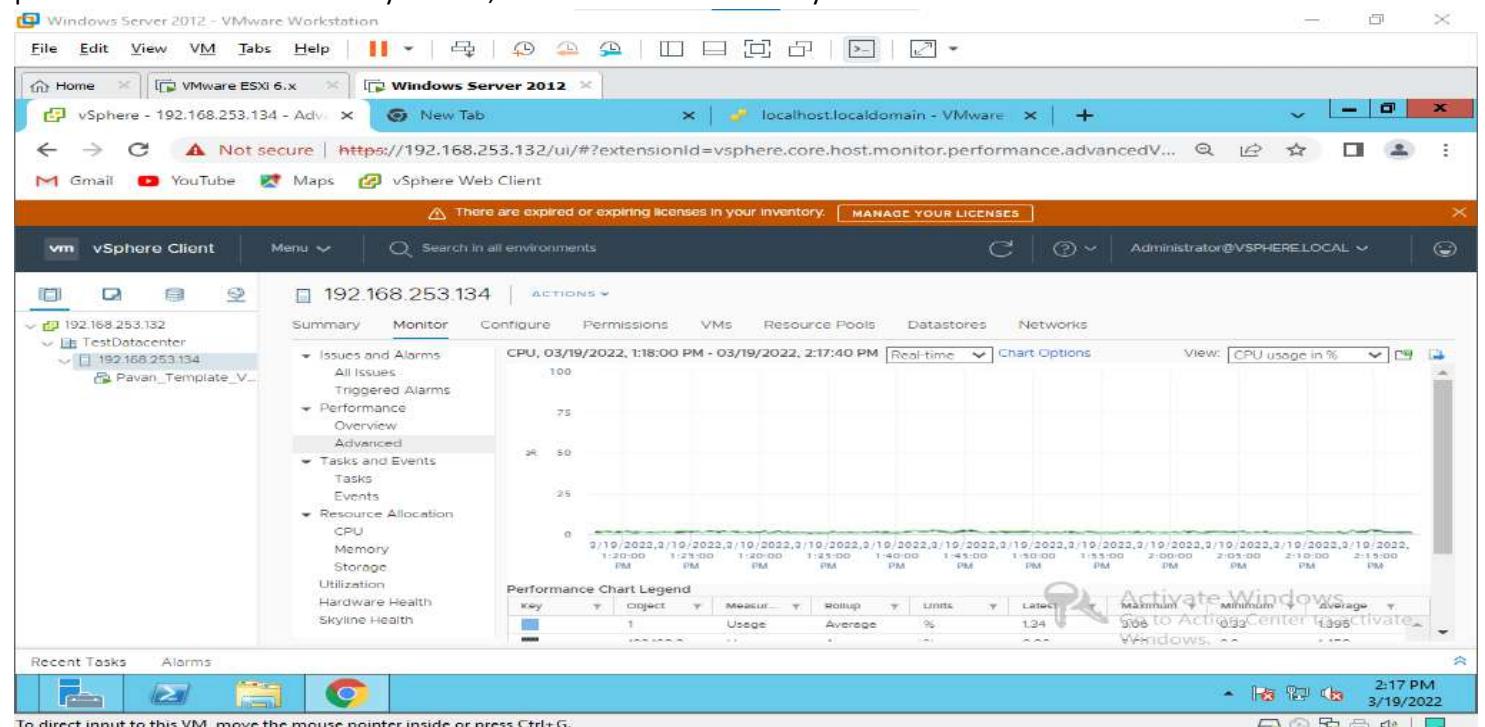


Select Host IP address then Click the **Monitor** tab & Click **Overview** under the Performance section.





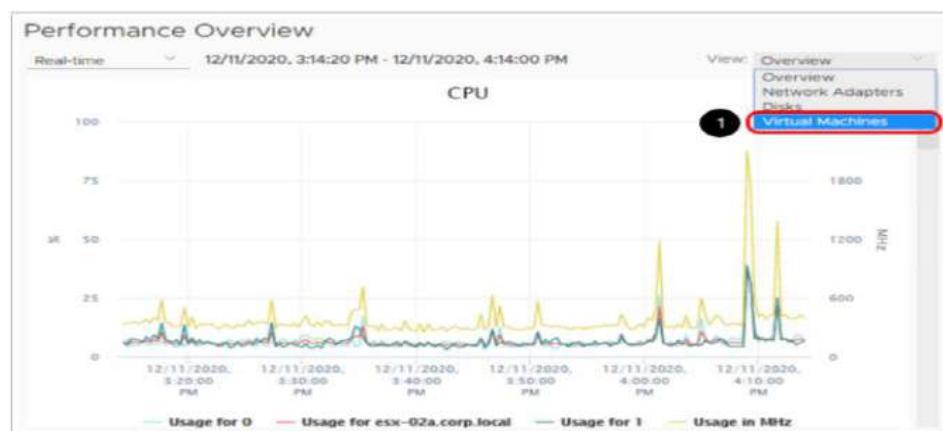
Ensure Real-time has been selected from the Time Range drop-down menu. Here we can see in real-time the CPU usage in percent for **HOST IP address**. By default, the chart will refresh every 20 seconds.



Now click the View drop-down box and select **Virtual Machines**.

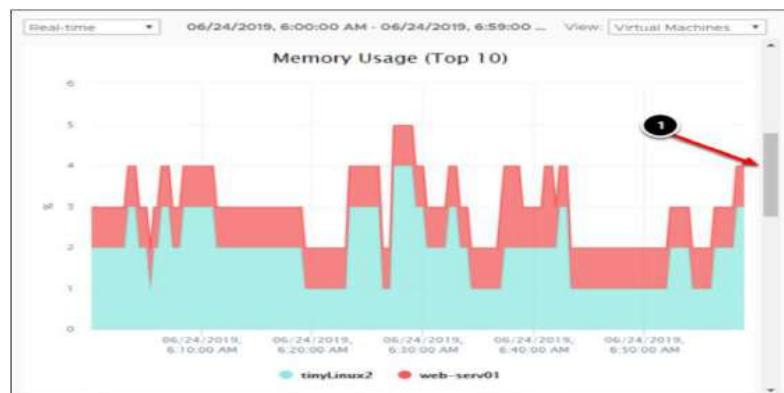
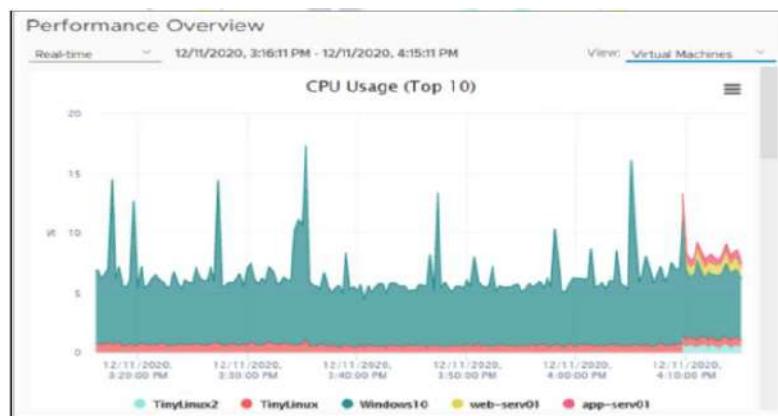
This chart shows the real-time CPU usage of each virtual machine. Each VM is represented by a different color in the graph and you can see at the bottom, which VM is represented by what color. Combined, they give you an idea of overall CPU usage on the host.

There are other graphs available to show host and virtual machine memory usage, network (Mbps), and disk (KBps). Use the scroll bars to access the additional charts.



The graphs we have looked at so far will give you an overview of the four main components, CPU, memory, disk, and storage. The advanced graphs will give you more detailed information on each of these.

Click on the **Monitor** tab. & Click **Advanced** in the Performance section.

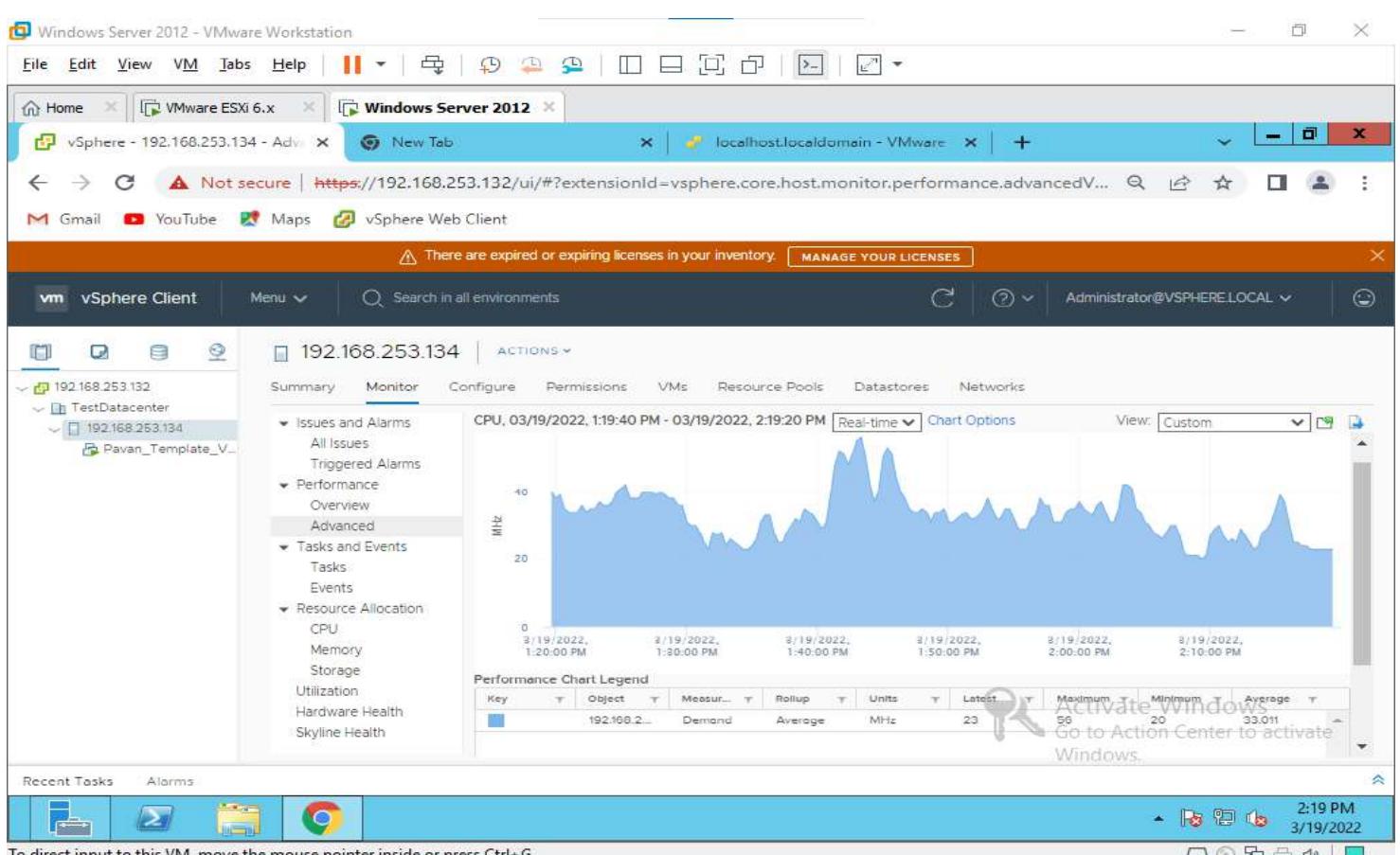
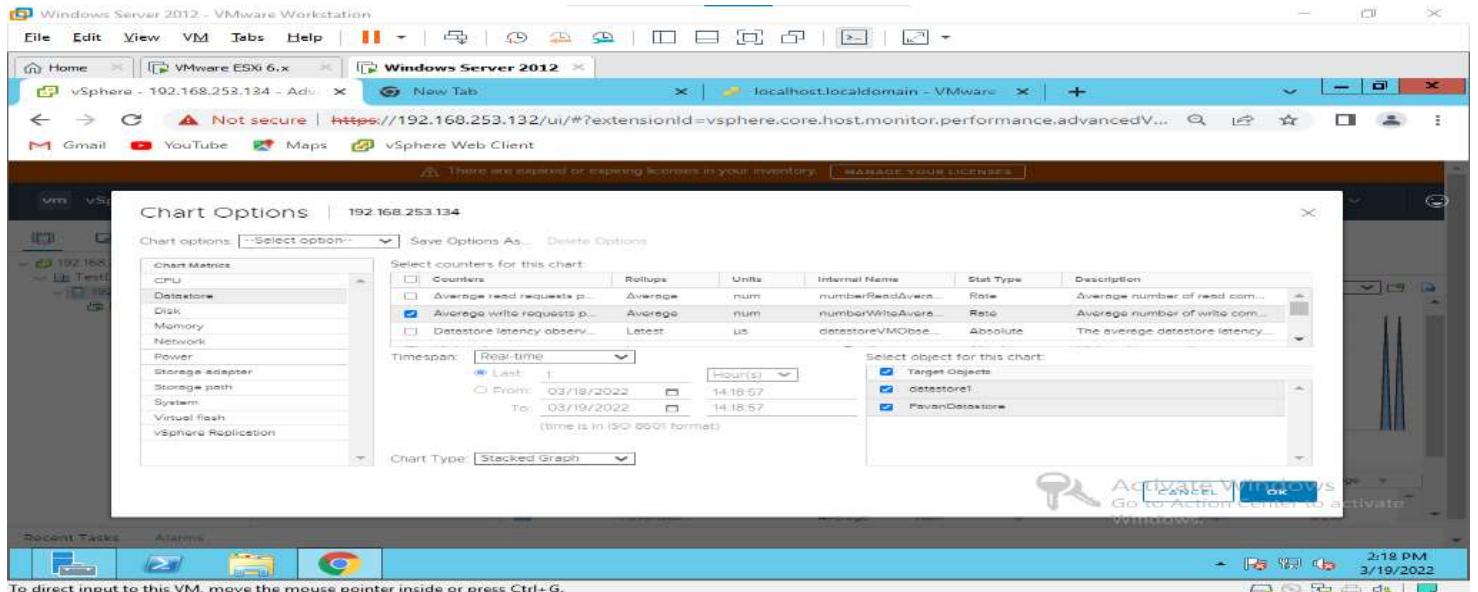


This screenshot shows the vSphere Client interface for a host with IP 192.168.253.134. The left sidebar shows the inventory tree with a selected folder named 'Pavan\_Template\_V...'. The 'Monitor' tab is selected under the 'Performance' section. A sub-menu is open for 'Advanced' performance monitoring. The main pane displays a bar chart for I/O wait (IOW) over time, with the Y-axis ranging from 0 to 1. The chart shows several sharp peaks, indicating periods of high I/O wait. Below the chart is a 'Performance Chart Legend' table.

Click the **Chart Options** link. This will bring up options to **customize the chart**.

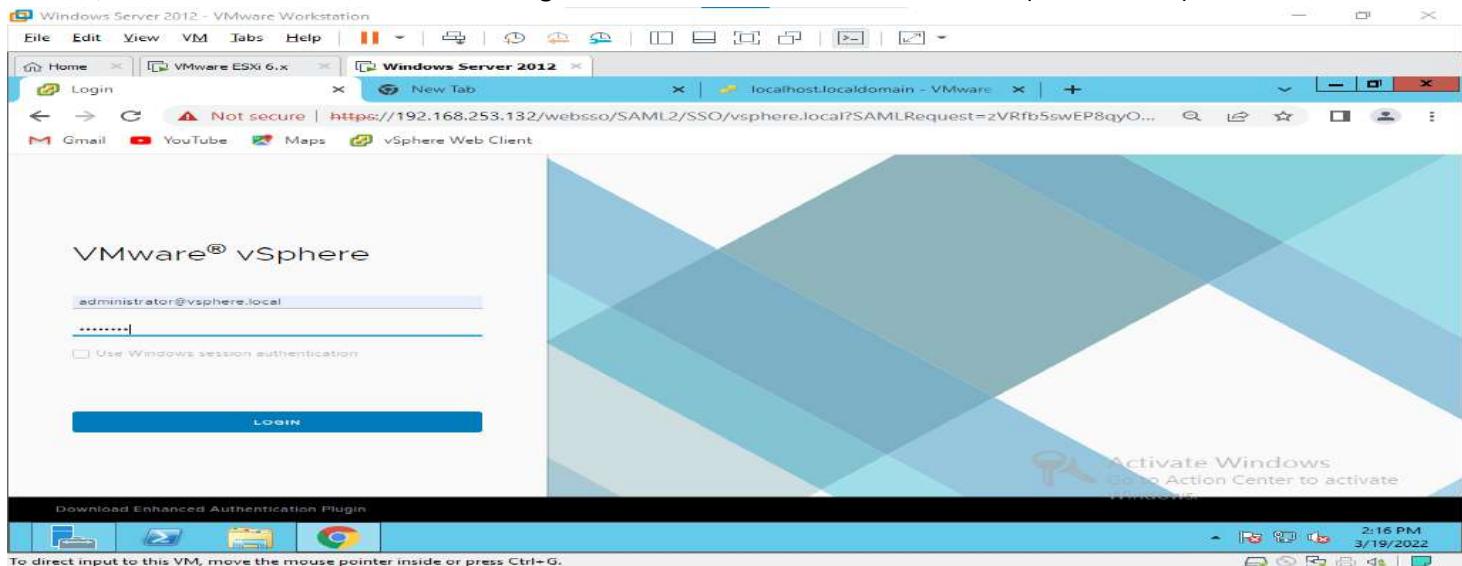
From the **Chart Type** drop-down menu, select **Stacked Graph** per VM.

Under the Select objects for this chart box, verify all the virtual machines are selected. Click the OK button to see the newly customized chart.

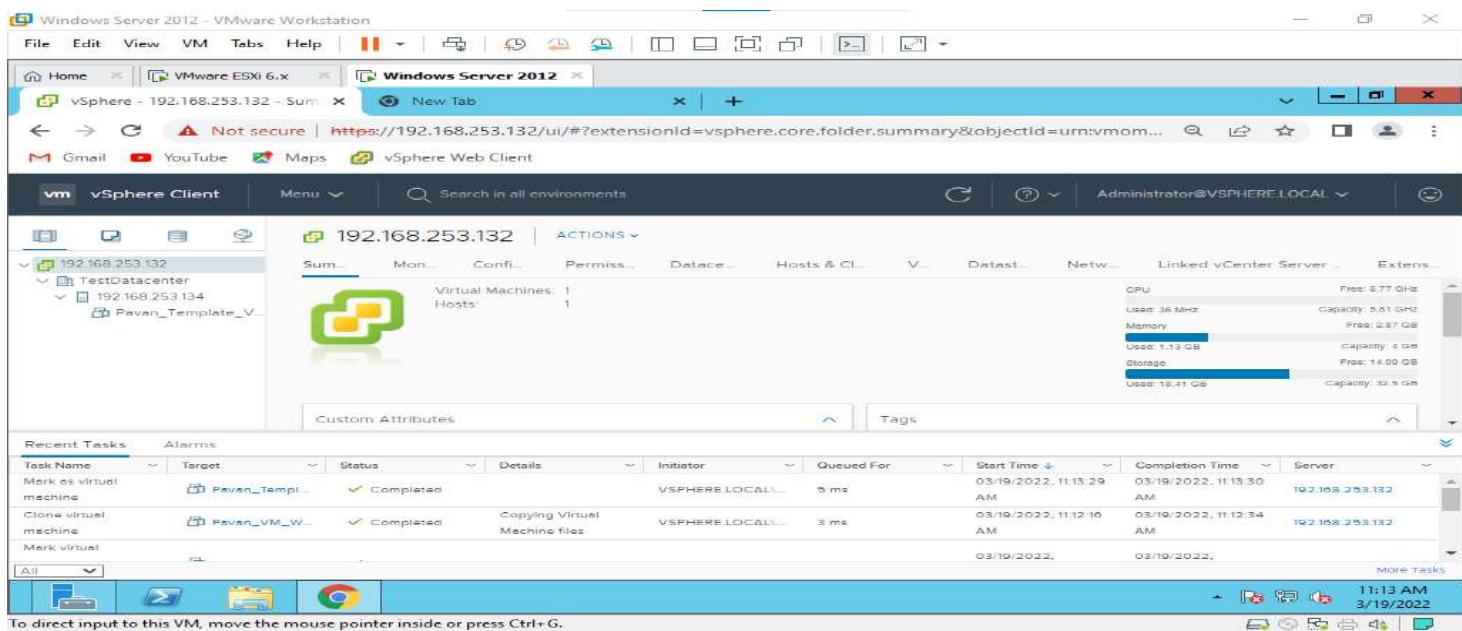


## B- Monitoring Guest Operating System Performance & View Performance Statistics for Windows Guest Operating Systems.

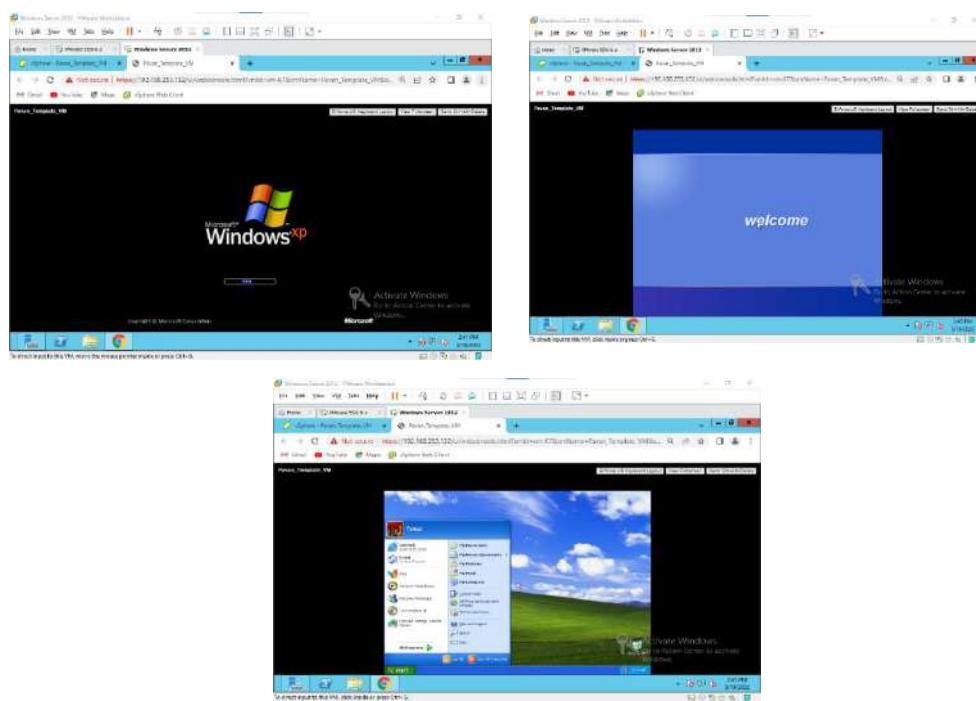
For this, we need a virtual machine in running status. Let's install the virtual machine (Windows XP).



Select the virtual machine we have created.



Start the VM



## Monitor the Usages of VM

Windows Server 2012 - VMware Workstation

File Edit View VM Tabs Help Home VMware ESXi 6.x Windows Server 2012 vSphere - Pavan\_Template\_VM Pavan\_Template\_VM Not secure https://192.168.253.132/ui/#?extensionId=vsphere.core.vm.monitor.performance.overviewView... Gmail YouTube Maps vSphere Web Client

There are expired or expiring licenses in your inventory. MANAGE YOUR LICENSES

vSphere Client Menu Search in all environments

Pavan\_Template\_VM | ACTIONS

Summary Monitor Configure Permissions Datastores Networks

Issues and Alarms All Issues Triggered Alarms Performance Overview Advanced Tasks and Events Tasks Events Utilization

Real-time 03/19/2022, 1:46:20 PM - 03/19/2022, 2:46:00 PM

CPU Memory

Memory Consumed Windows 1.8 GB to Action Center to activate Windows.

Ready for Pavan\_Template\_VM

View Overview

Recent Tasks Alarms

To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

2:46 PM 3/19/2022

Detailed description: This screenshot shows the vSphere Client interface for a Windows Server 2012 VM named 'Pavan\_Template\_VM'. The 'Monitor' tab is selected. Two line graphs are displayed: 'CPU' and 'Memory'. The CPU graph shows usage percentages over time, with two distinct peaks. The Memory graph shows consumption in megabytes, with a significant jump occurring between 2:00 PM and 2:46 PM. A message at the bottom right encourages activating Windows.

Windows Server 2012 - VMware Workstation

File Edit View VM Tabs Help Home VMware ESXi 6.x Windows Server 2012 vSphere - Pavan\_Template\_VM Pavan\_Template\_VM Not secure https://192.168.253.132/ui/#?extensionId=vsphere.core.vm.monitor.performance.advancedView... Gmail YouTube Maps vSphere Web Client

There are expired or expiring licenses in your inventory. MANAGE YOUR LICENSES

vSphere Client Menu Search in all environments

Pavan\_Template\_VM | ACTIONS

Summary Monitor Configure Permissions Datastores Networks

Issues and Alarms All Issues Triggered Alarms Performance Overview Advanced Tasks and Events Tasks Events Utilization

Disk, 03/19/2022, 1:47:20 PM - 03/19/2022, 2:47:00 PM Real-time Chart Options View: Custom

Bps

Performance Chart Legend Key Object Measure... Rollup Units Latest Maximum Minimum Average

Pavan\_Te... Usage Average KBps 163 7.384 4.480 2.222

Activate Windows 1.8 GB to Action Center to activate Windows.

Ready for Pavan\_Template\_VM

Recent Tasks Alarms

To direct input to this VM, move the mouse pointer inside or press Ctrl+G.

2:47 PM 3/19/2022

Detailed description: This screenshot shows the vSphere Client interface for the same VM. The 'Monitor' tab is selected, and a single line graph for 'Disk' usage is shown. The Y-axis represents bandwidth in Bps, with major ticks at 0, 2.5k, 5k, 7.5k, and 10k. The X-axis shows time points from 2/19/2022, 1:50:00 PM to 2/19/2022, 2:40:00 PM. The line shows a general upward trend with several smaller fluctuations. A message at the bottom right again encourages activating Windows.