



**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.) Part – I SEM II**  
**Subject: Virtualization**

**Name: Kedar Jadhav**  
**Roll No: 30**

## DEPARTMENT OF INFORMATION TECHNOLOGY



### CERTIFICATE

This is to certify that **Mr. Kedar Jadhav** with **Seat No: 30** has successfully completed the necessary course of experiments in the subject of Virtualization (VIR) 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) Part I Semester-II.

Internal Guide

Coordinator

External Examiner

Date: 24-Mar-2022

College Seal

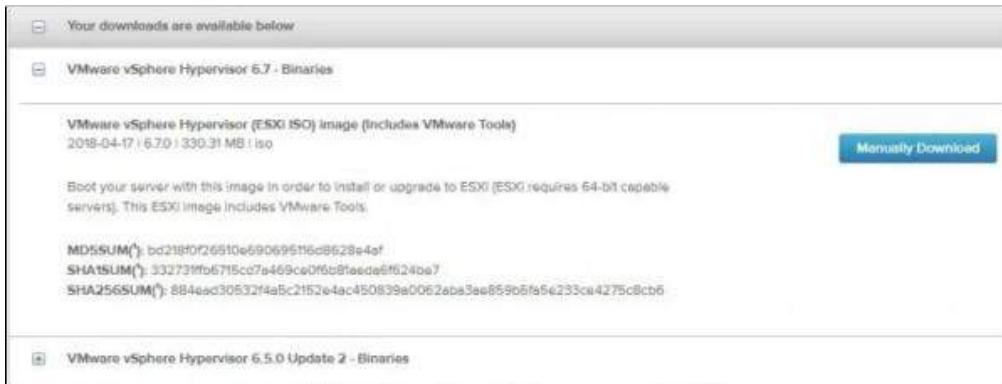
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## Practical 1: Implement VMwareESXi for server virtualization.

### A. Install VMwareESXi server and vSphere client.

**Step 1:** 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.

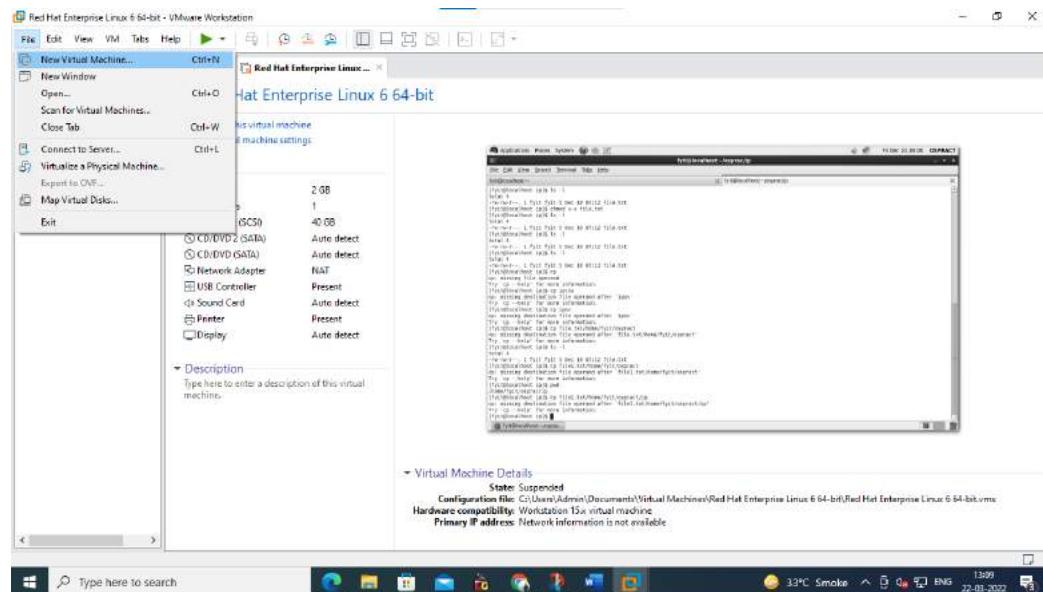


The installation file name - VMware-VMvisor-Installer-6.7.0.update03-14320388.x86\_64.iso

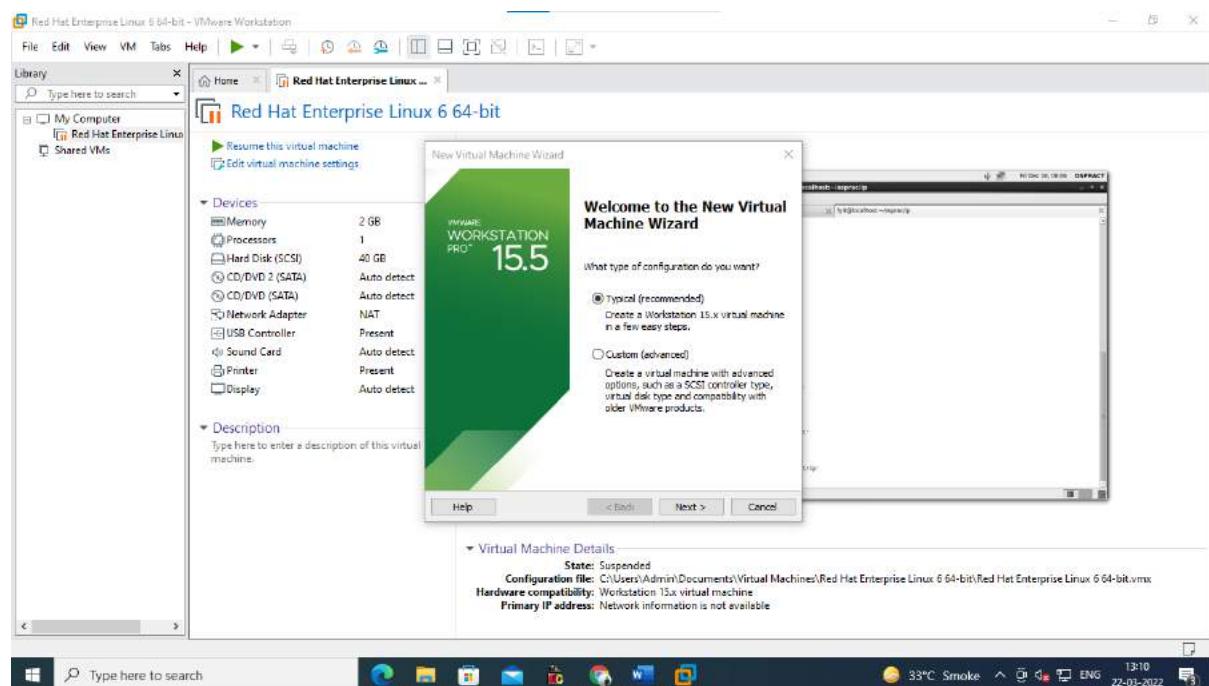


**Step 2:** Create a new virtual machine in VMWare Workstation.

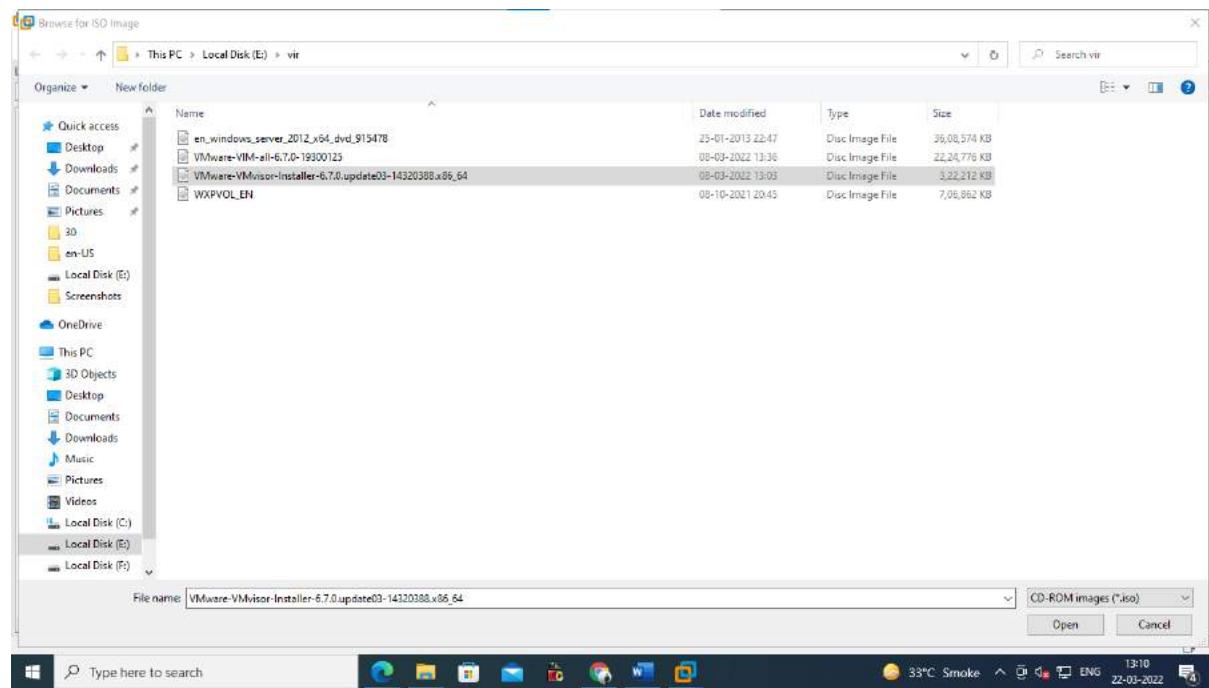
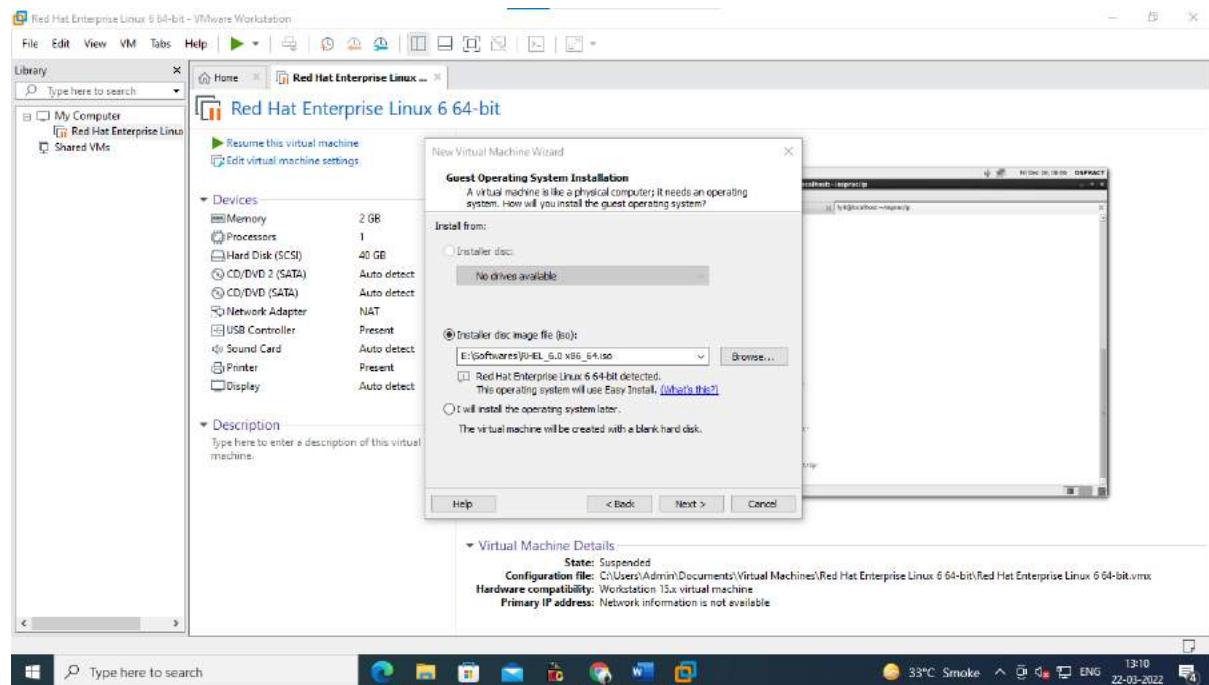
Open VMWare Workstation application and then Click on **File -> New Virtual Machine...**

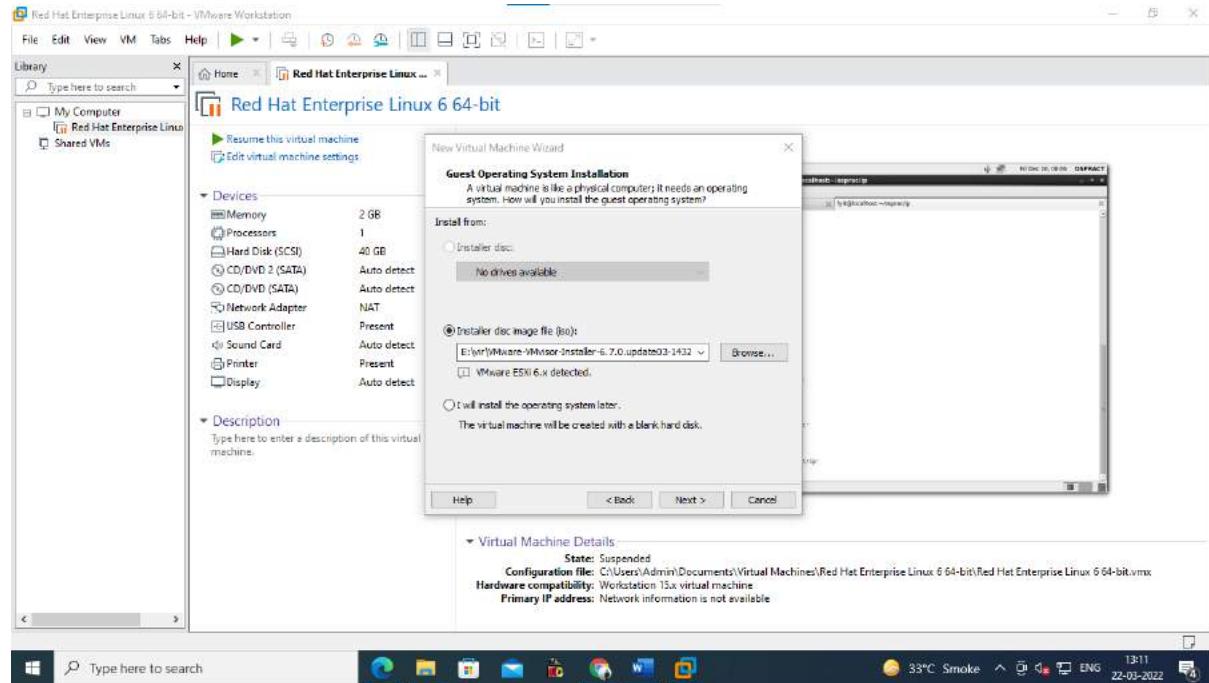


**Step 3:** Select first option - **Typical(recommended)** and Click on **Next >** button.

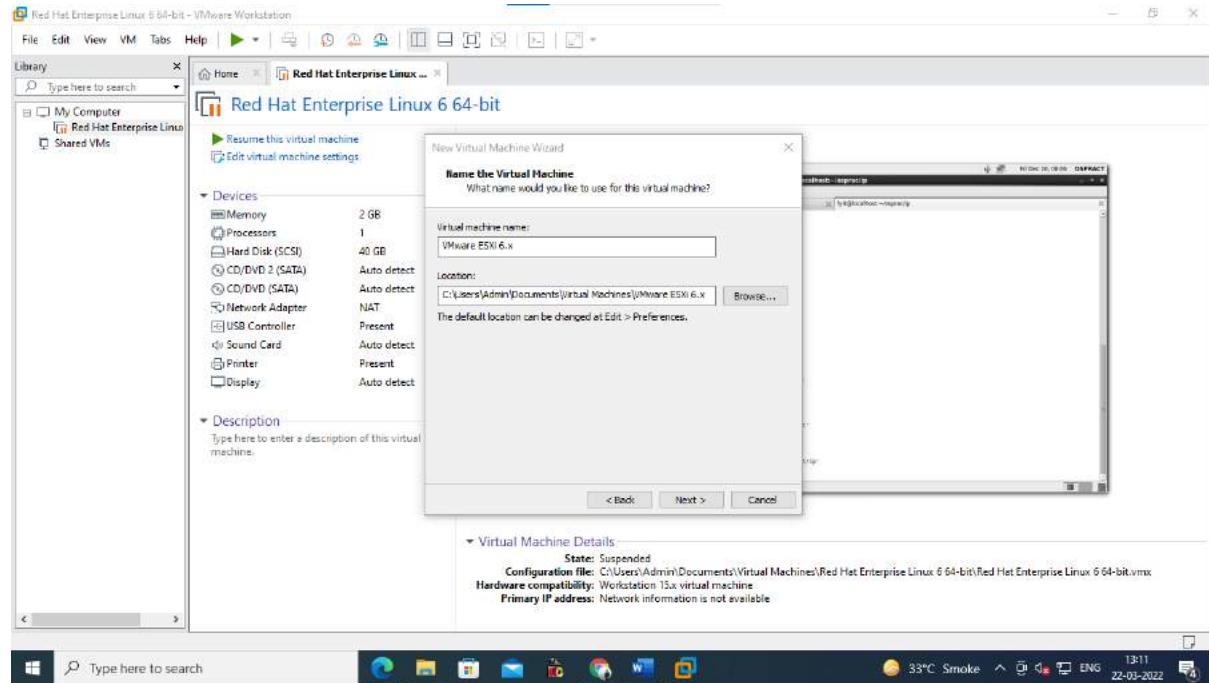


**Step 4:** Select installer disc image file(iso) option, browse the **VMware-VMvisor-Installer-6.7.0.update03-14320388.x86\_64.iso** setup zip file and click on **Next >** button.

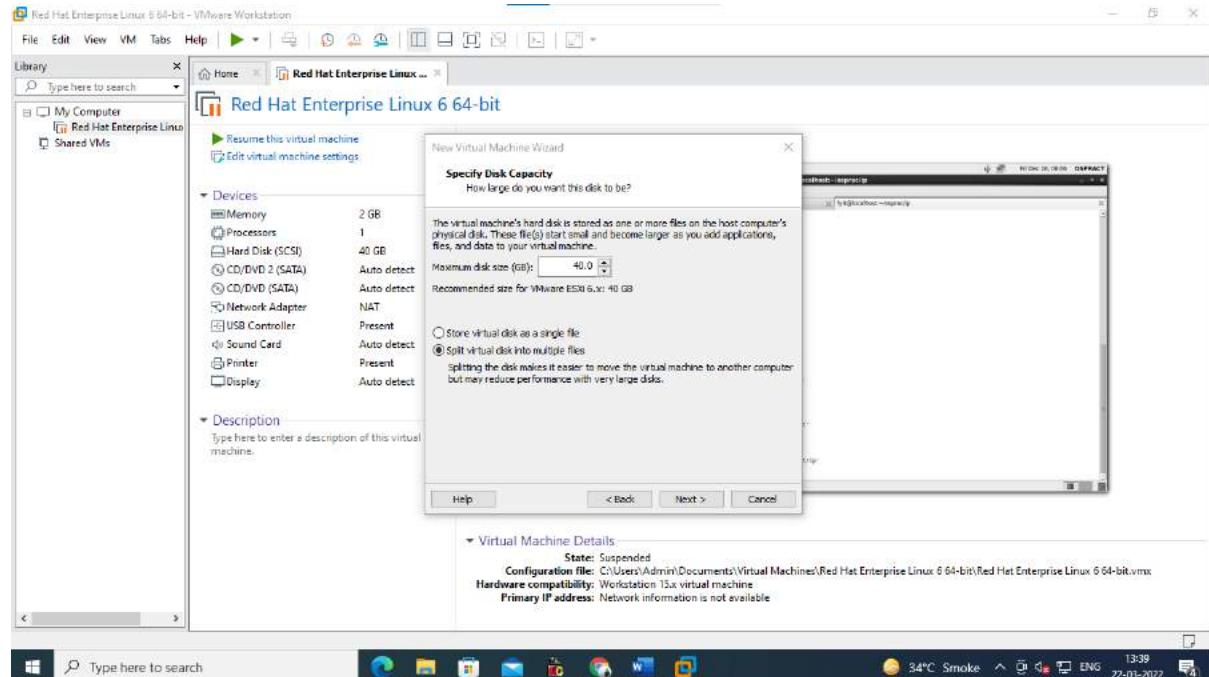




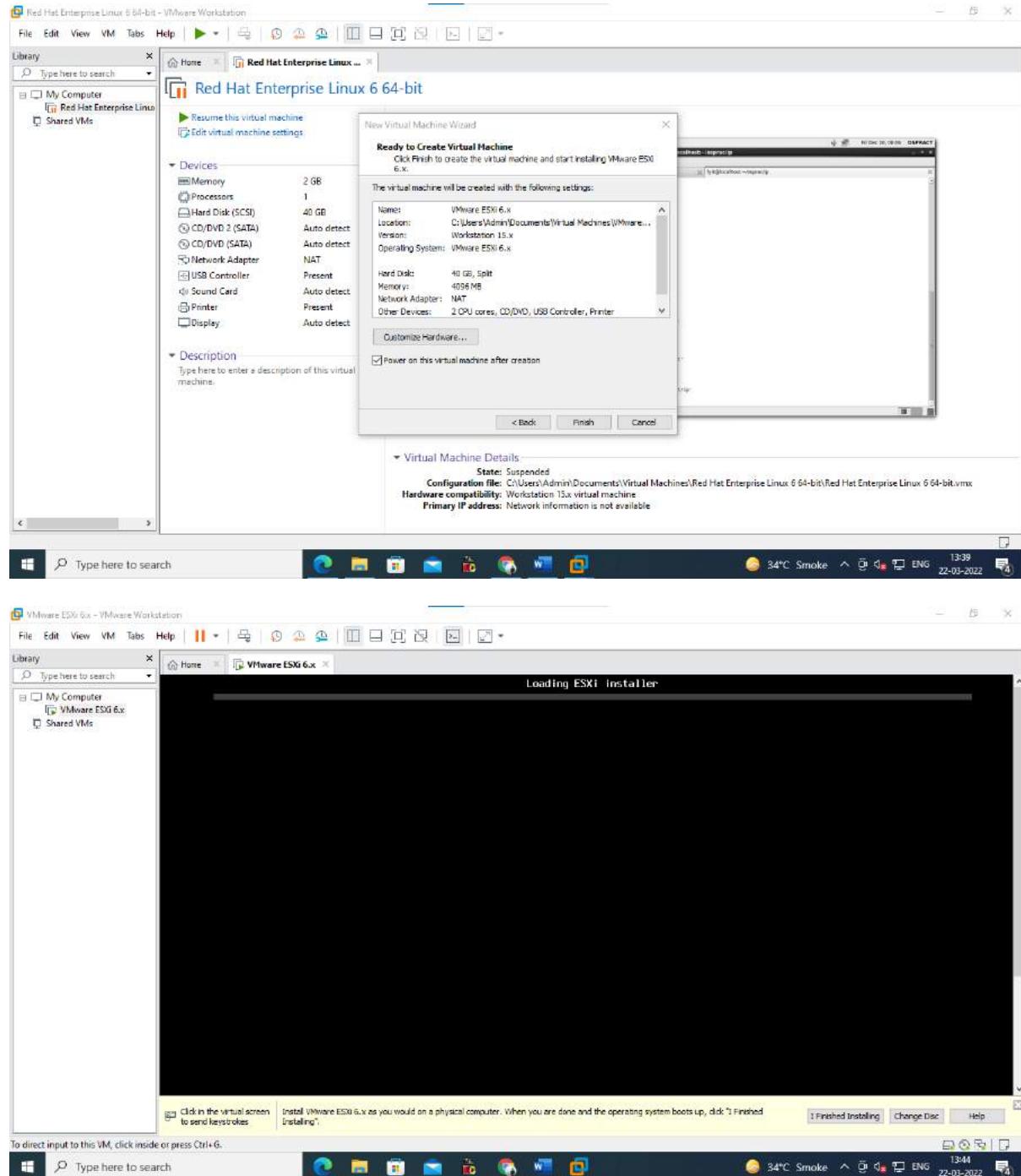
**Step 5:** Click on **Next >** button.

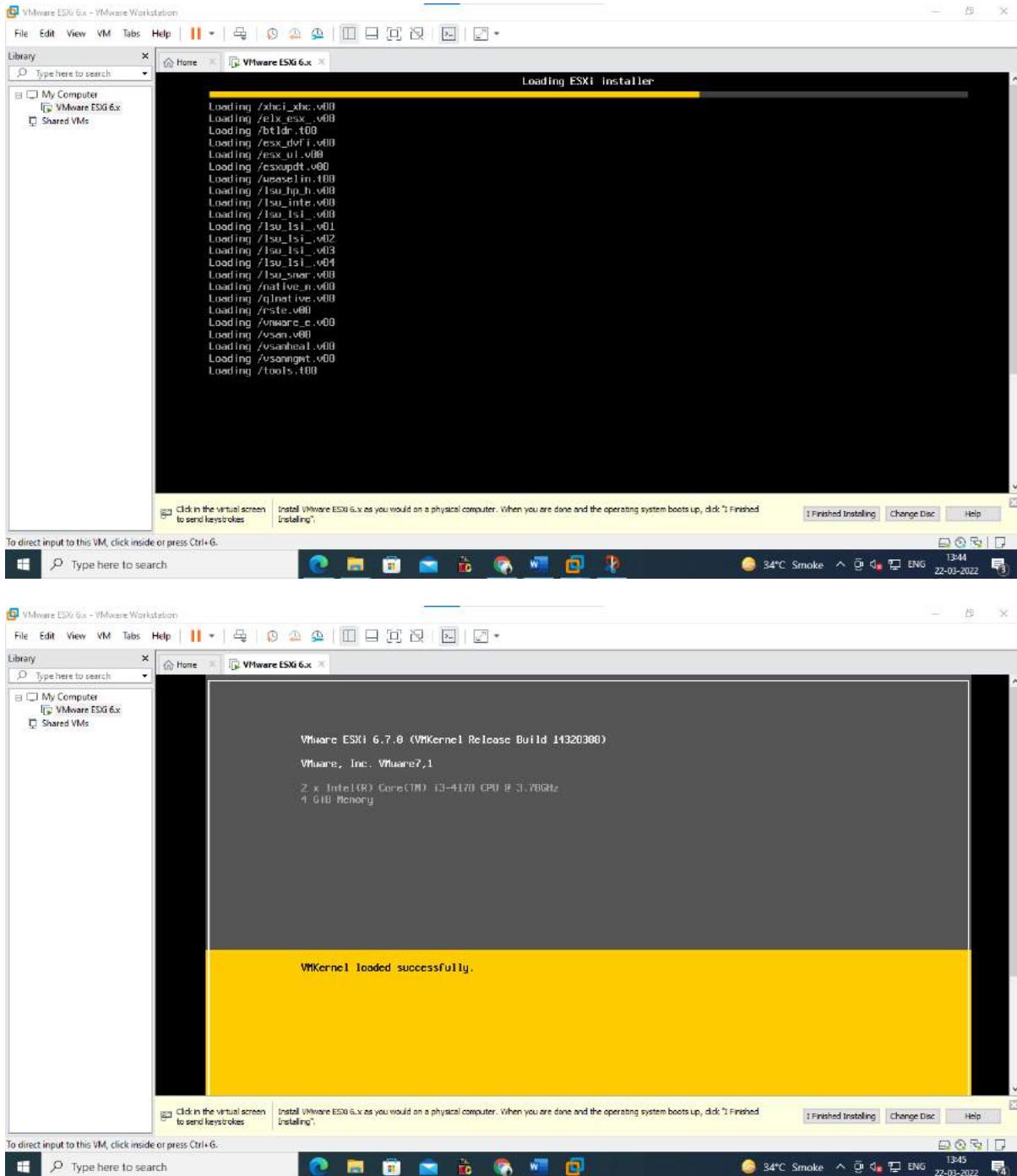


**Step 6:** Add Maximum disk size (GB) **40.0** and select option **Split virtual disk into multiple files** then Click on **Next >** button.

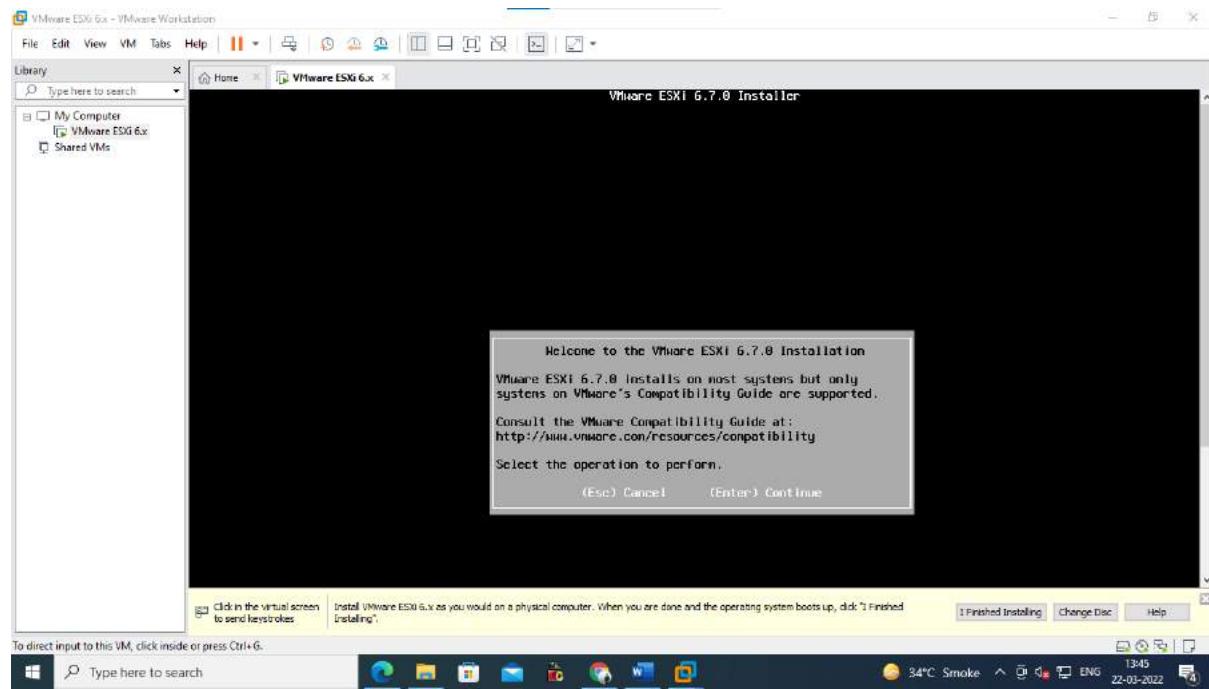


**Step 7:** Click on **Finish** button.

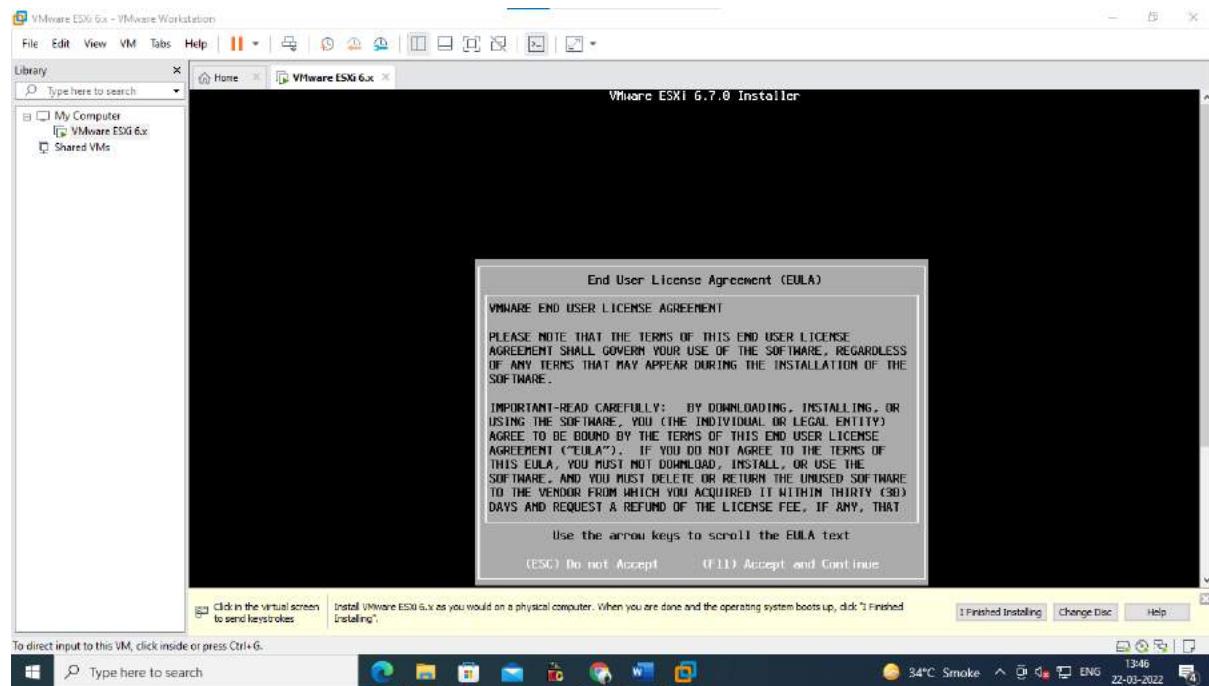


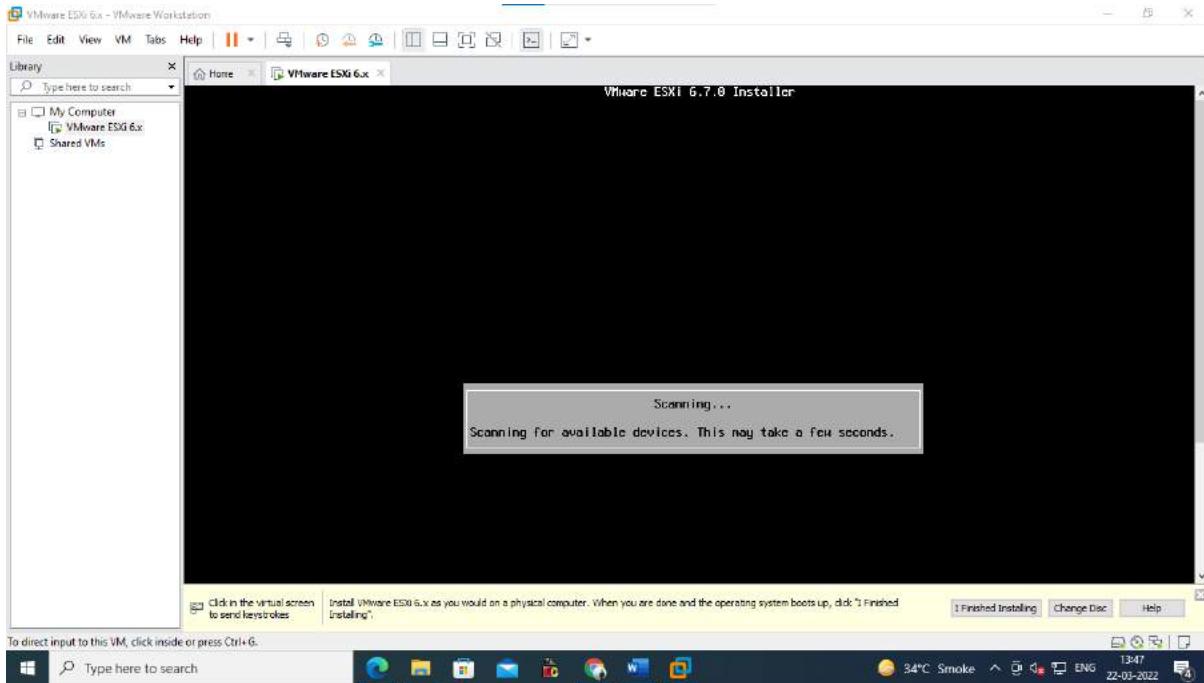


**Step 8: Click on Continue or Press Enter.**

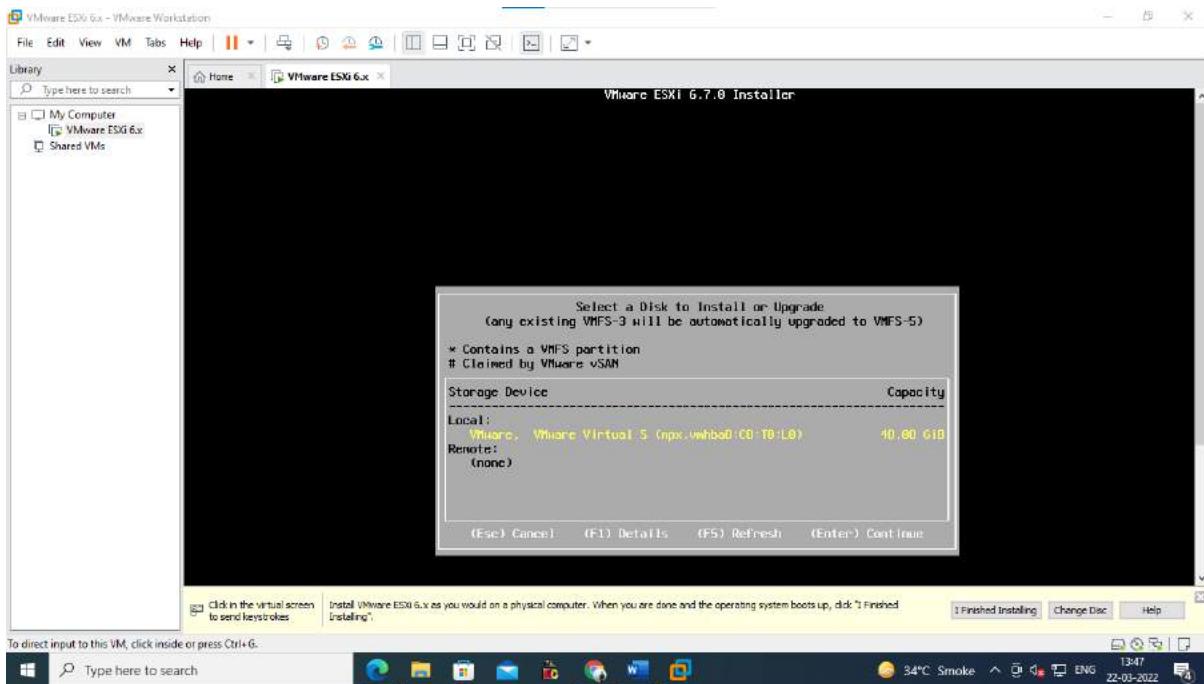


**Step 9: Click on Accept and Continue or Press F11.**

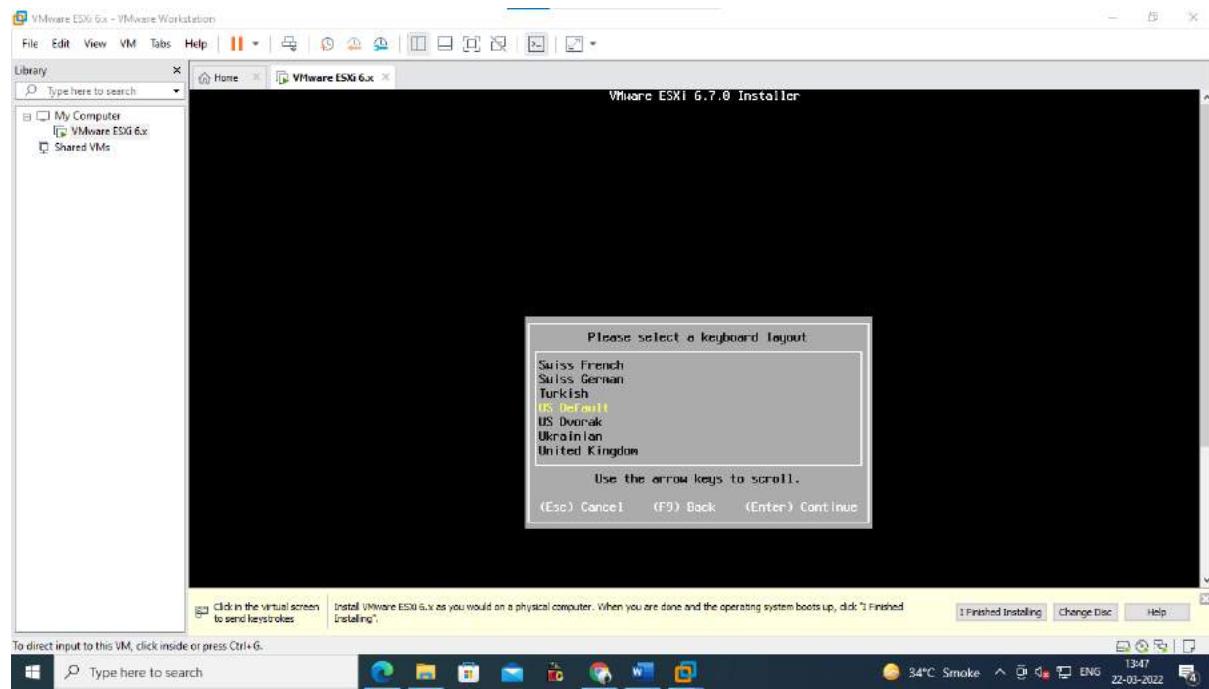




### Step 10: Click on Continue or Press Enter.

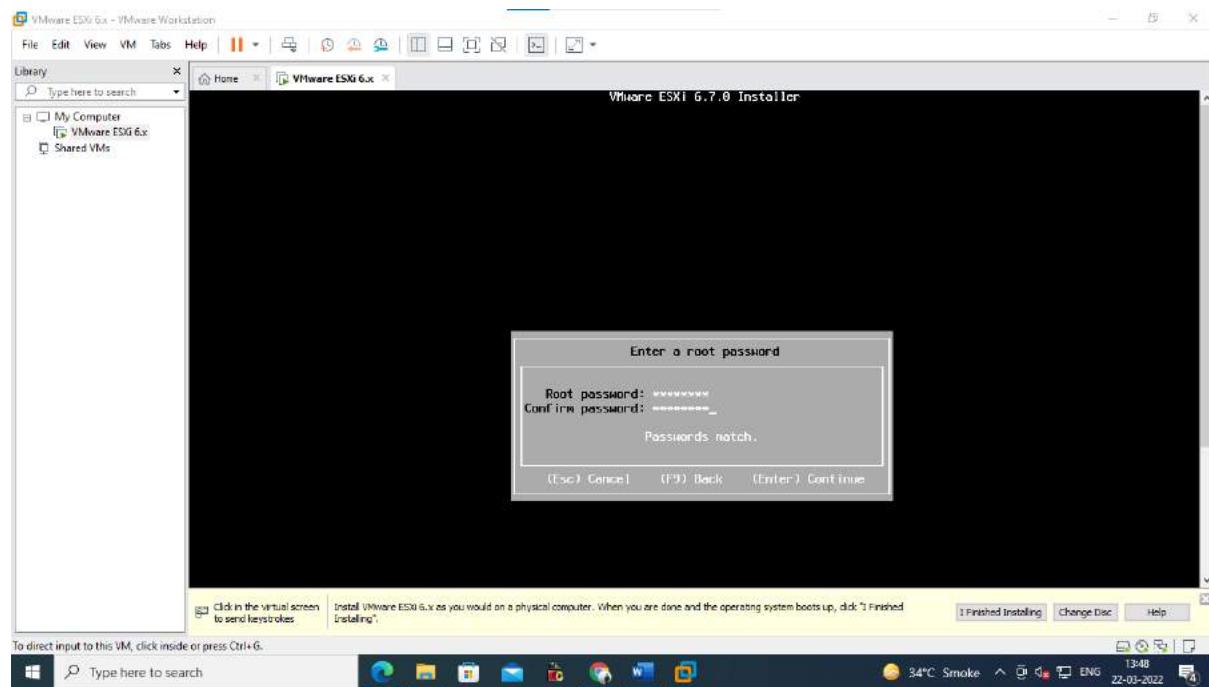


**Step 11:** Click on **Continue** or Press **Enter**.

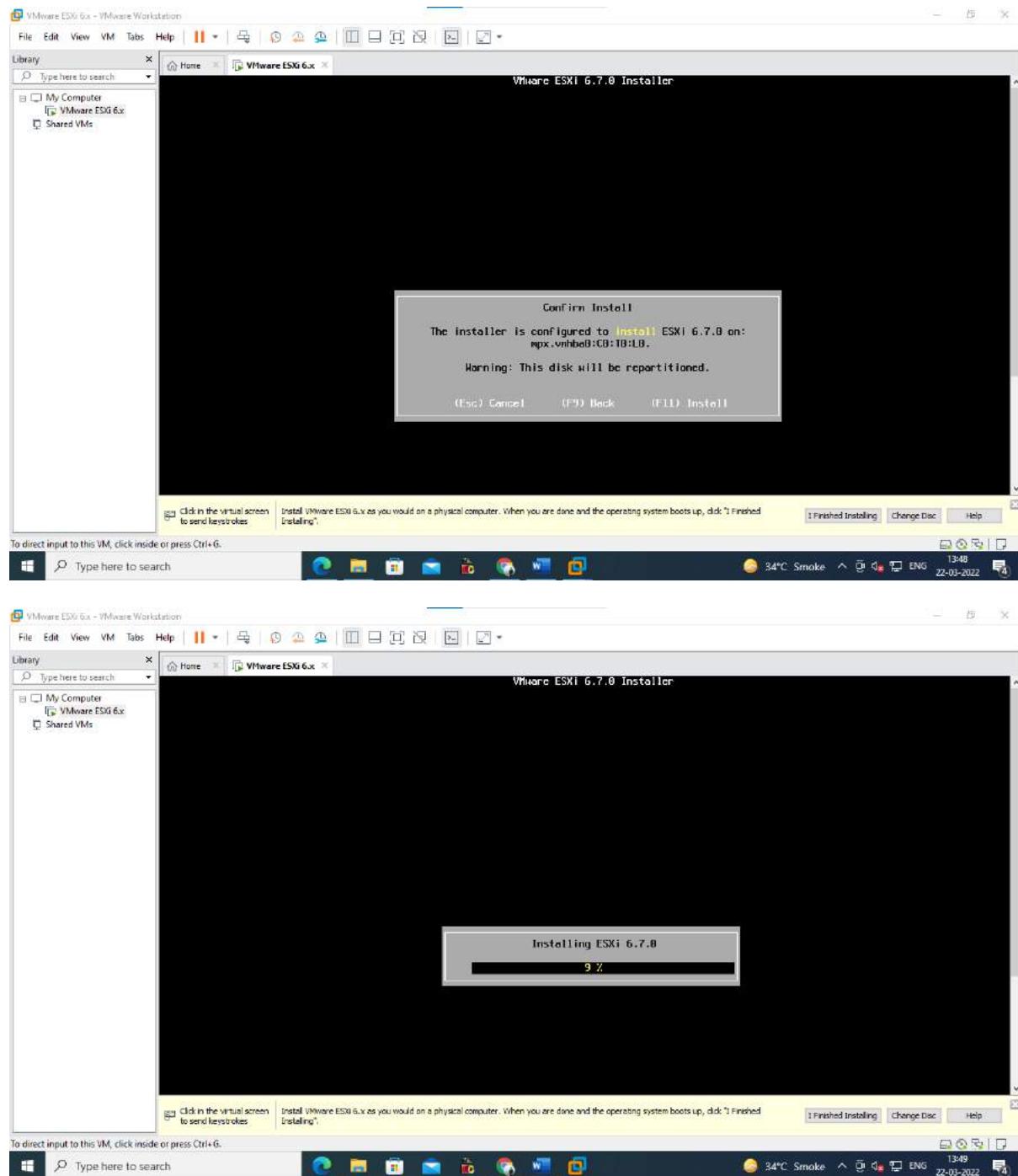


**Step 12:** Enter Root Password and Confirm Password then click on **Continue** or Press **Enter**.

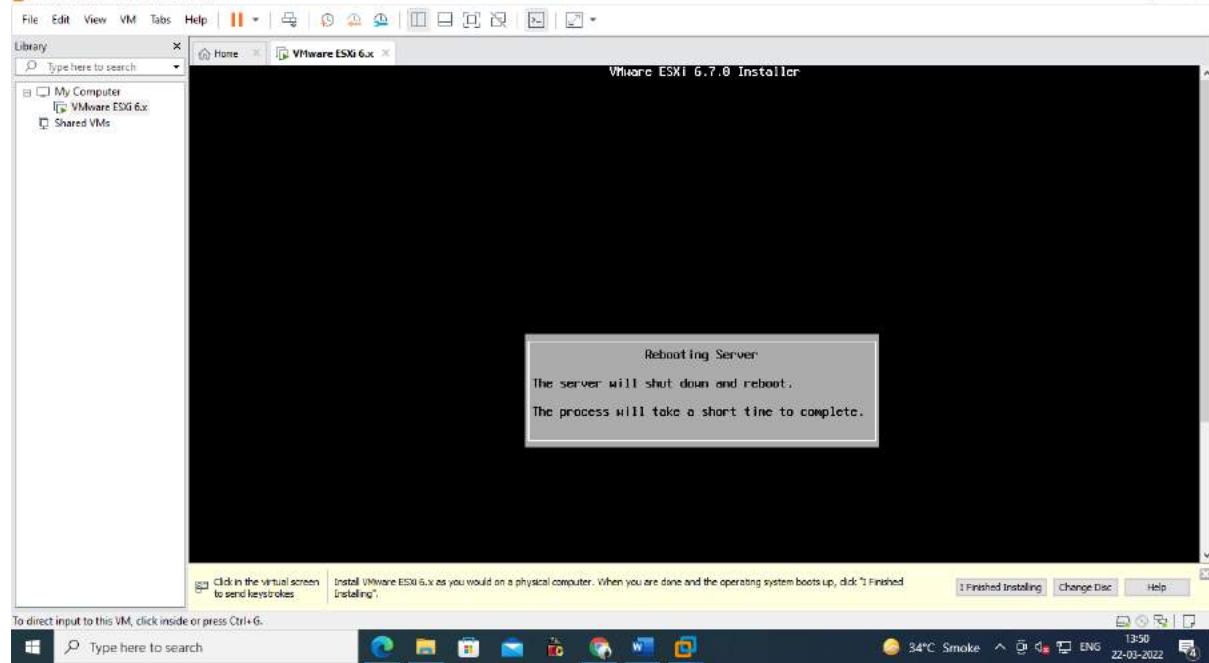
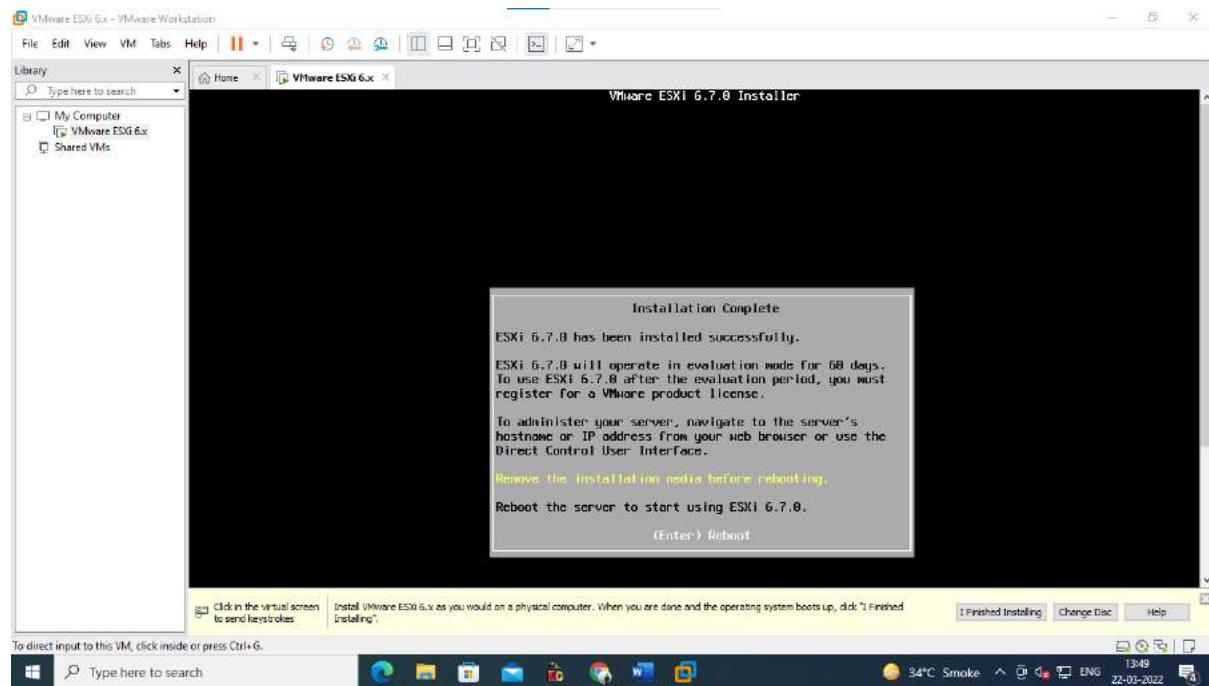
Root Password: lt@13579

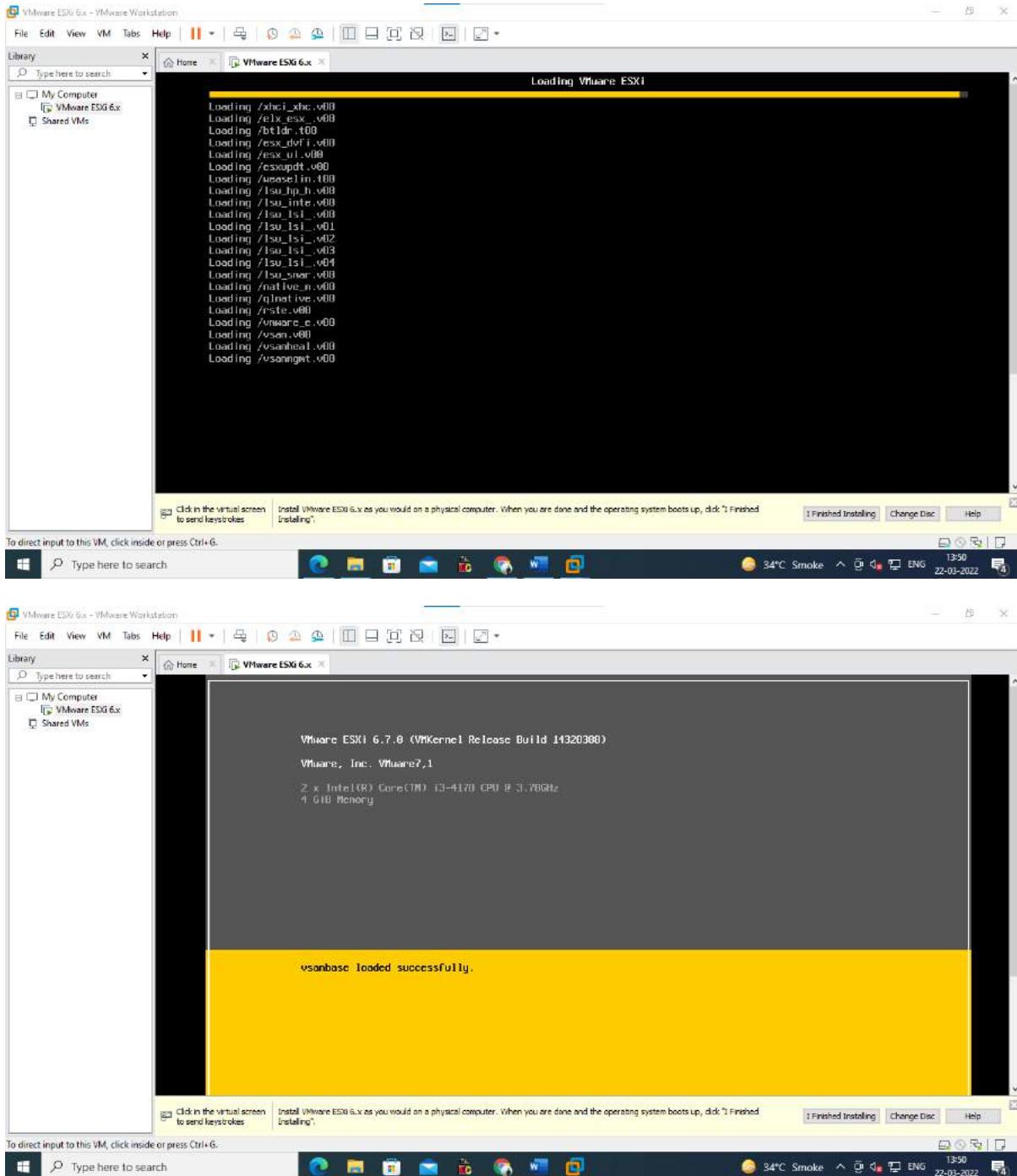


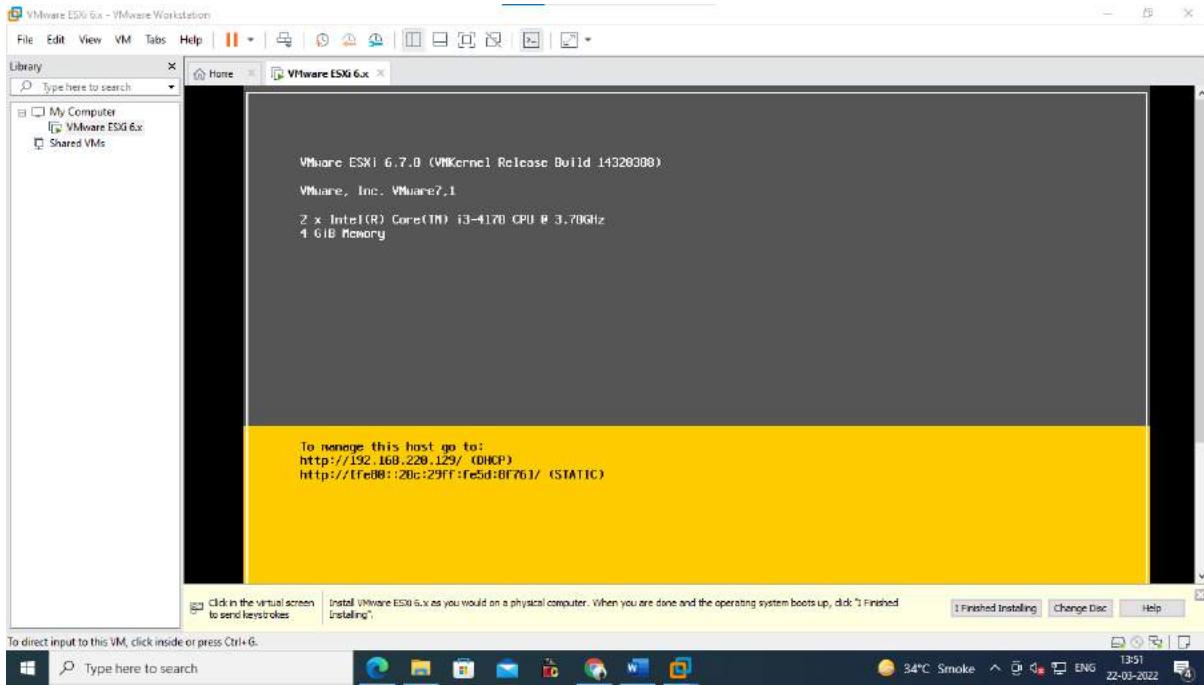
**Step 13: Click on Install or Press F11.**



**Step 14: Click on Reboot or Press Enter.**





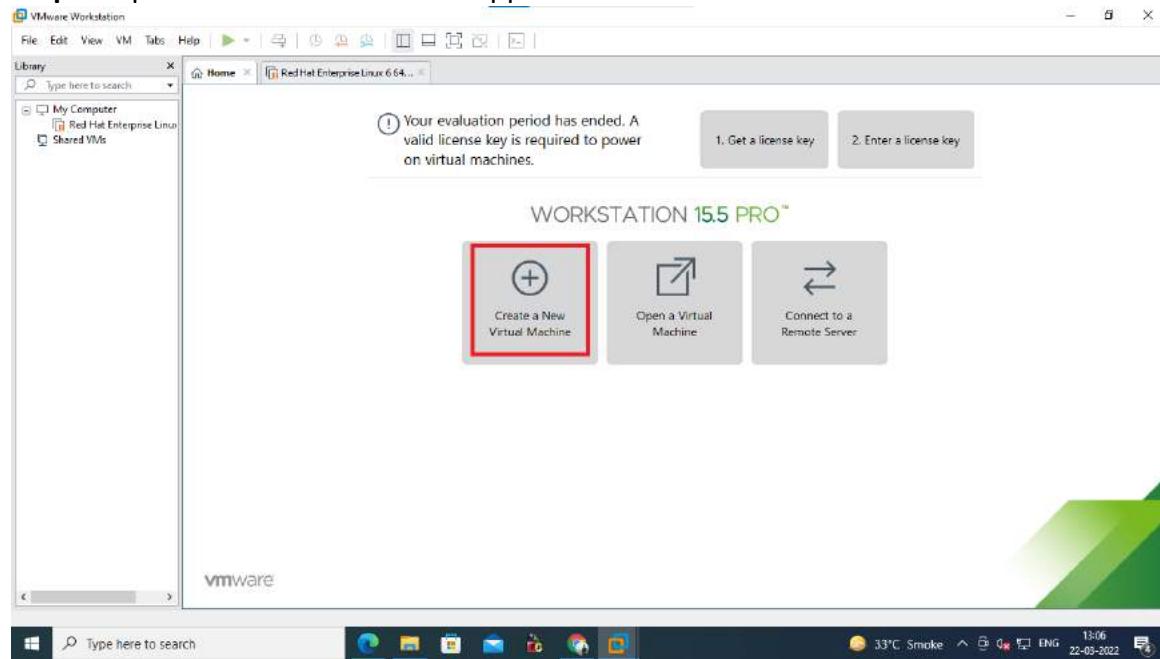


**VMWare ESXi** successfully installed. Use IP address – **192.168.220.129** for new host creation.

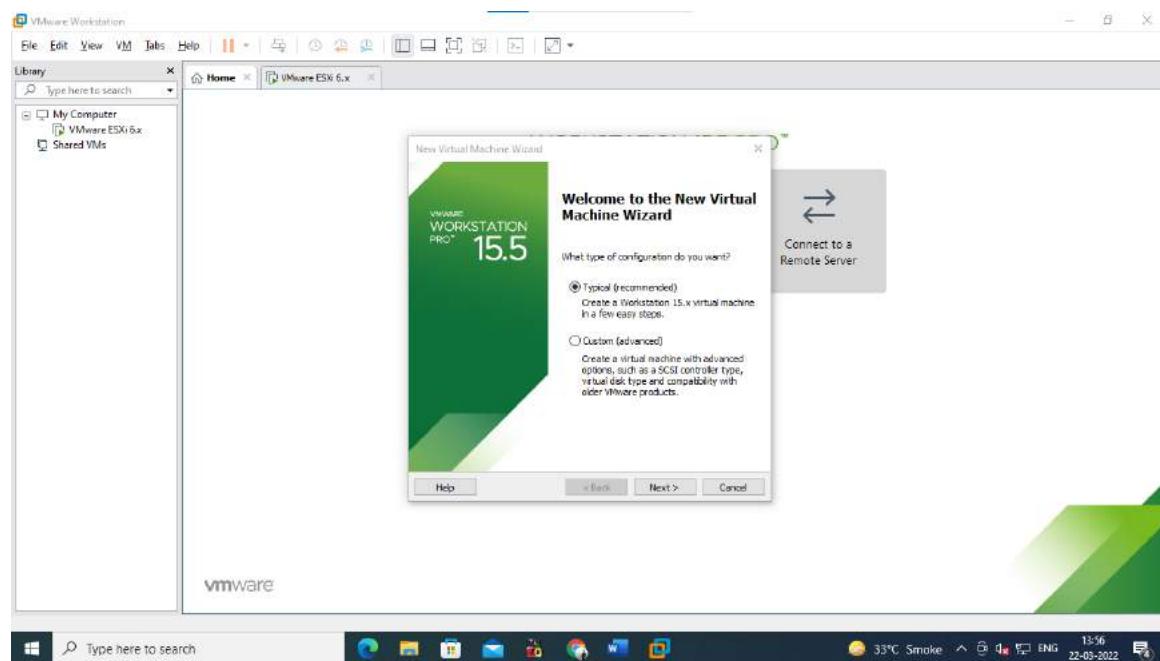
## B. Install vCenter Single Sign-On as Part of a vCenter Server Simple Install

- Install Microsoft windows Server 2012.

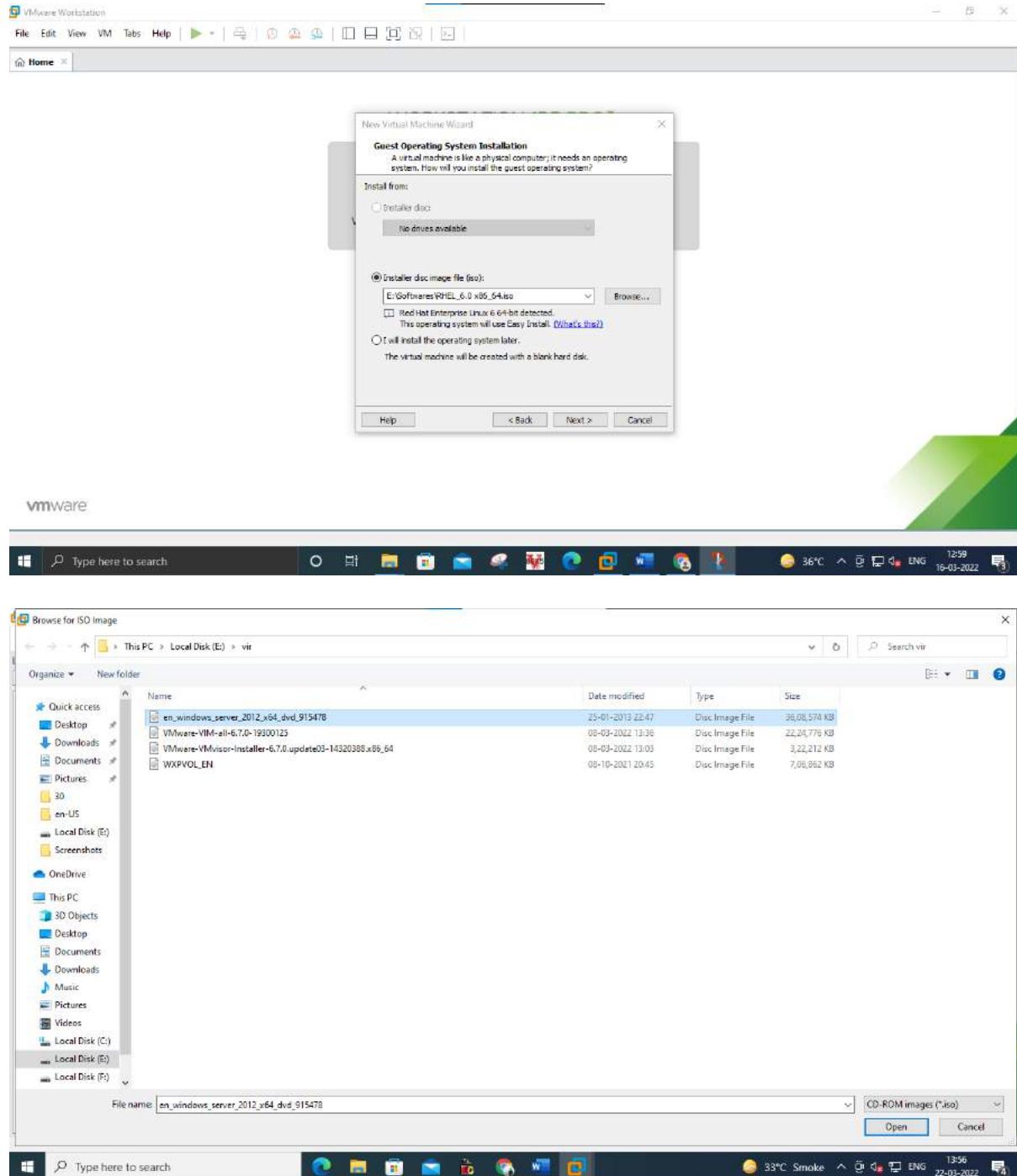
**Step 1:** Open VMware Workstation application and then **Create a New Virtual Machine** option.

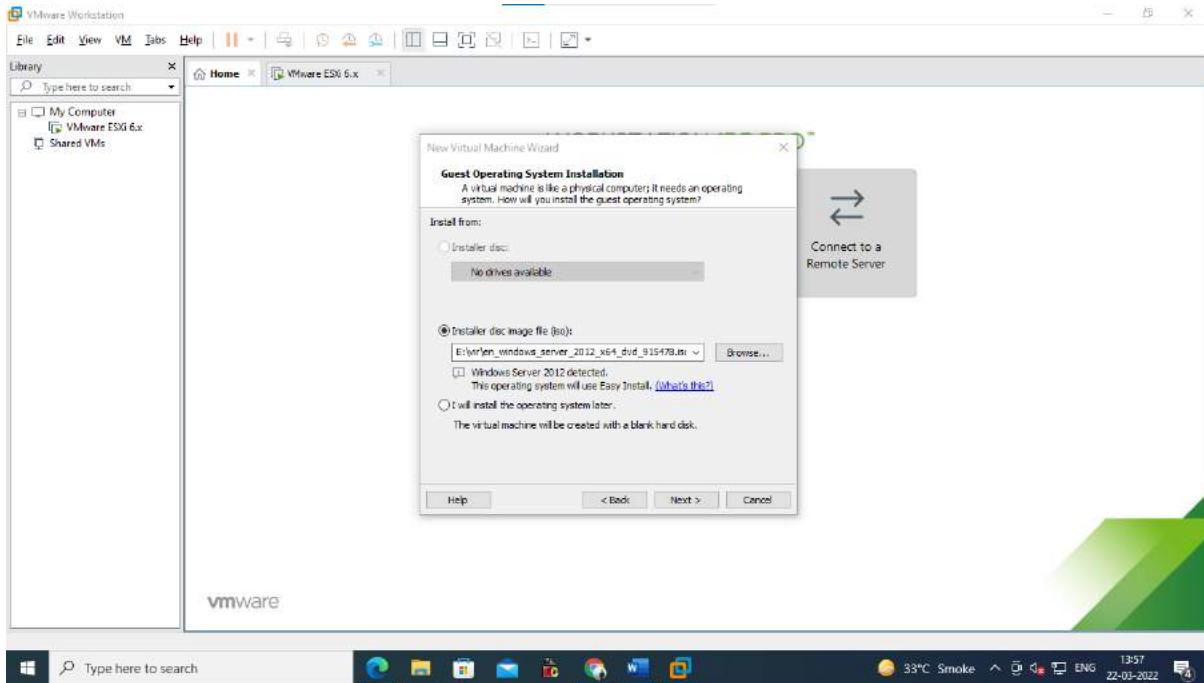


**Step 2:** Select first option - **Typical(recommended)** and Click on **Next >** button.



**Step 3:** Select installer disc image file(iso) option, browse the Microsoft Windows Server setup zip file and click on **Next >** button.

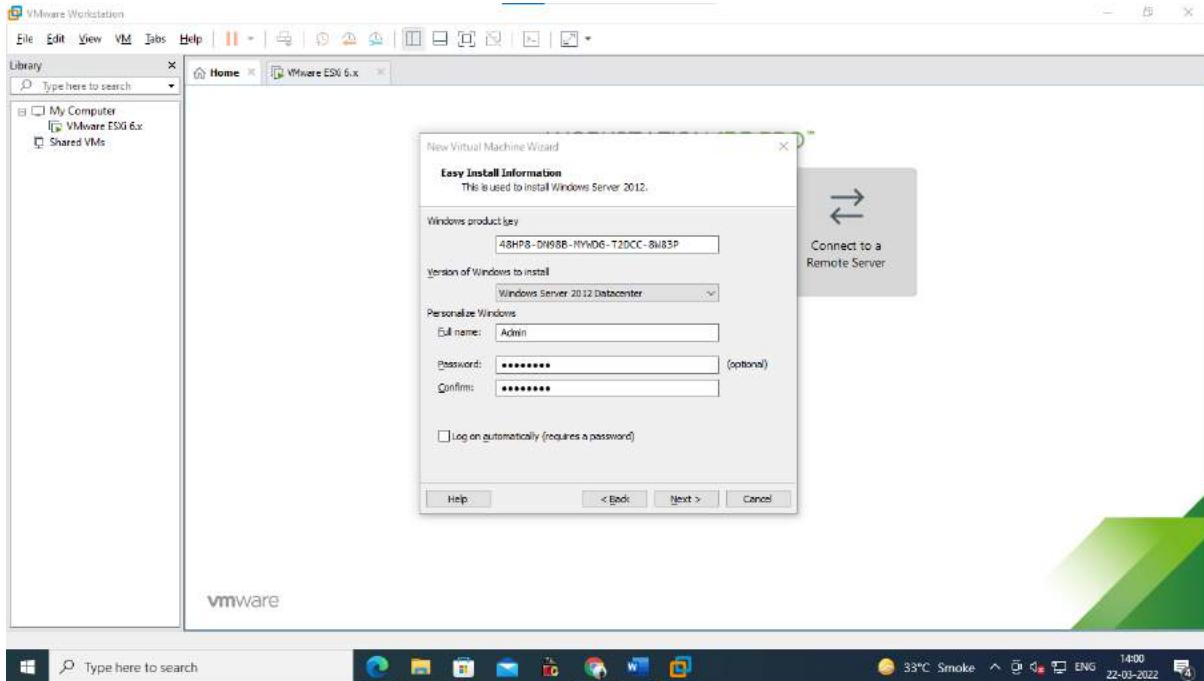




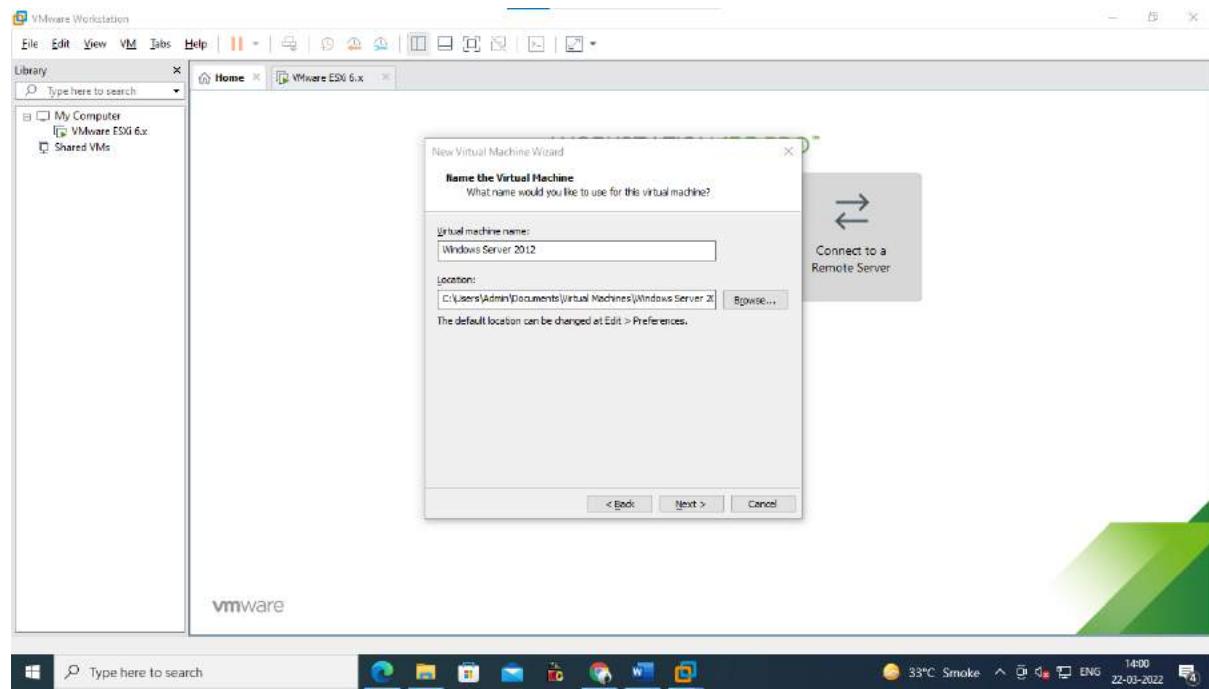
**Step 4:** Enter windows product key, select version of windows to install as windows server 2012 datacenter and provide personalize windows details as below then click on **Next >**

**Full Name:** admin

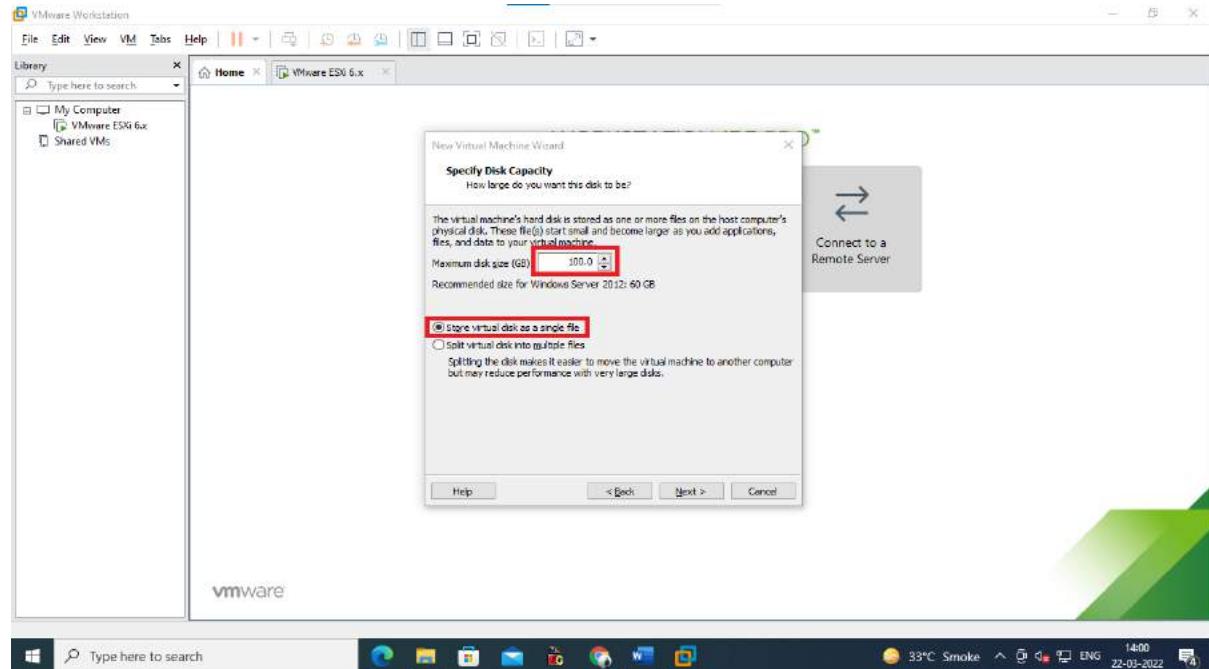
**Password:** lt@13579



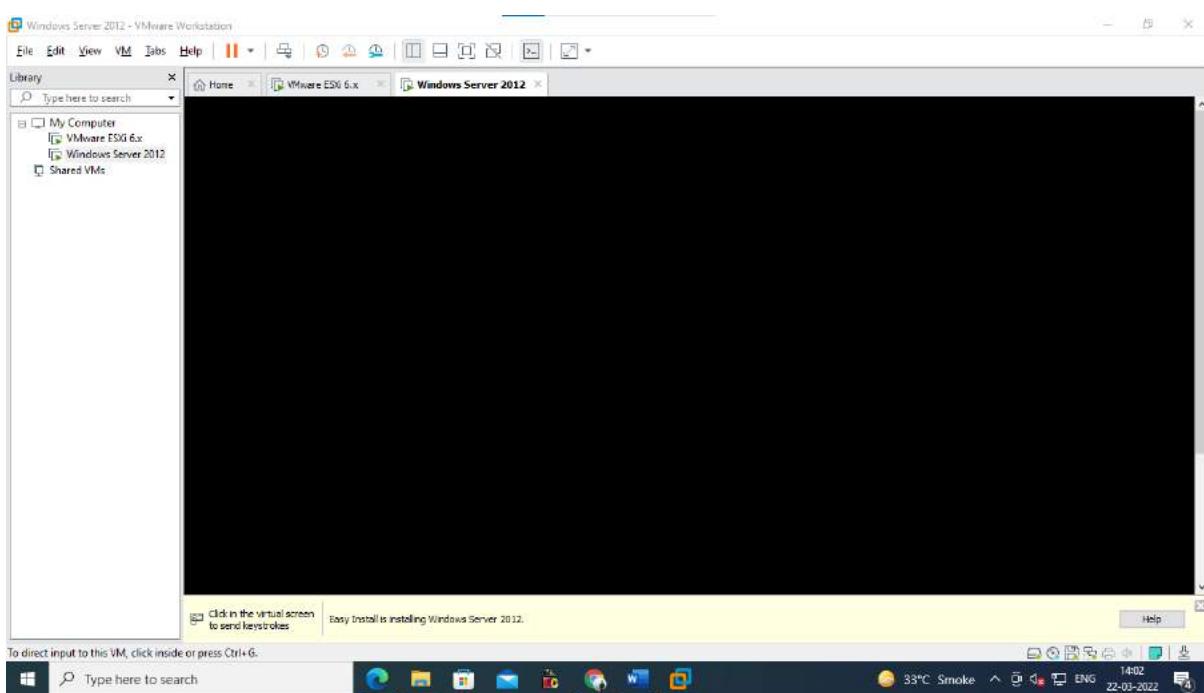
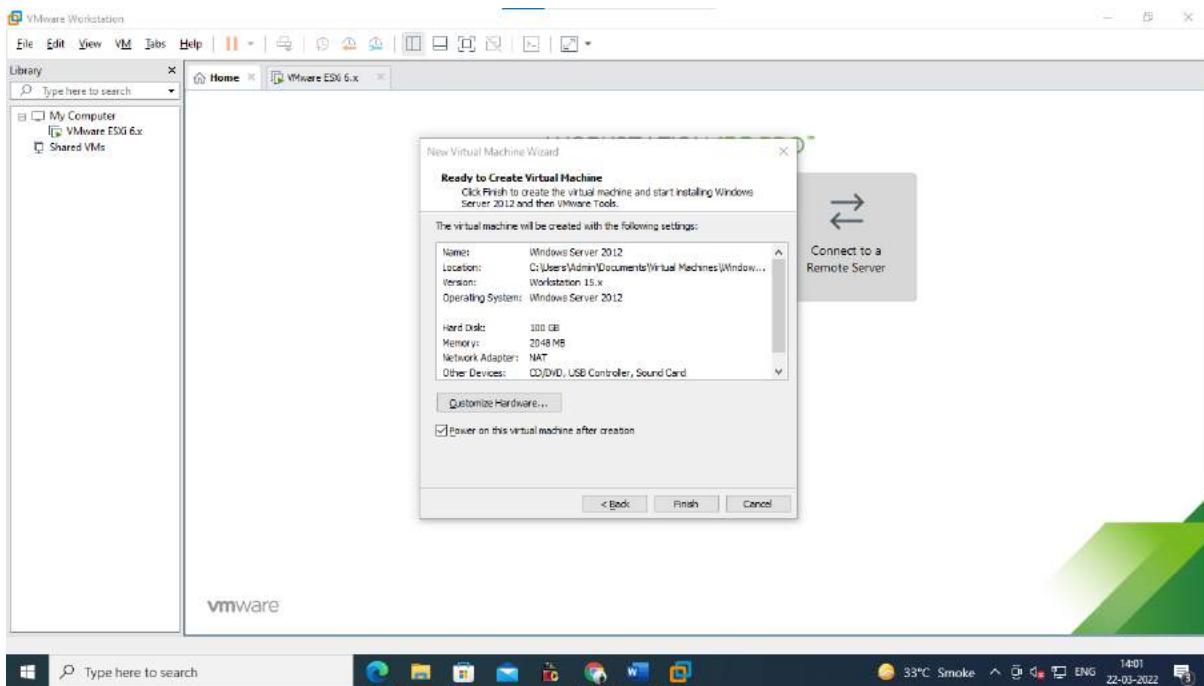
**Step 5:** Click on **Next >** button.

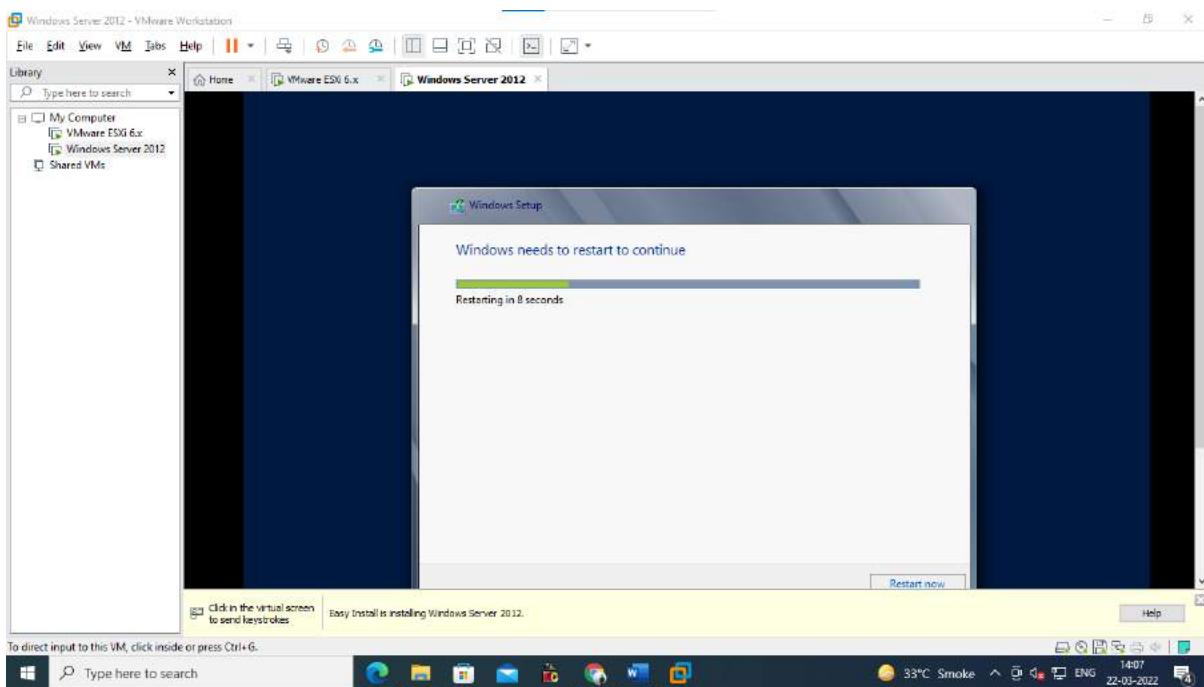
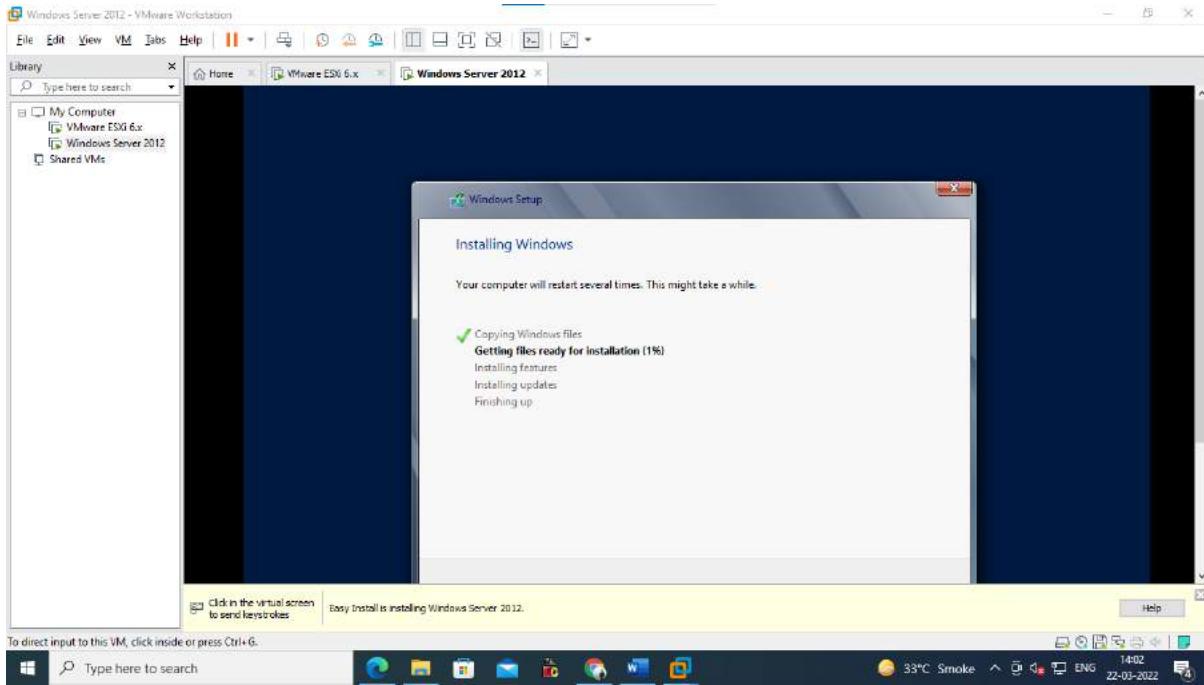


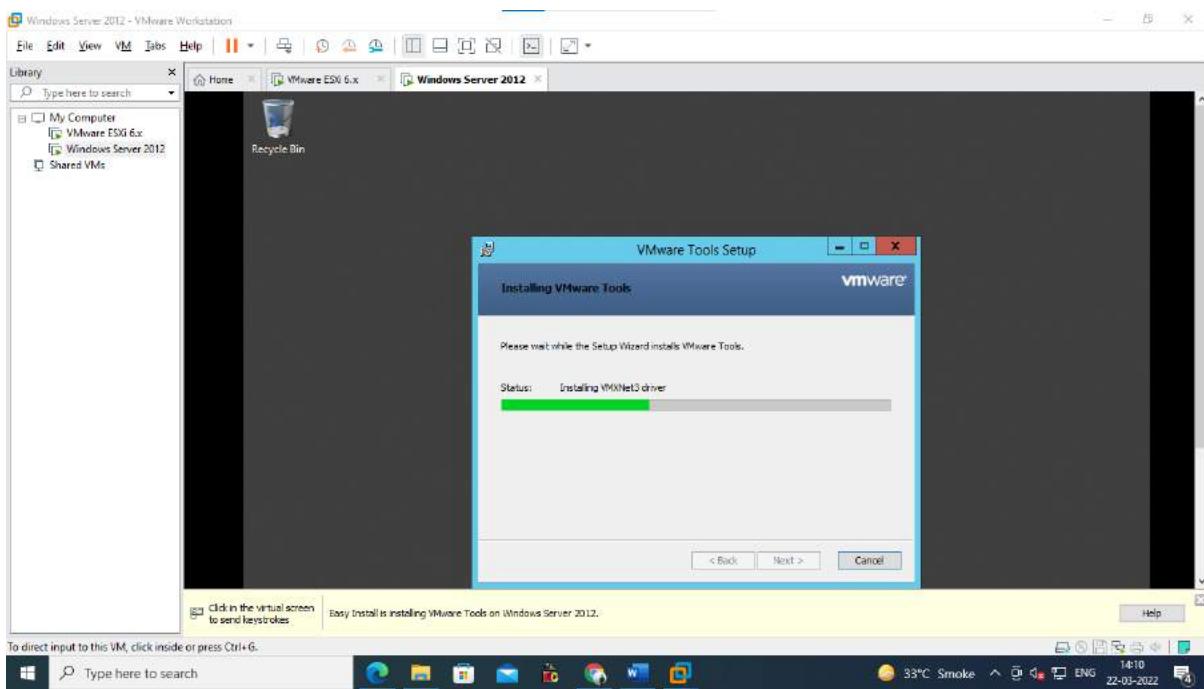
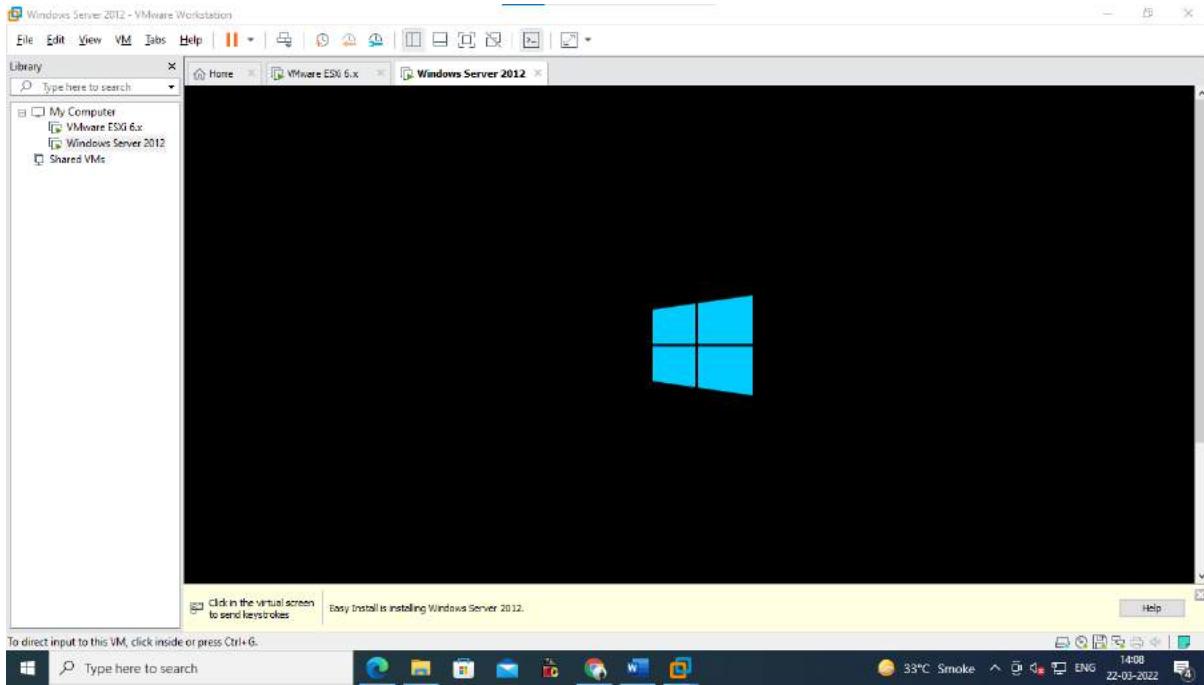
**Step 6:** In specify Disk capacity window, enter the maximum disk size (GB) **100.0** and select **Store virtual disk as a single file** option and click on **Next >** button.



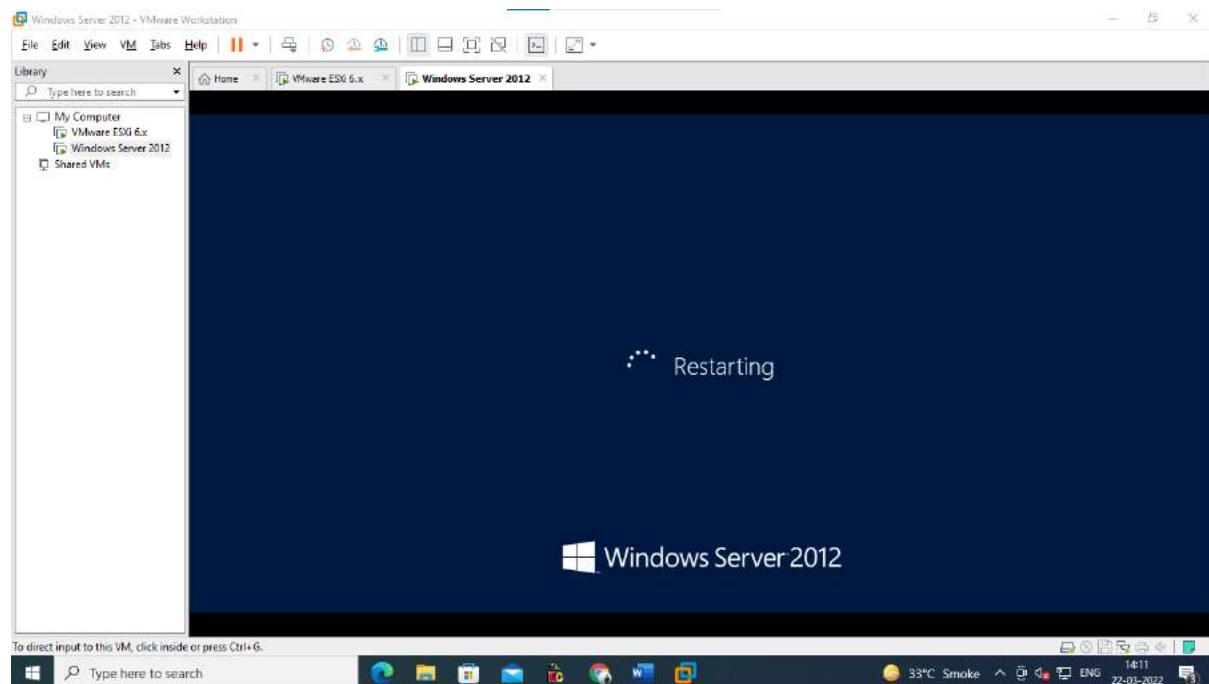
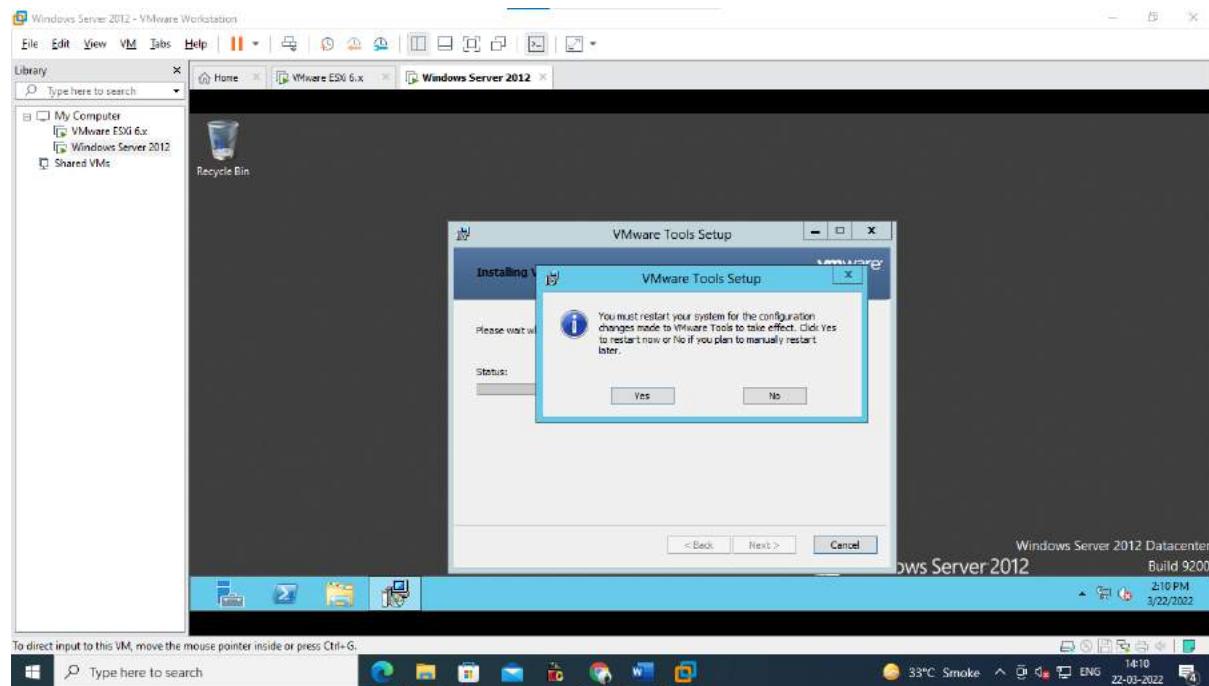
**Step 7: Click on Finish button.**



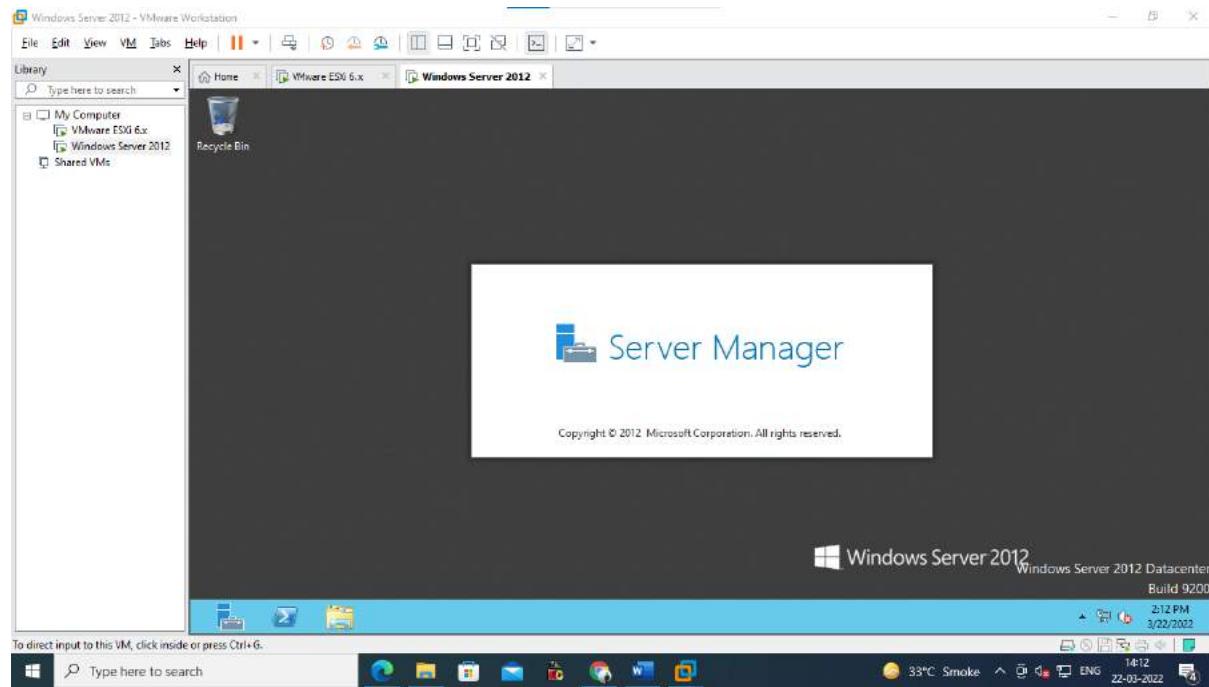
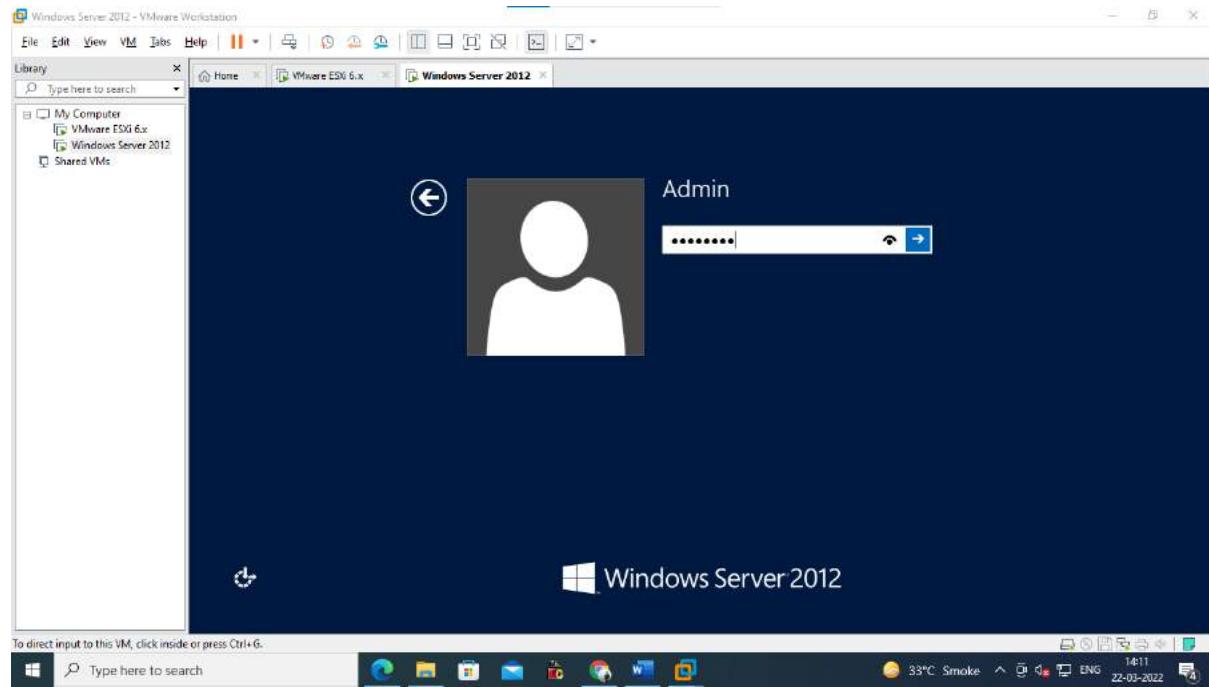


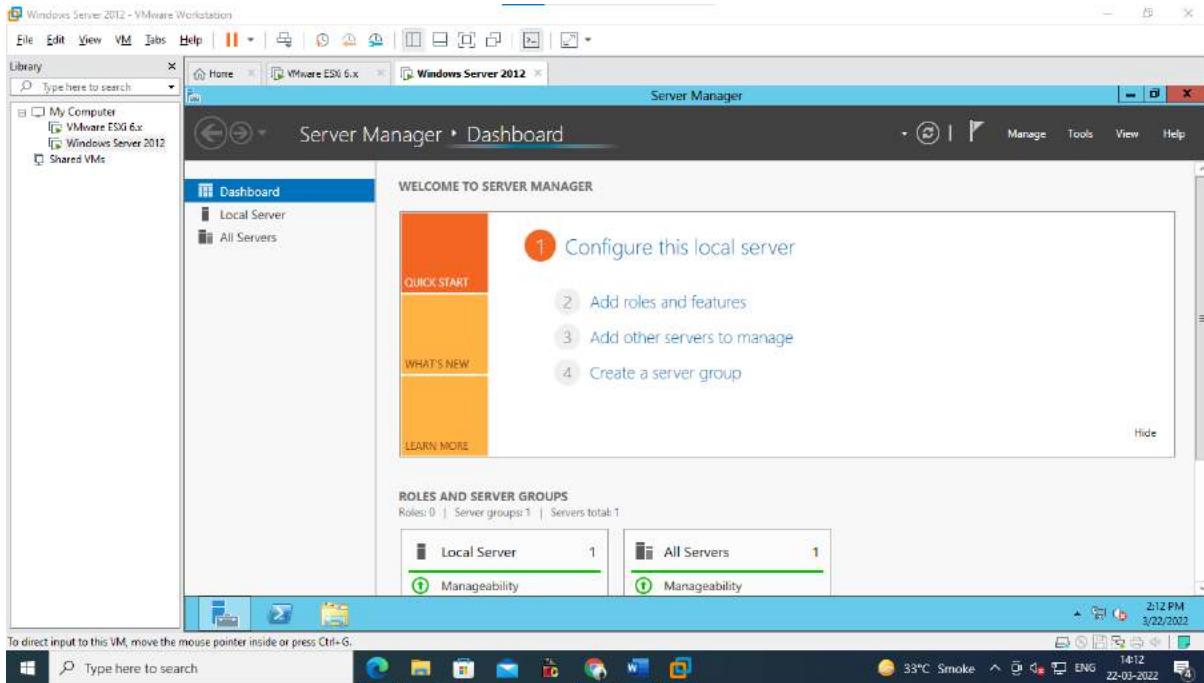


**Step 8:** Click on Yes button.



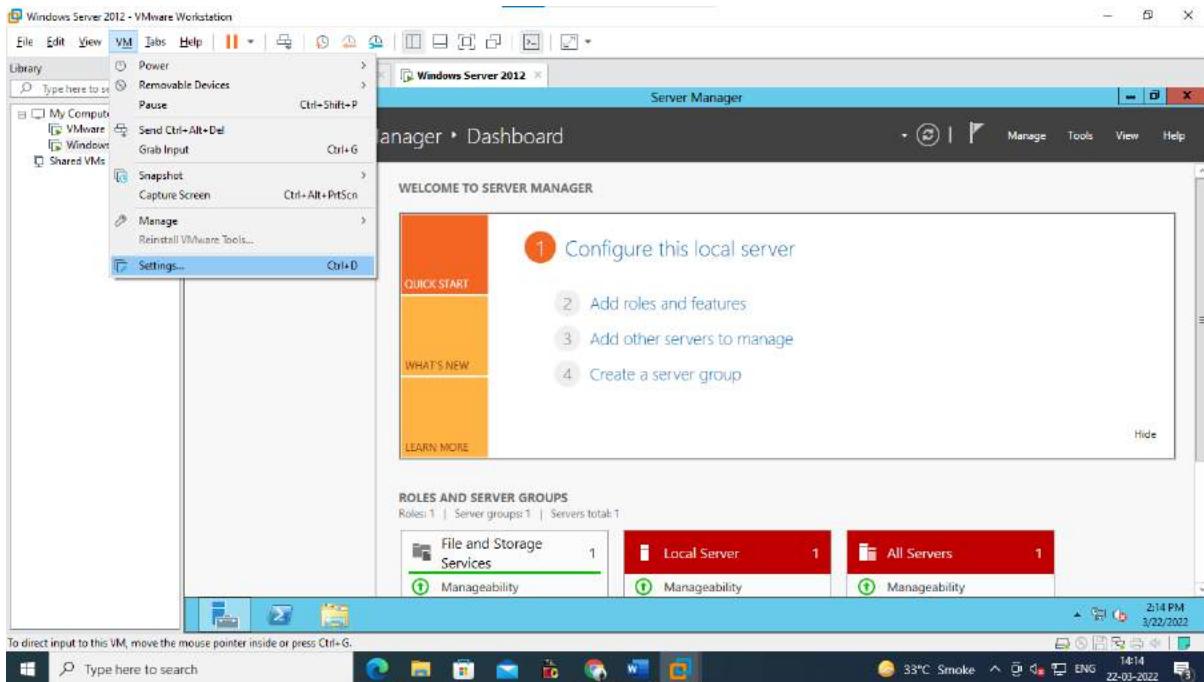
**Step 9:** Enter Password in password textbox. (lt@13579)



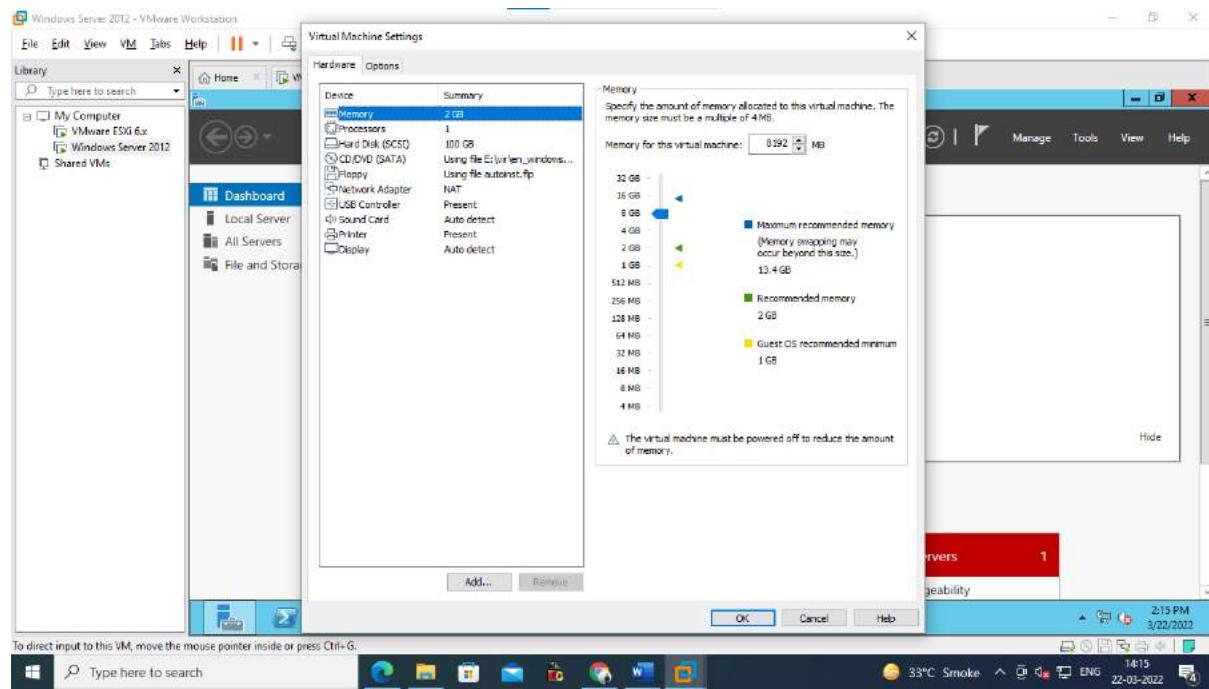


- Add Roles and Features for .NET framework 3.5 features

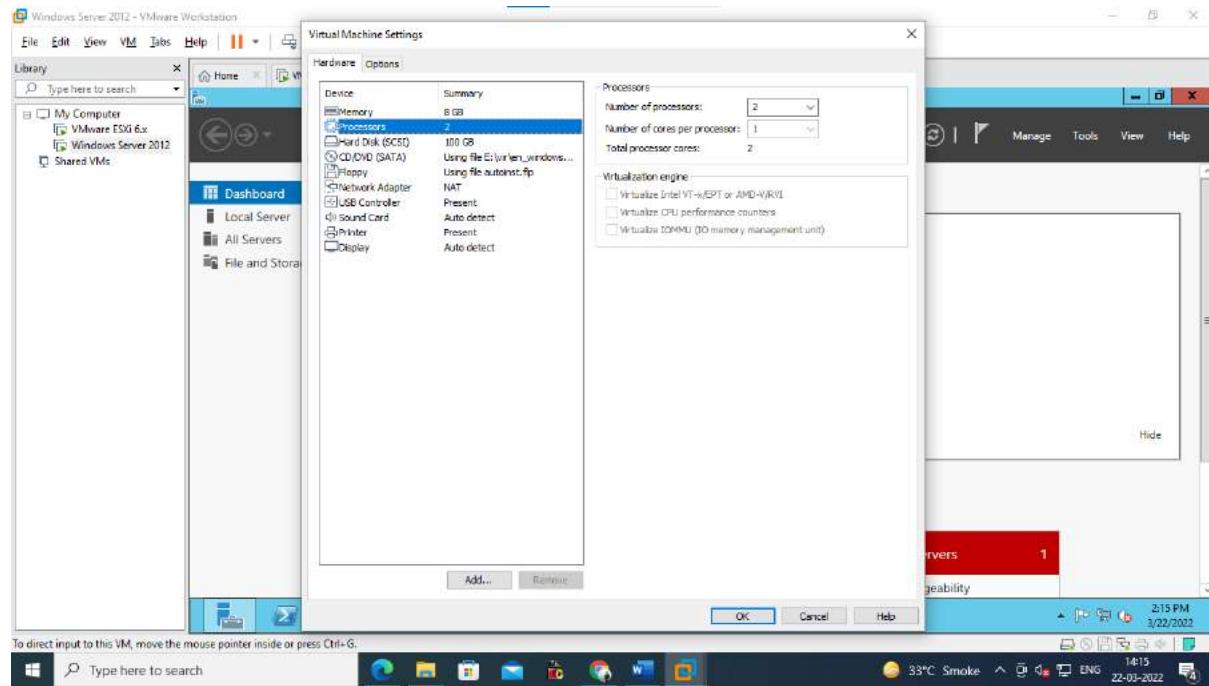
### Step 1: Select Settings... option under VM.



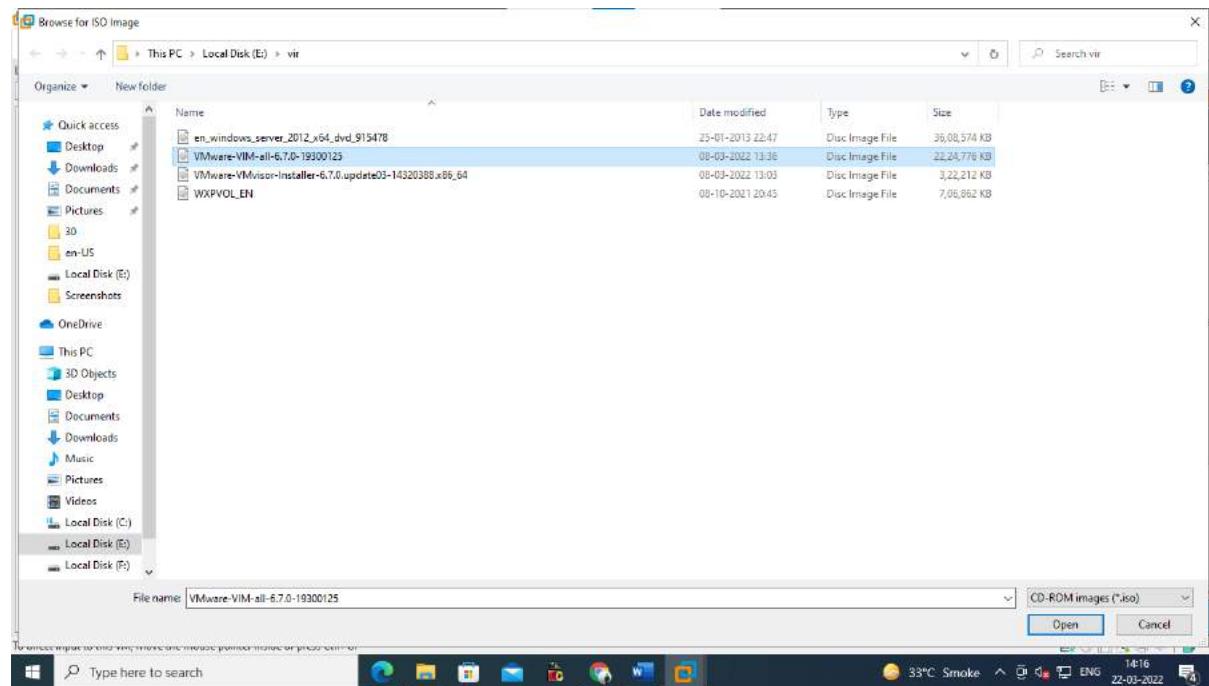
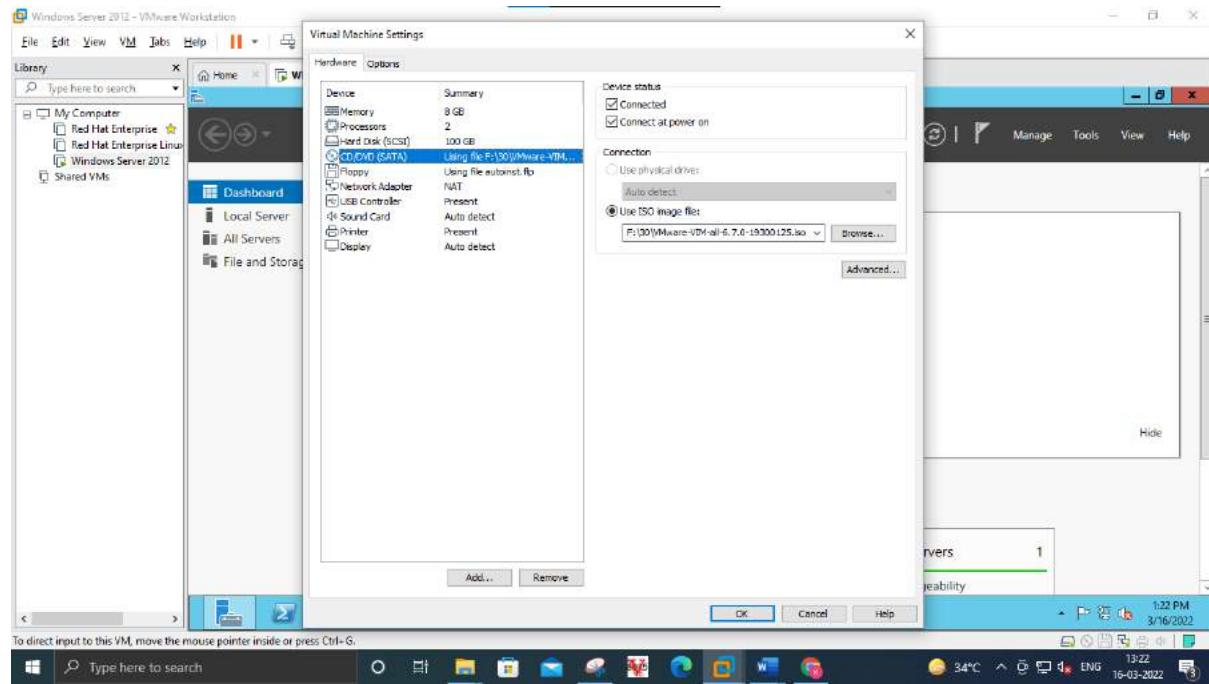
### Step 2(A): Add a memory size 8 GB.



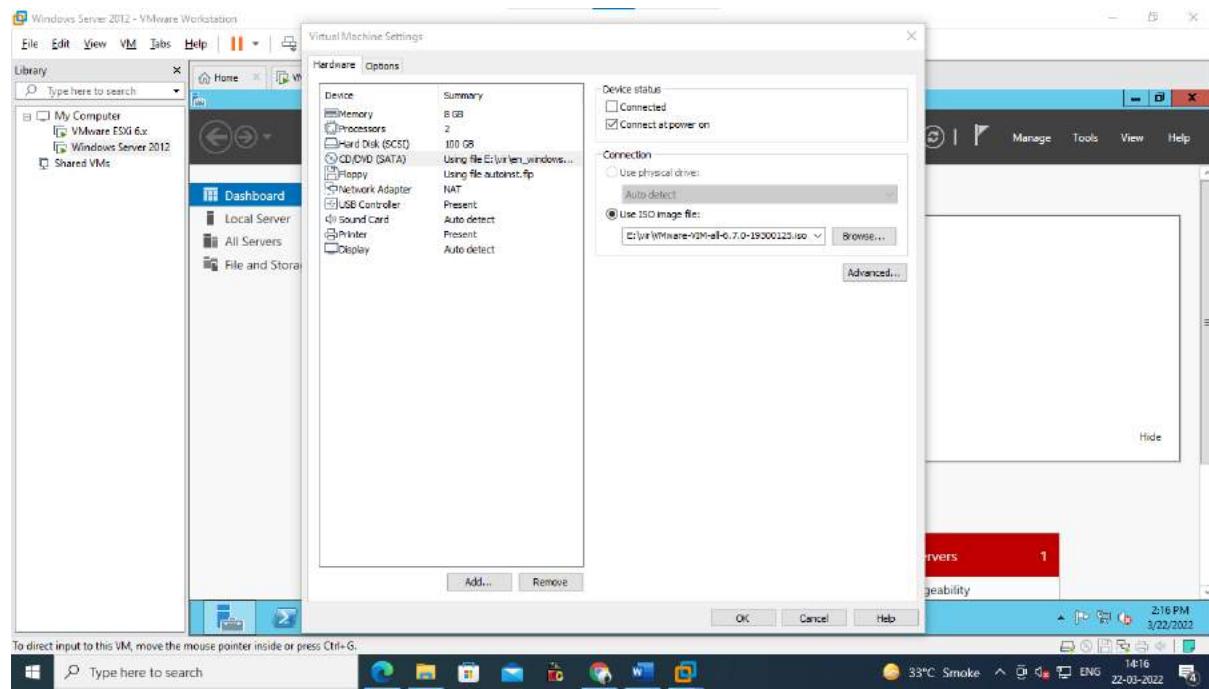
### Step 2(B): Add a Number of Processor 2.



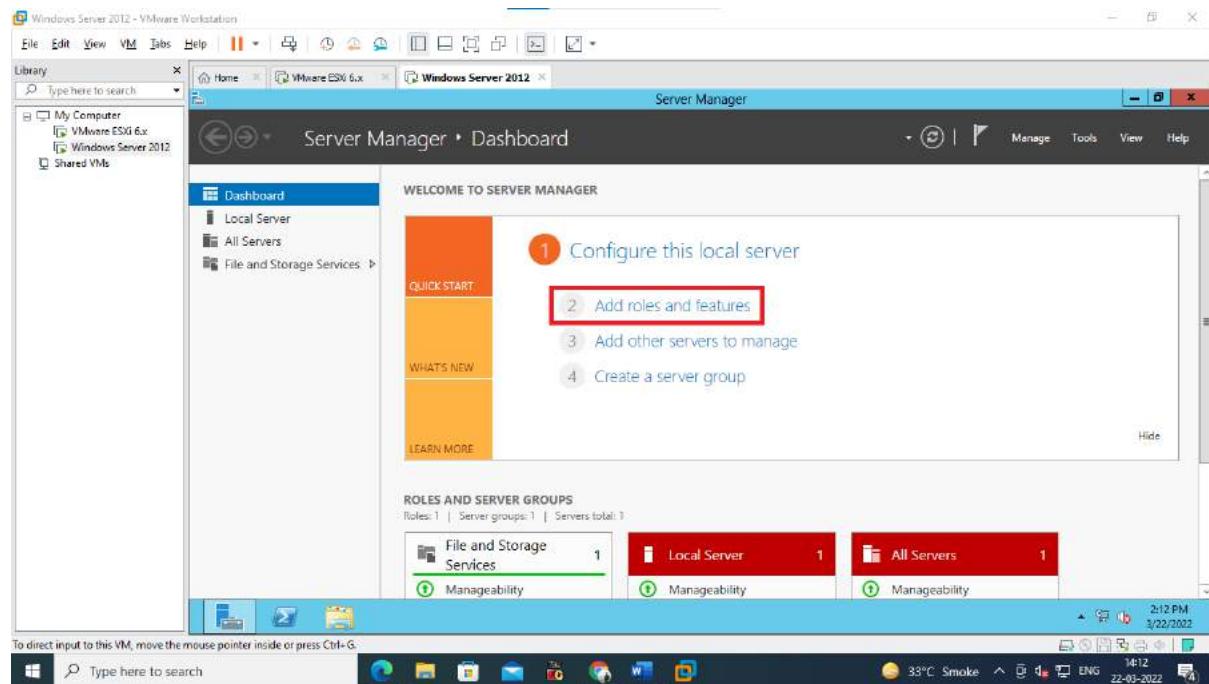
**Step 2(C):** Select the **CD/DVD(SATA)** option and browse virtual machine setup iso file and then select Device Status -> **Connected** and **Connected at power on** and then click on **OK** button.



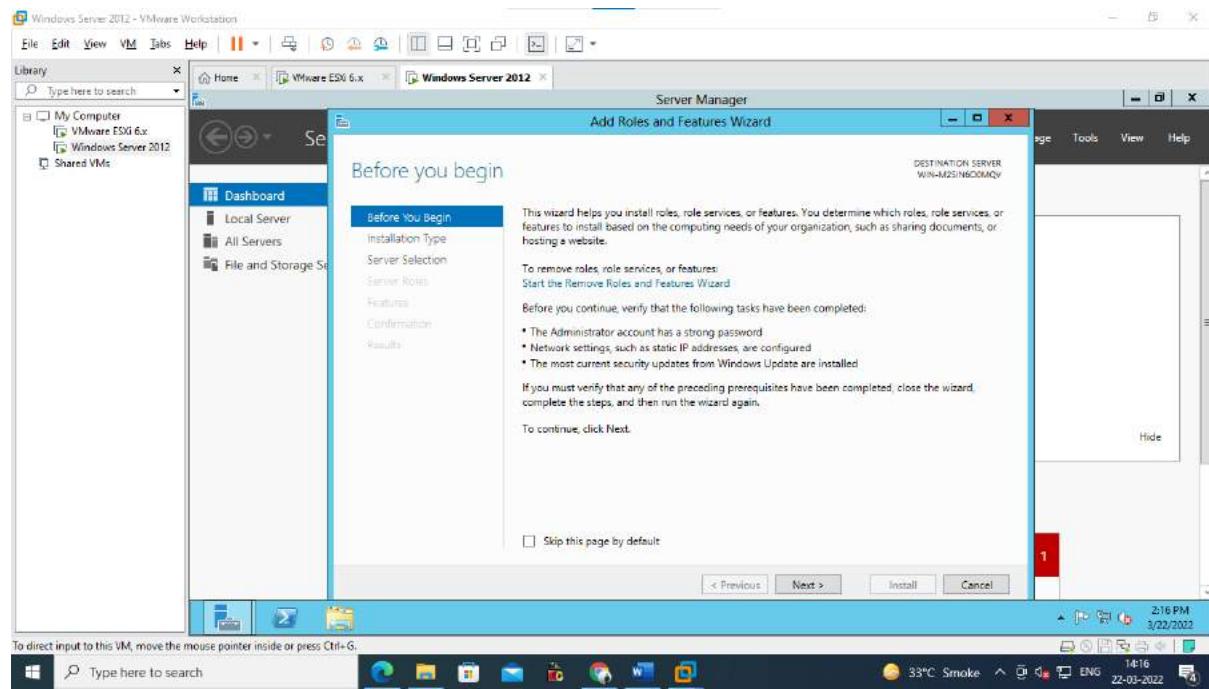
**Step 3: Click on OK button.**



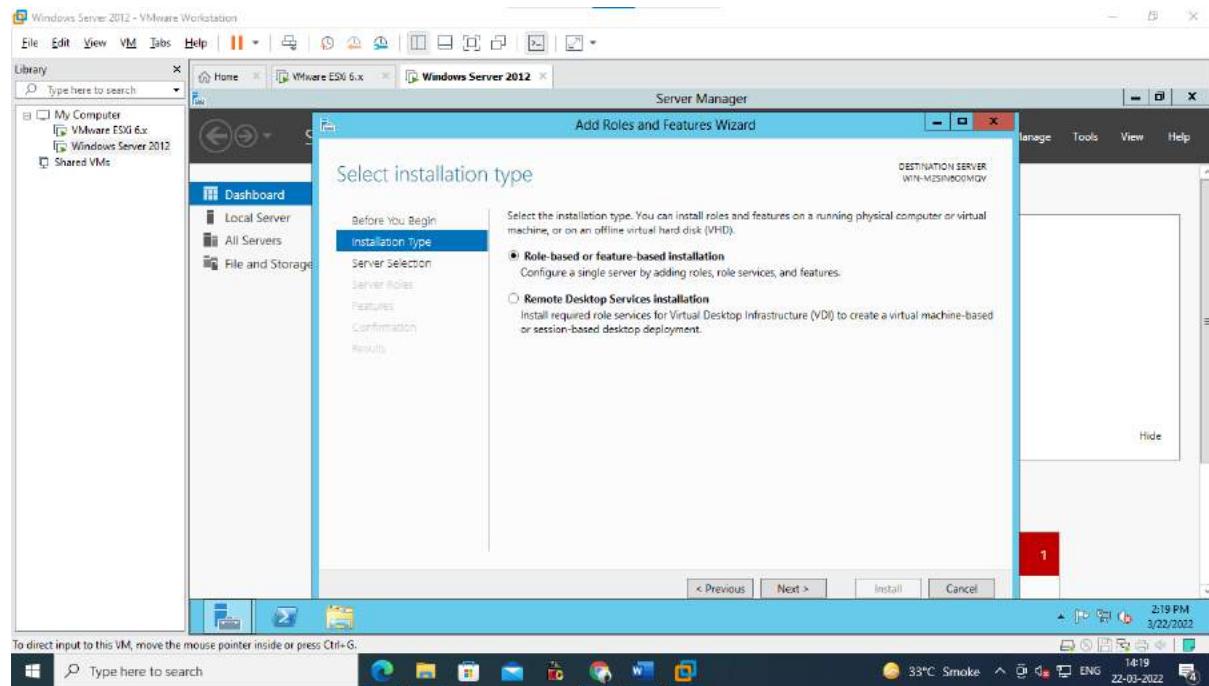
**Step 4: Click on Add roles and features option.**



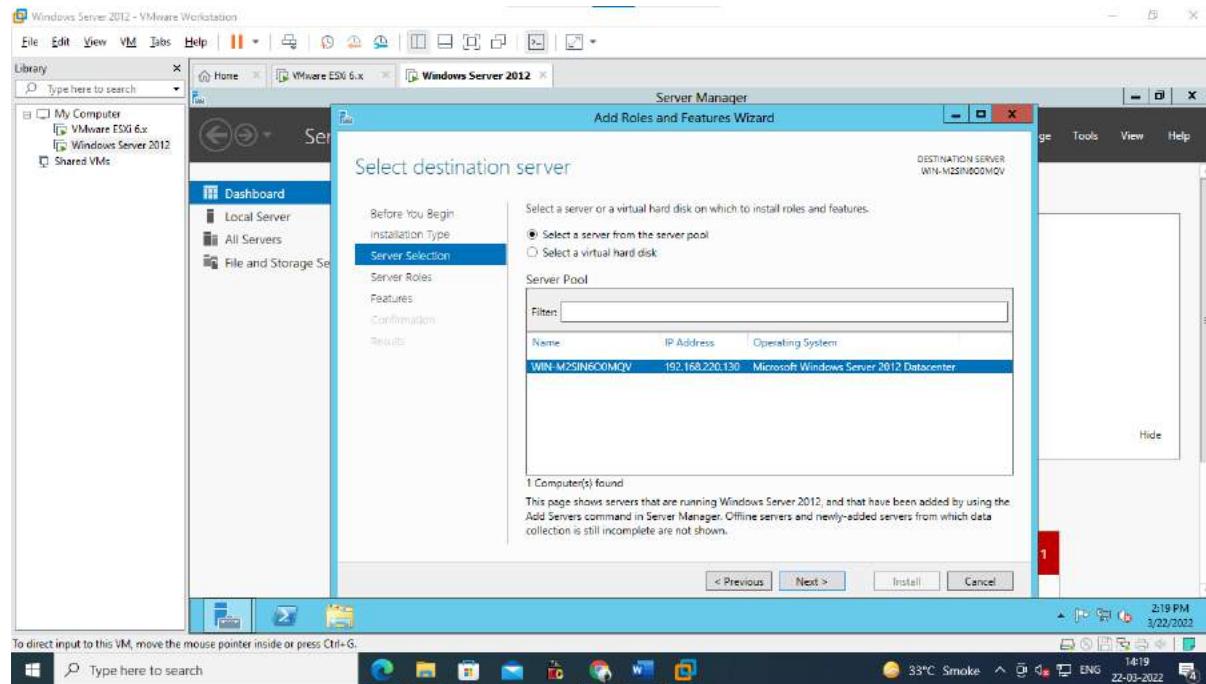
**Step 5: Click on Next > button.**



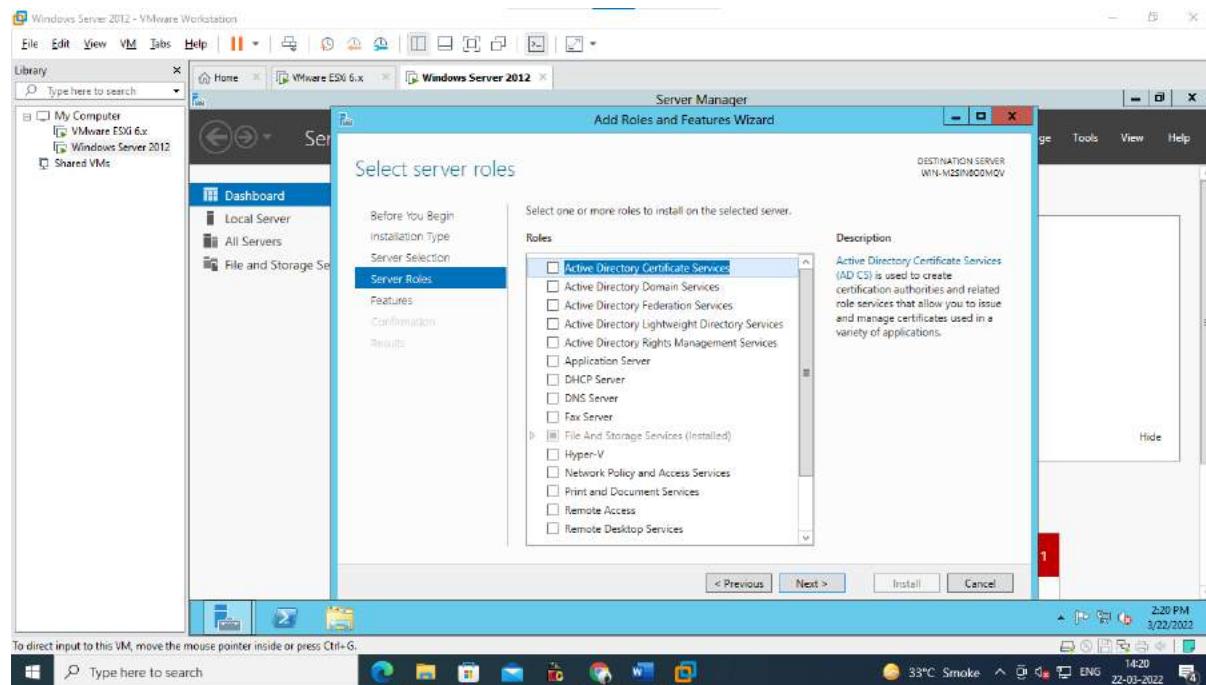
**Step 6: Select Installation type is Role based or feature based installation and then click on Next > button.**



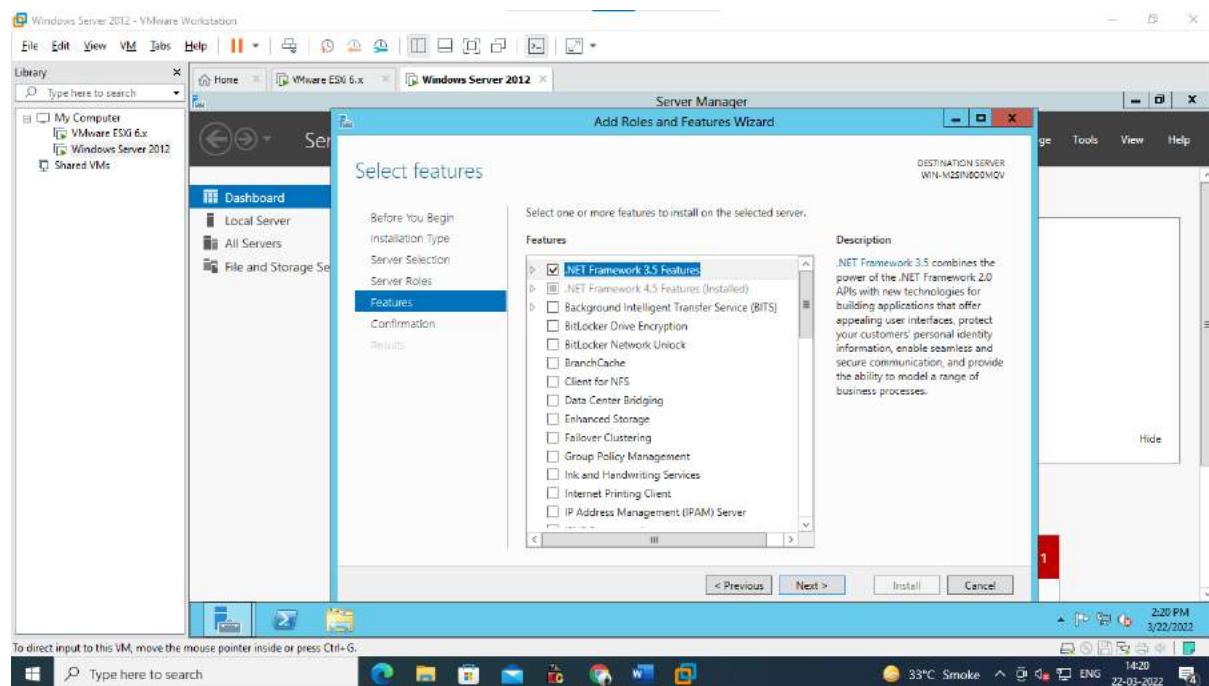
**Step 7:** Select option **Select a server from the server pool** on server selection tab and then click on **Next >** button.



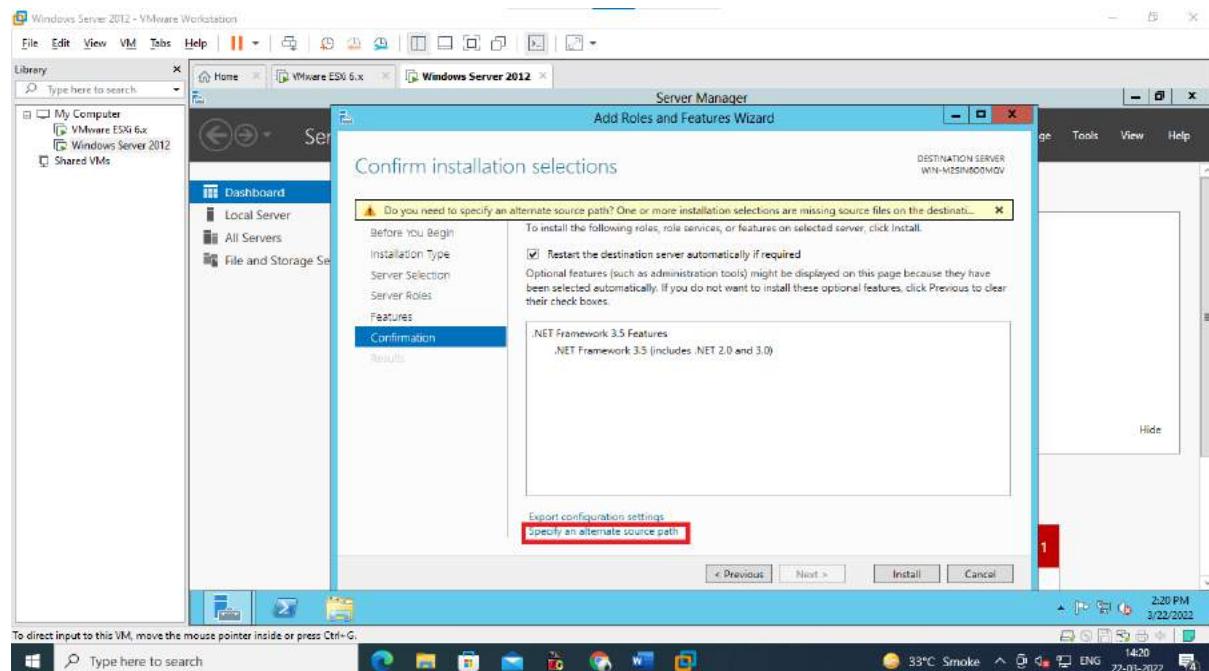
**Step 8:** Make the Server role feature as default (do not select any role) and Click on **Next >** button.



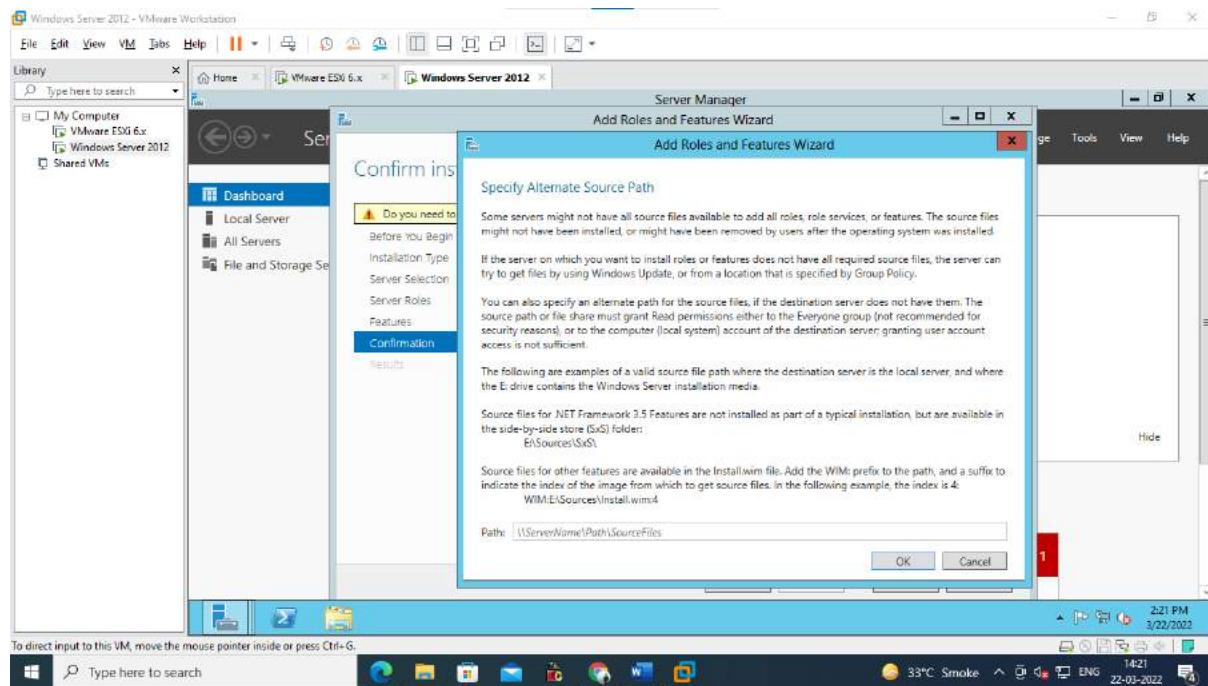
**Step 9:** Select .NET Framework 3.5 Feature in Features tab and Click on Next > button.



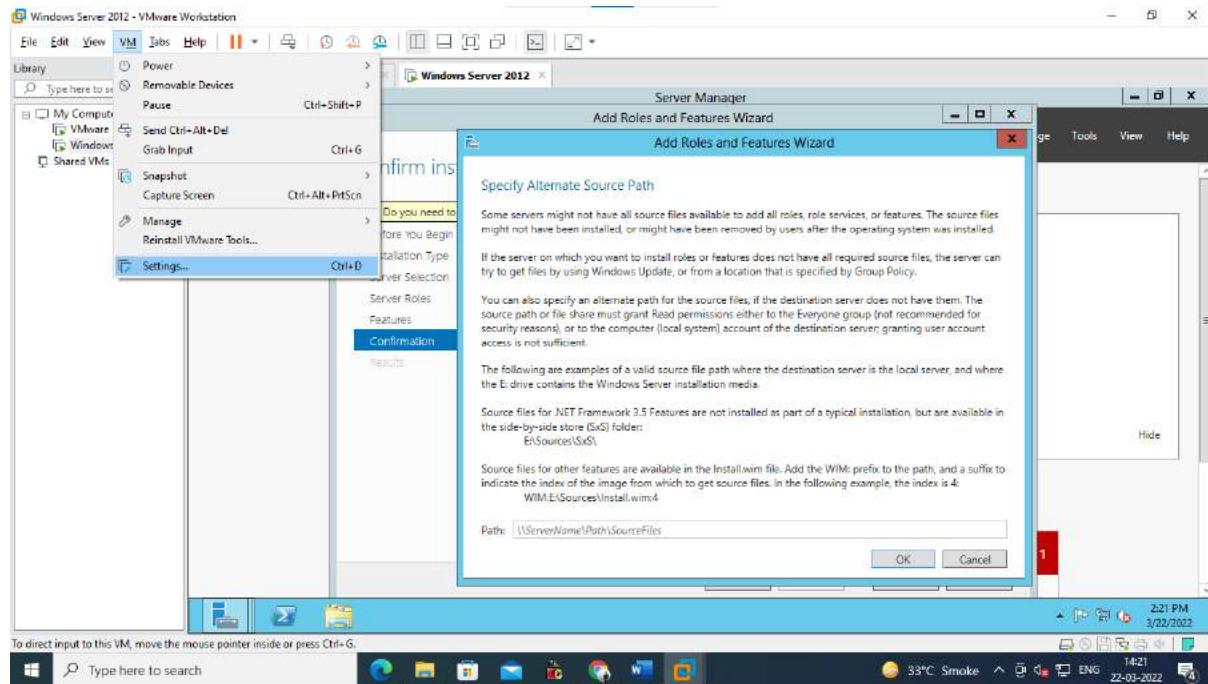
**Step 10:** In Add Roles and Feature wizard screen click on **Specify an alternate source path** link.



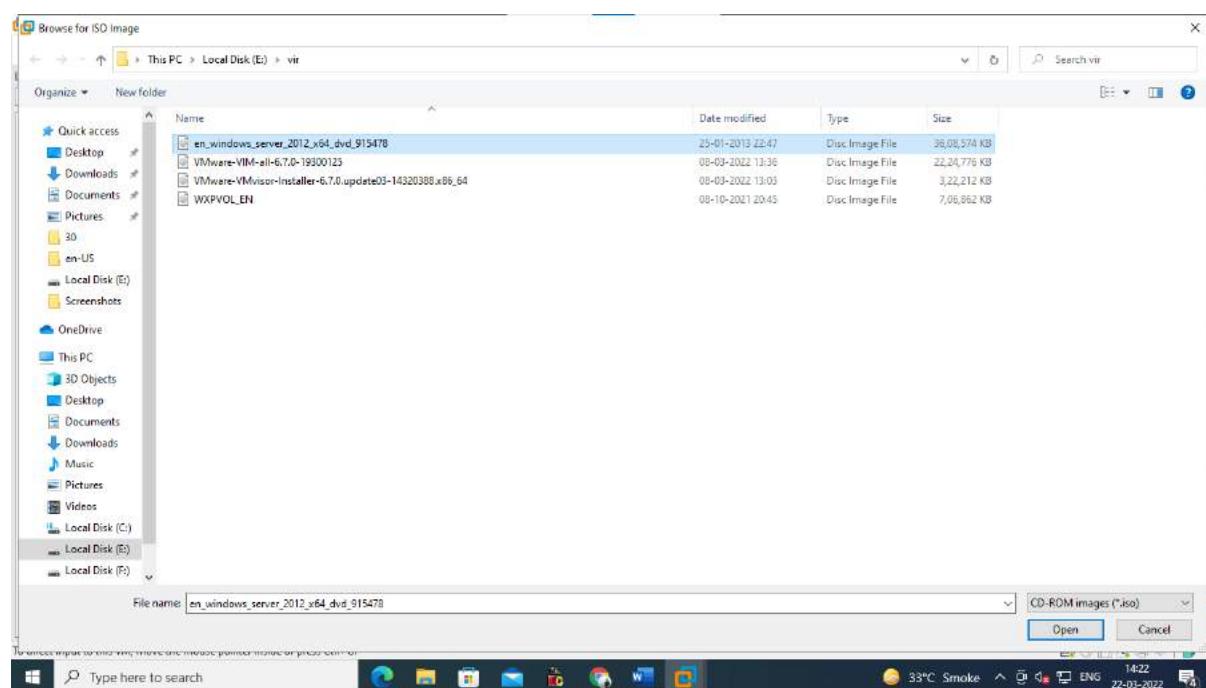
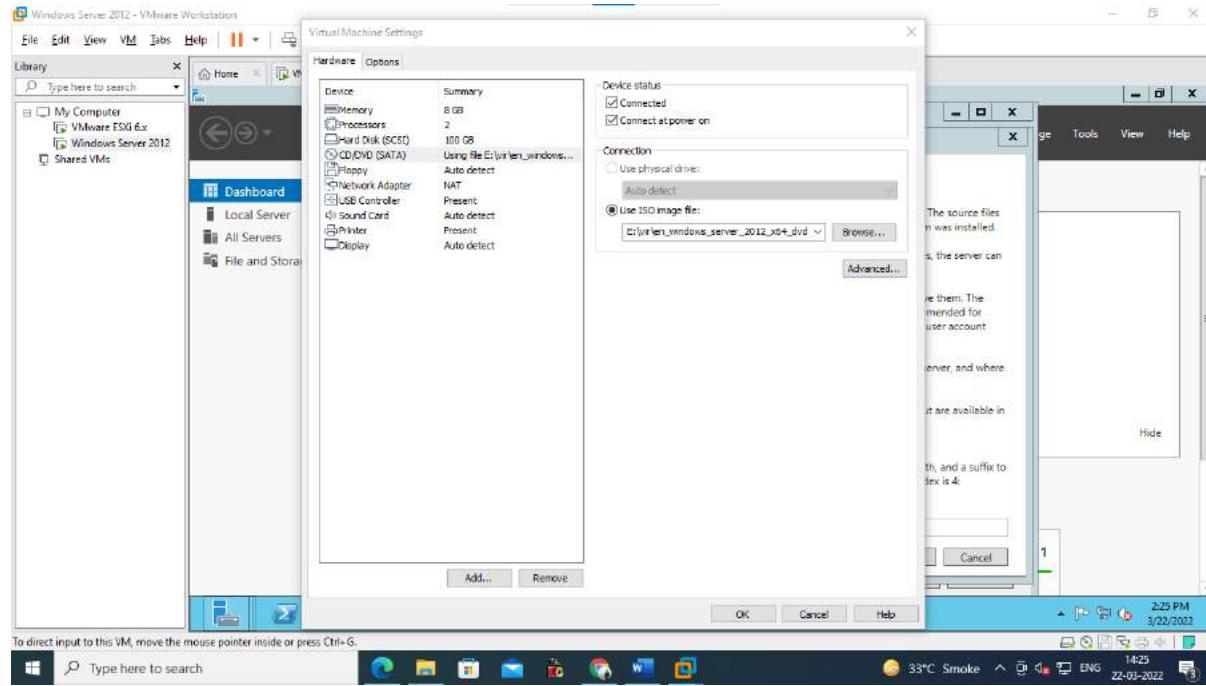
## Step 11: Add Path.

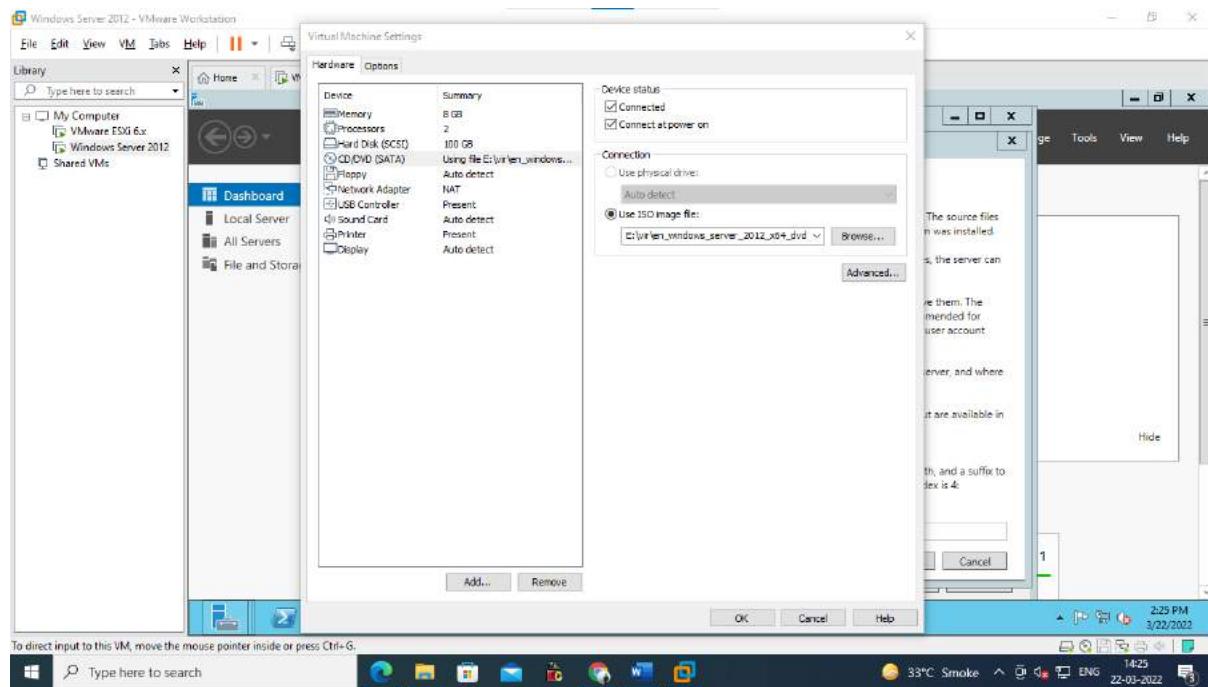


## Step 11(A): Go to **Settings...** option under VM



**Step 11(B):** Select the **CD/DVD (SATA)** feature in hardware tab. Browse the **Windows server ISO image file path** then click on **OK** button.

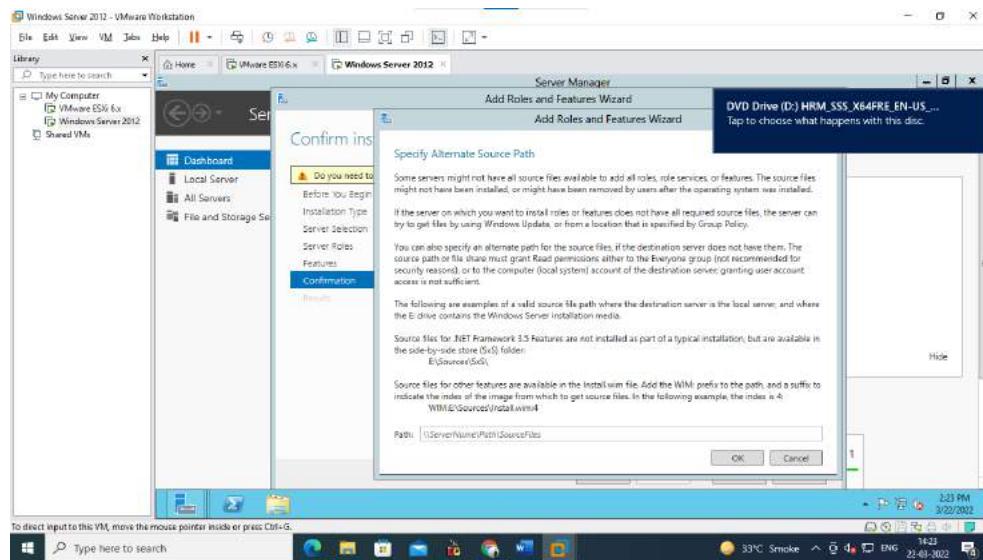


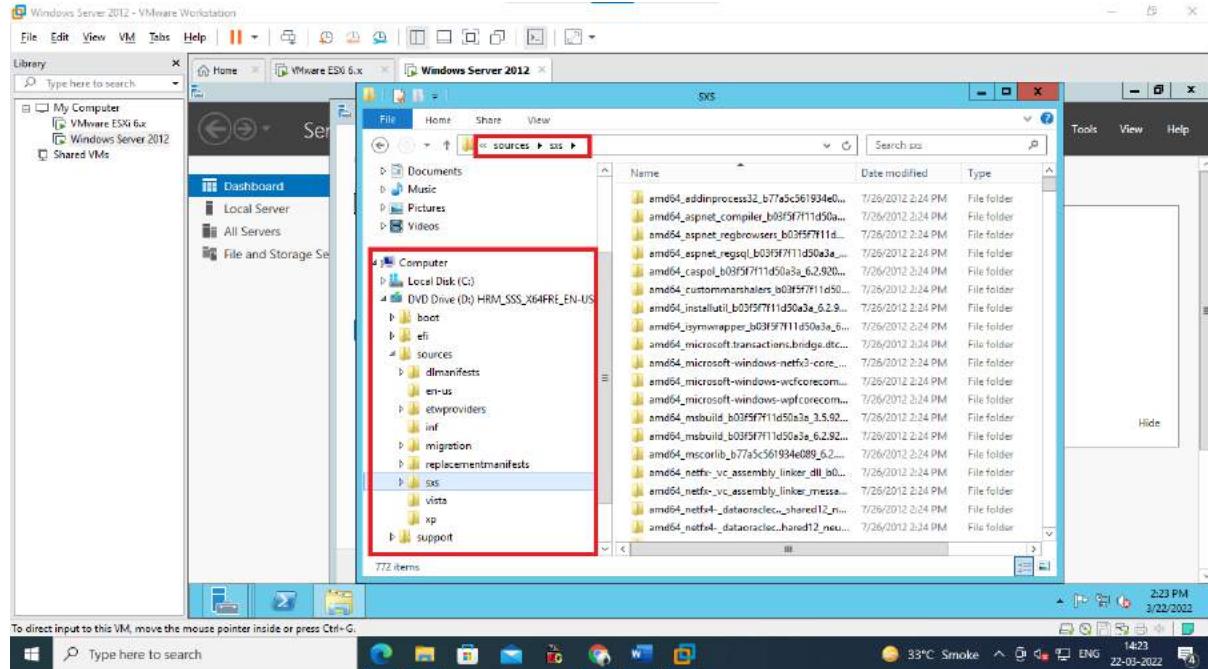


**Step 11(C):** After completing the settings, the CD/DVD drive appears on right side top corner. Click on that CD/DVD drive option and select the browse folder option.

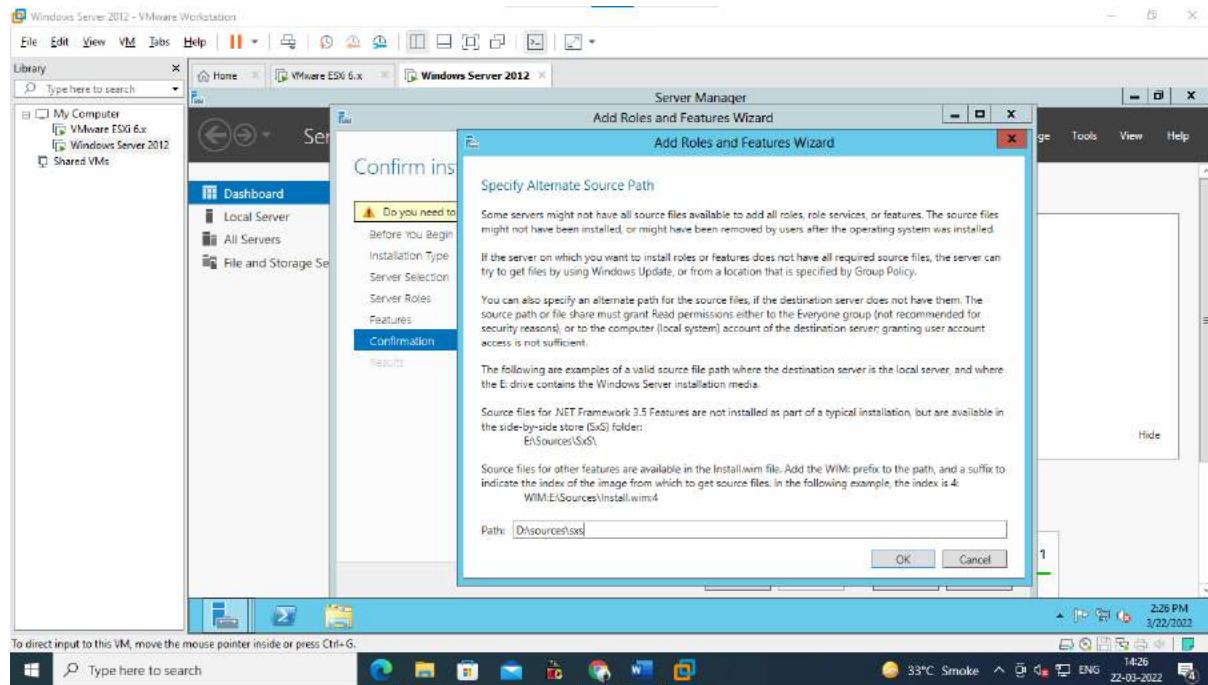
OR

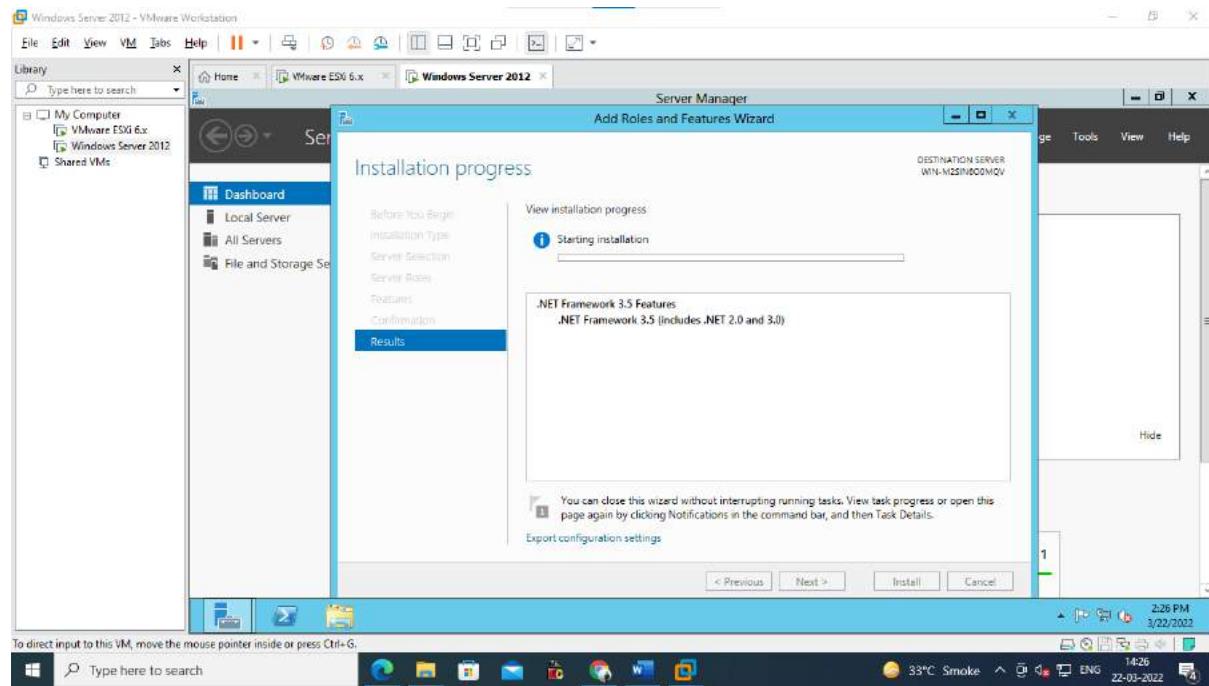
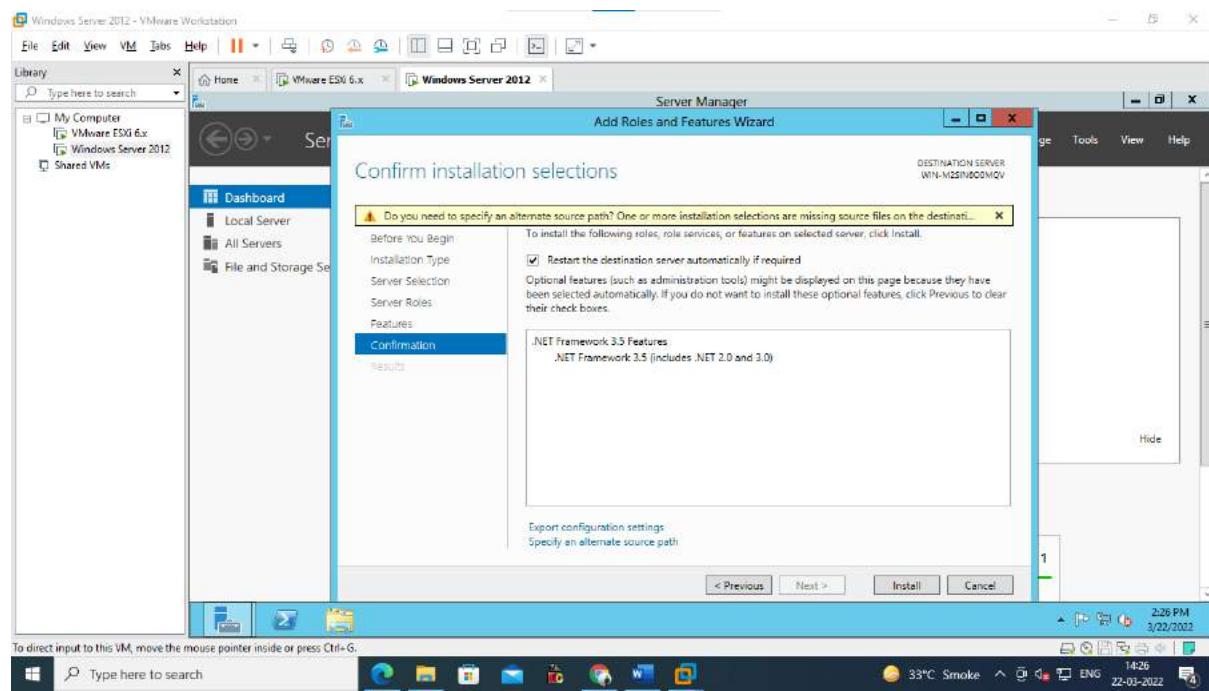
Go to File explorer and expand the DVD drive on left side and then select source-> sxs folder and copy the entire path.

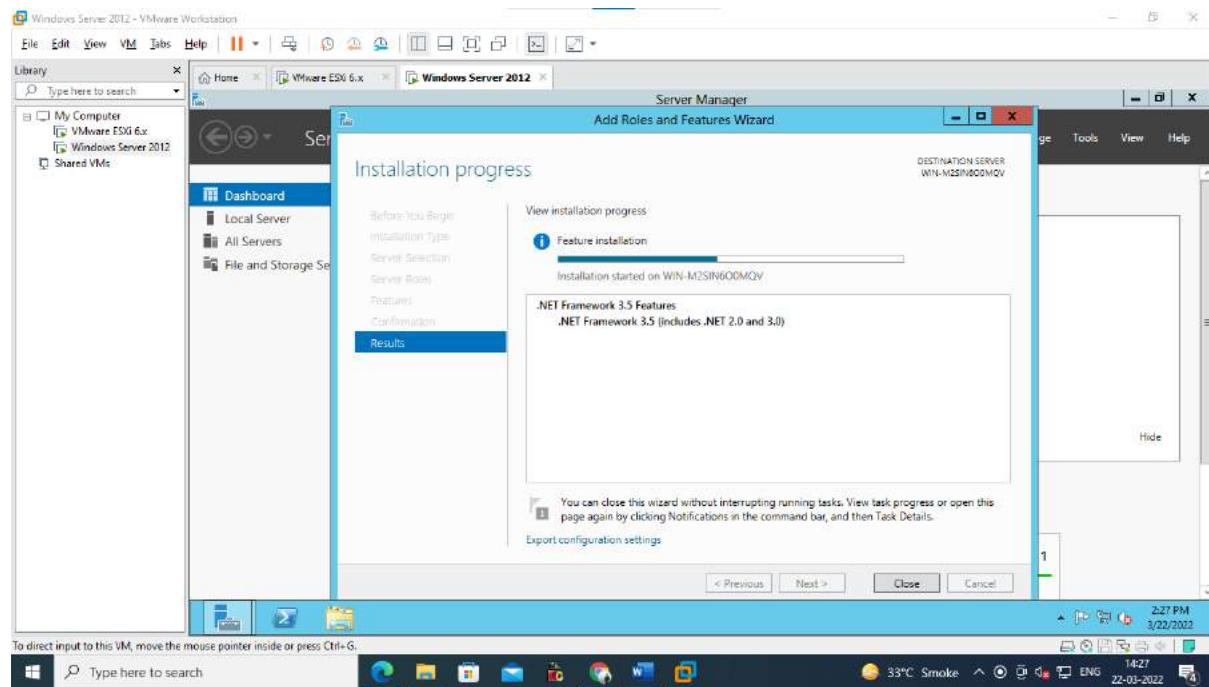




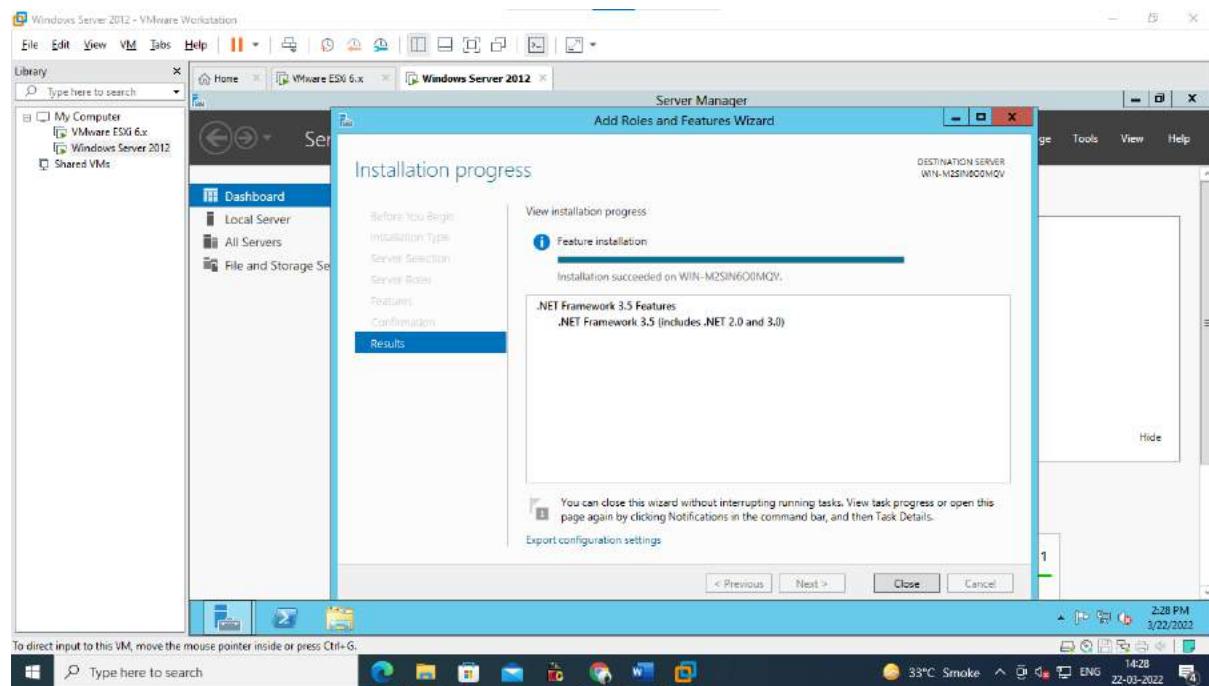
**Step 11(D): Paste the copied path on path textbox and then click on **OK** button.**



**Step 12: Click on Install button**

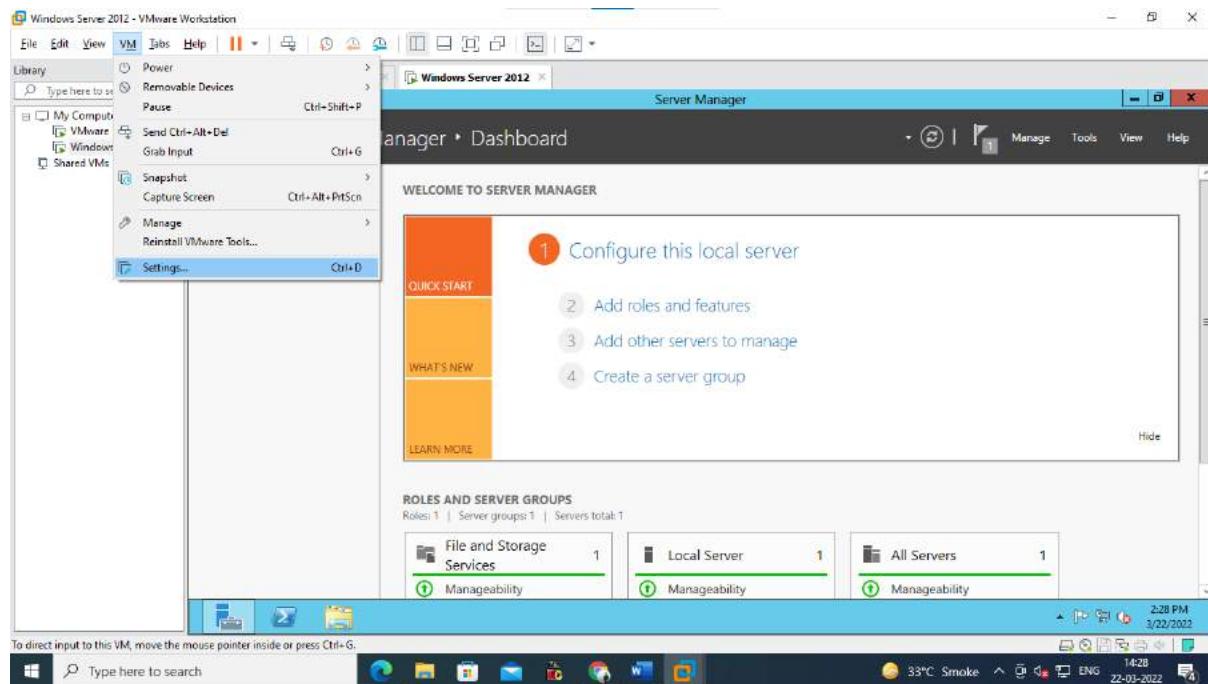


### Step 13: Click on Close button

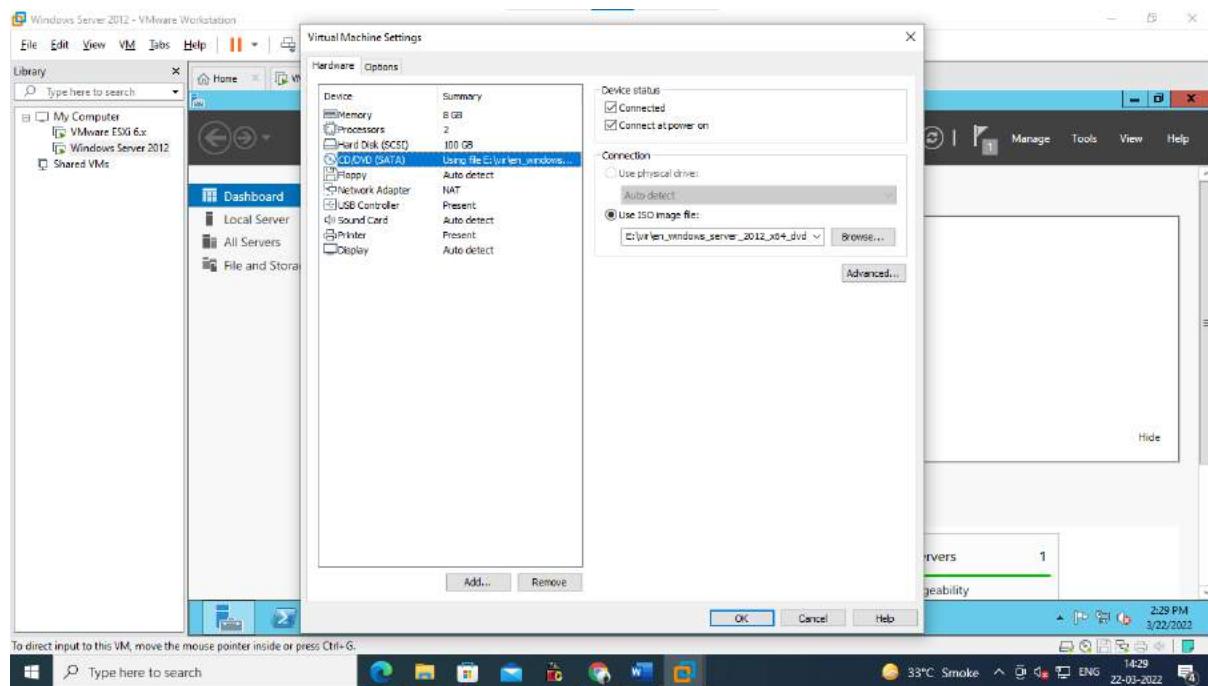


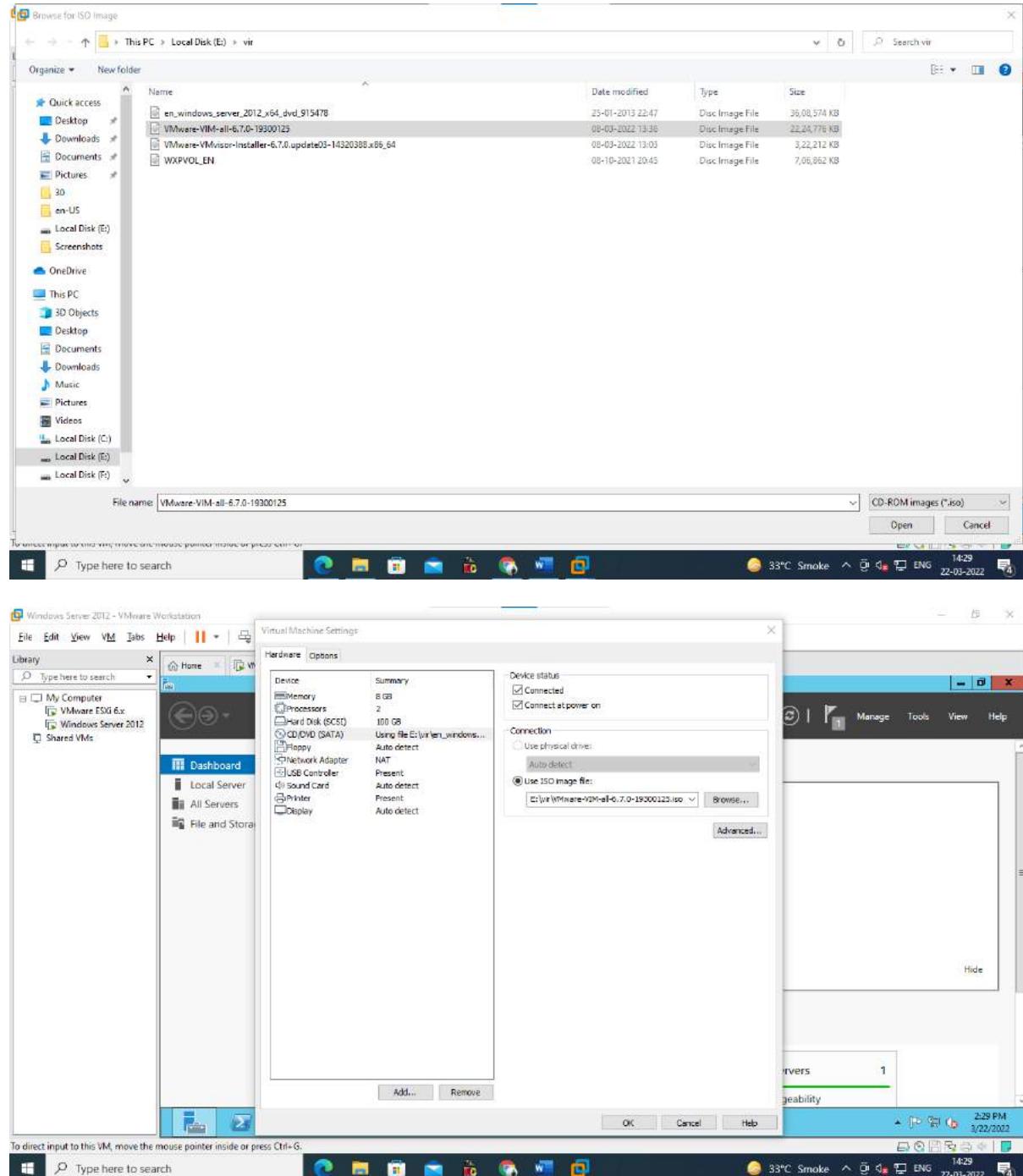
- Install vCenter Server for Windows.

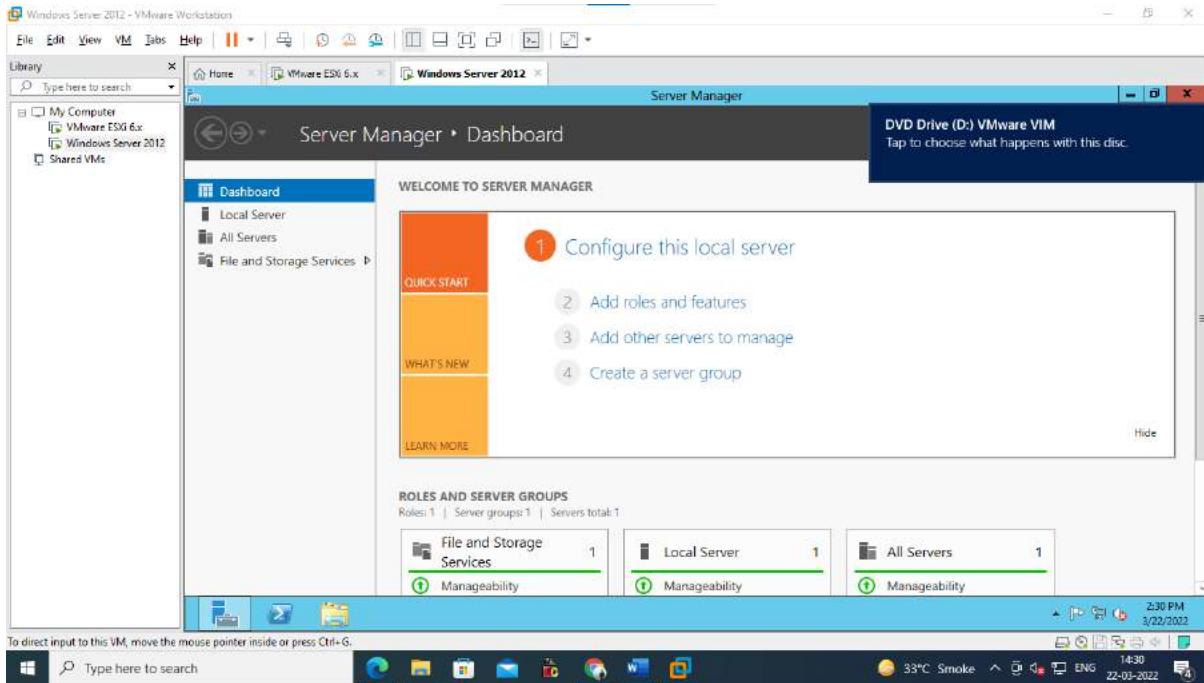
### Step 1: Select **Settings...** option under **VM**.



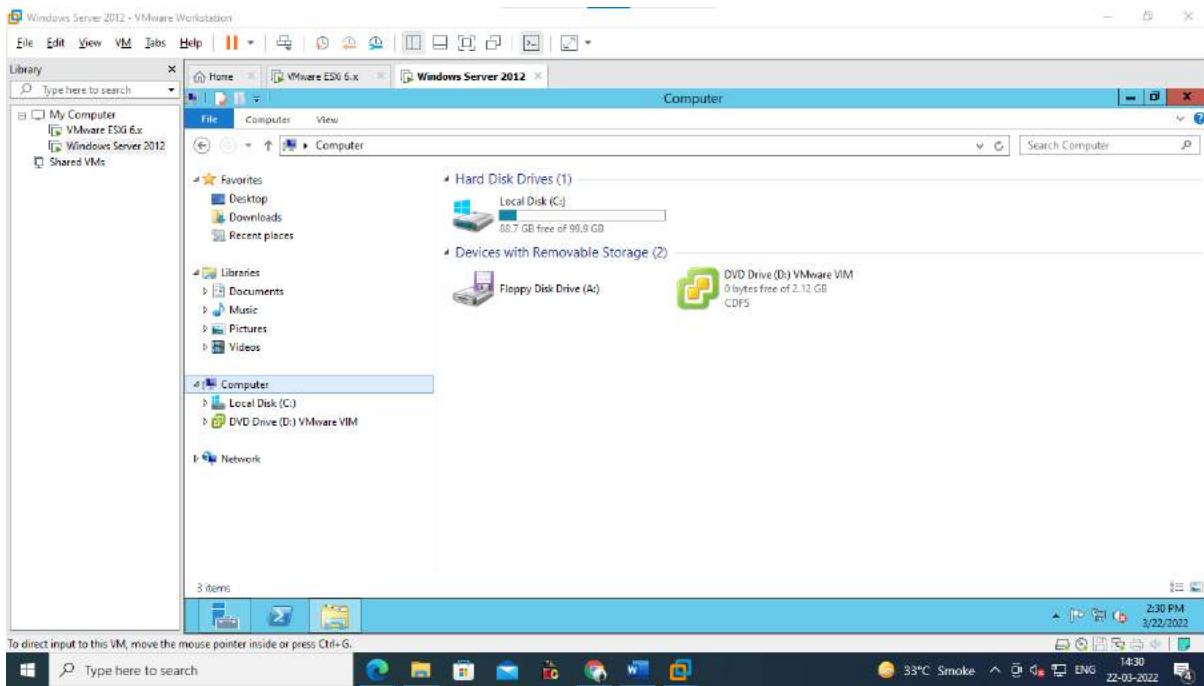
### Step 2: Select the **CD/DVD(SATA)** option and browse **VMware-VIM-All setup iso** file and then select Device Status -> **Connected** and **Connected at power on** and then click on **OK** button.



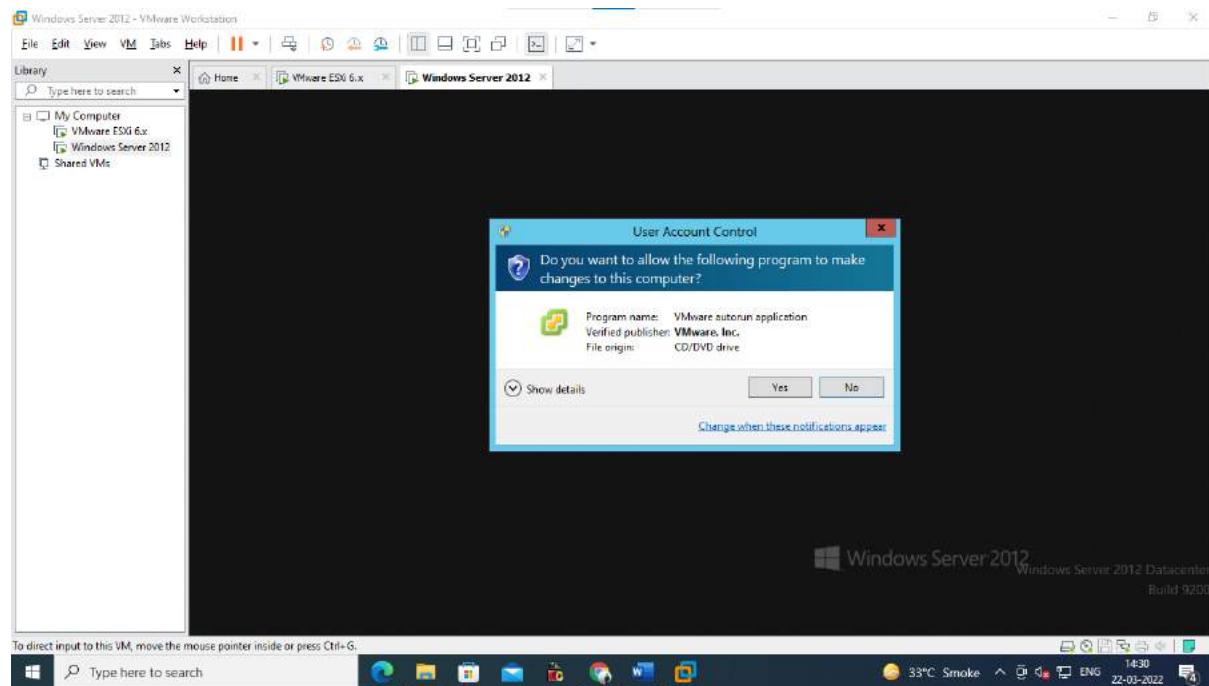




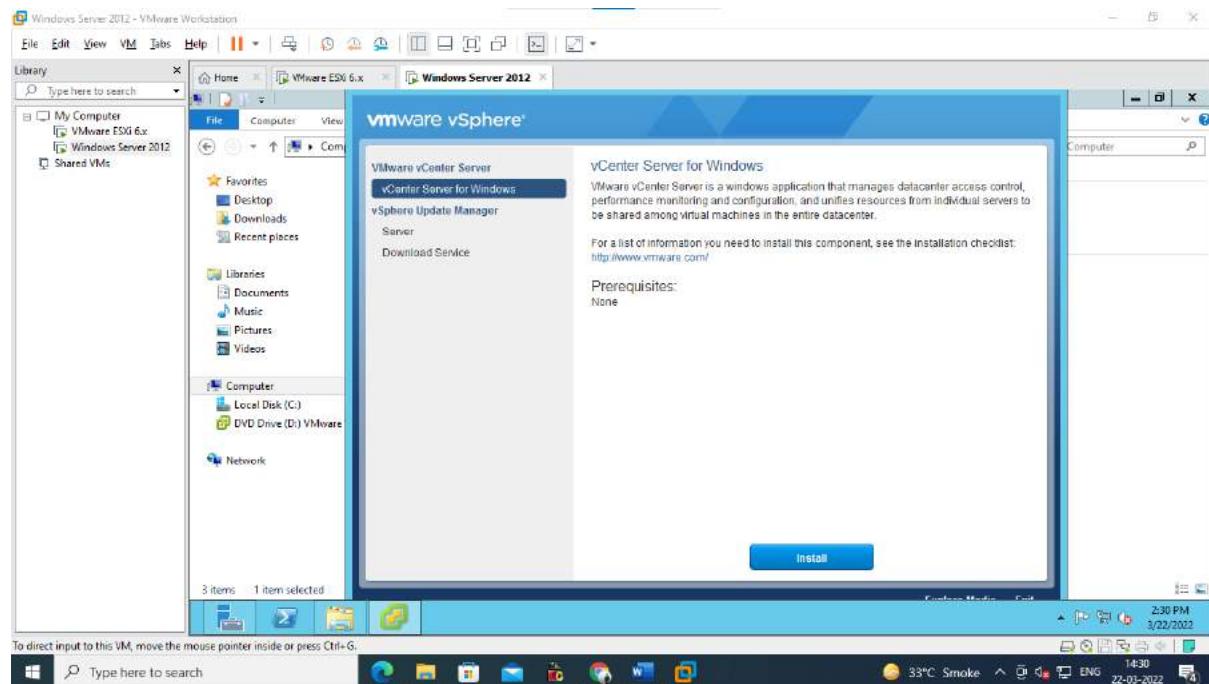
### Step 3: Go to File explorer and click on VMware VIM.



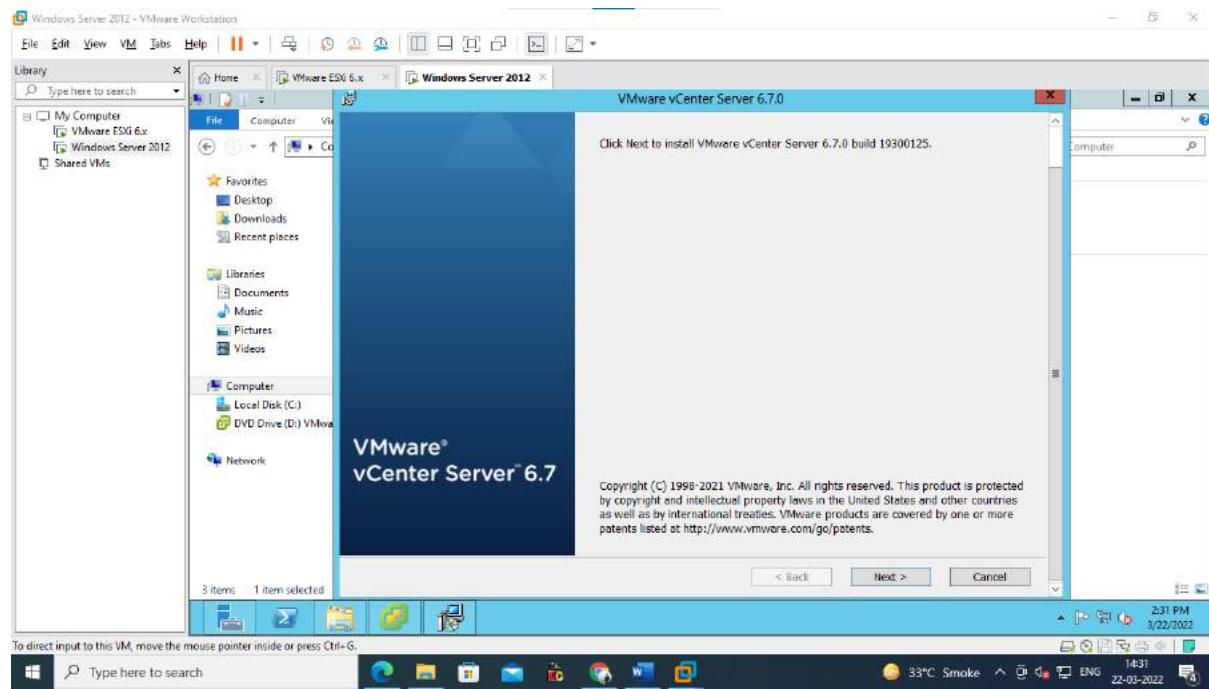
**Step 4:** Click on Yes button.



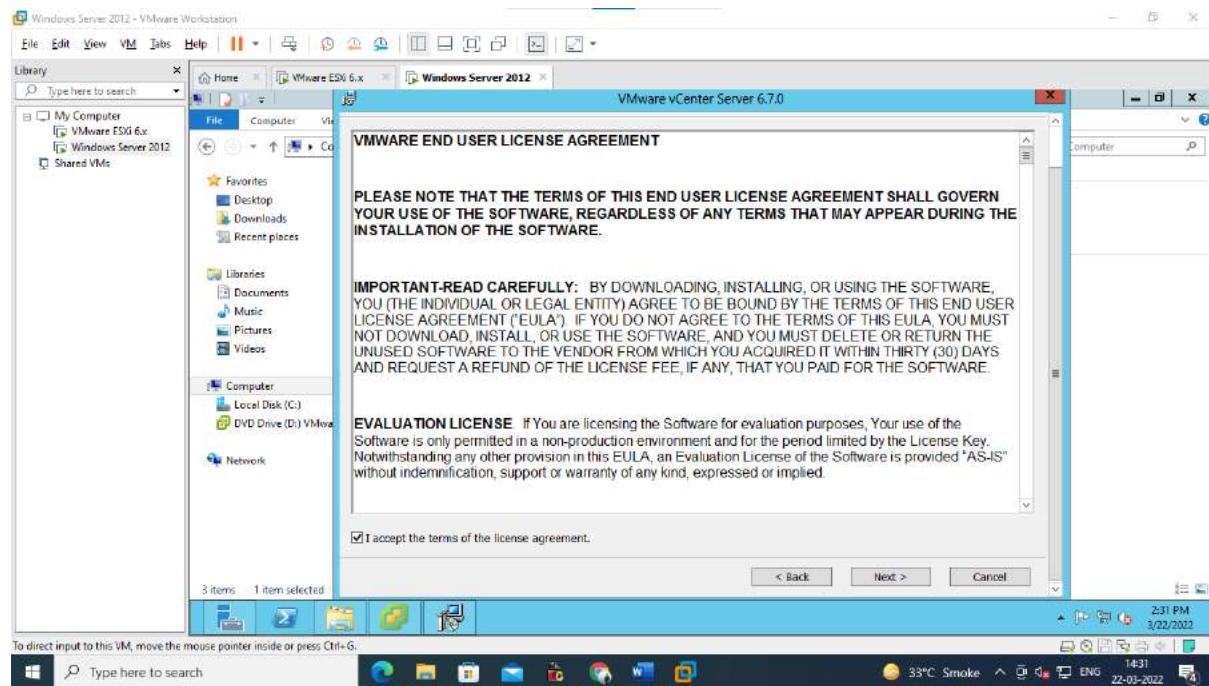
**Step 5:** Click on Install button.



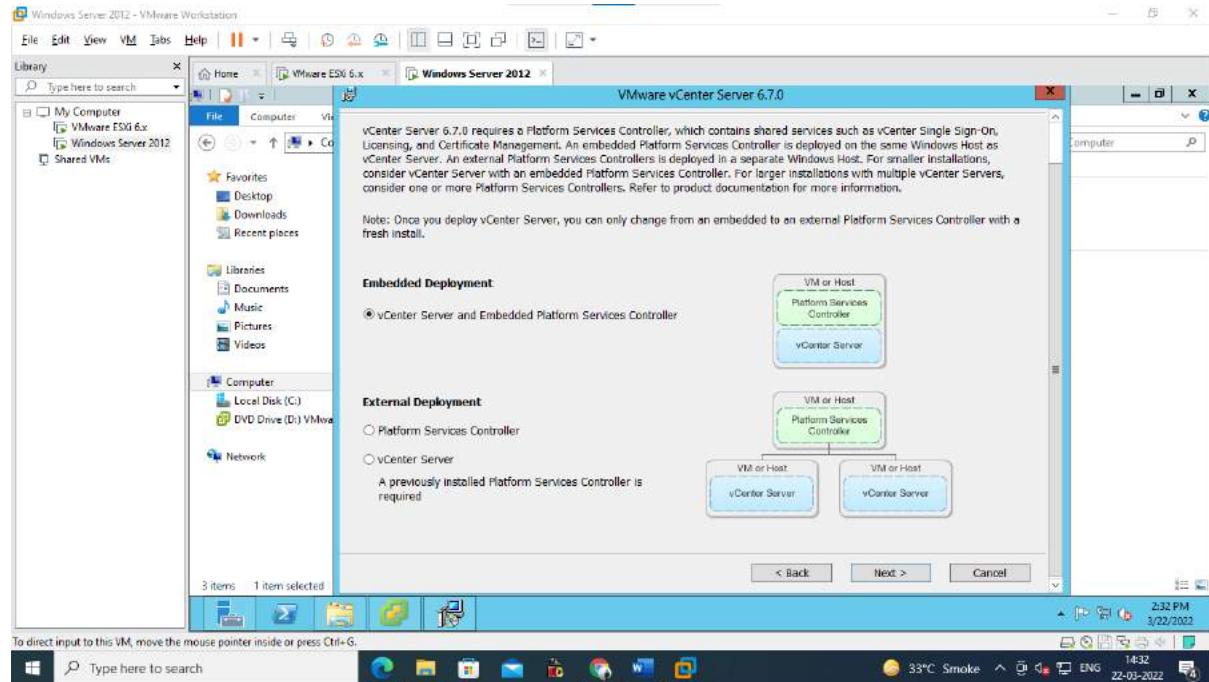
**Step 6:** Click on **Next >** button.



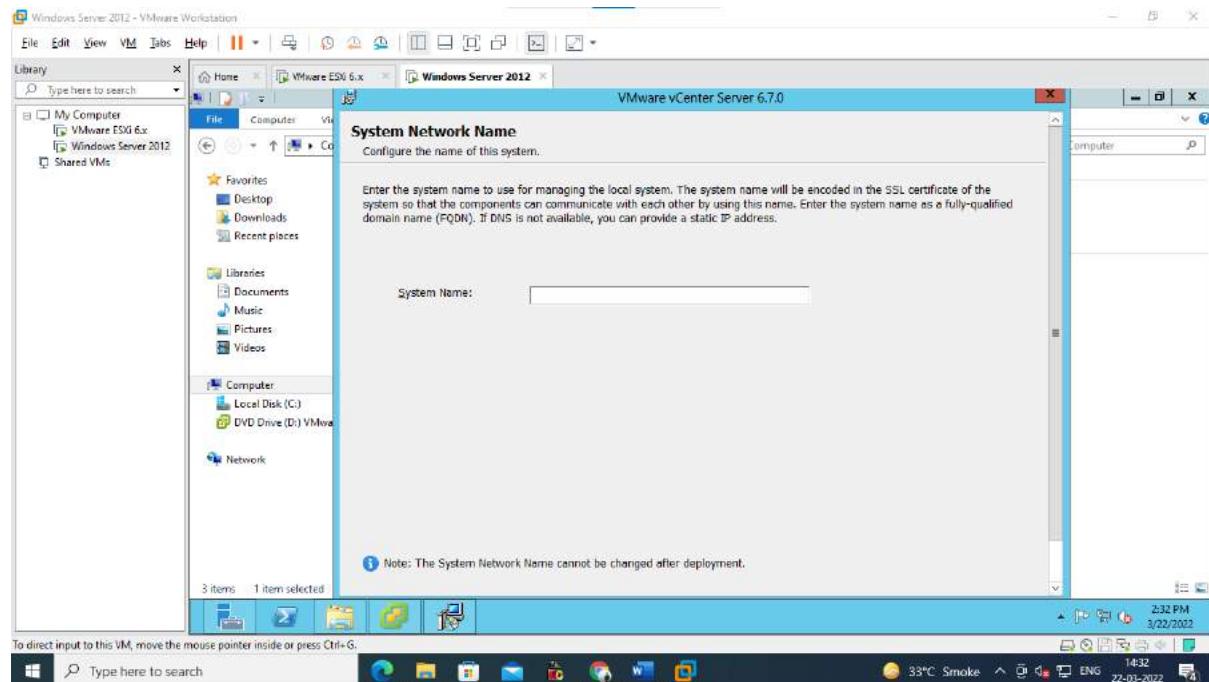
**Step 7:** Select **Accept the term of the license agreement** and click on **Next >** button.



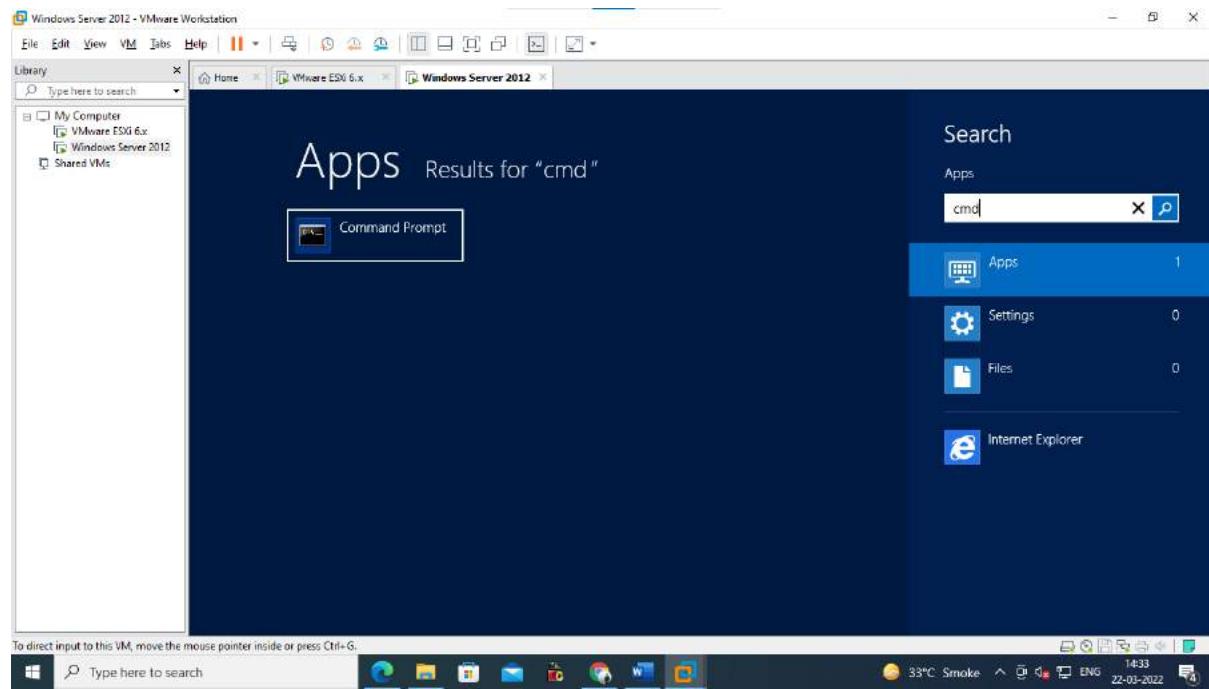
**Step 8:** Select **Embedded deployment** as vCenter server and embedded platform services controller option and Click on **Next >** button.



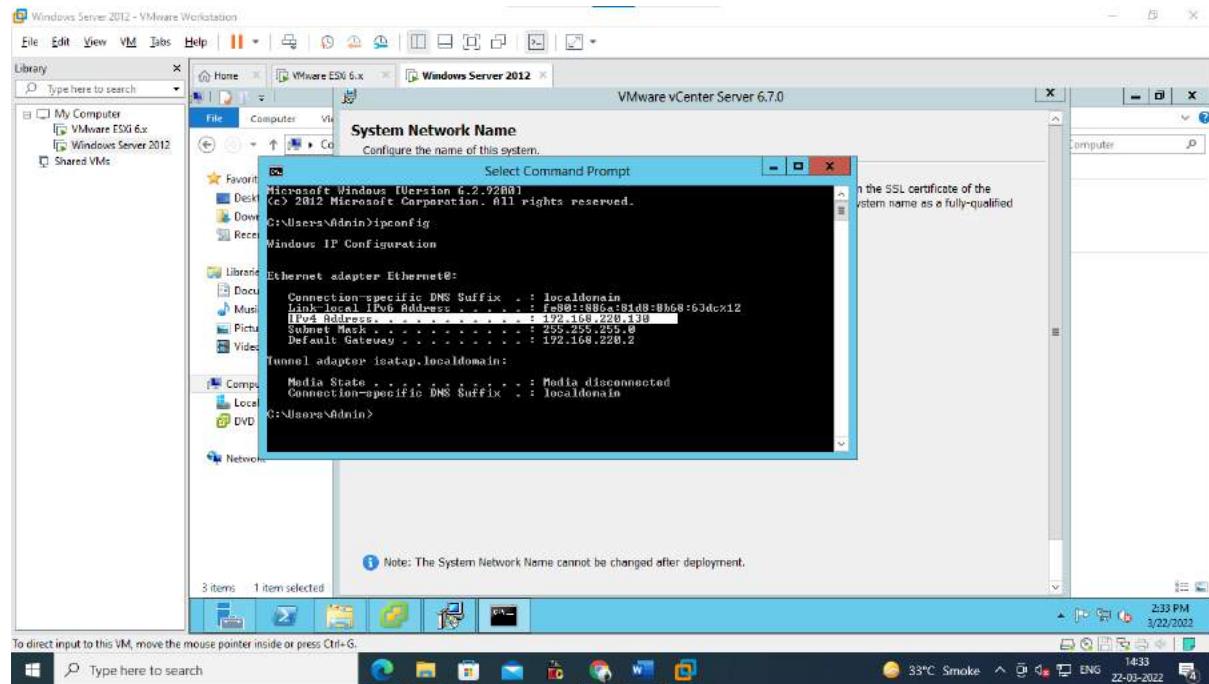
**Step 9(A):** Enter the system name as IP address of windows server system.



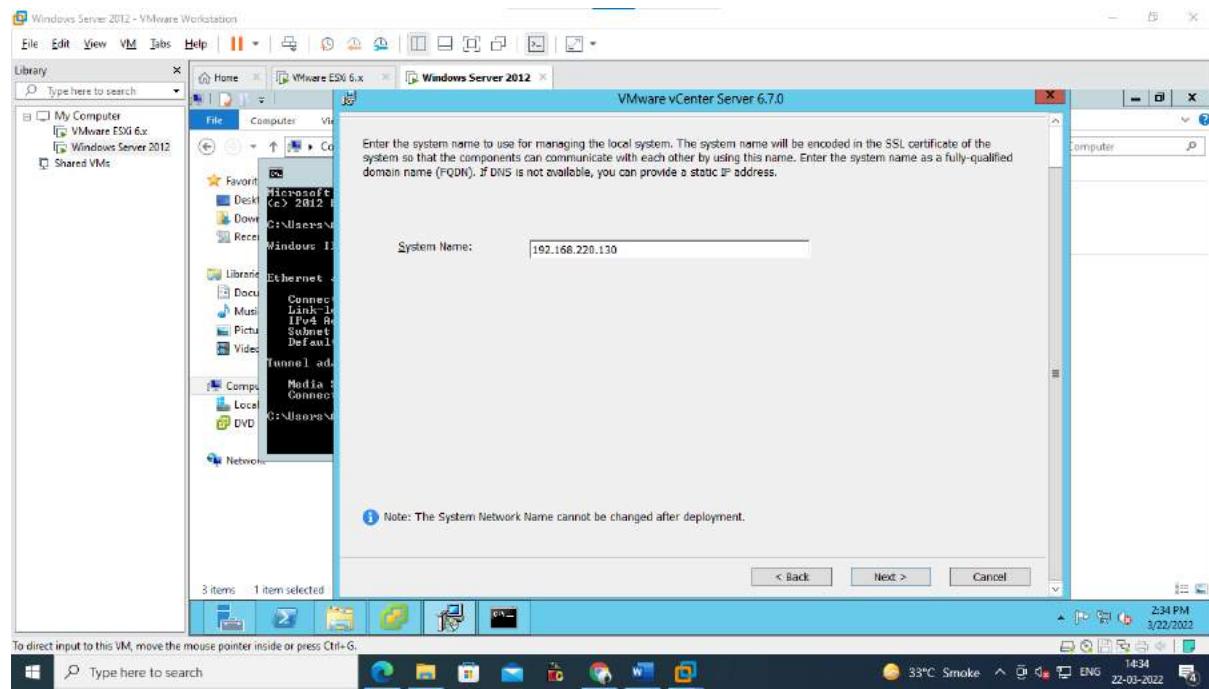
**Step 9(B): Open Command prompt.**



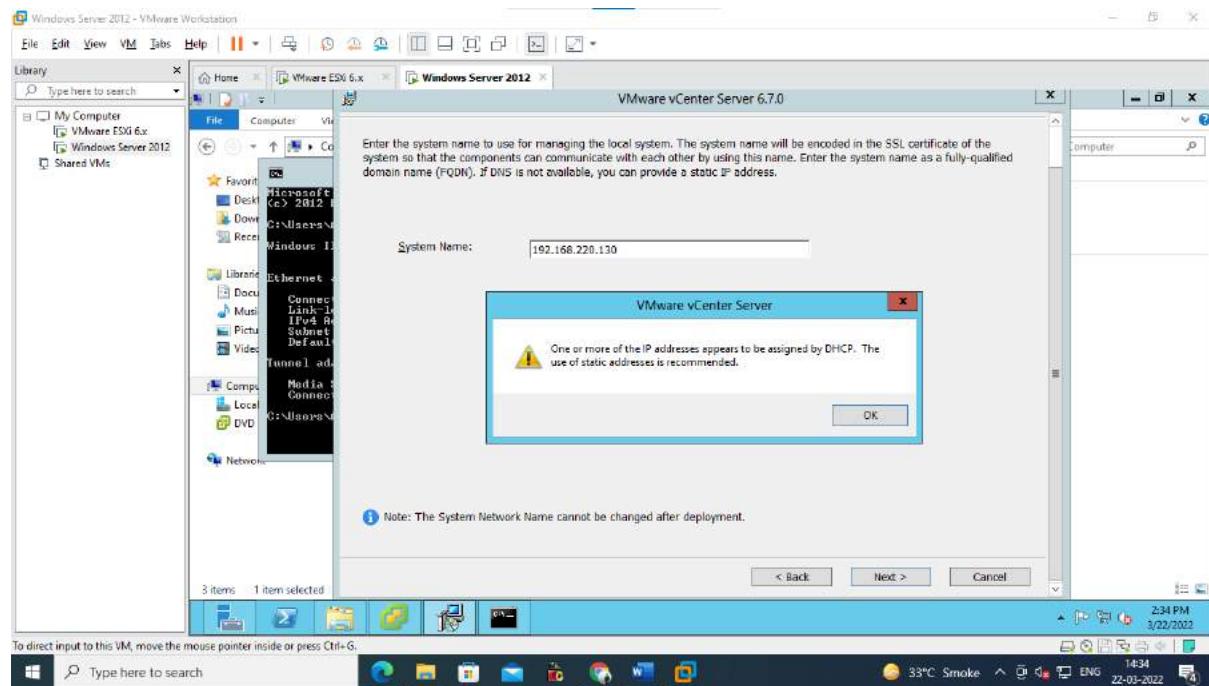
**Step 9(C): Type ipconfig and select and copy IPv4 address.**



**Step 9(D): Paste copied IPv4 address to system name textbox.**

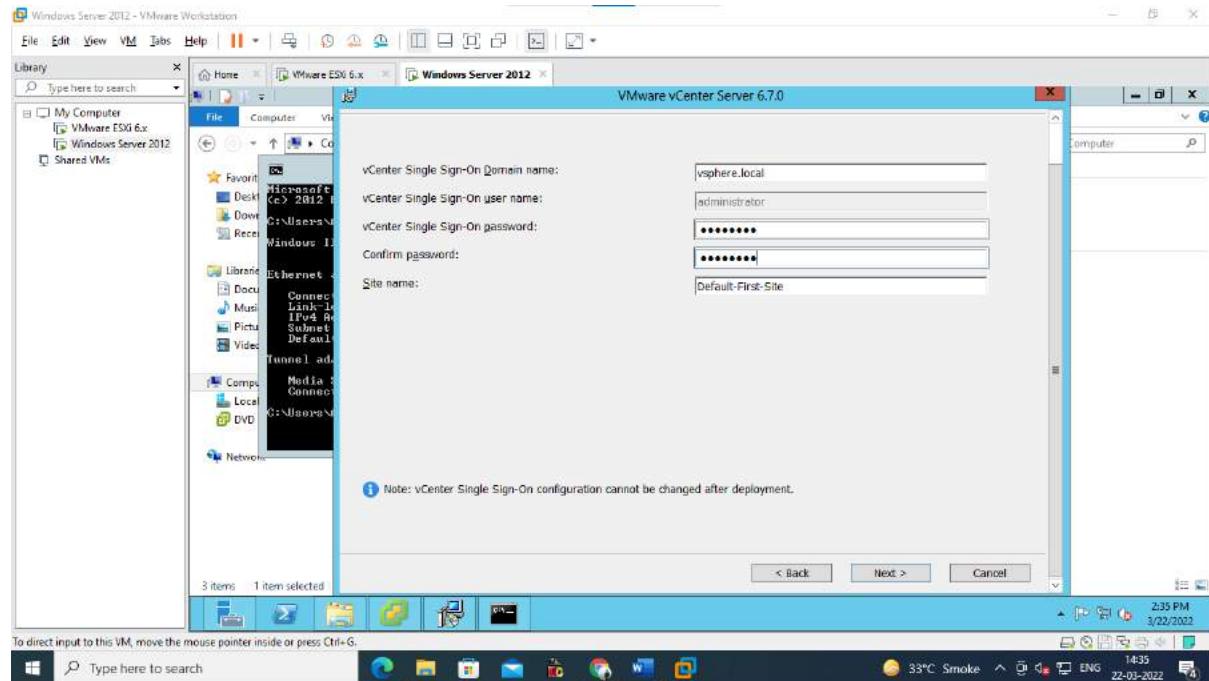


**Step 10: Click on OK button.**

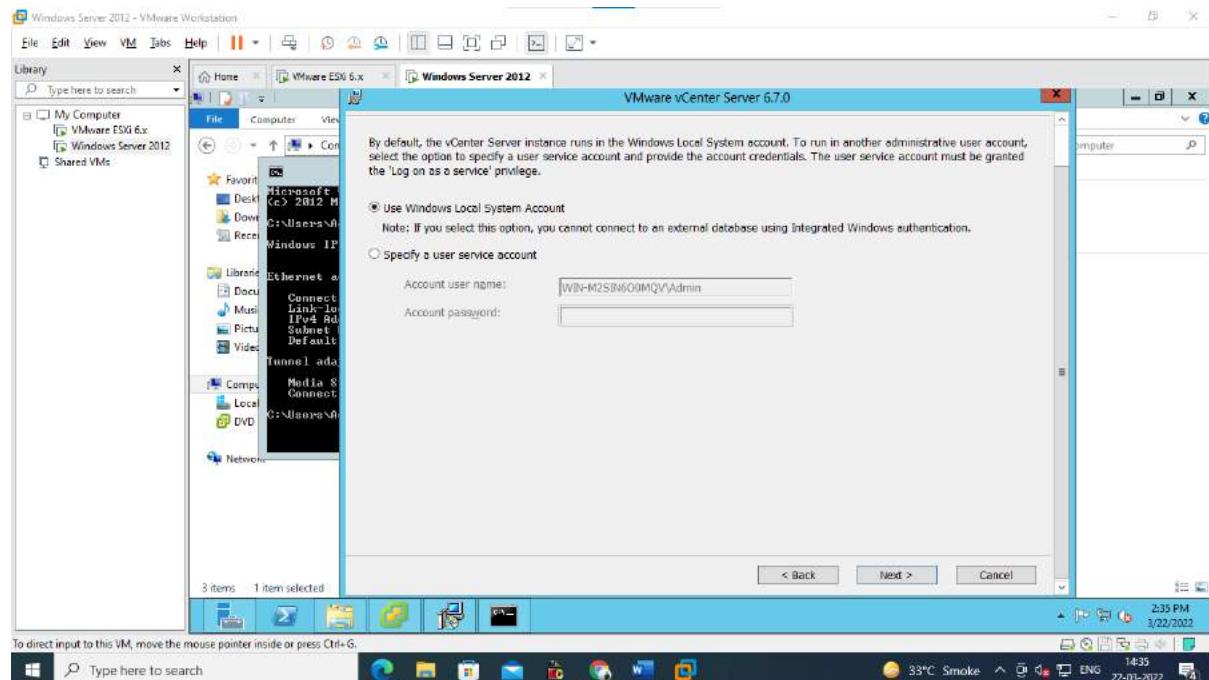


**Step 11:** Enter the Name of vCenter Single Sign-on Domain name is **vsphere.local** and **password** and **confirm password** field.

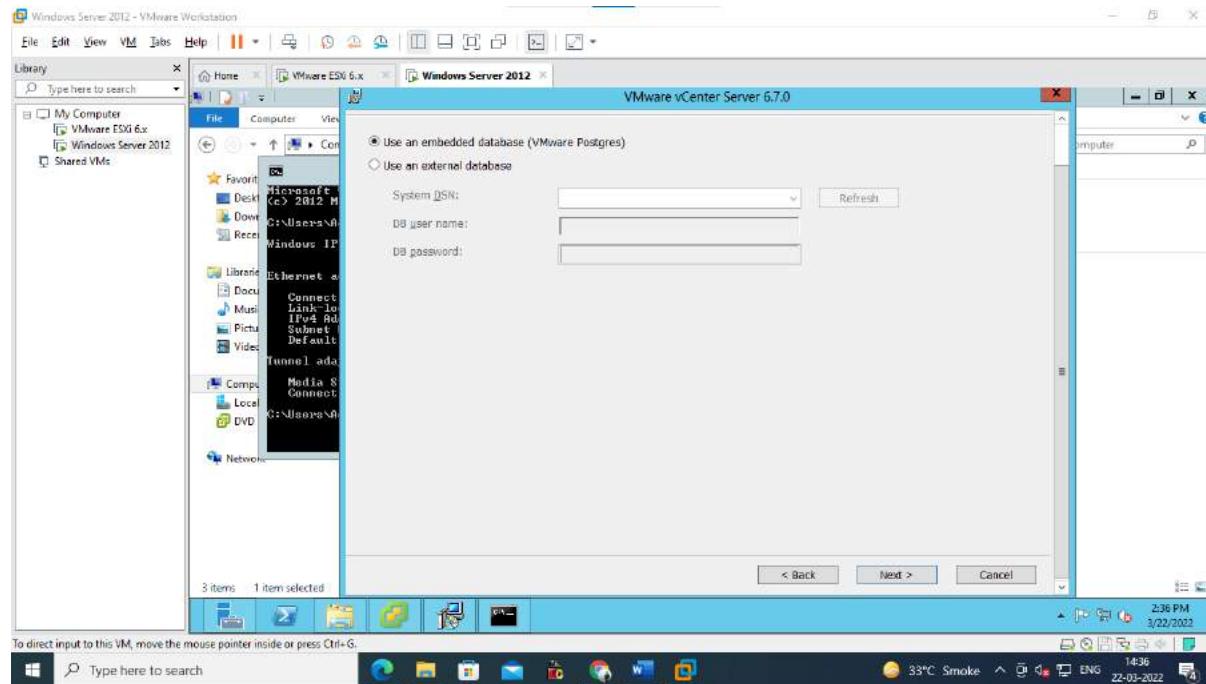
**Password:** lt@13579.



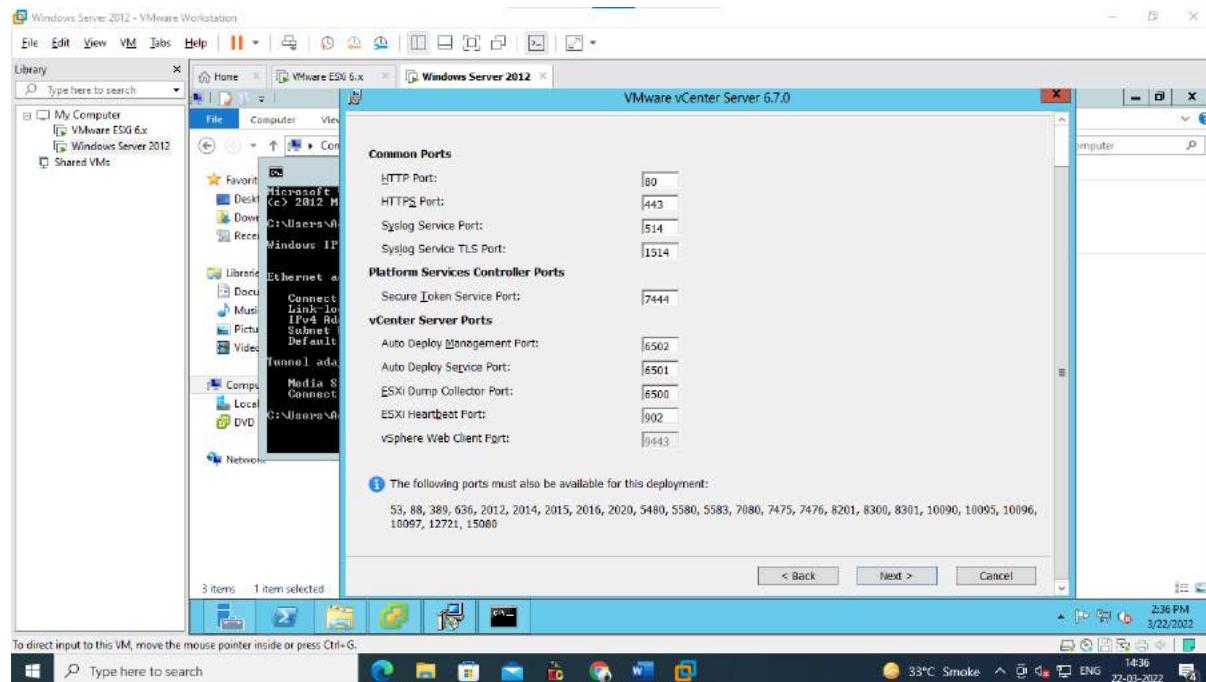
**Step 12:** Select **Use Windows Local System Account** option and click on **Next >** button.



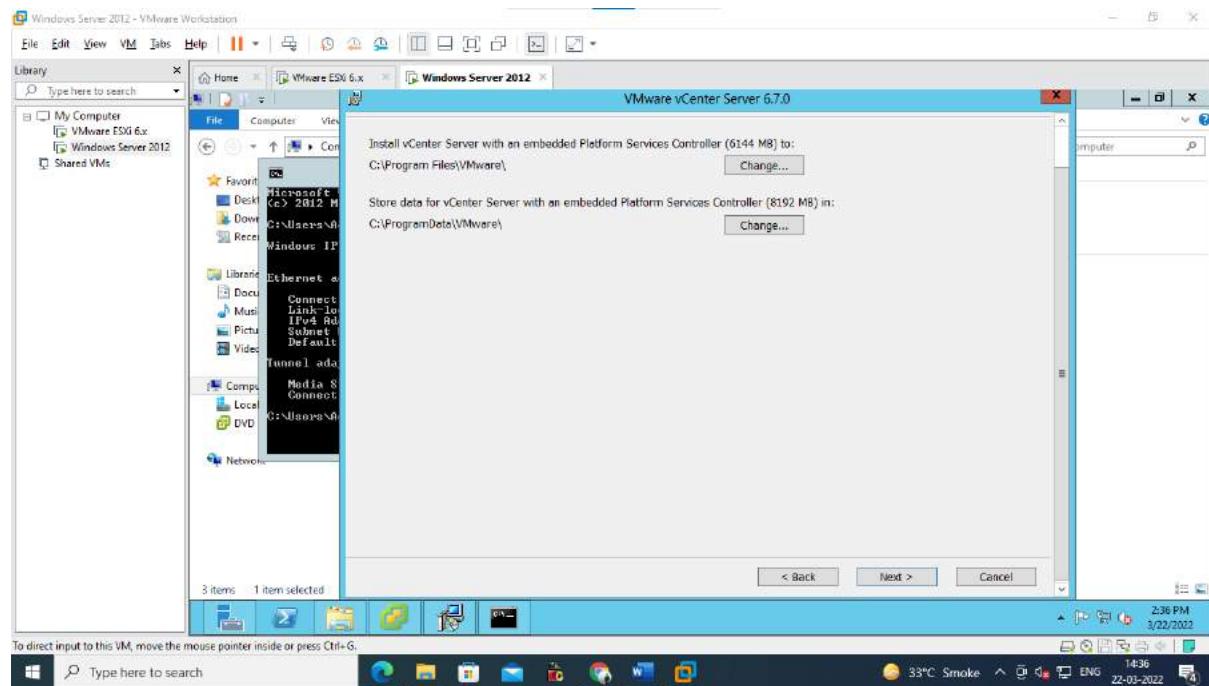
**Step 13:** Select **Use an embedded database (VMware Postgres)** option and click on **Next >** button.



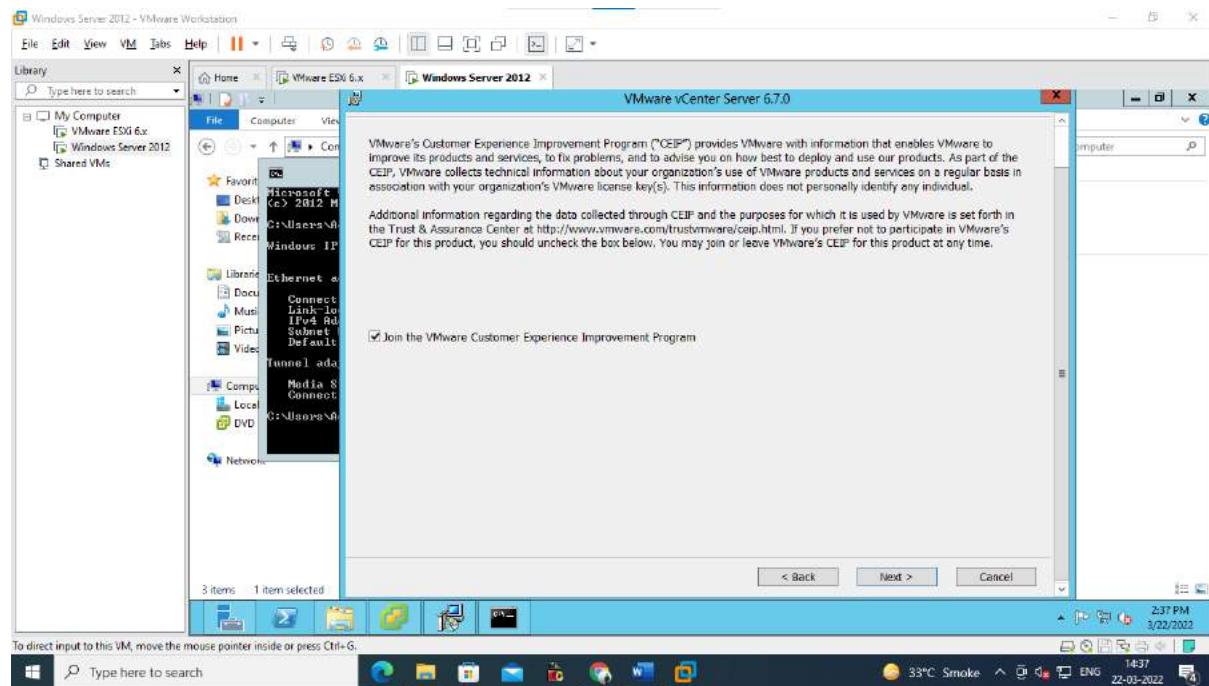
**Step 14:** Click on **Next >** button.

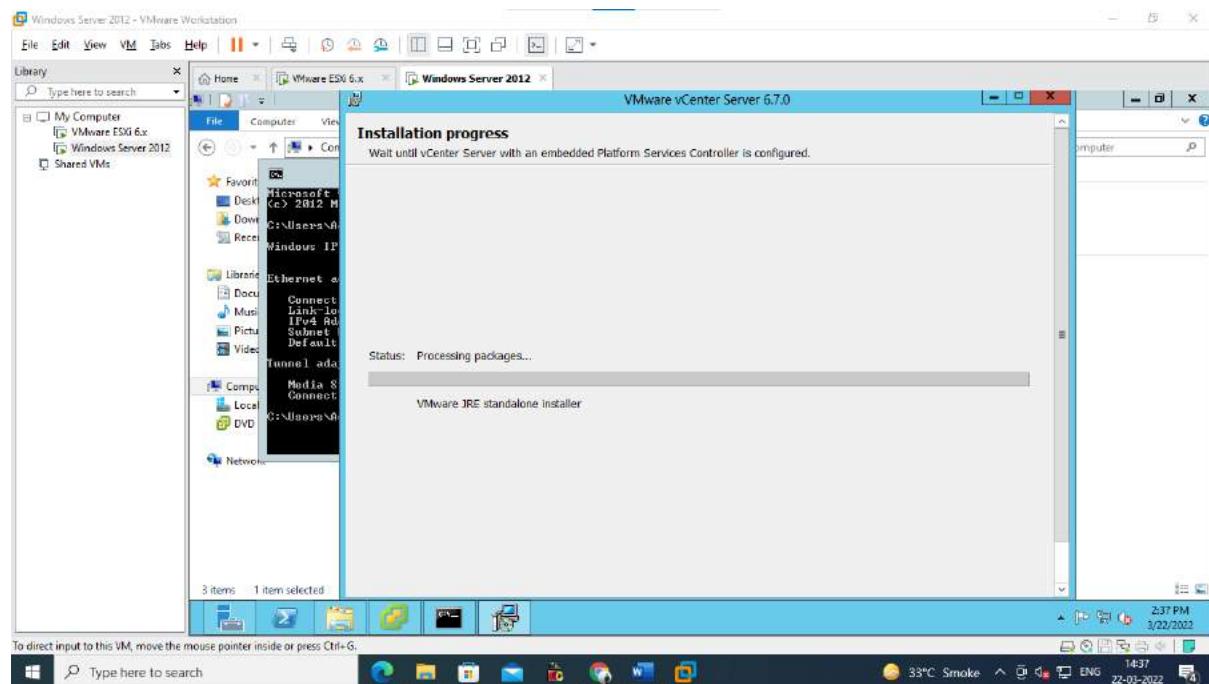
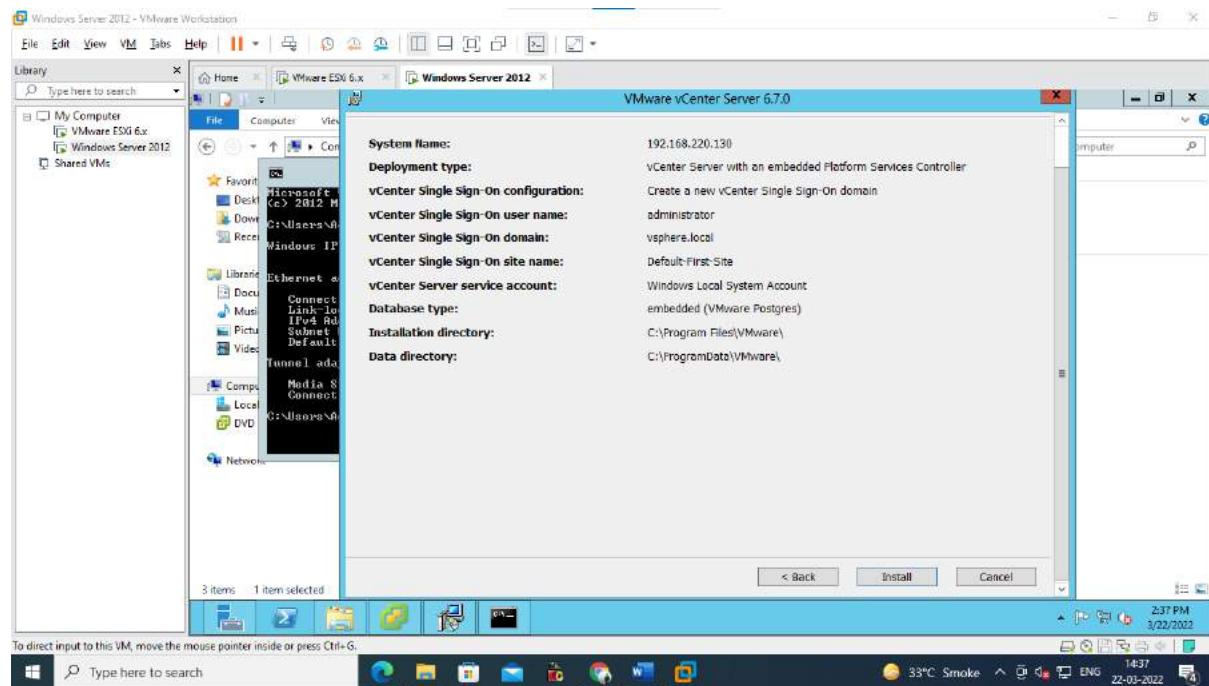


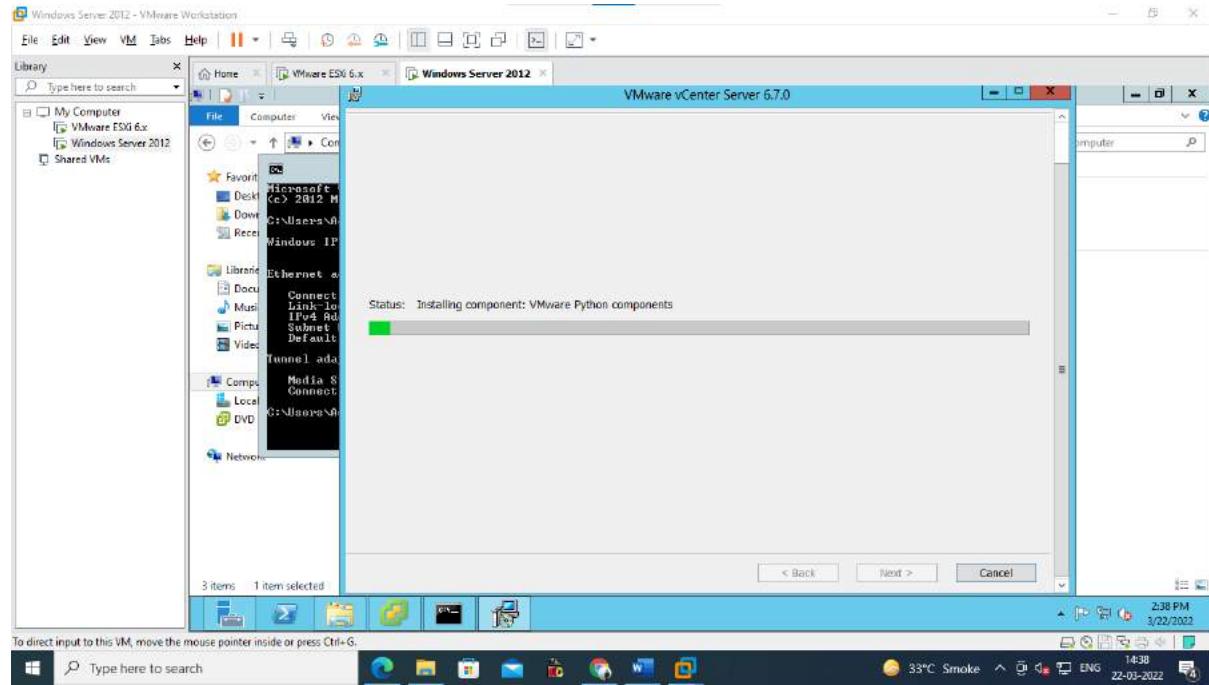
**Step 15:** Click on **Next >** button.



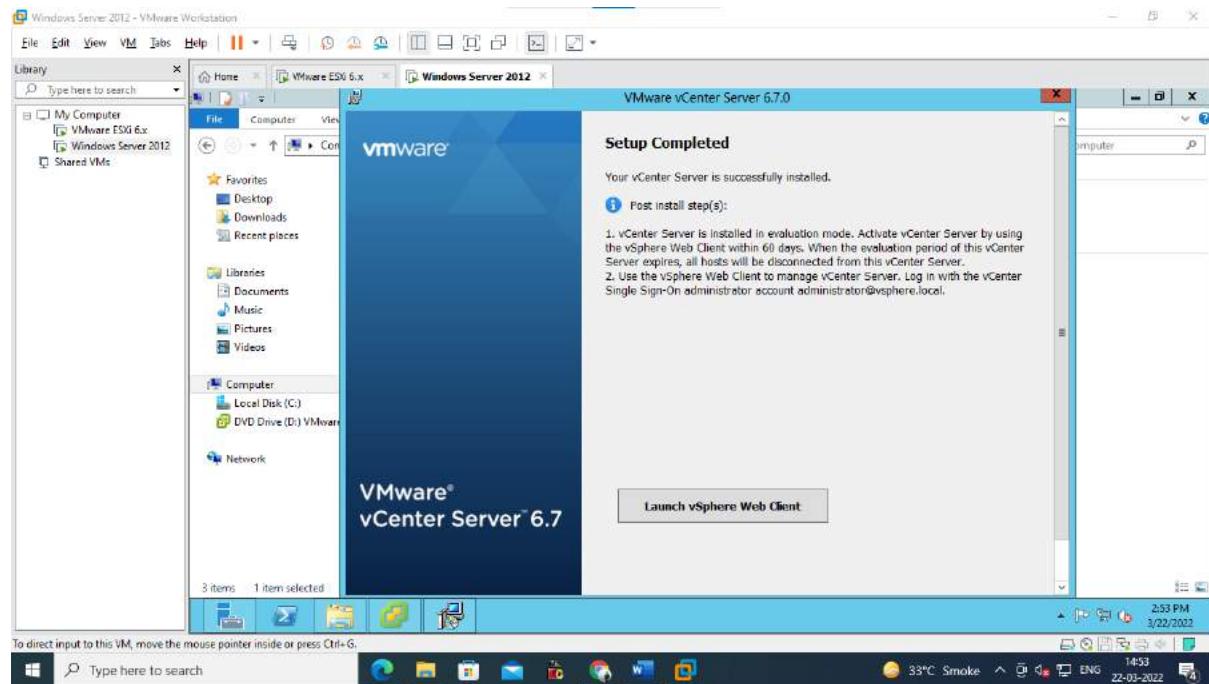
**Step 16:** Click on **Next >** button.



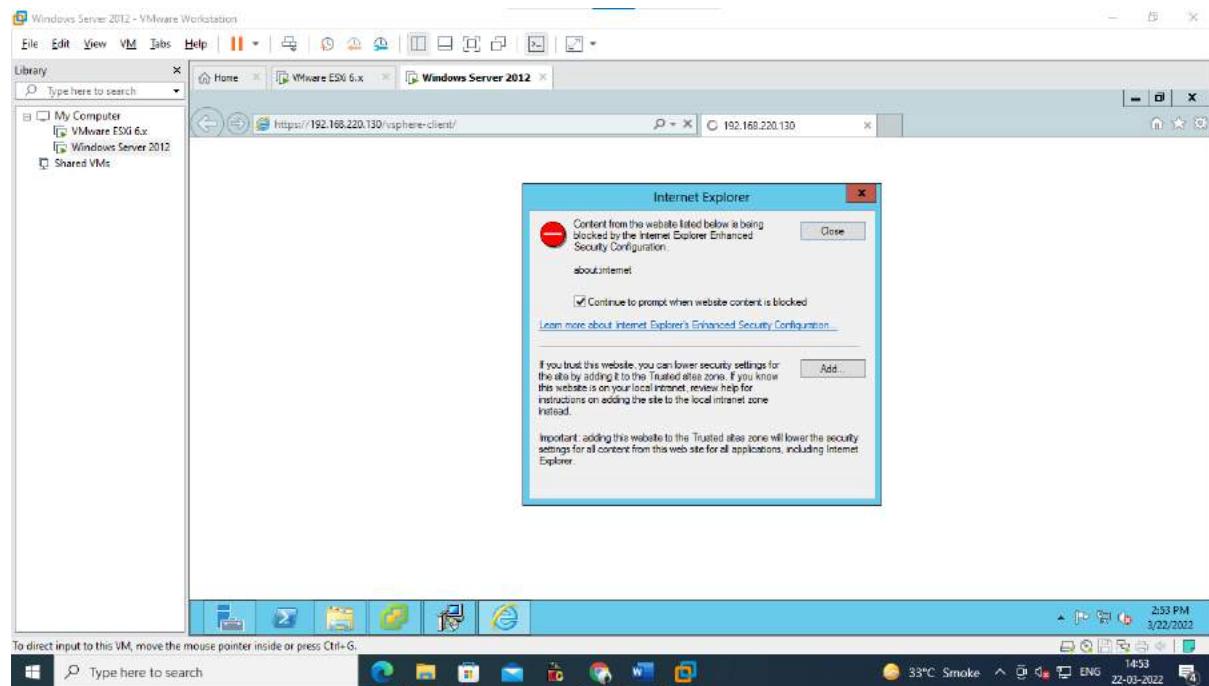
**Step 17: Click on Install button.**



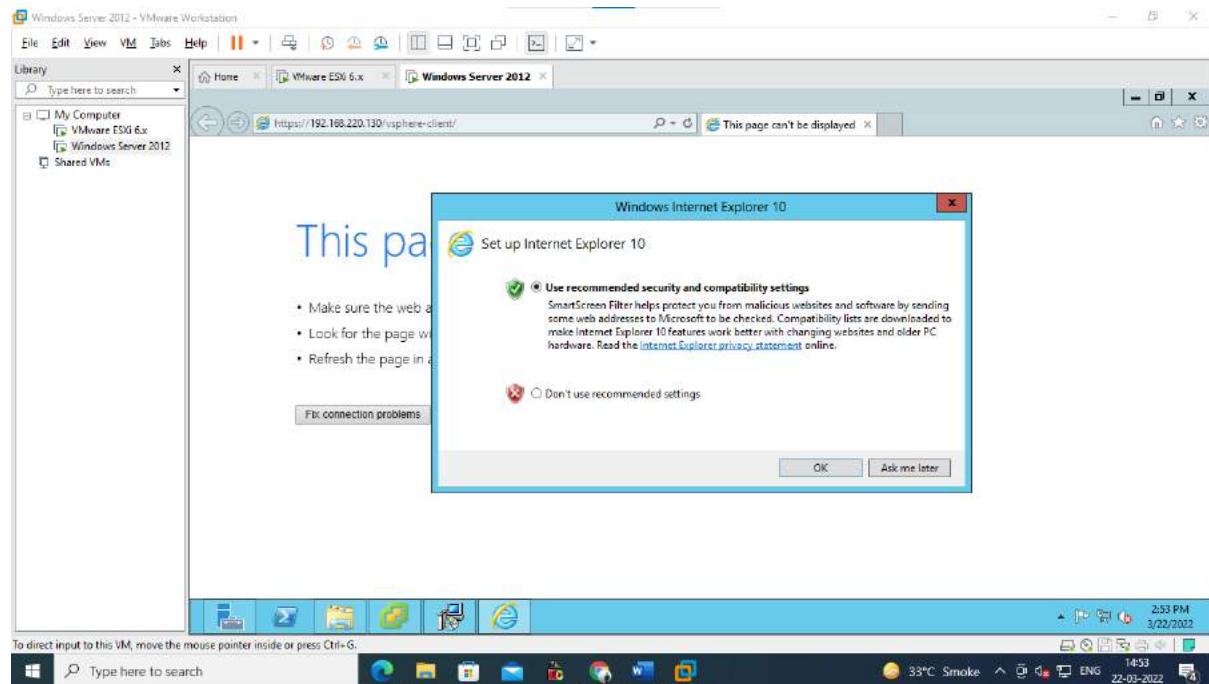
**Step 18:** After complete installation then click on **Launch vSphere Web Client** button.



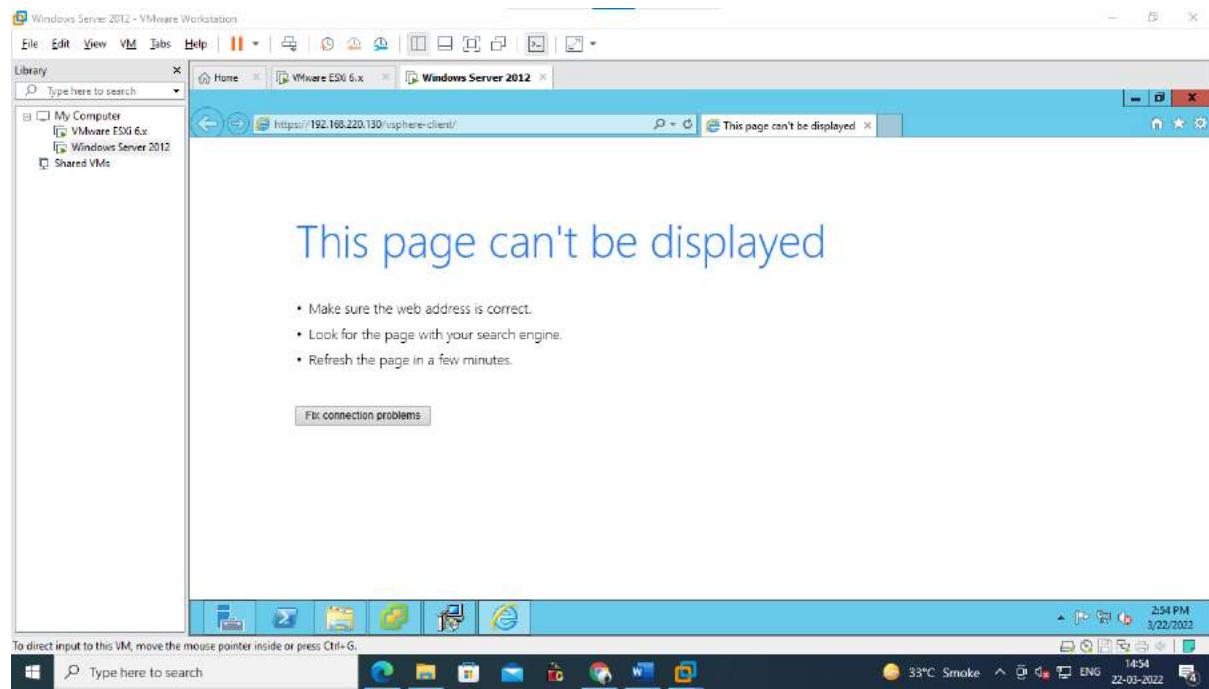
**Step 19(A): Click on Close button.**



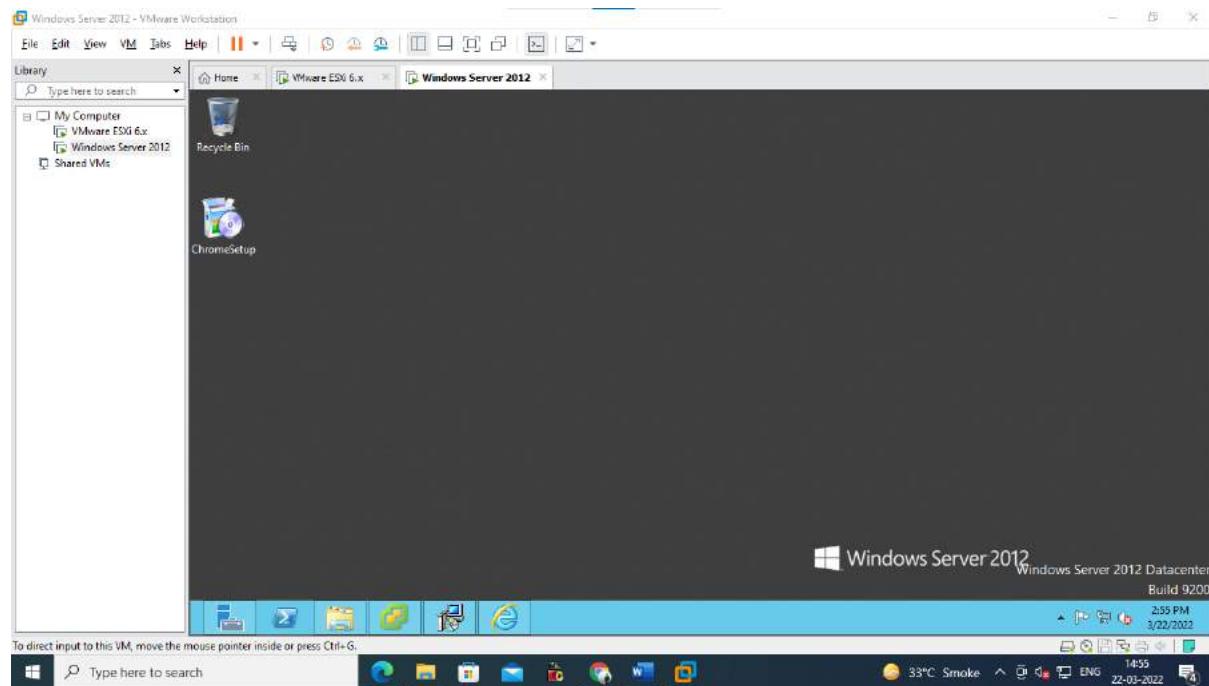
**Step 19(B): Select Use recommended security and compatibility settings option and Click on OK button.**

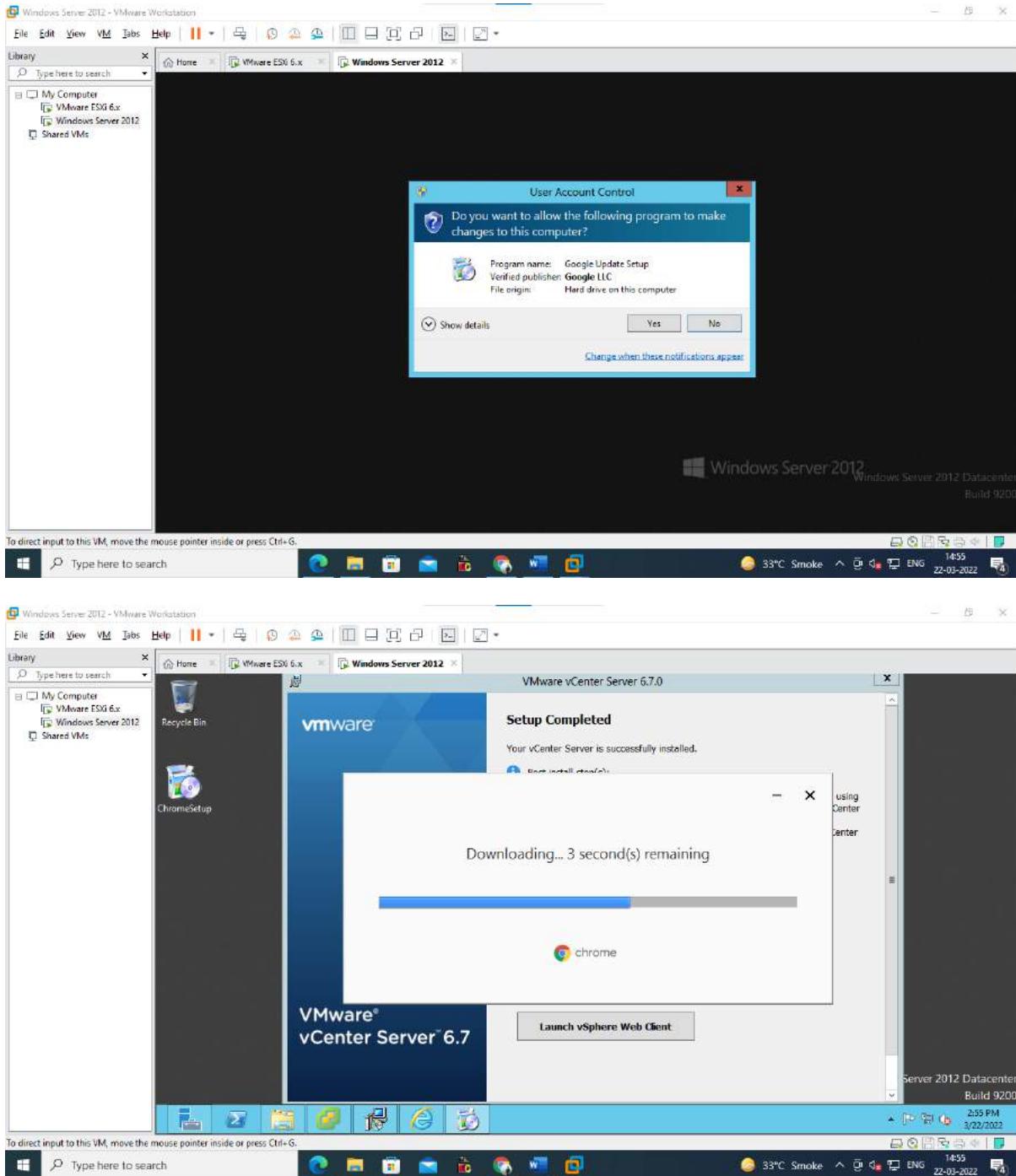


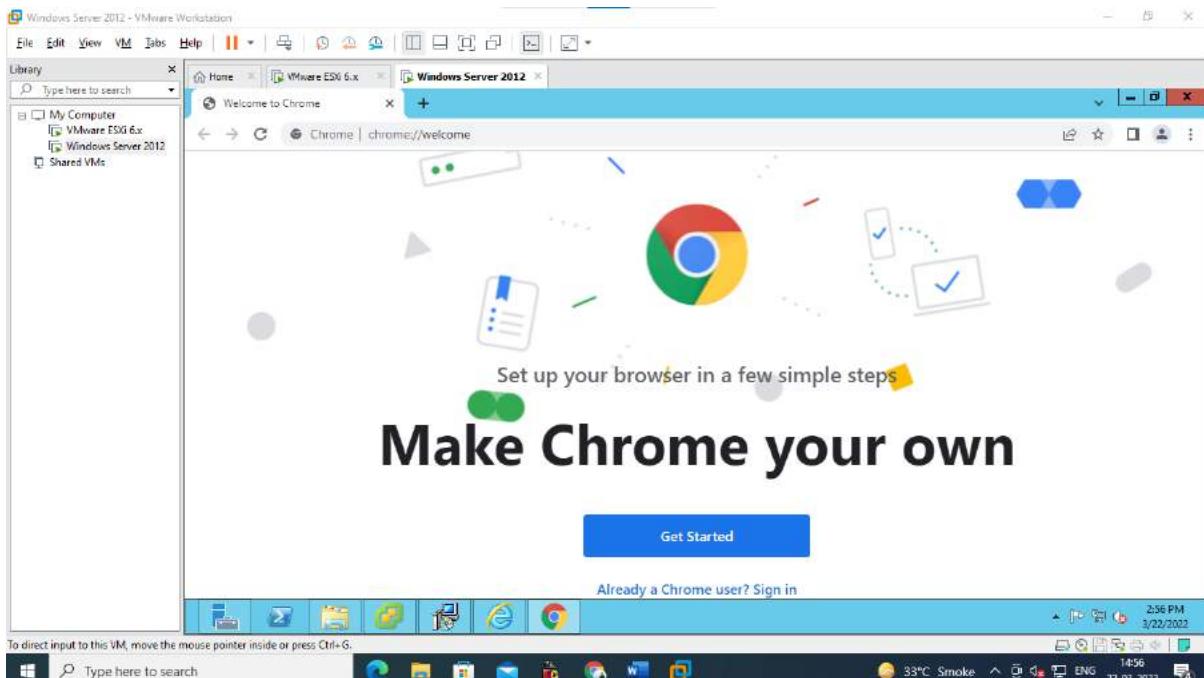
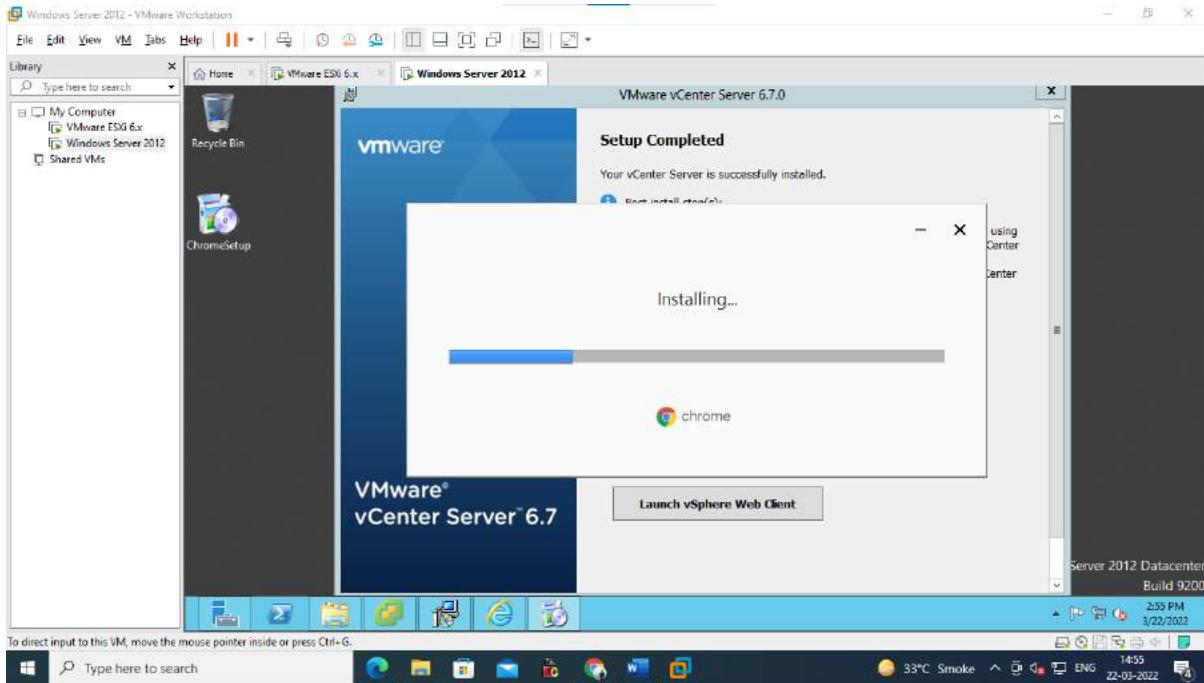
**Step 19(C): Copy the URL.**

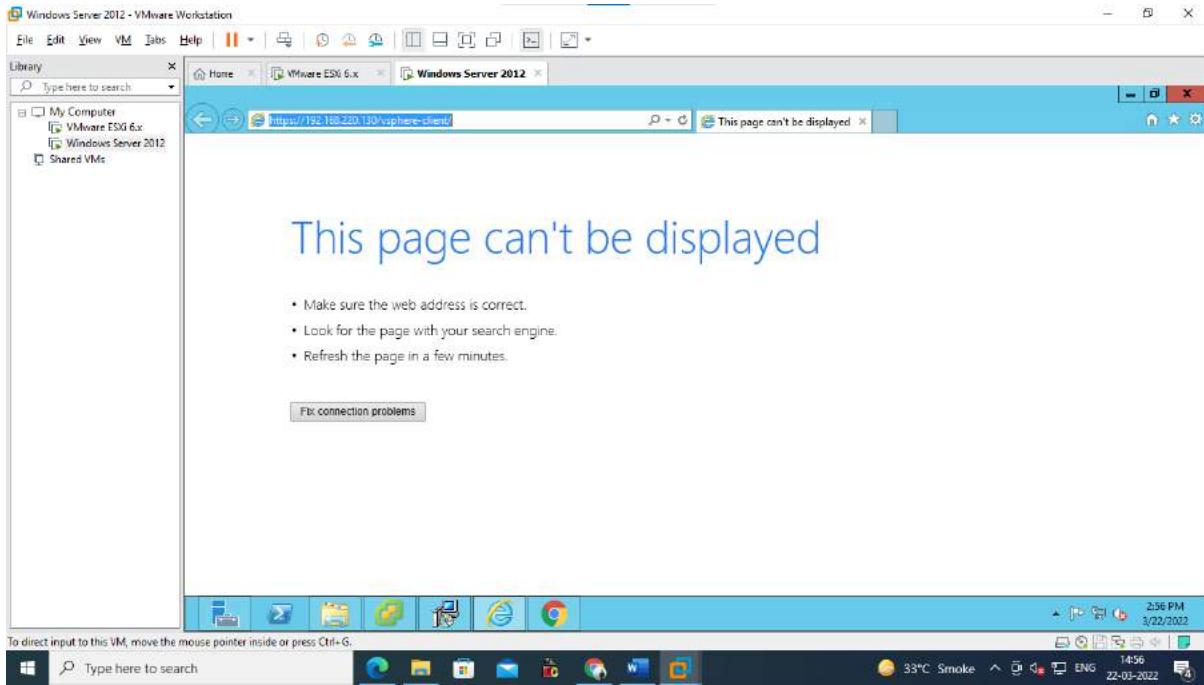


**Step 20: Install Google Chrome setup.**

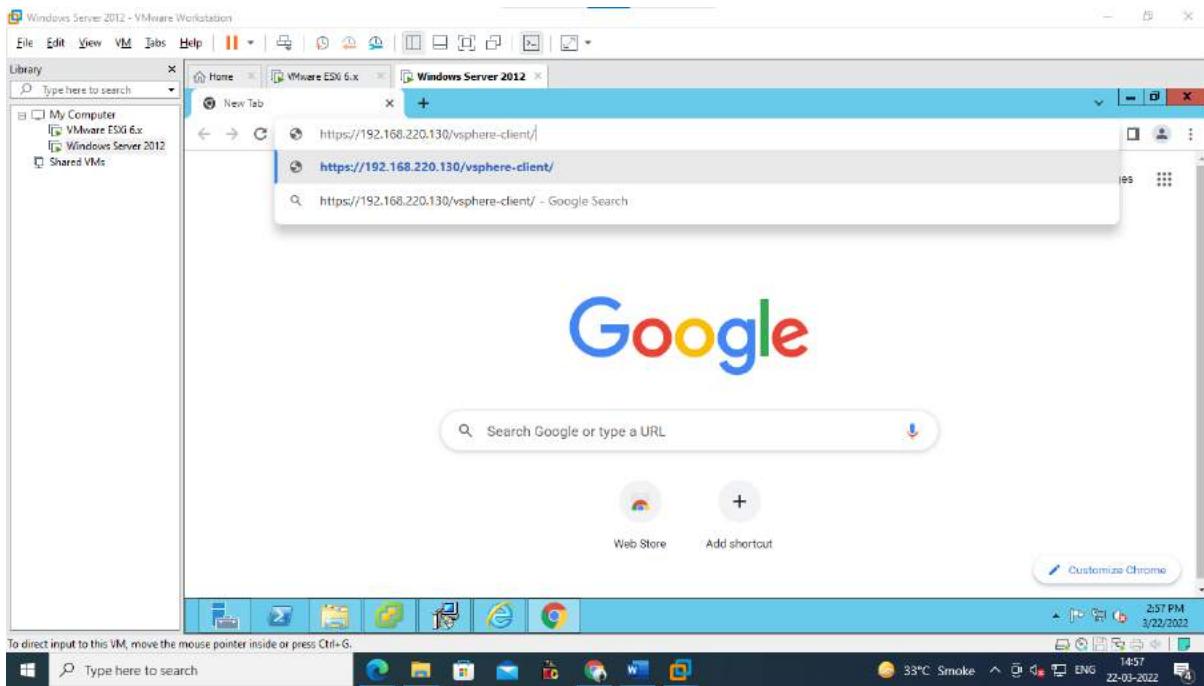




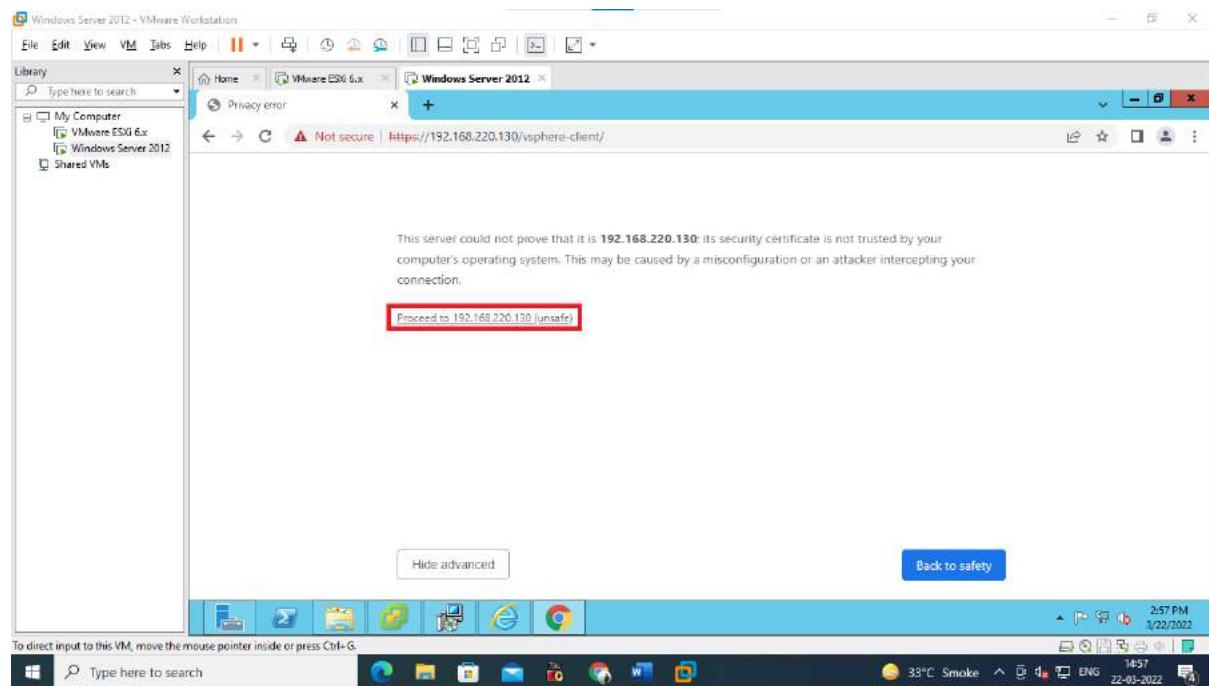
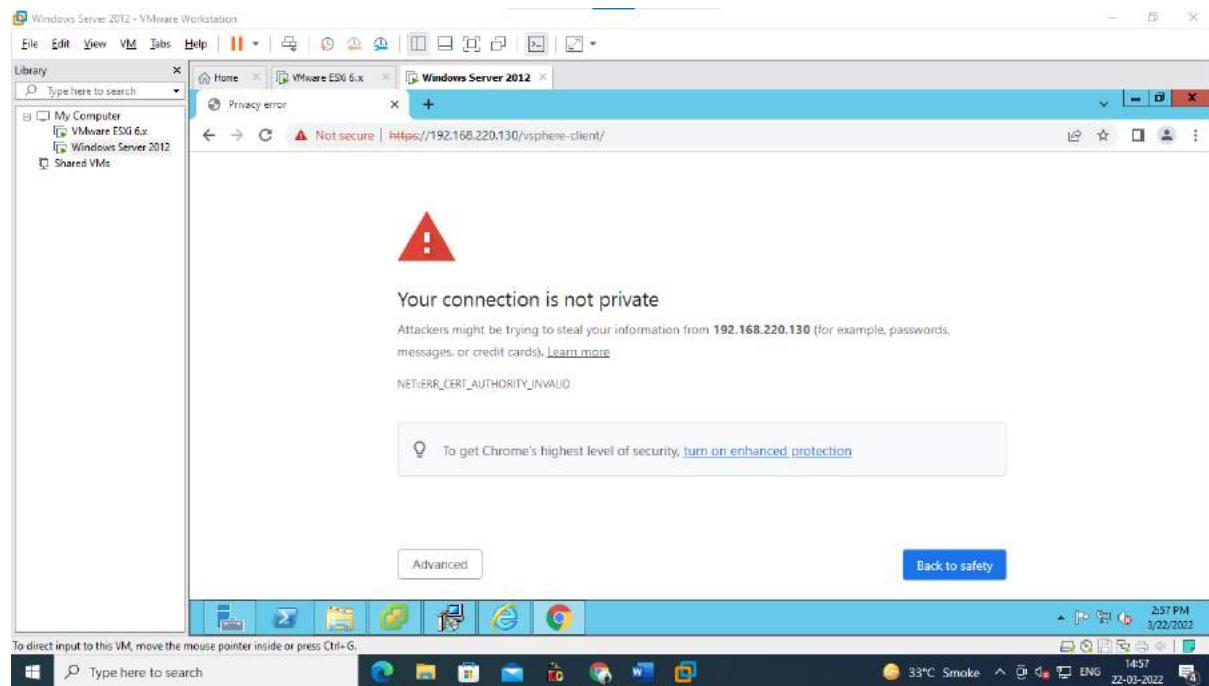




**Step 21:** Paste the copied URL on chrome.



**Step 22:** Click on **Advanced** button and then click on **Proceed to 192.168.220.130(unsafe)** link.

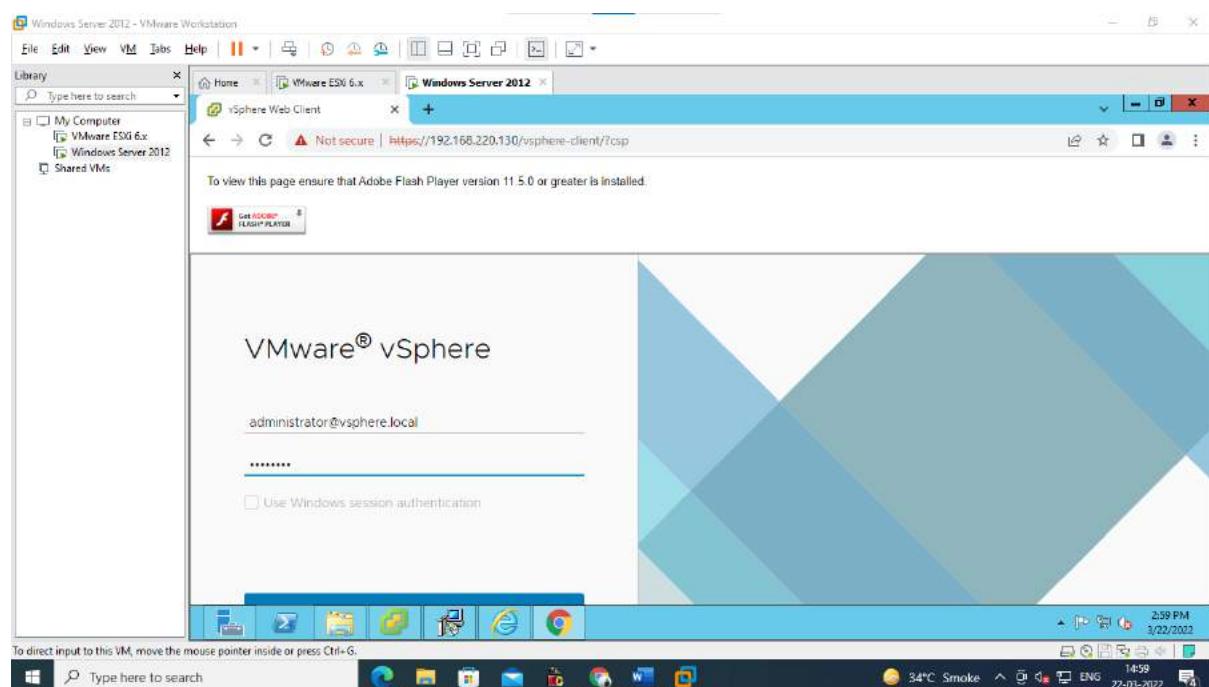
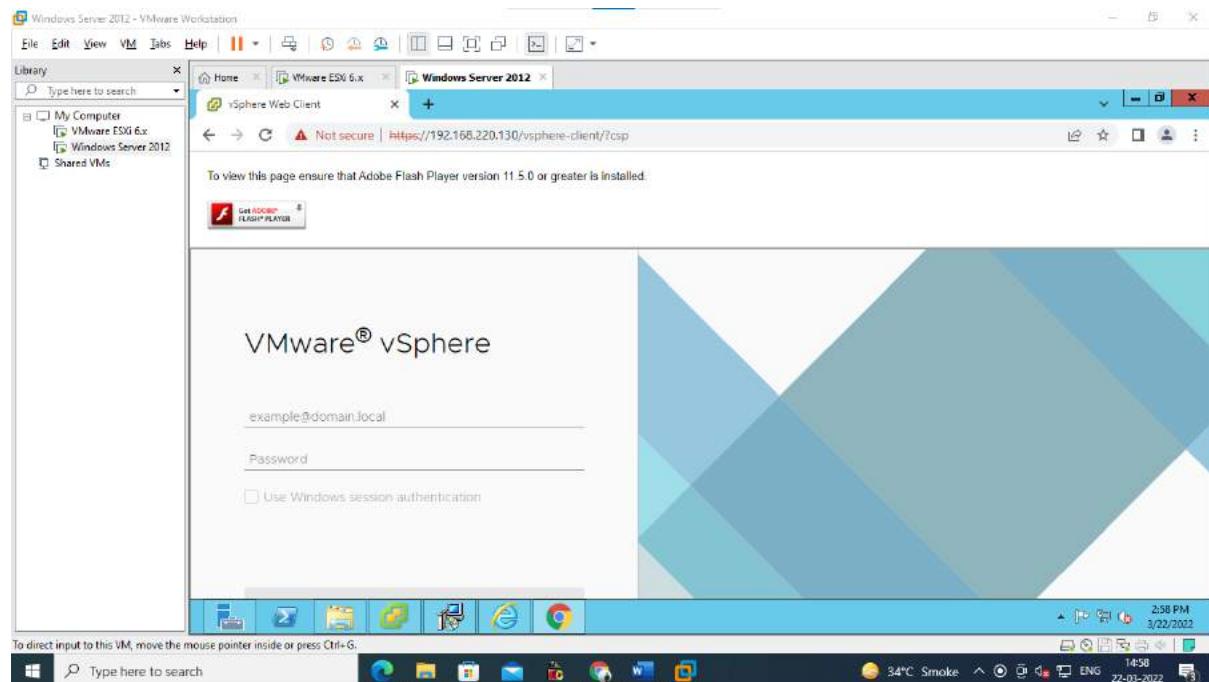


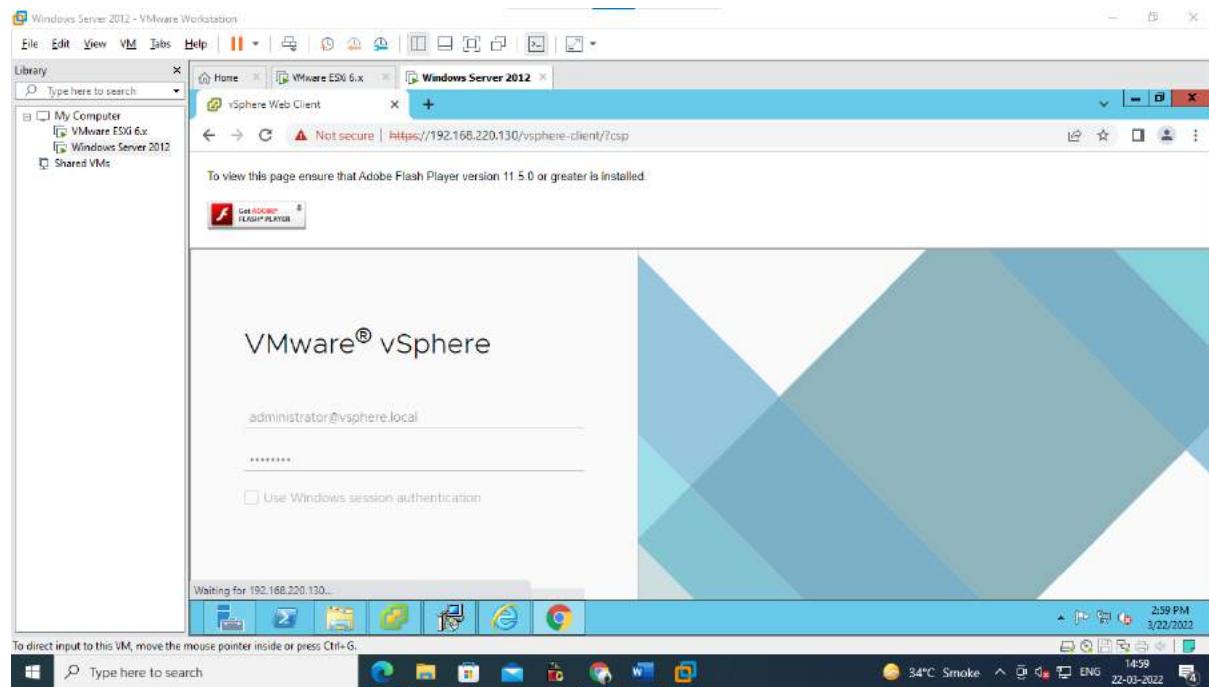
**Step 23:** In VMware vSphere login screen enter the **User name** and **password** and then click on **login** button.

**URL:** [192.168.220.130/vsphere-client](https://192.168.220.130/vsphere-client)

**Username:** [administartor@vsphere.local](mailto:administartor@vsphere.local)

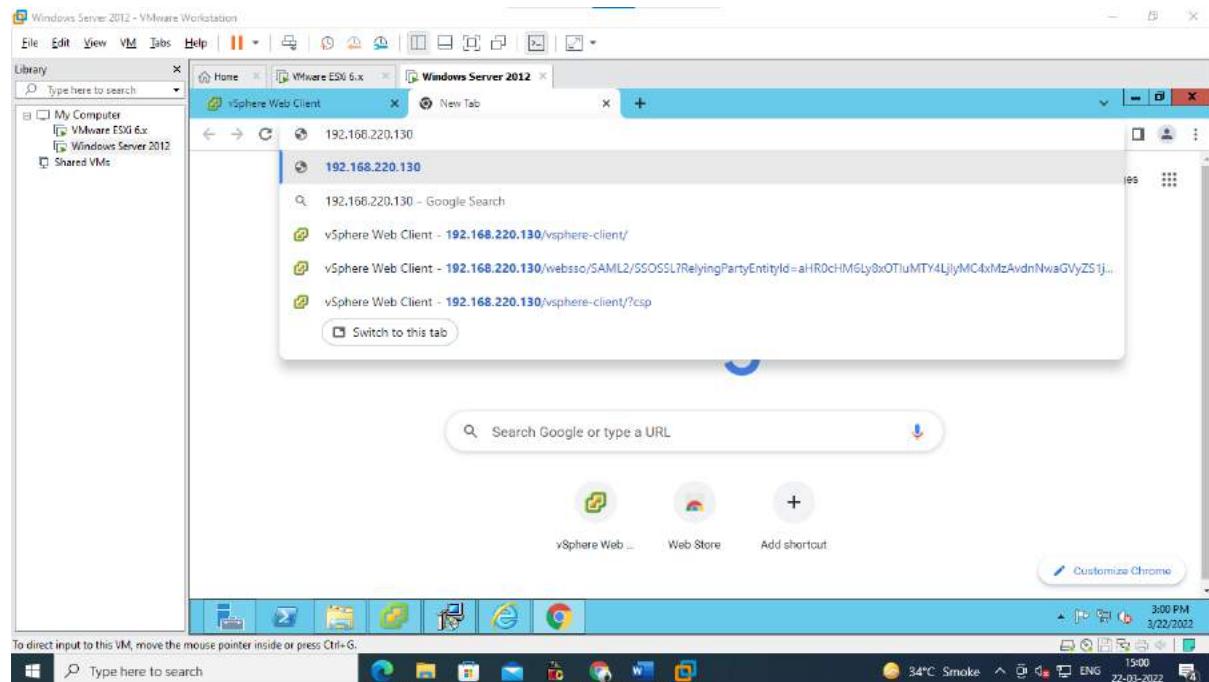
**Password:** lt@13579

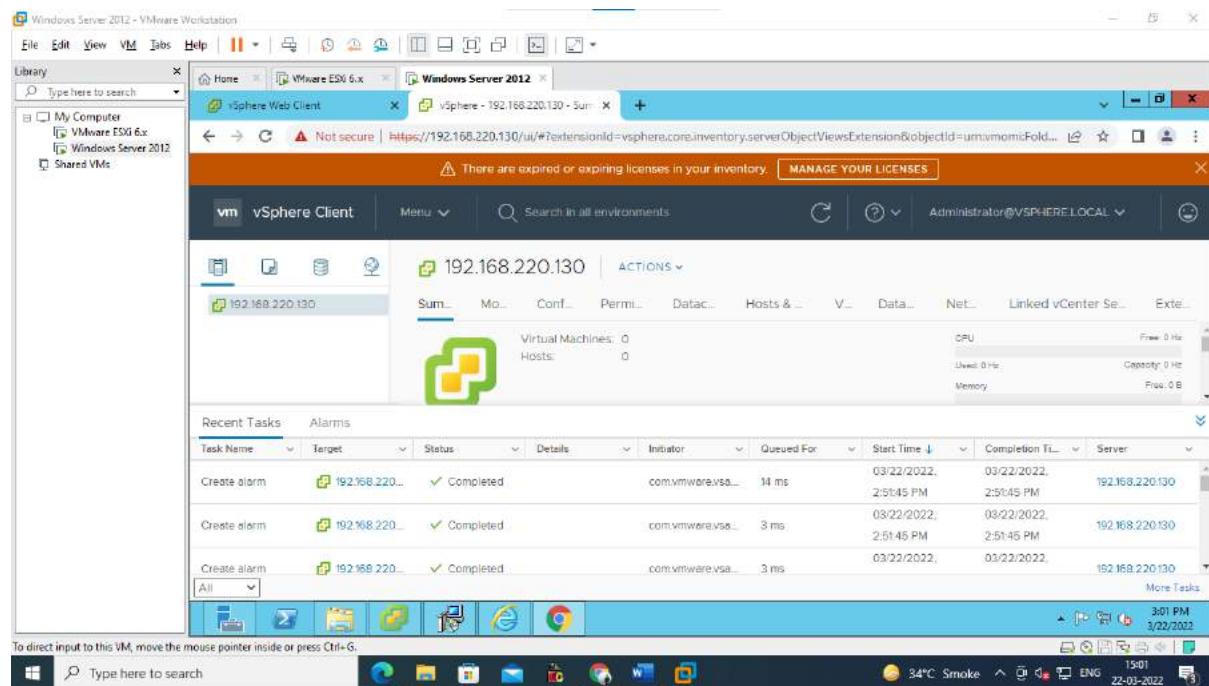
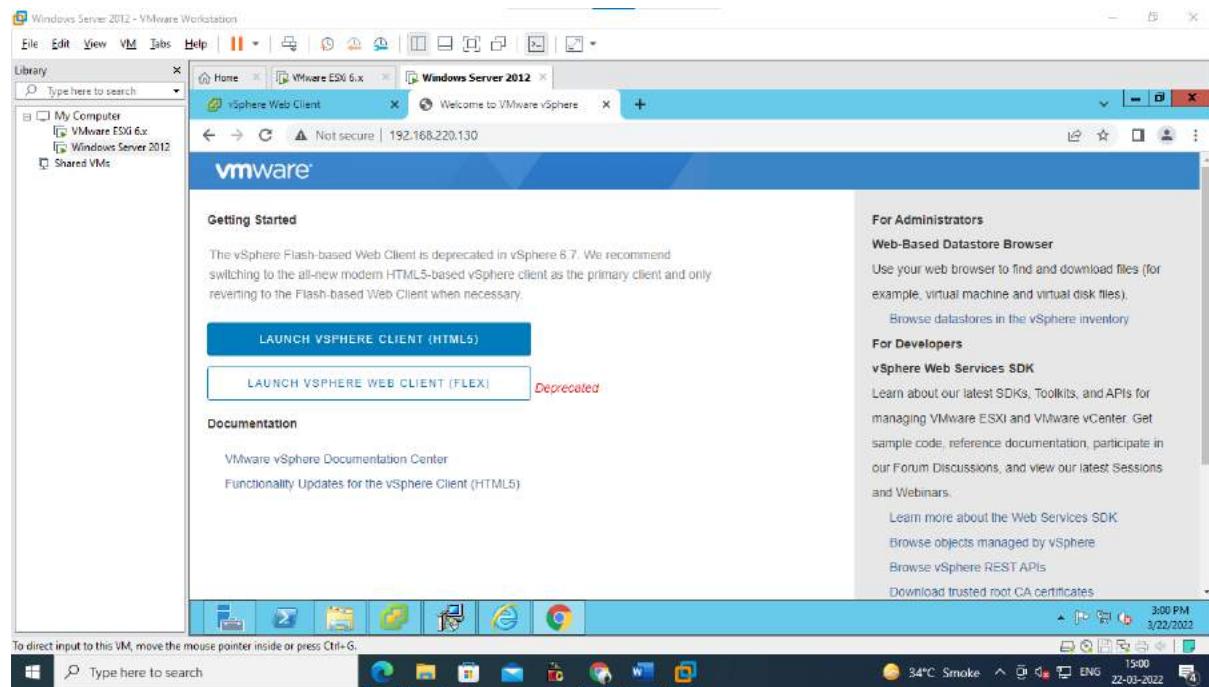




**Step 24:** Enter the below link in chrome browser and click on **LAUNCH VSPHERE CLIENT(HTML5)** button.

<http://192.168.220.130/>





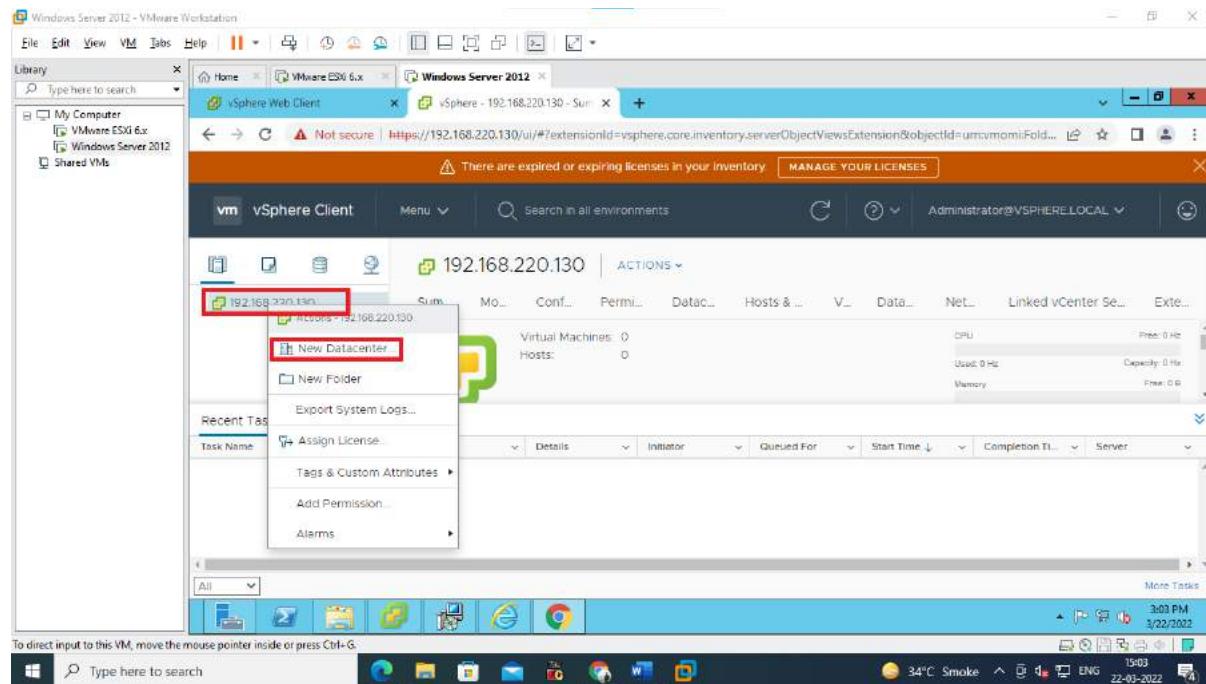
## Practical 2: Manage VMwareESXi server with vCentre server

### A. Create a virtual machine in vmwareESXi Server

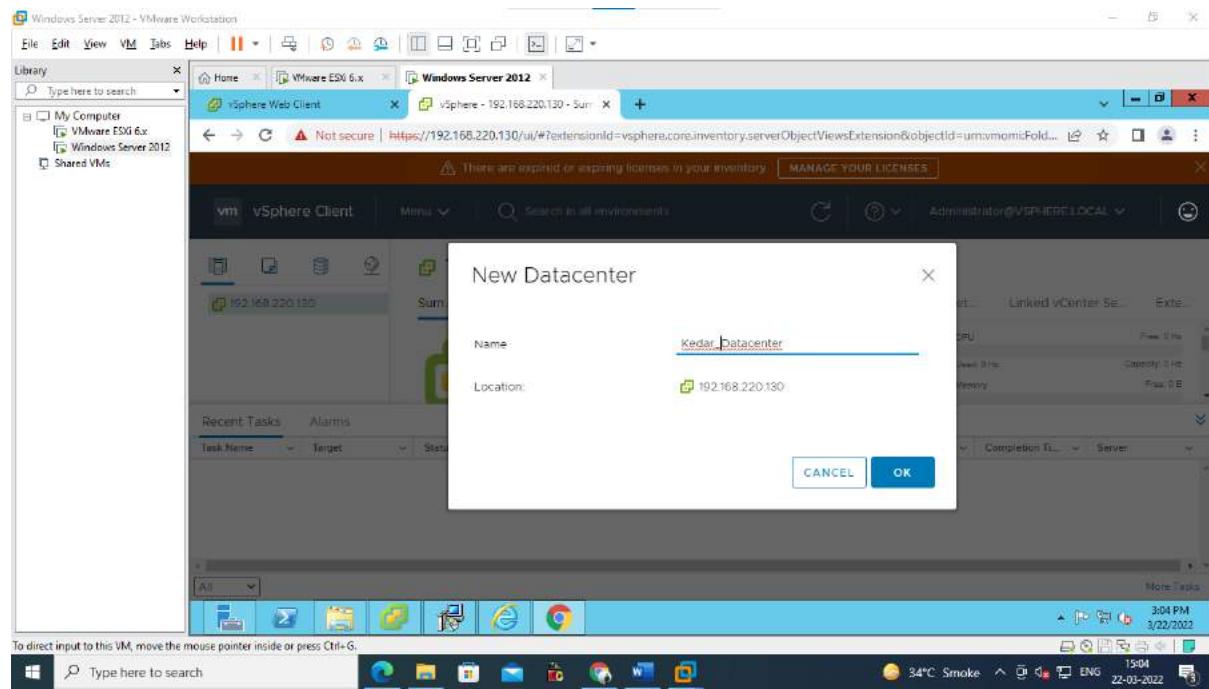
- Create New Datacenter and add host on it.

#### Step 1: Create a New Datacenter.

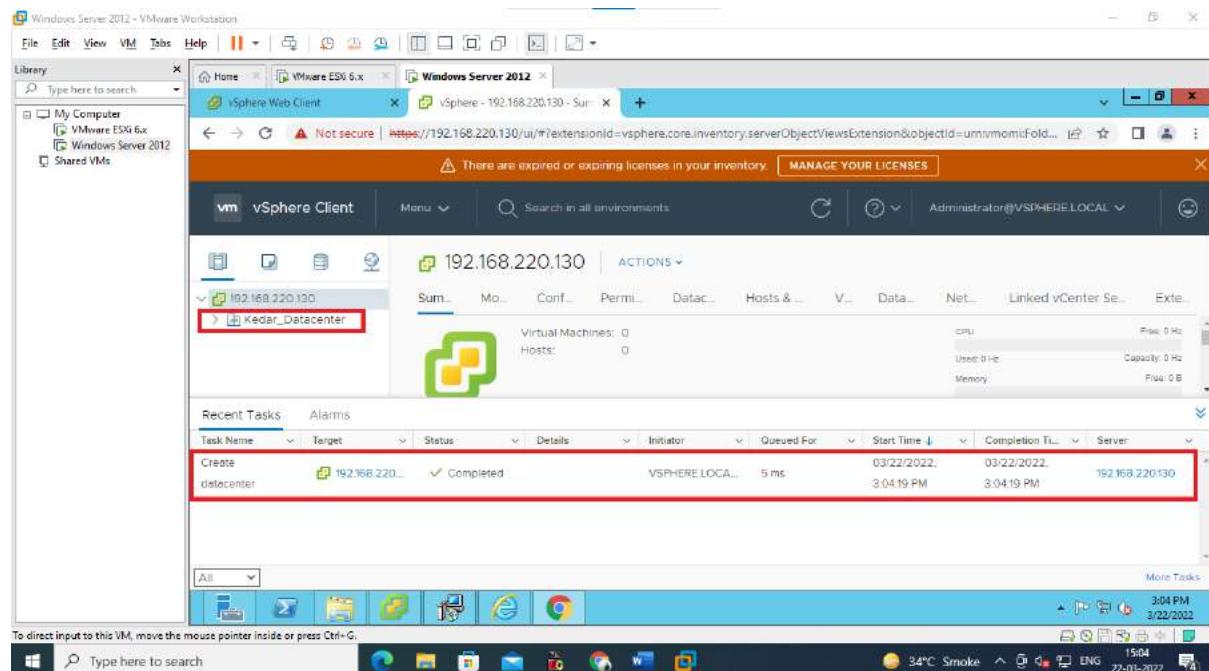
Right click on system (192.168.220.130) and select option as **New Datacenter...**



**Step 2:** Enter the name of New Datacenter and click on **OK** button.

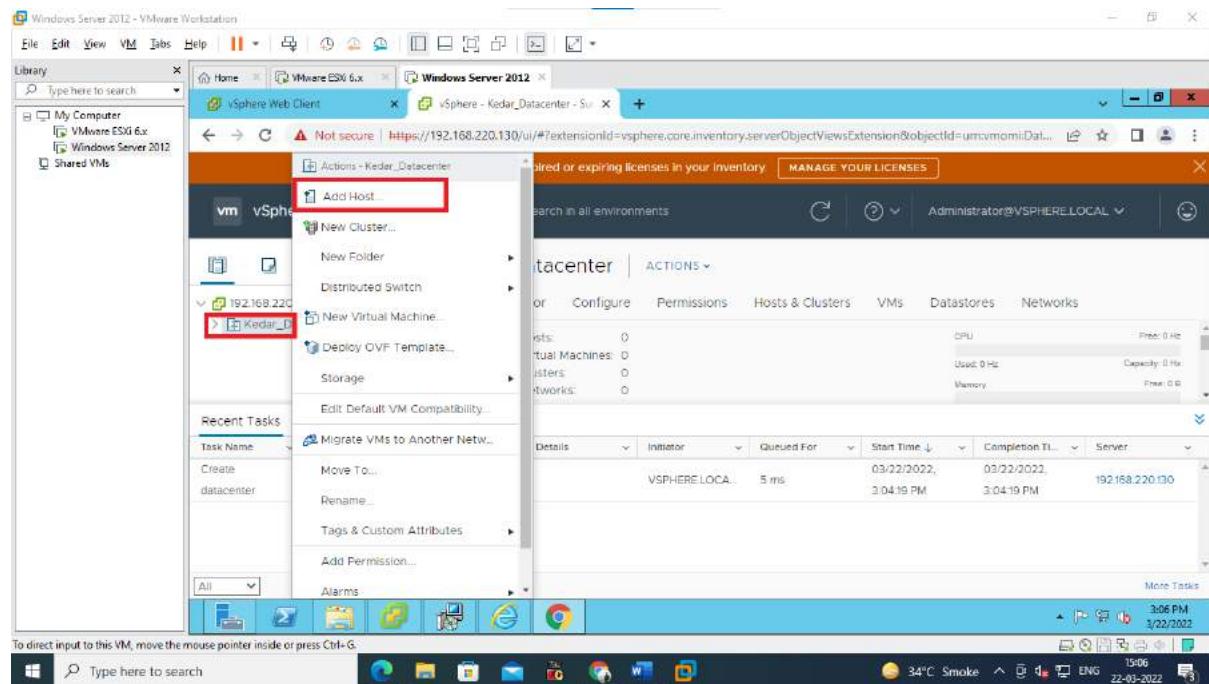


New Datacenter created and showed in Recent task.



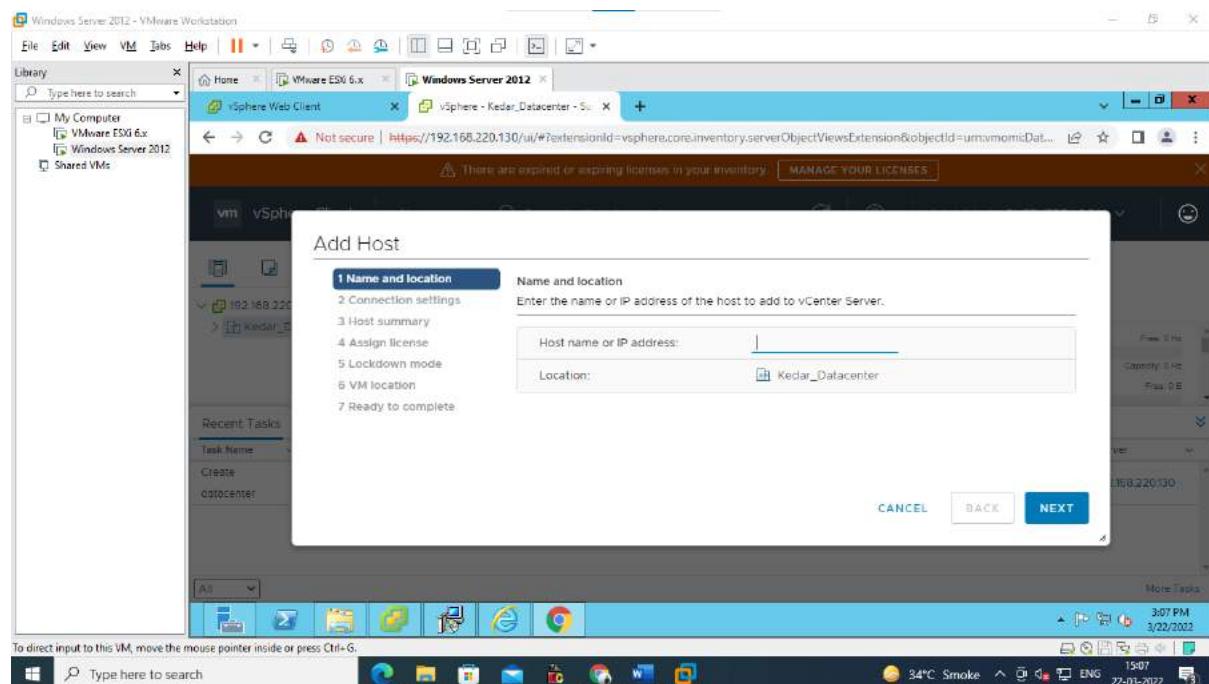
### Step 3: Create a New Host.

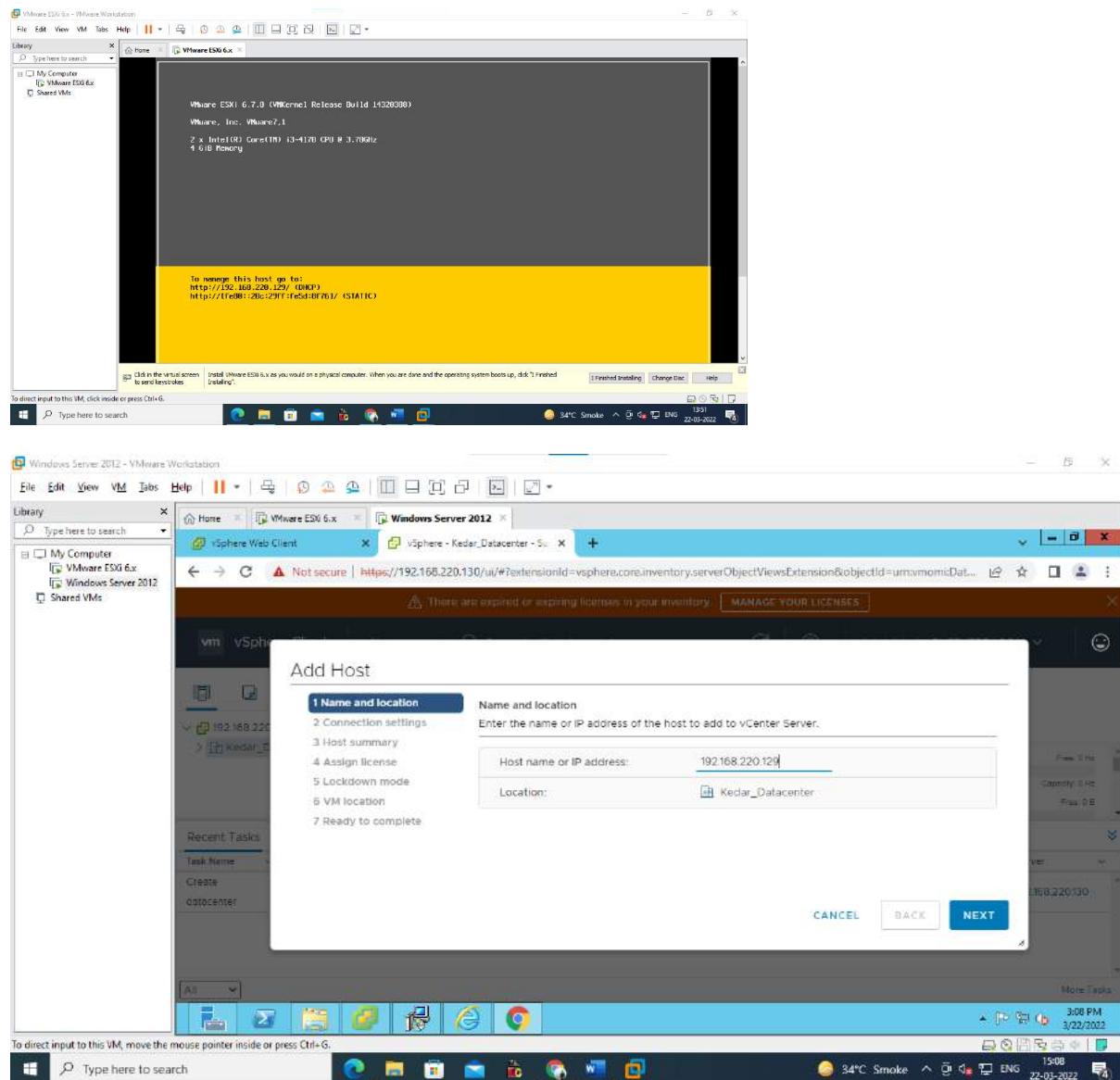
Right click on **Datacenter** and Select **Add Host...** option.



### Step 4: Enter the copied IP address (i.e., Practical No:1 A last) in host name or IP

address field and Click on **Next** button.

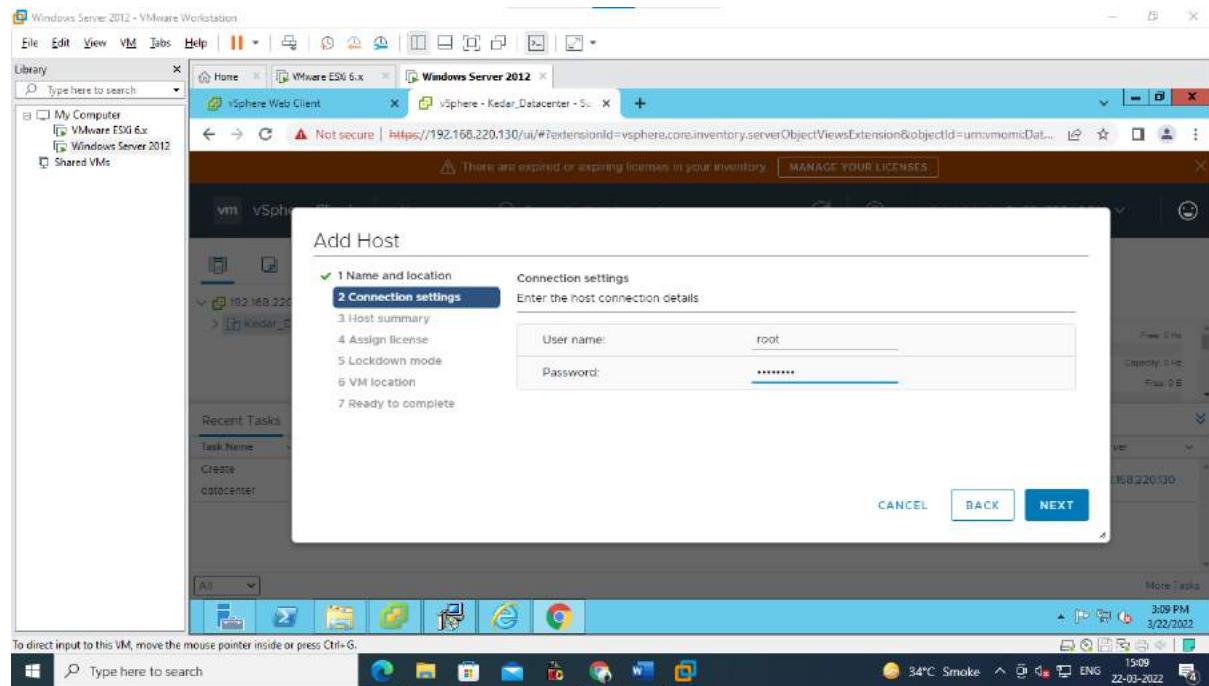




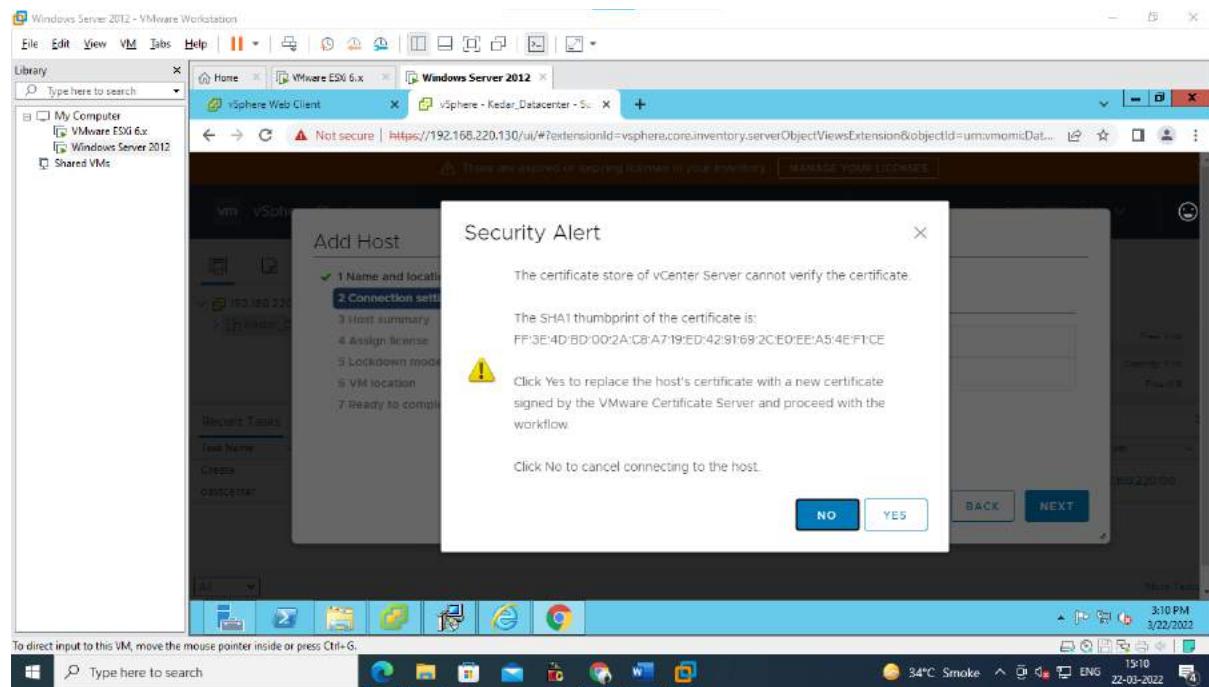
**Step 5:** Enter User name and Password and Click on **Next** button.

**User Name:** root

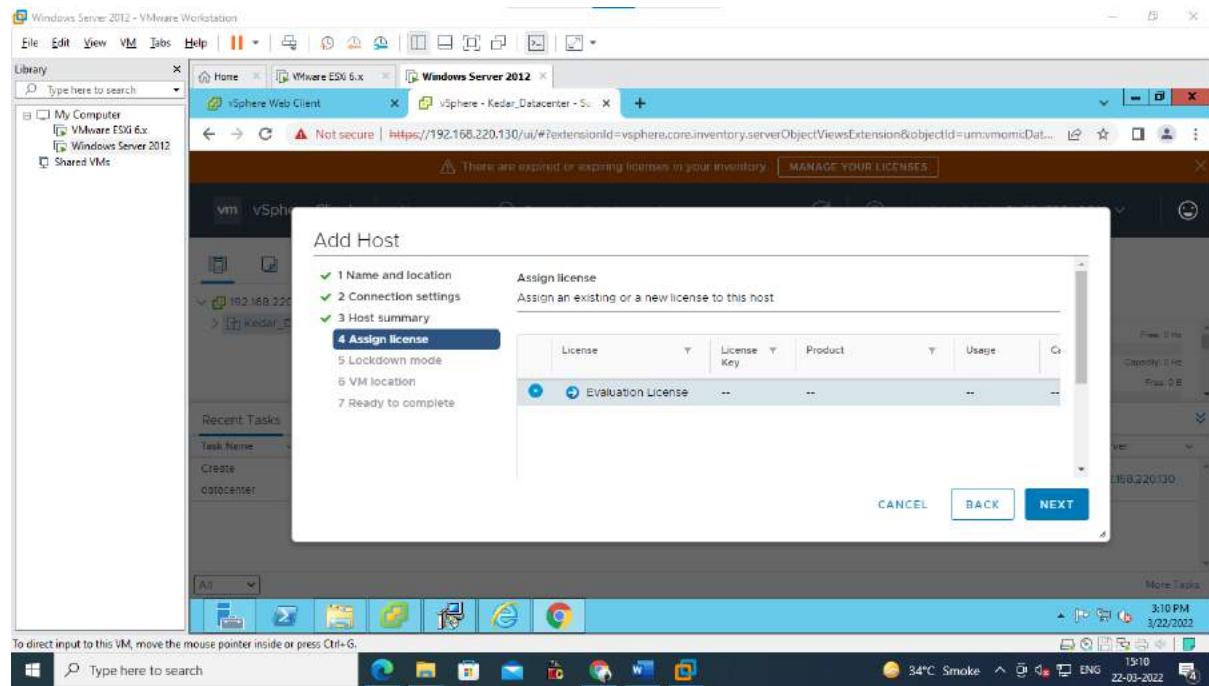
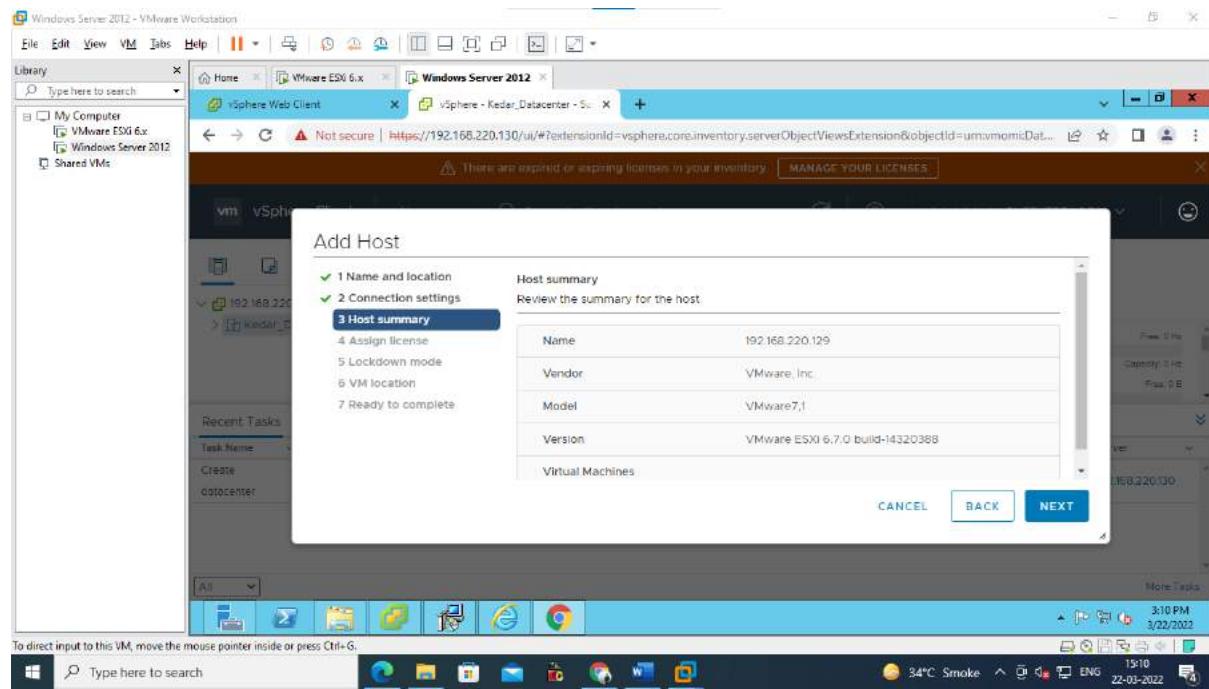
**Password:** lt@13579

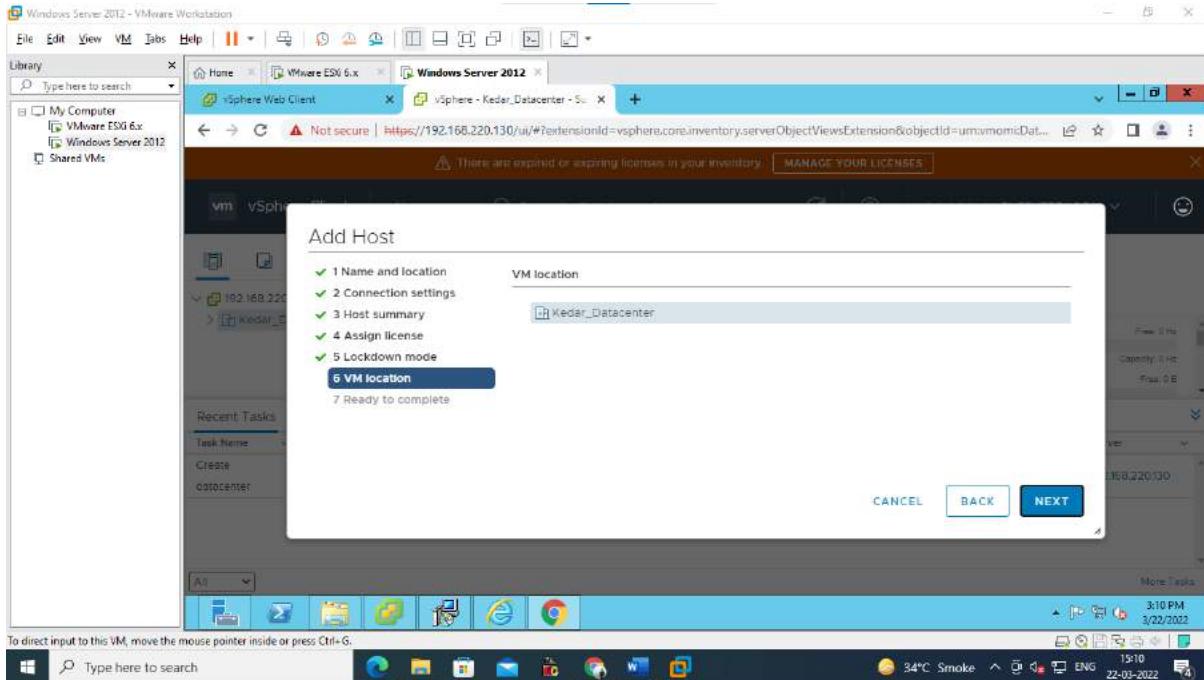
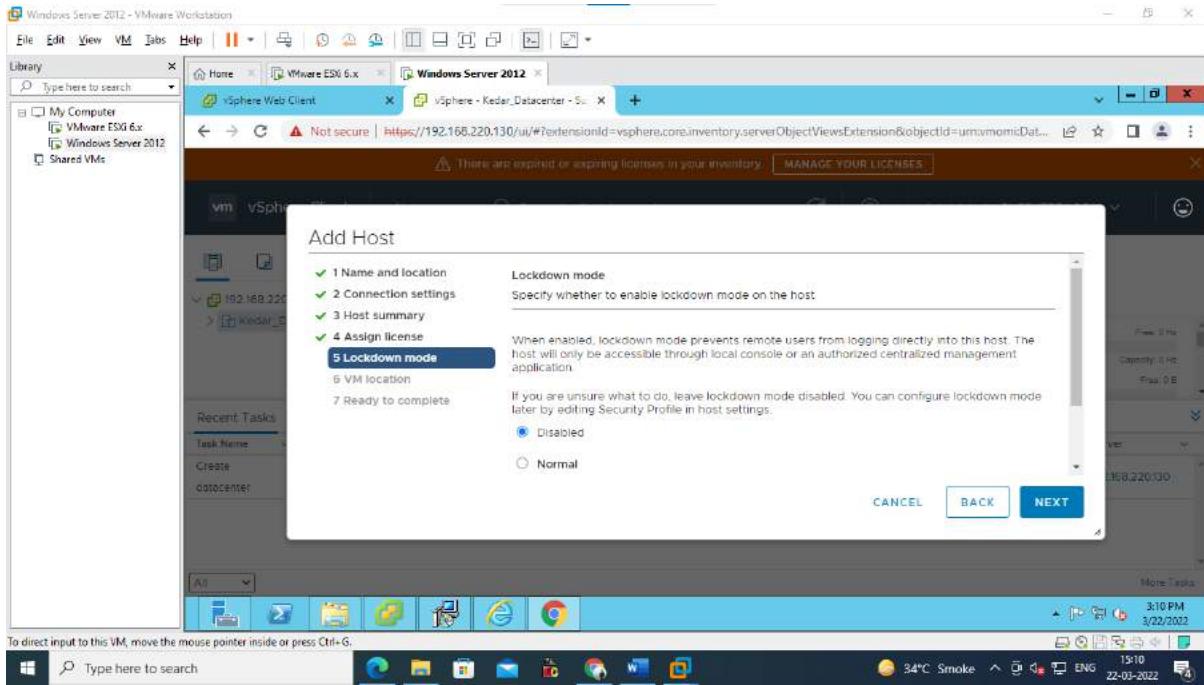


Click on **Yes** button

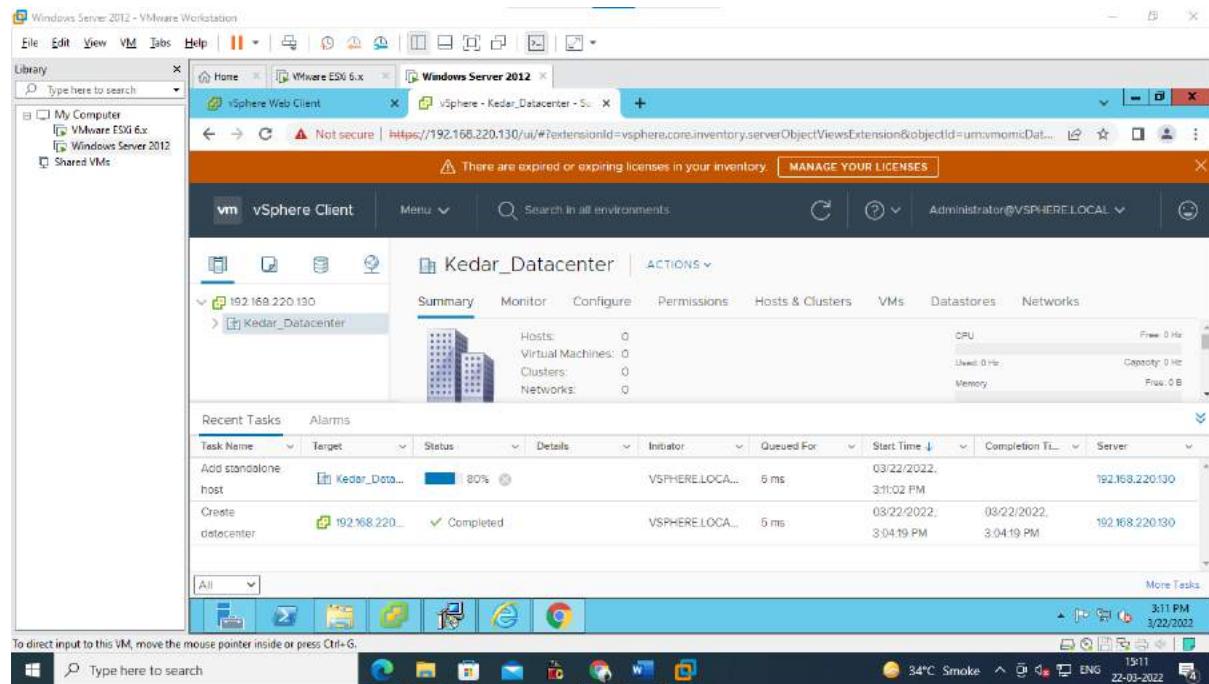
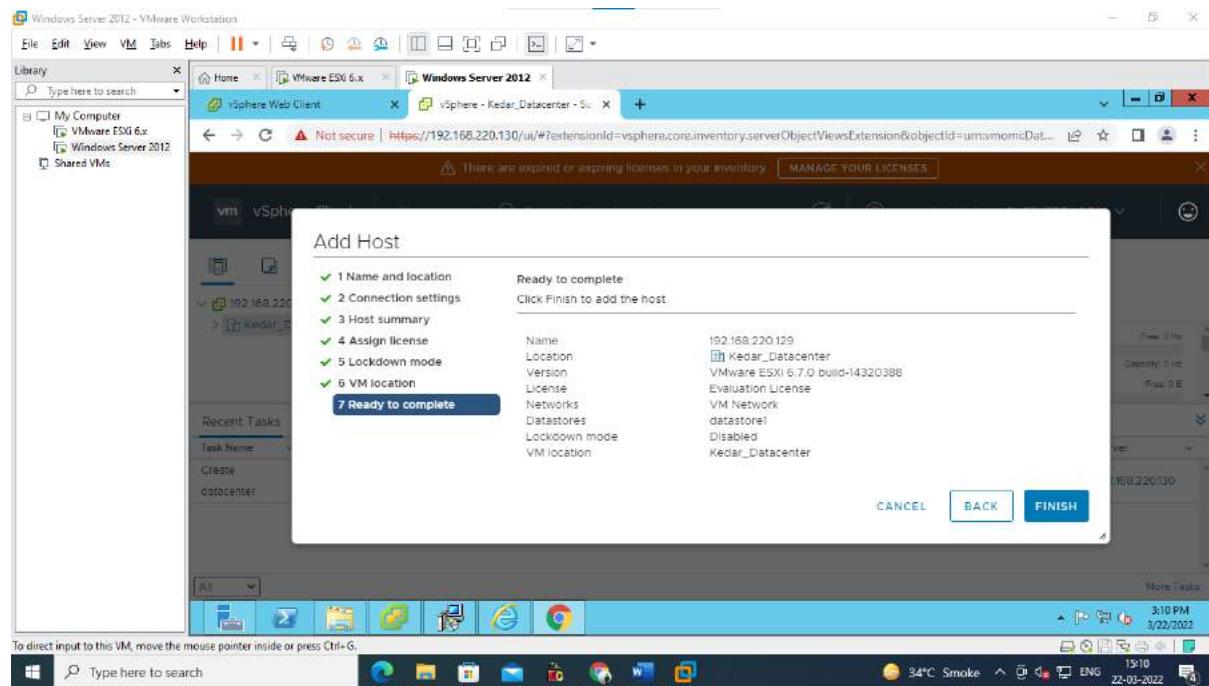


## Step 6: Click on Next button.

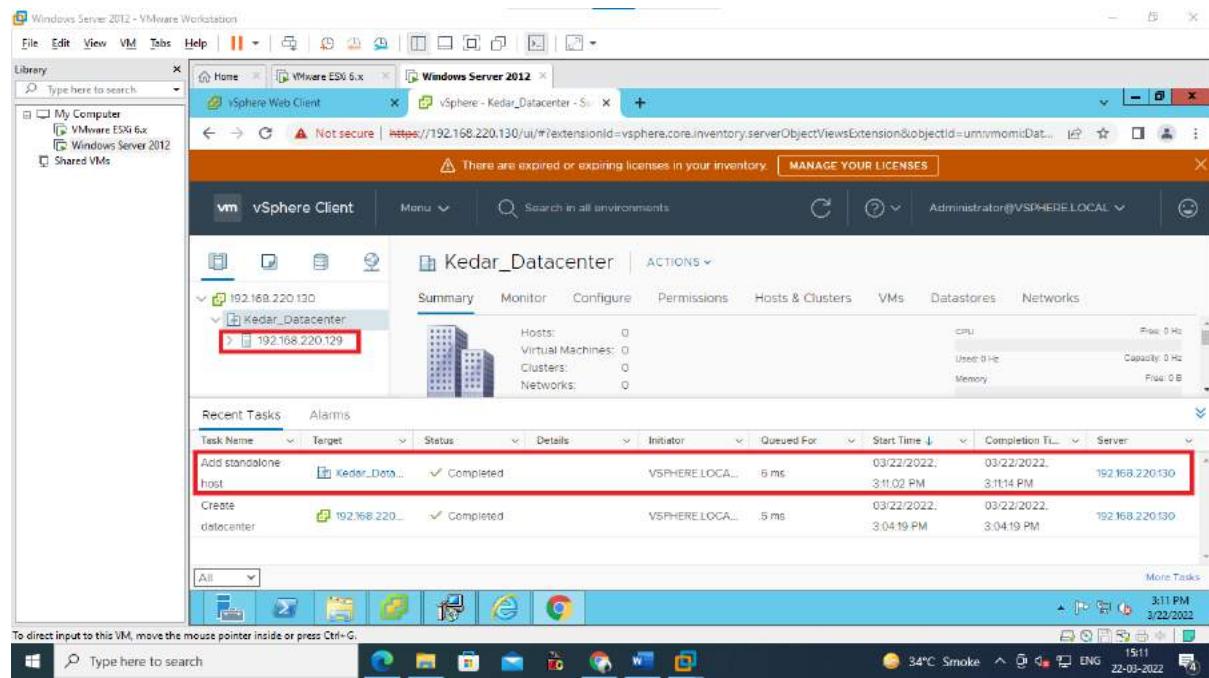




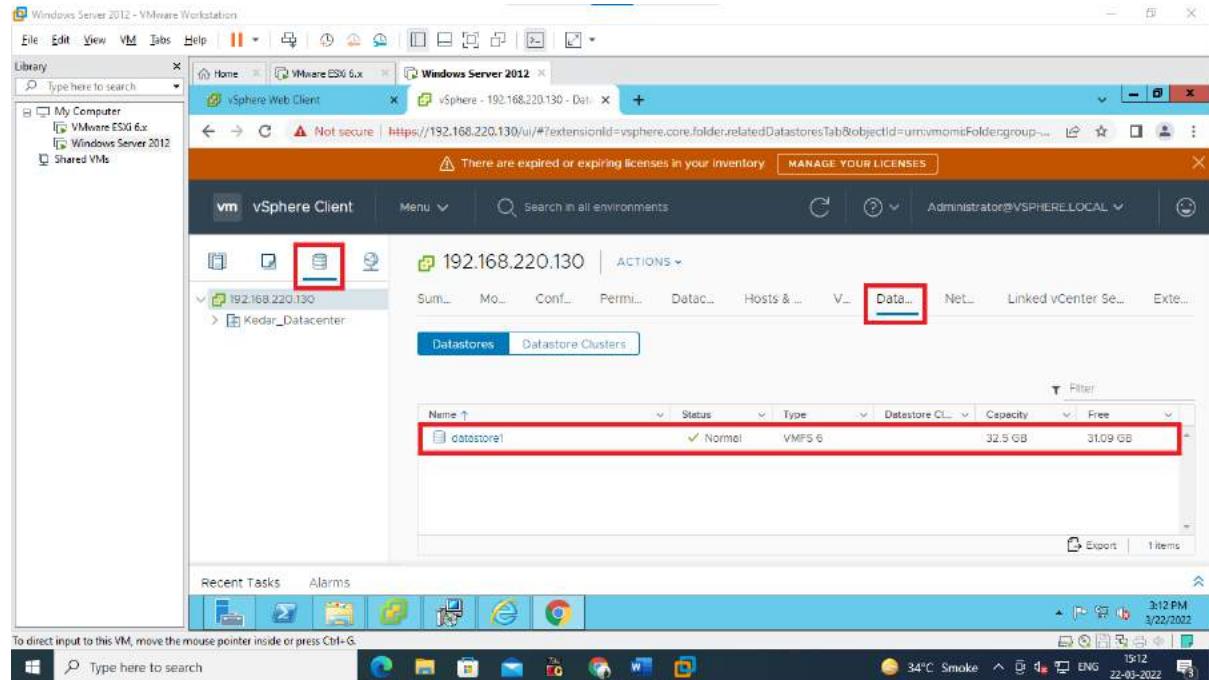
### Step 7: Click on Finish button.



New Host created under data center and visible under Recent task.

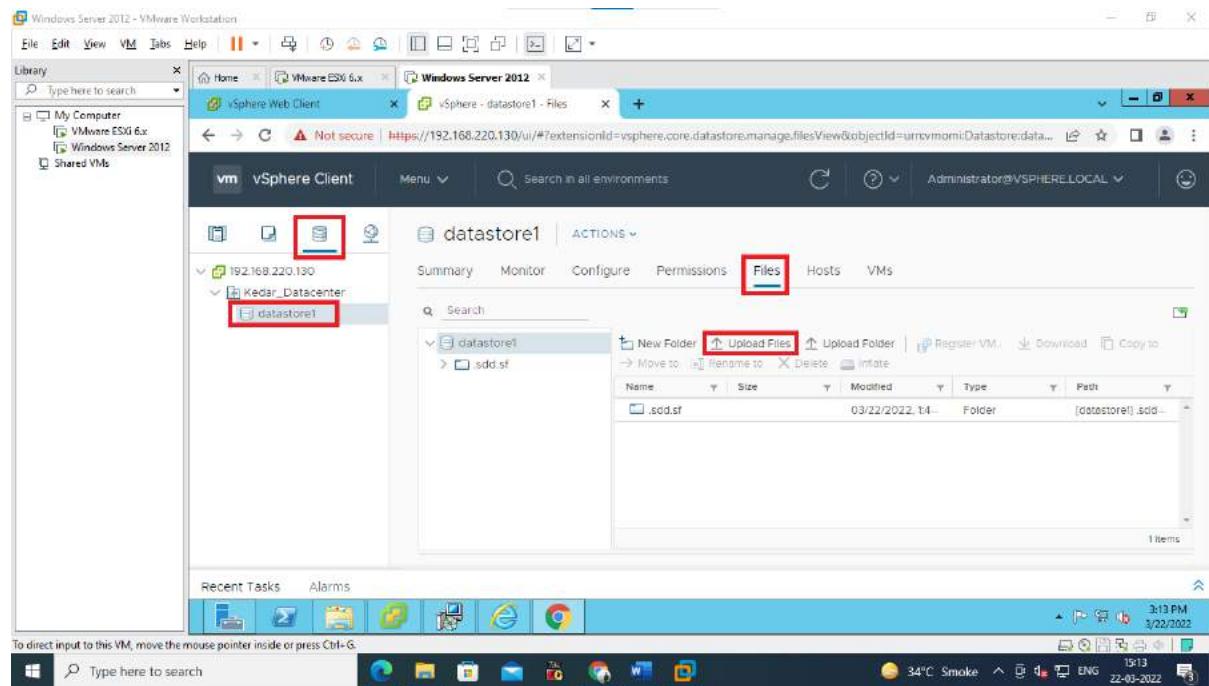


New Datastore is already created under **datastore tab** and **File** option. Create new datastore by right click on data center.

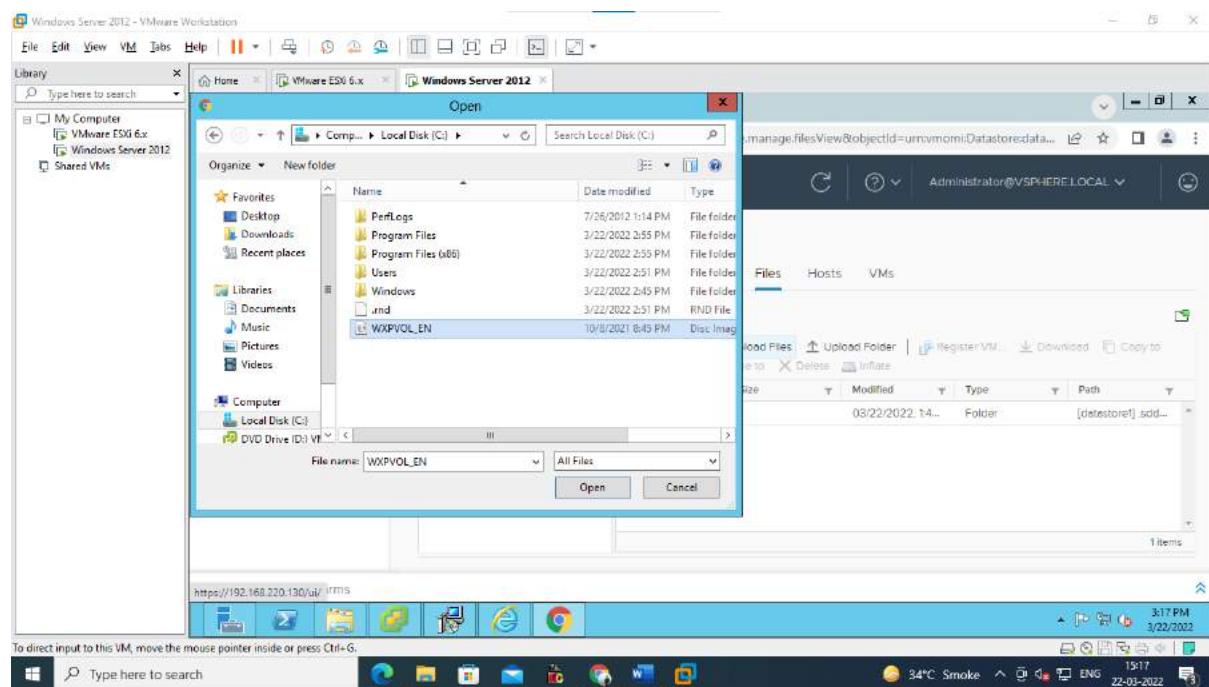


- Install new virtual machine under newly created host.

**Step 1:** Go to Datastore tab -> Select datastore1 -> Files -> Upload files

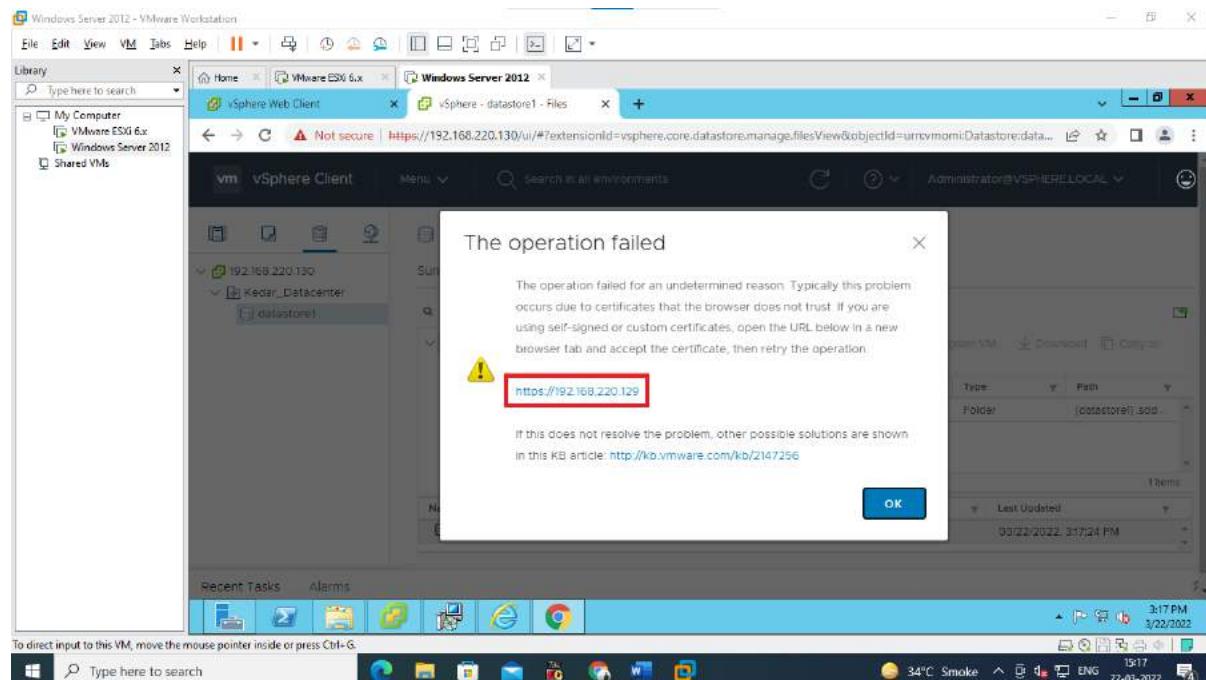
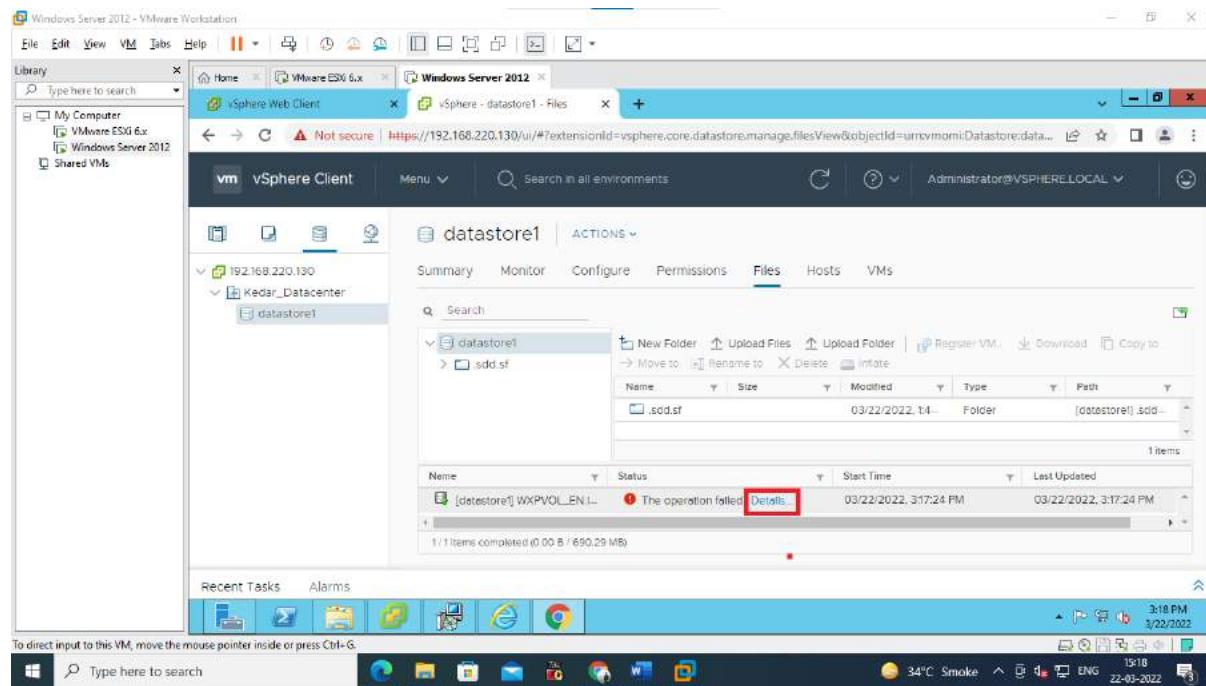


**Step 2:** Select Windows XP setup file.

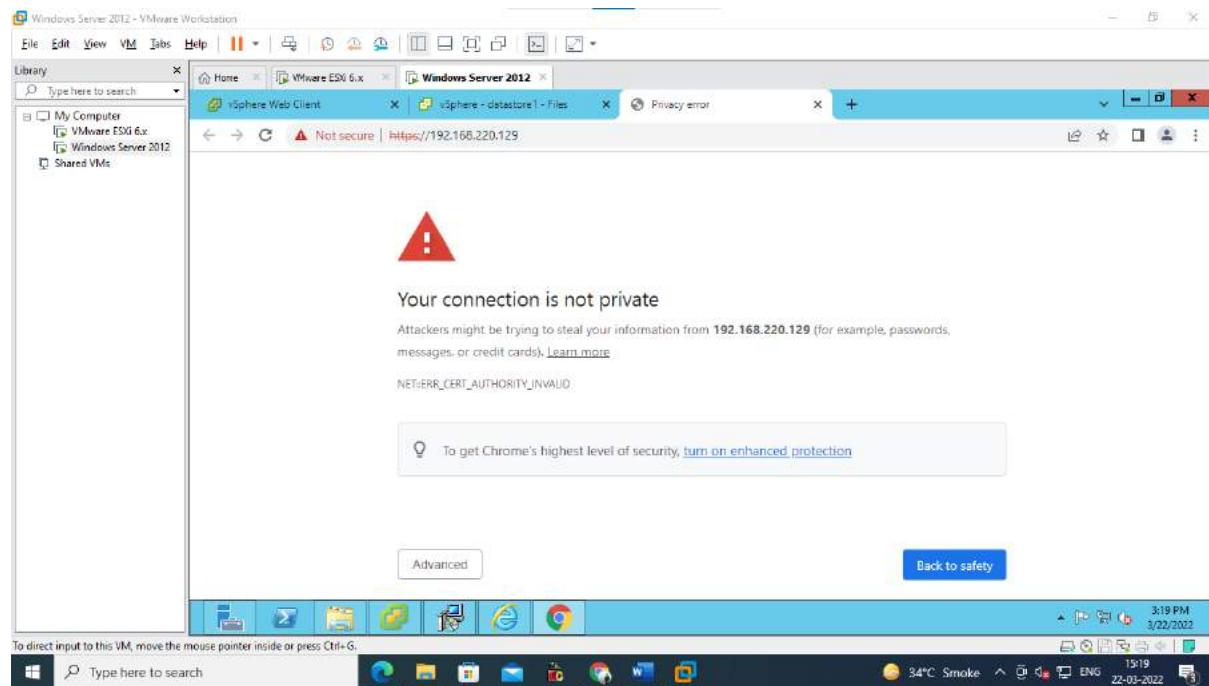


After uploading the setup file operations failed shows in recent task.

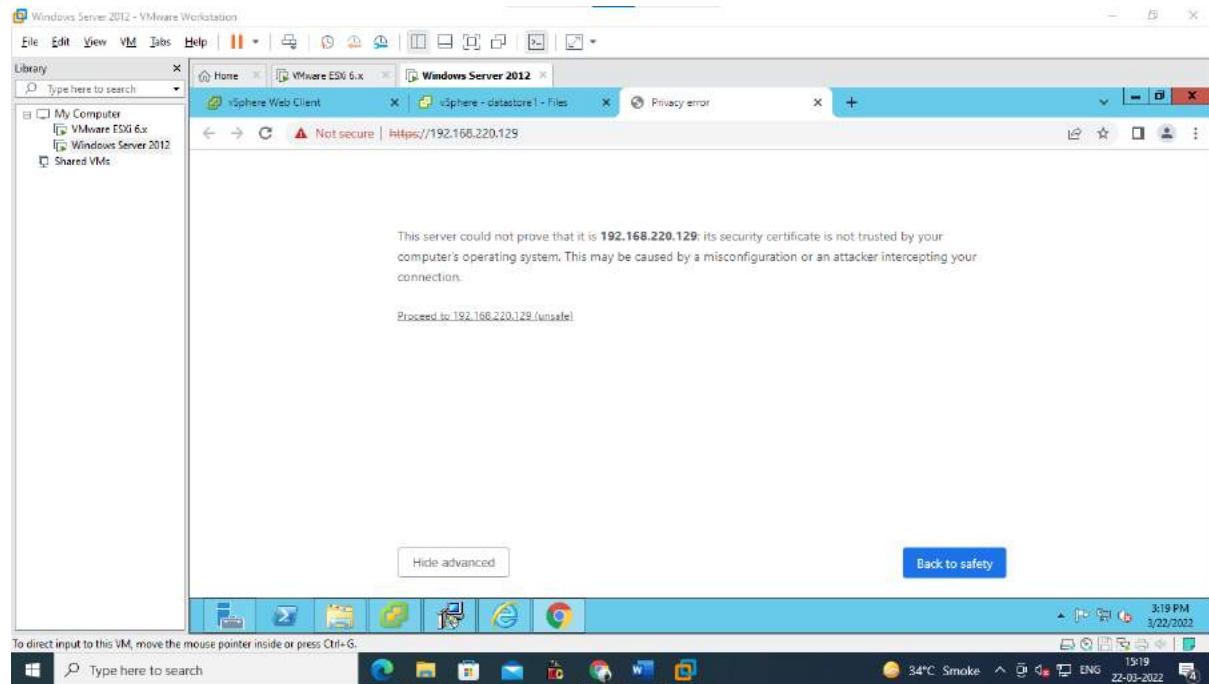
**Step 3:** Click on **Details...** link and then select the <https://192.168.220.129> URL.



**Step 4(A): Click on Advanced button.**



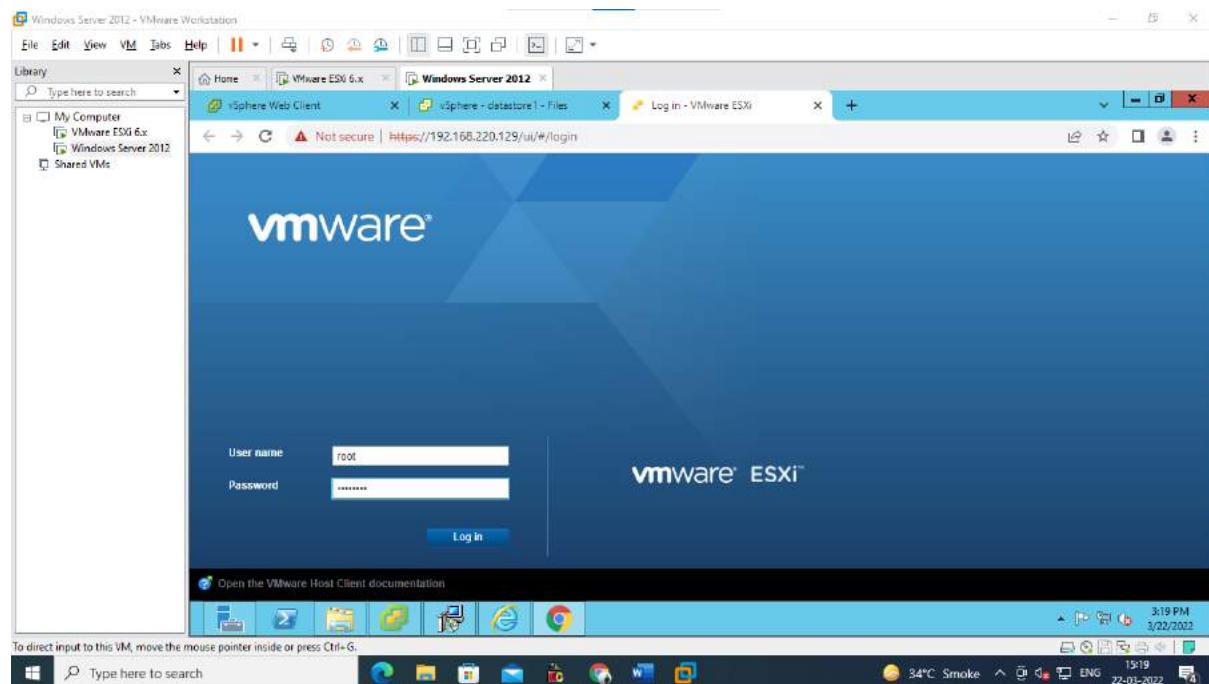
**Step 4(B): Click on Proceed to 192.168.220.139 (unsafe) link.**



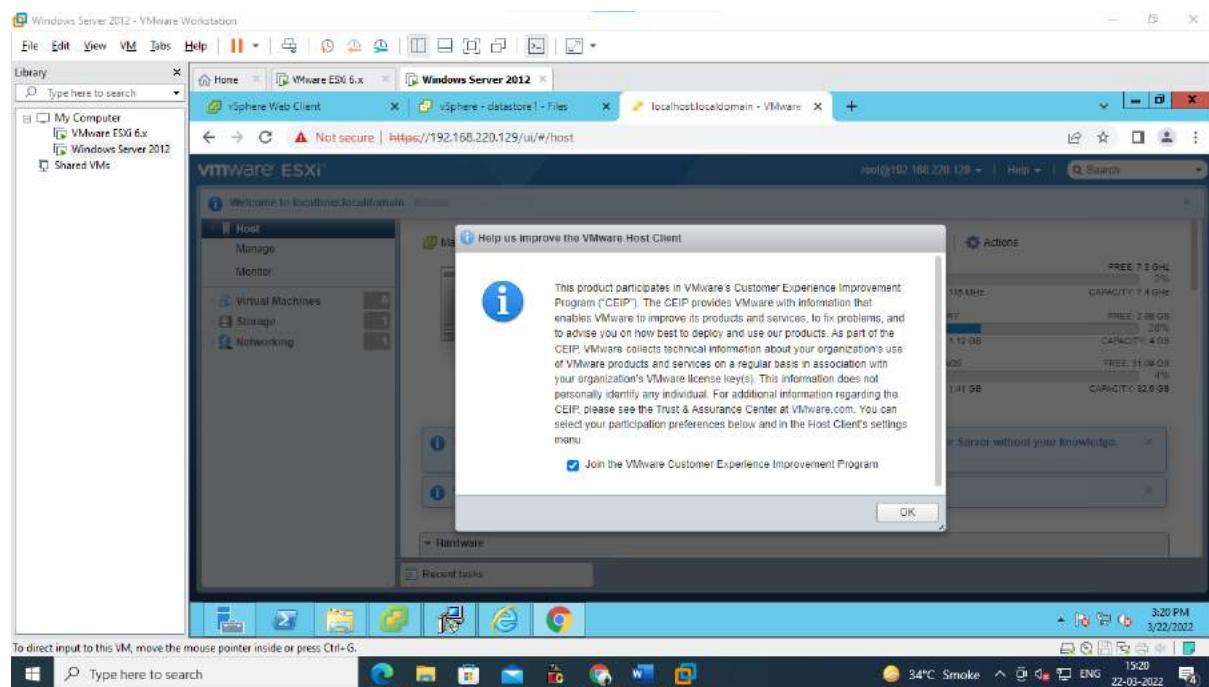
**Step 5:** Enter the User name and Password and click on Log in button.

**User Name:** root

**Password:** lt@13579

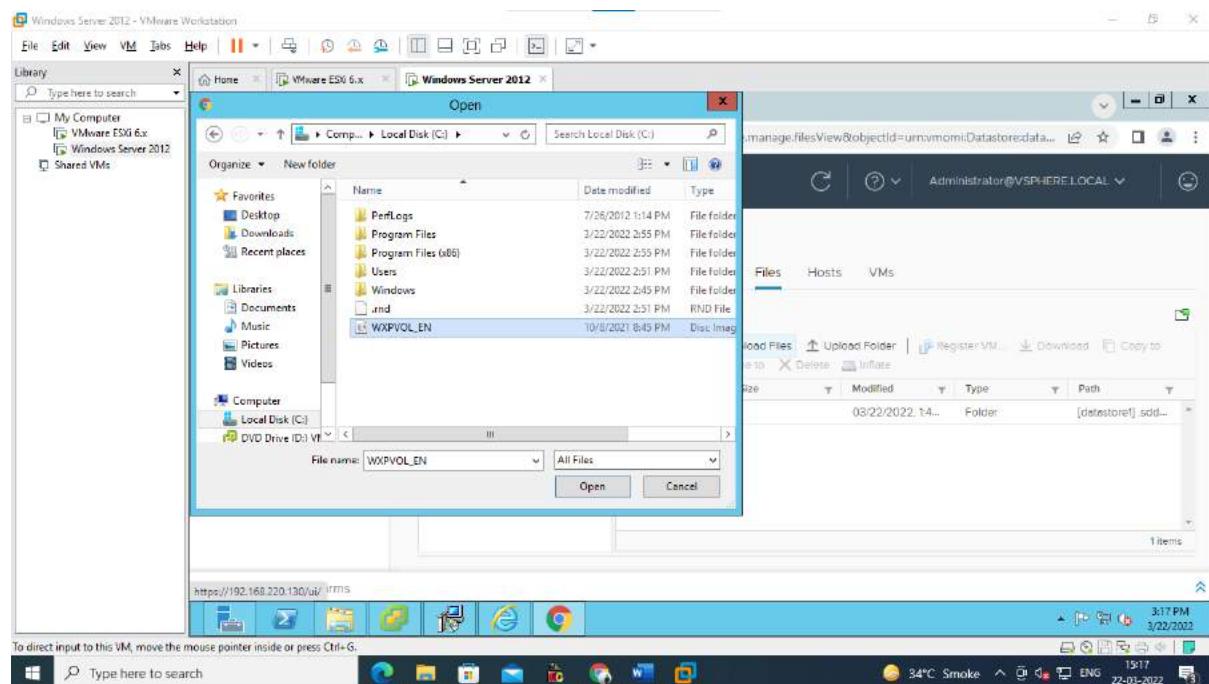
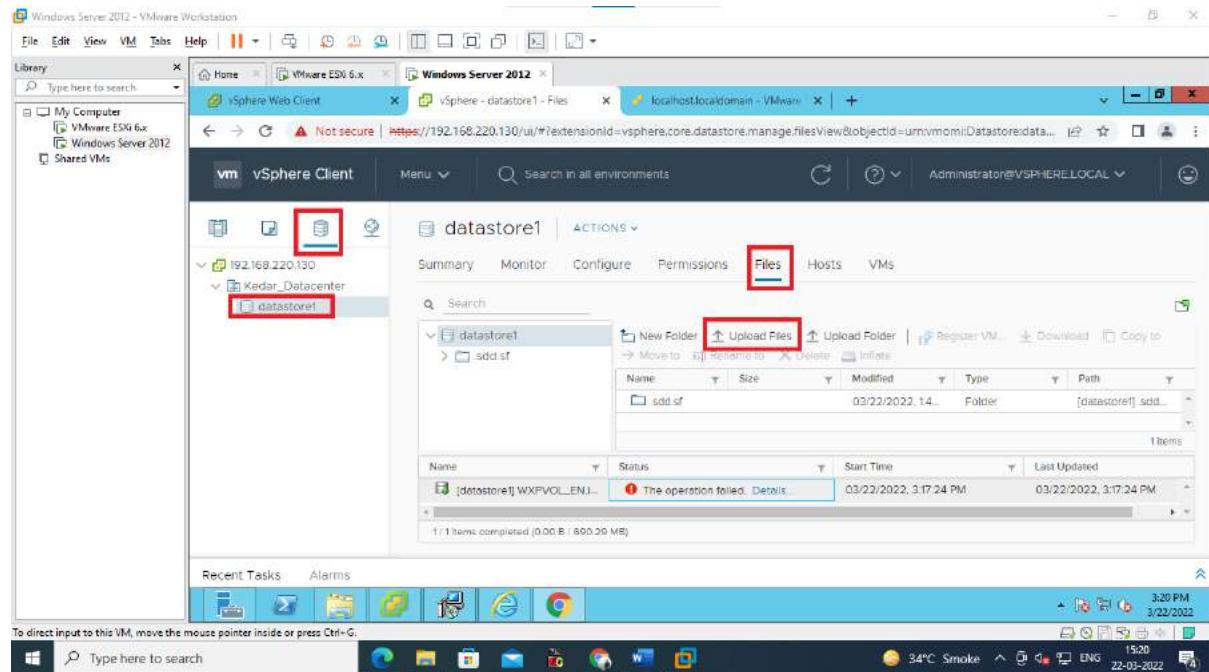


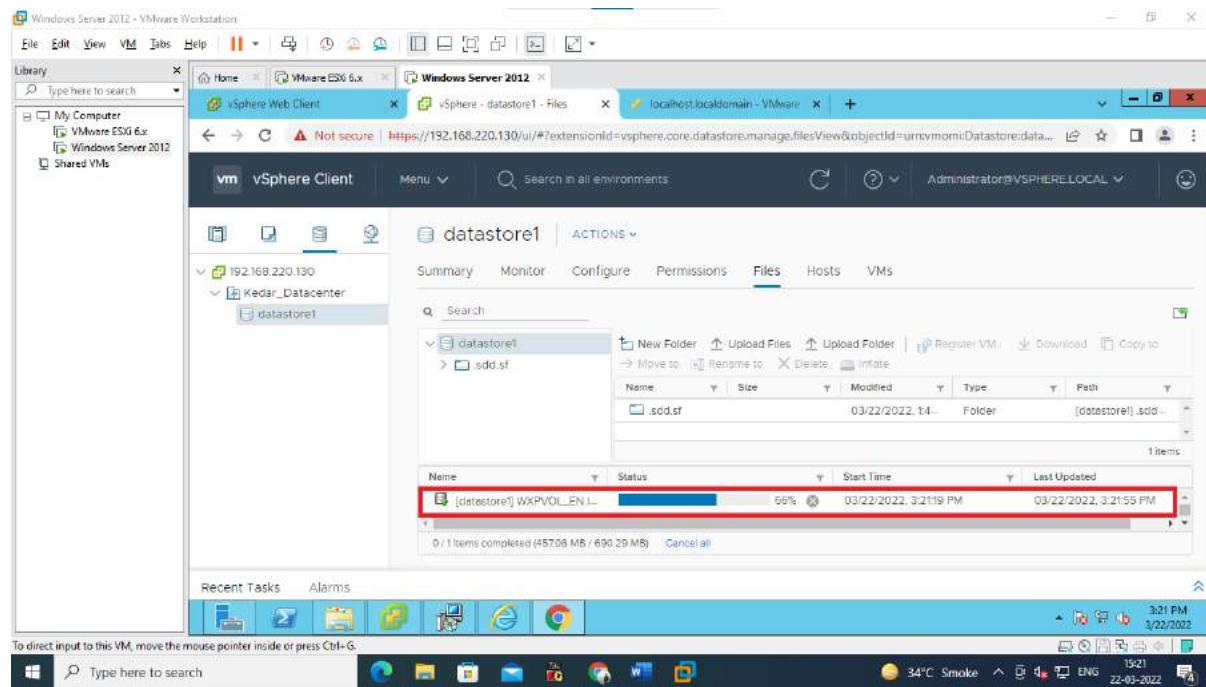
Click on OK button.



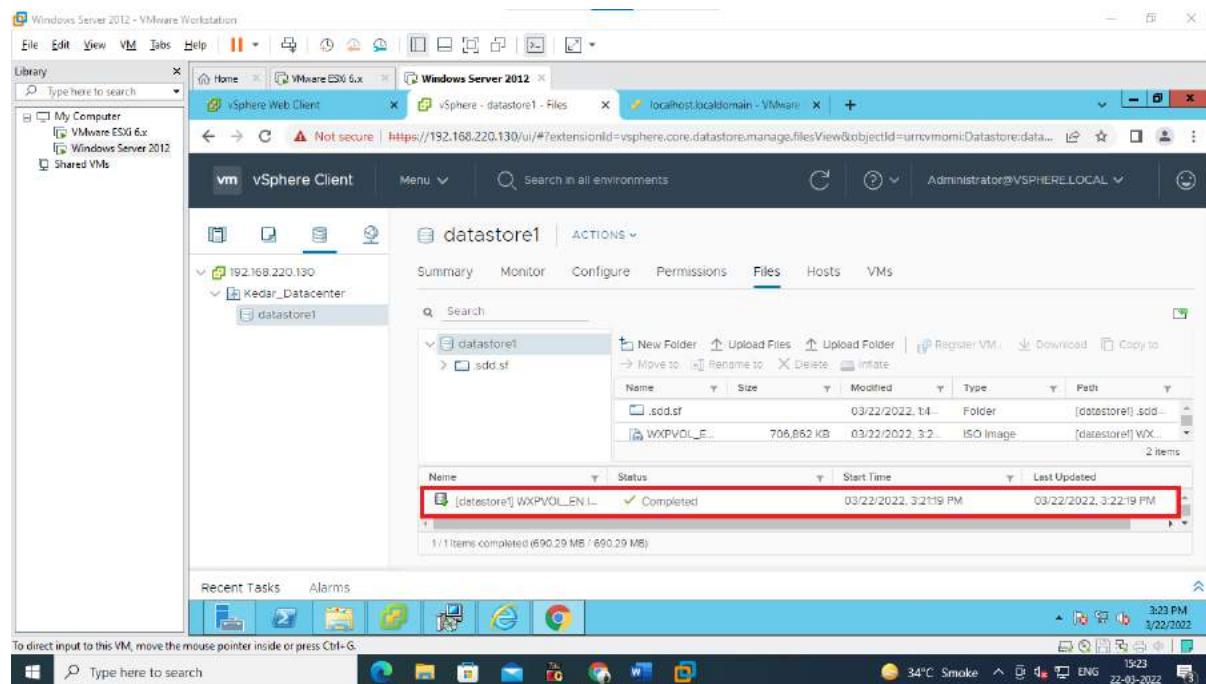
**Step 6:** Again, go to Datastore tab -> Select datastore1 -> Files -> Upload files

Then upload the Windows XP setup file.

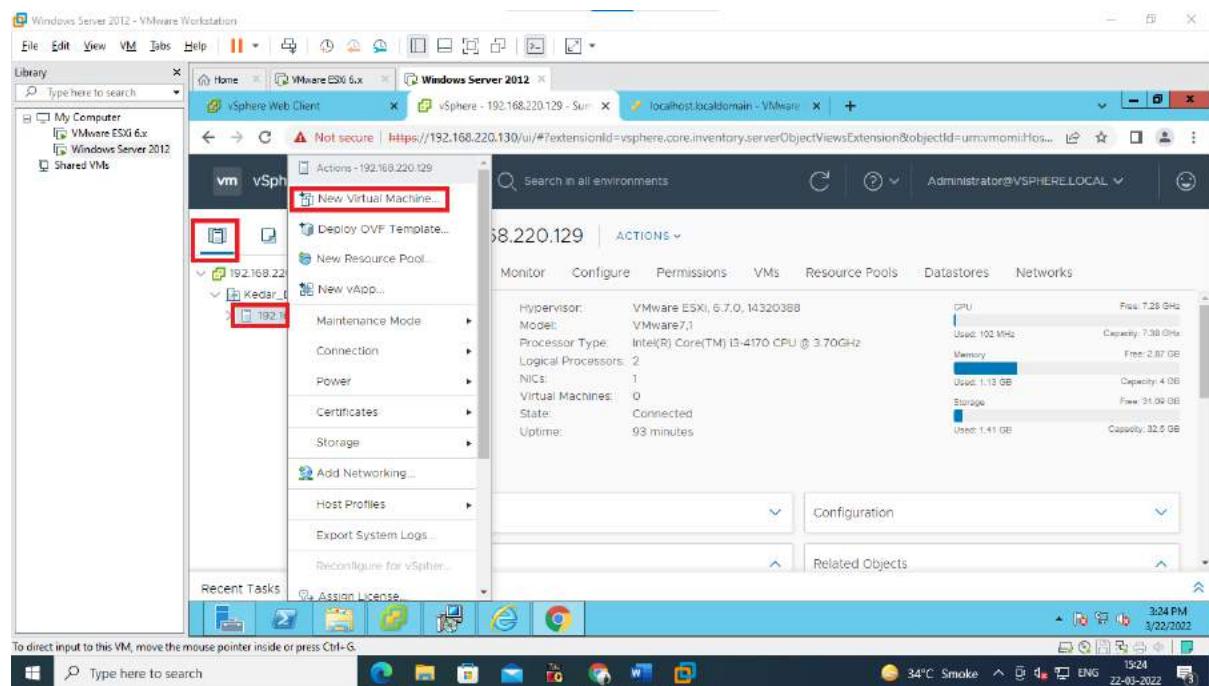




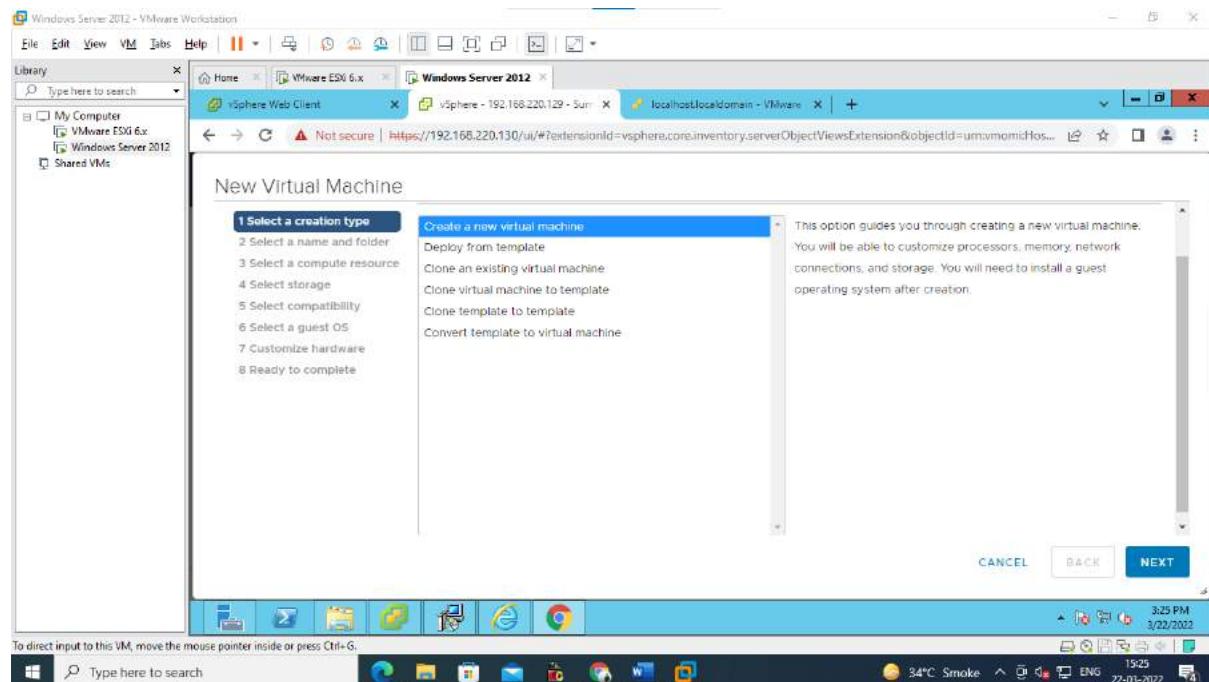
After completing the setup, appeared in Recent task bar with status completed.



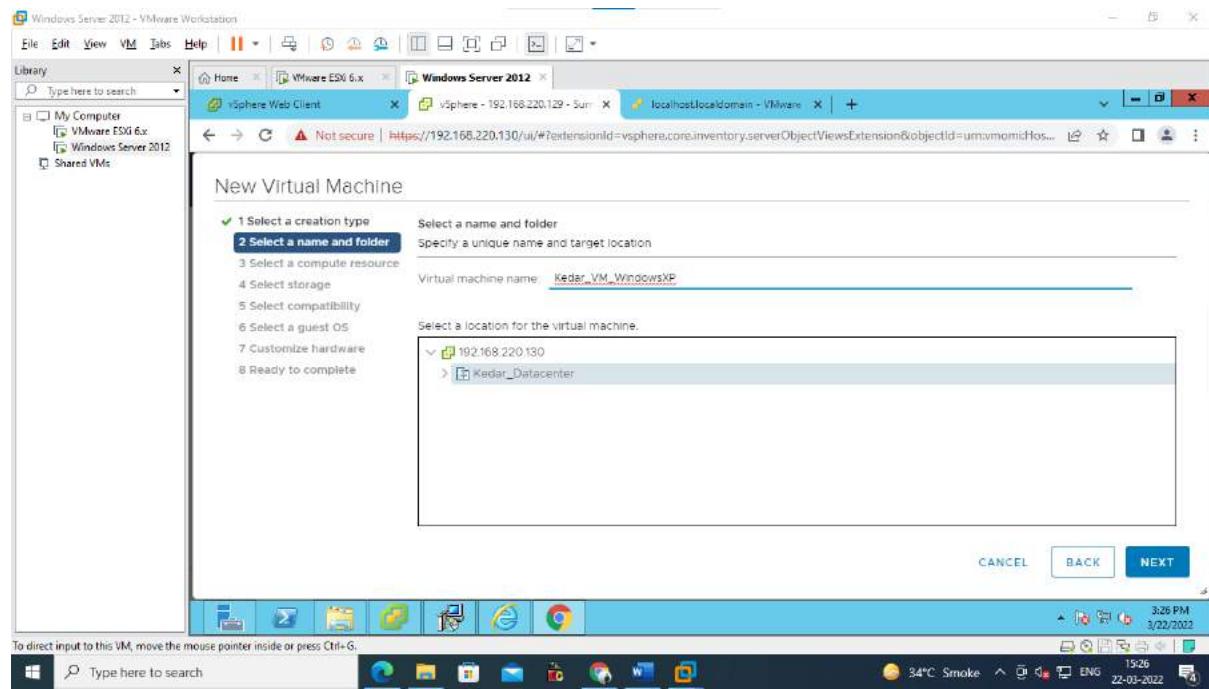
**Step 7:** Go to datacenter tab -> Select Newly created host -> Select **New Virtual Machine...**



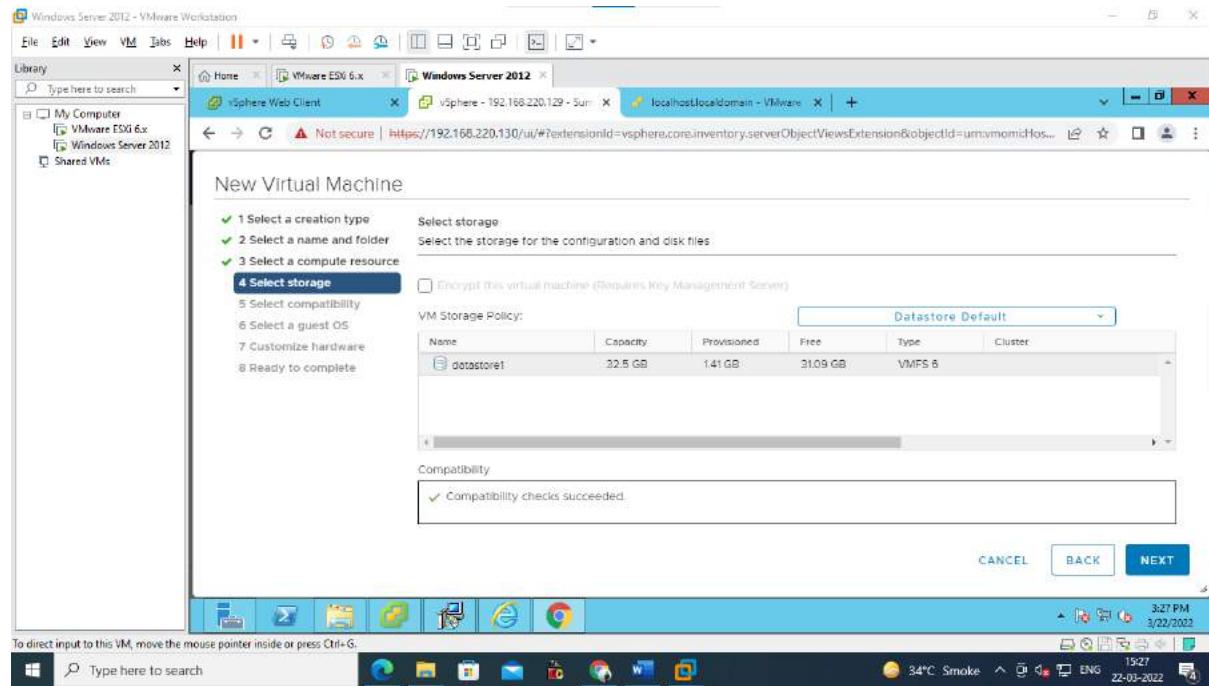
**Step 8:** Select Create a new virtual machine option and click On **Next** button.



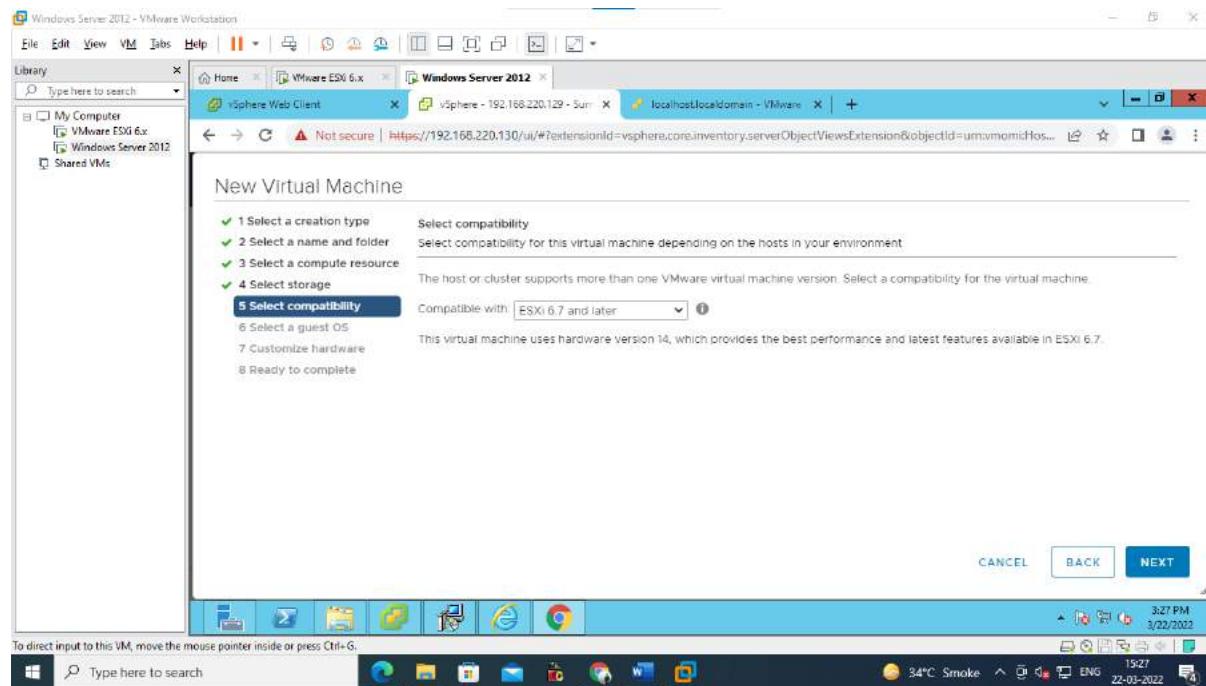
**Step 9: Enter Virtual machine name and Click on Next button.**



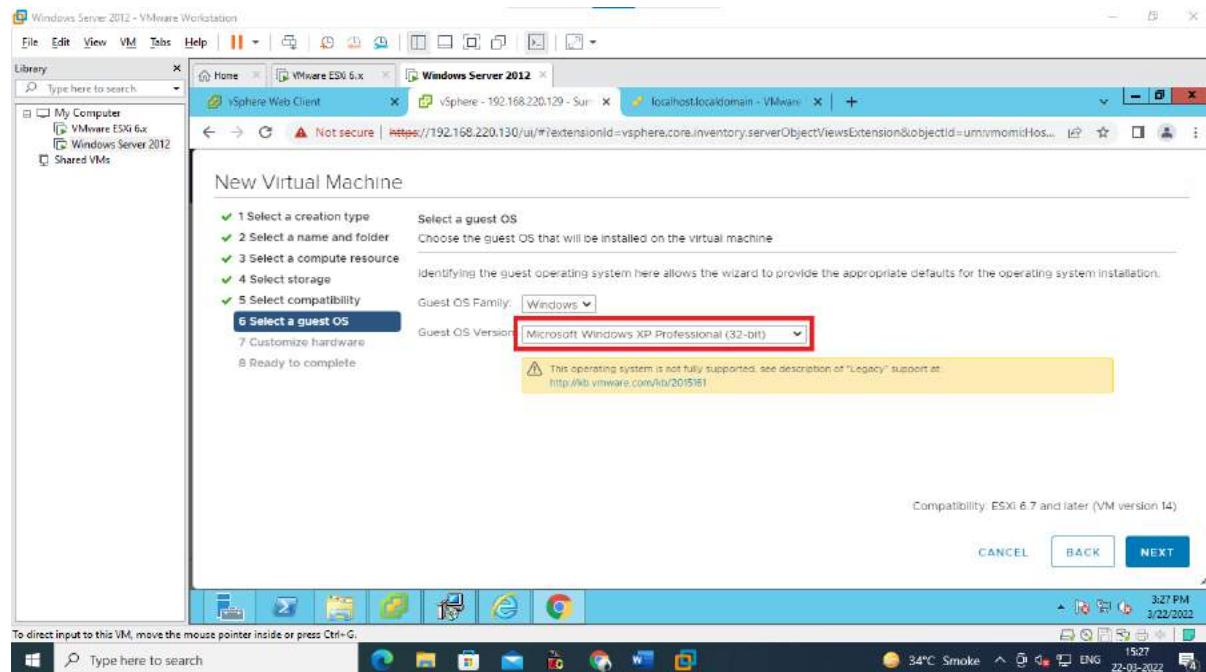
**Step 10: Click on Next button.**



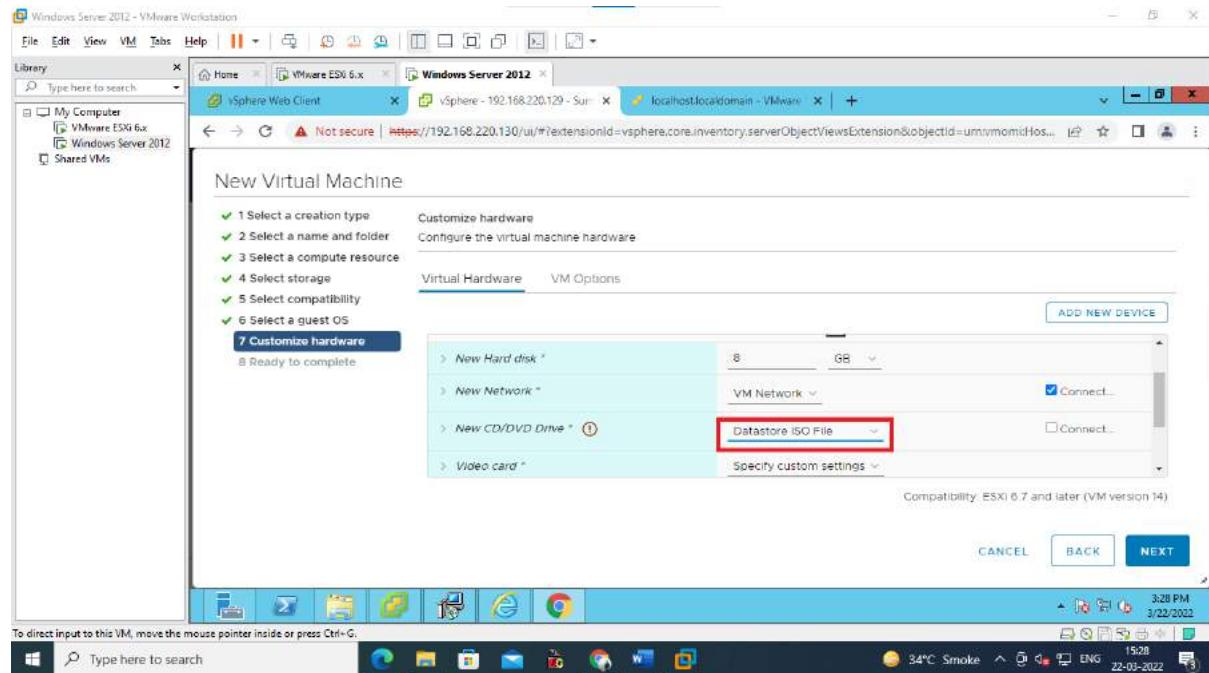
**Step 11:** Select Compatible with **ESXi 6.7 and later** and Click on **Next** button.



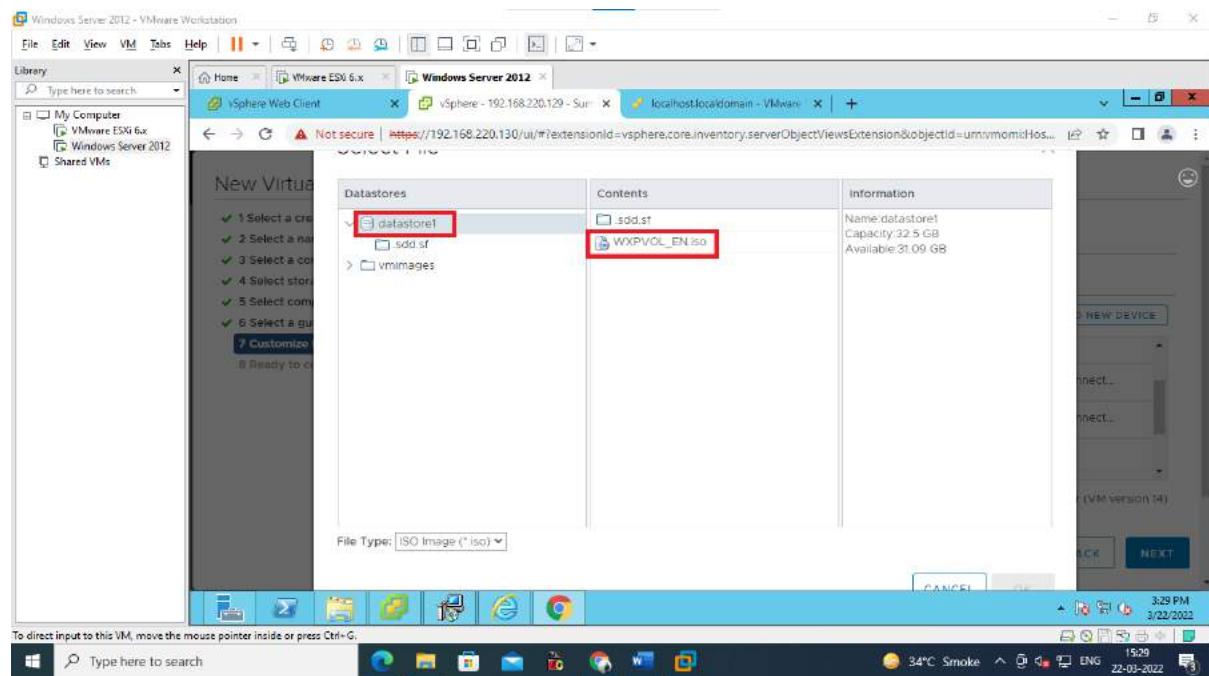
**Step 12:** Select Guest OS Family **Windows**, Guest OS Version **Microsoft Windows XP Professional (32 bit)** and Click on **Next** button.



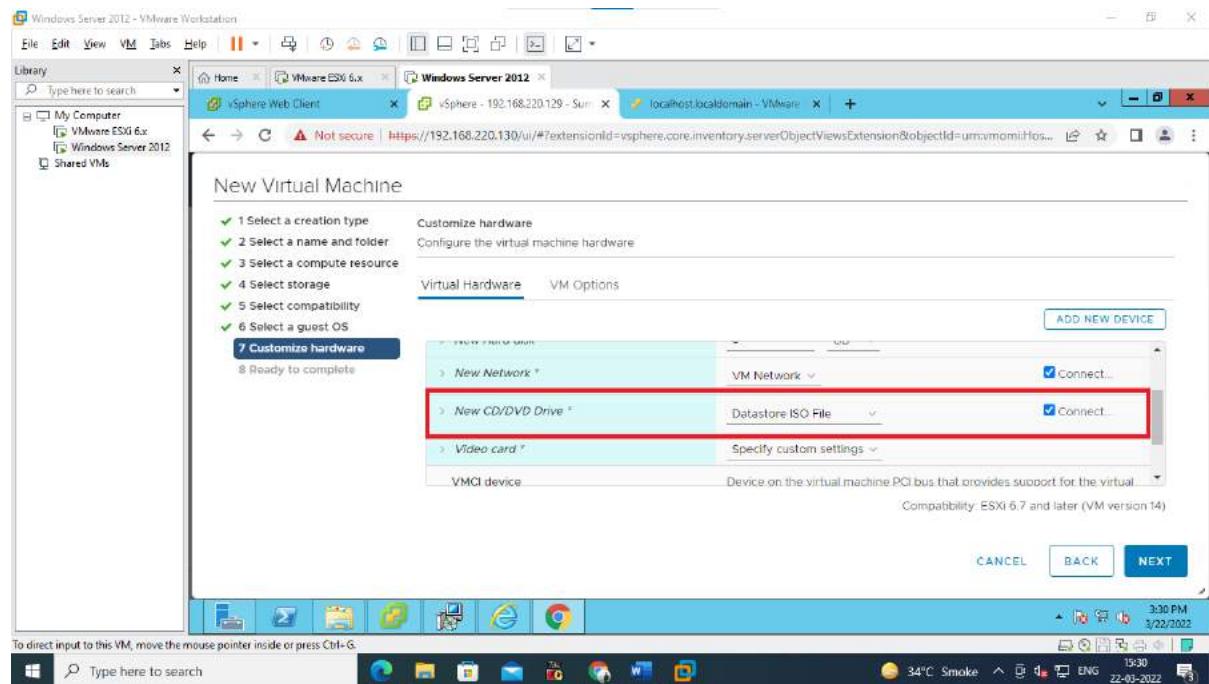
**Step 13:** Select **New CD/DVD Drive\* Datastore ISO File** and click on **Connect** then click on **Next** button.



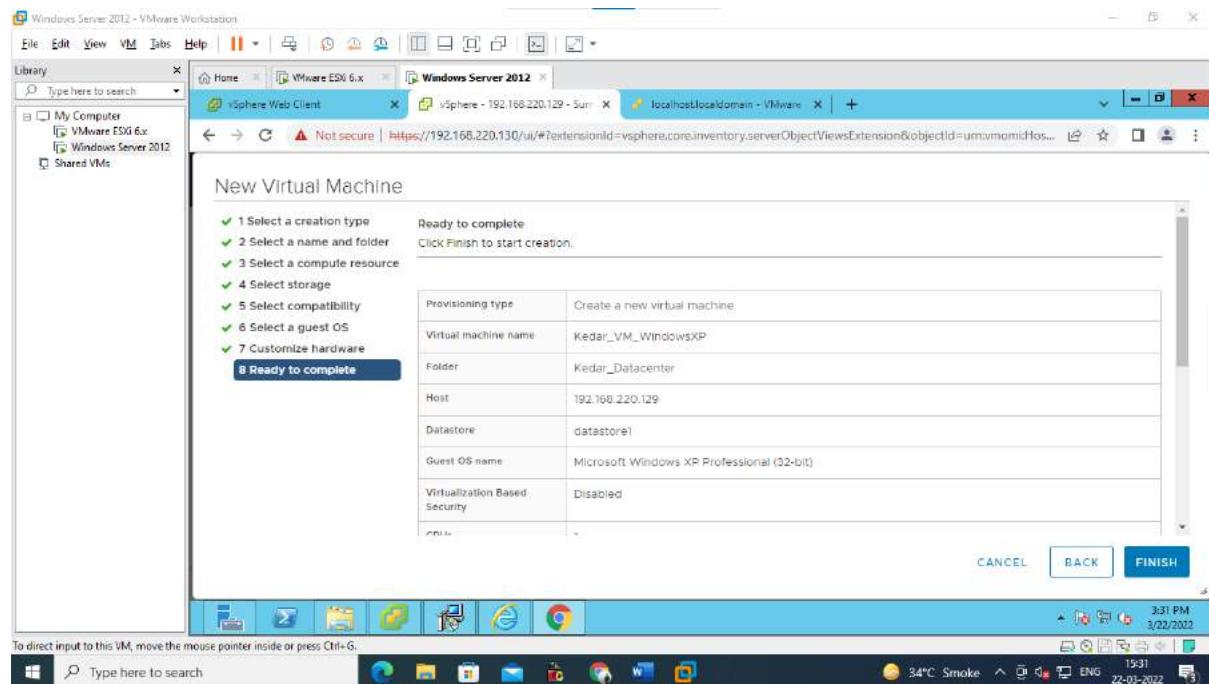
**Step 14:** Select Datastore 1, then select the Windows XP setup file (WXPVOL\_EN.iso) in Contents tab.



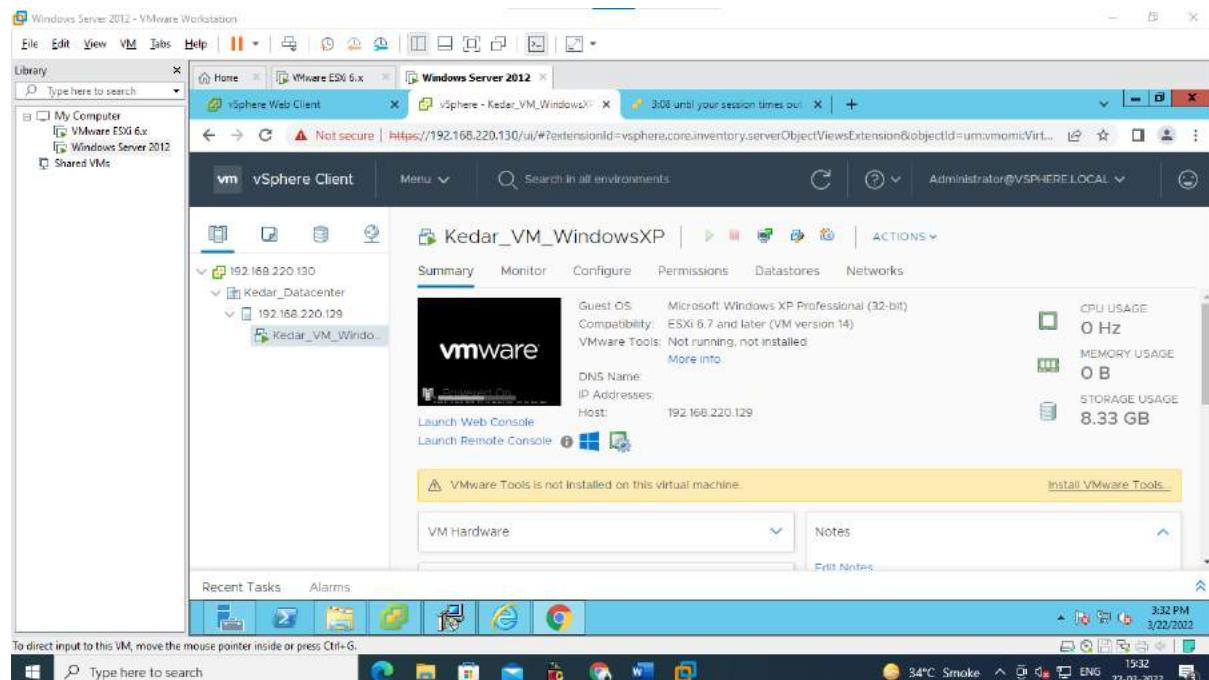
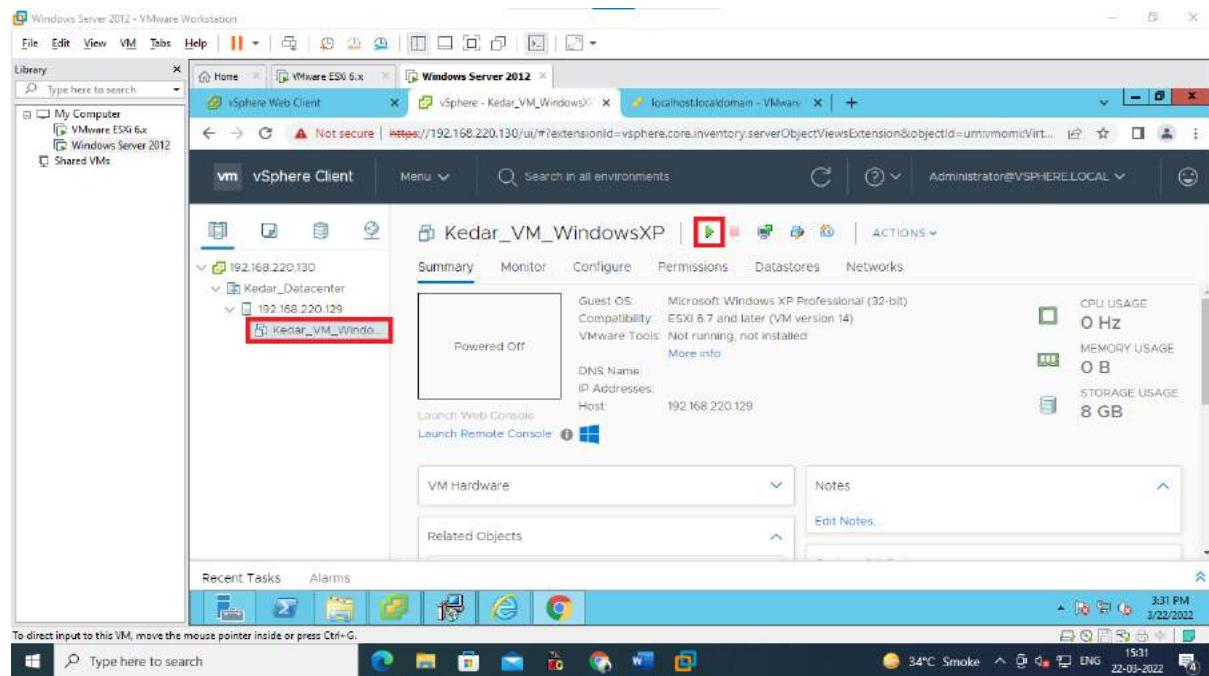
**Step 15:** Select **Connect** option and click on **Next** button.



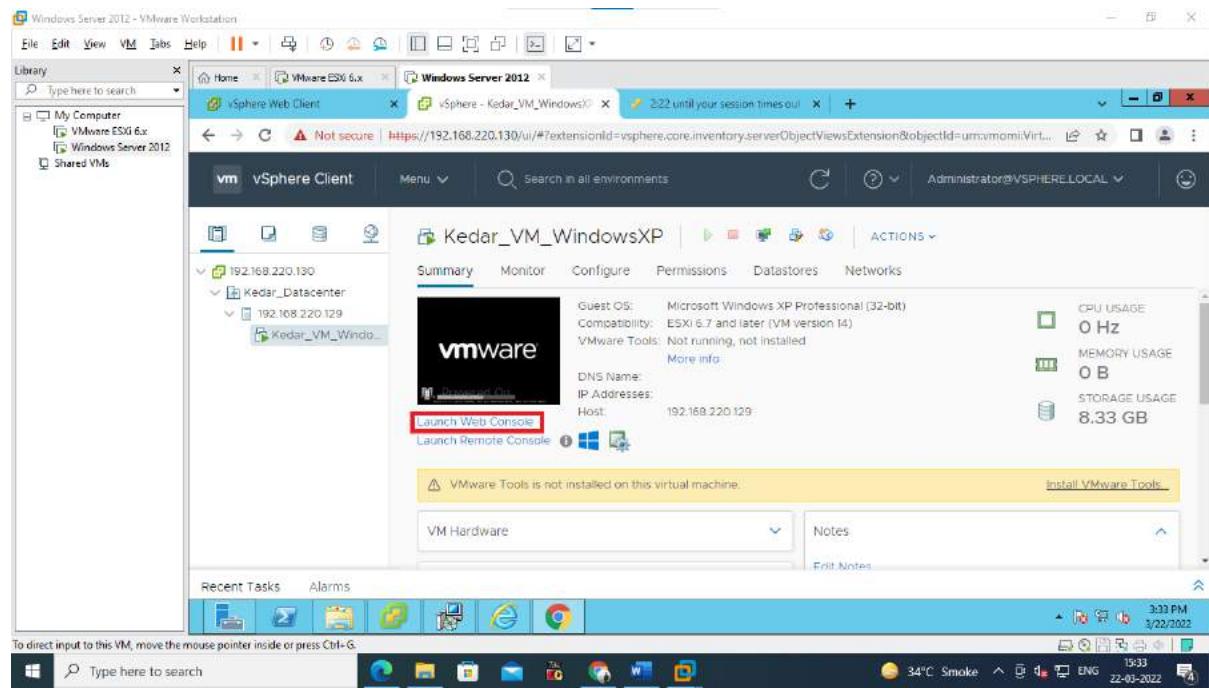
**Step 16:** Click on **Next** button.



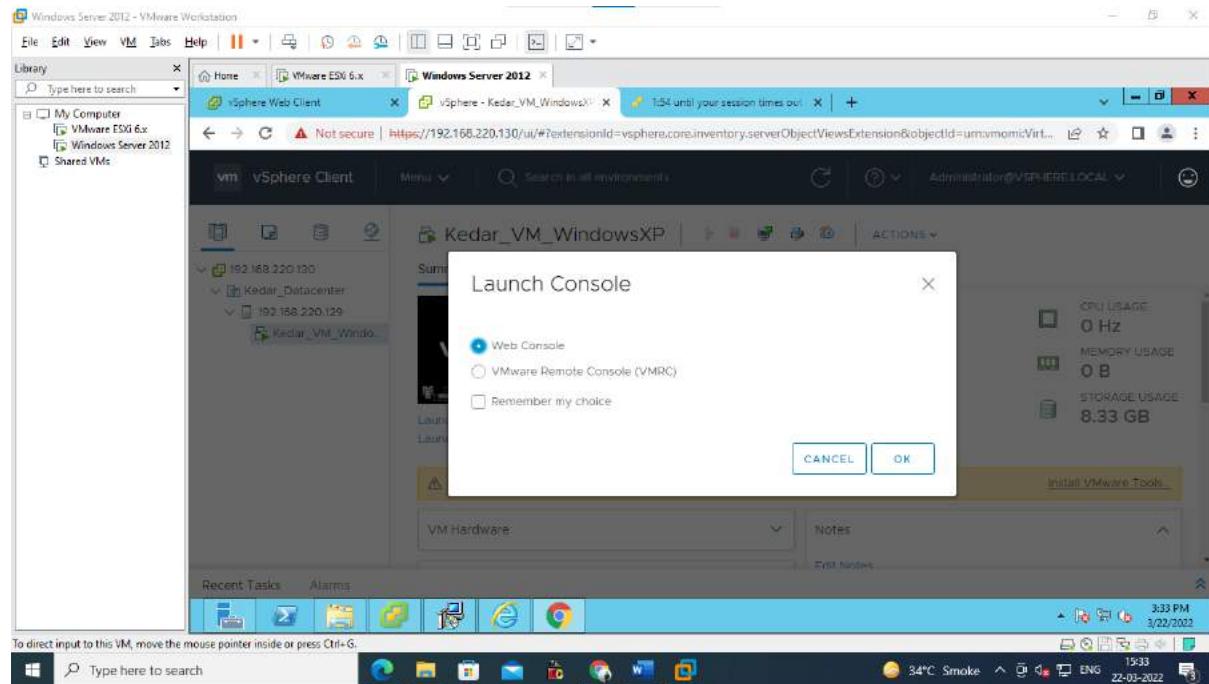
**Step 17:** Select the New virtual machine appears under the host and then Click on **Start** button.



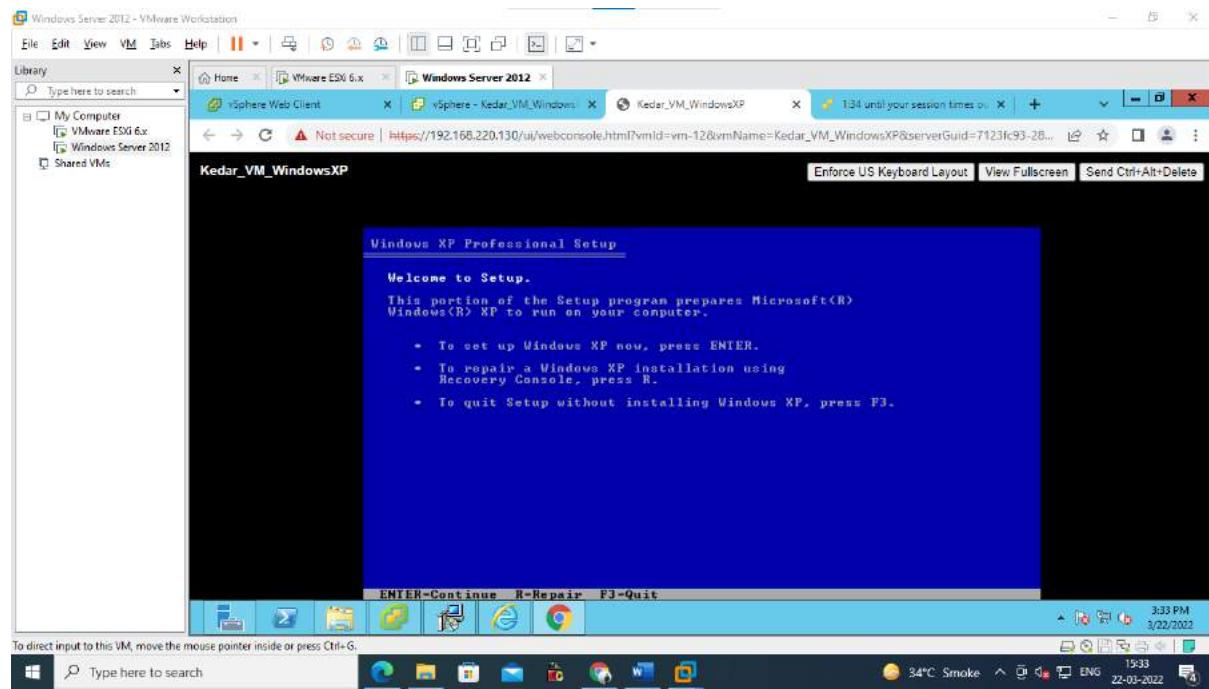
**Step 18:** Select the Launch Web Console link.



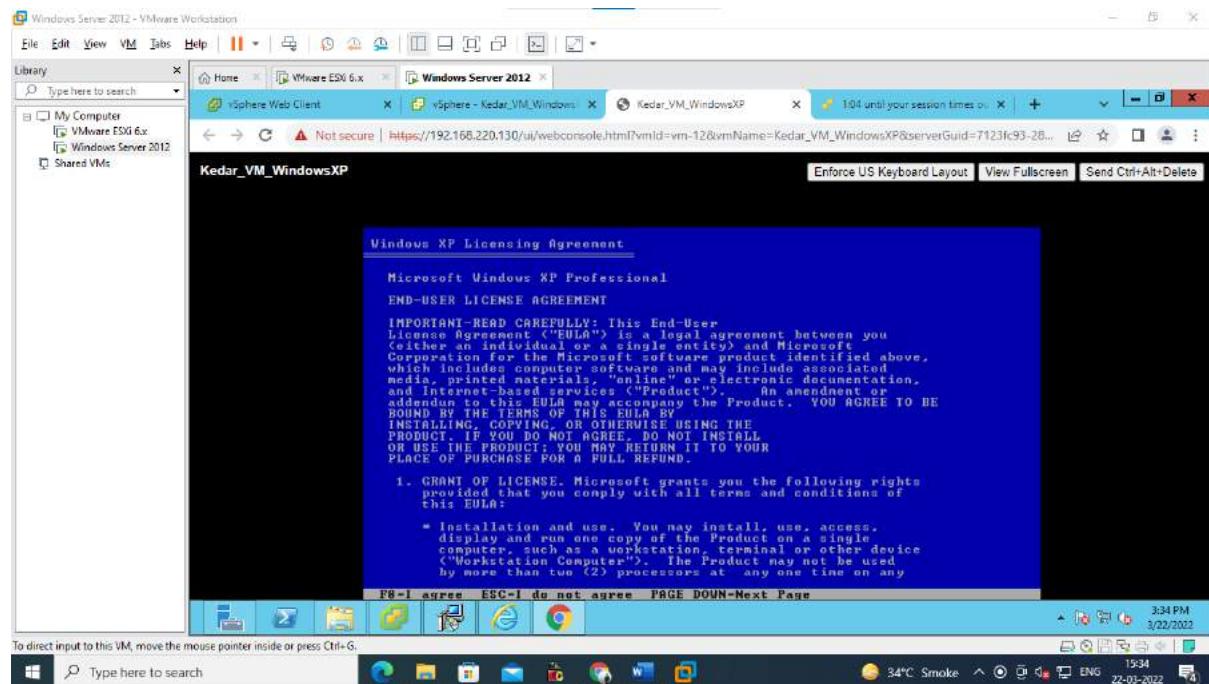
**Step 19:** Select the Launch Web Console option and click on OK button.



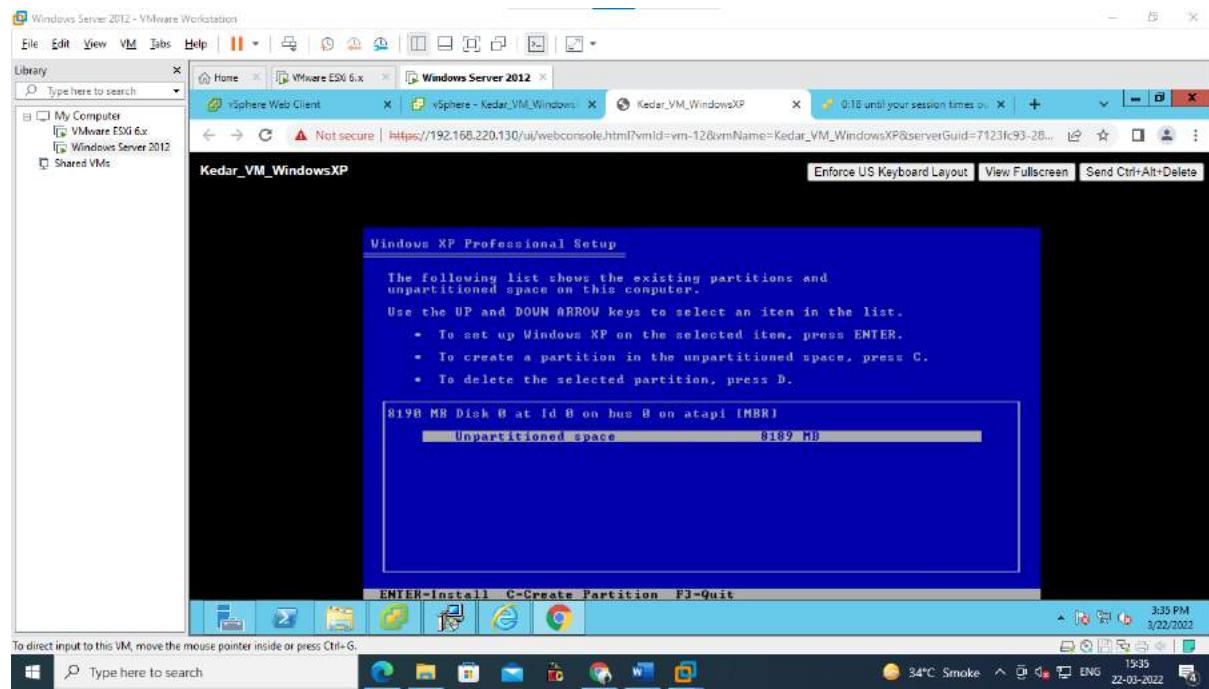
**Step 20: Press the Enter Key.**



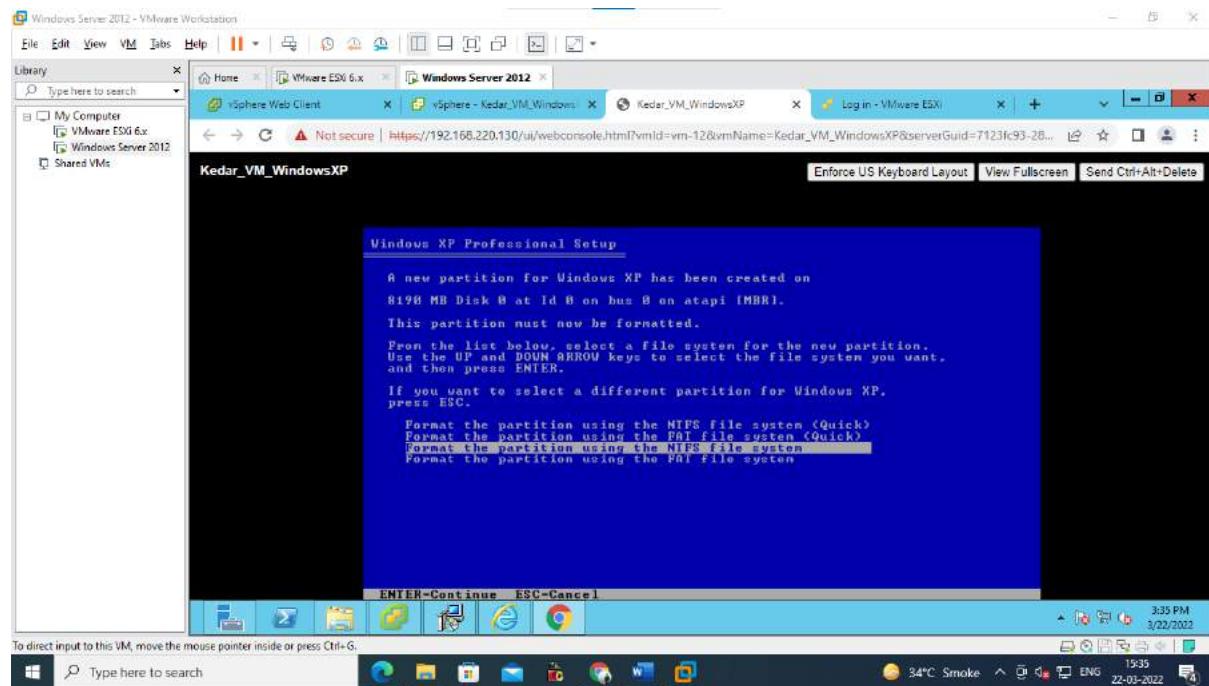
**Step 21: Press the F8 Key.**

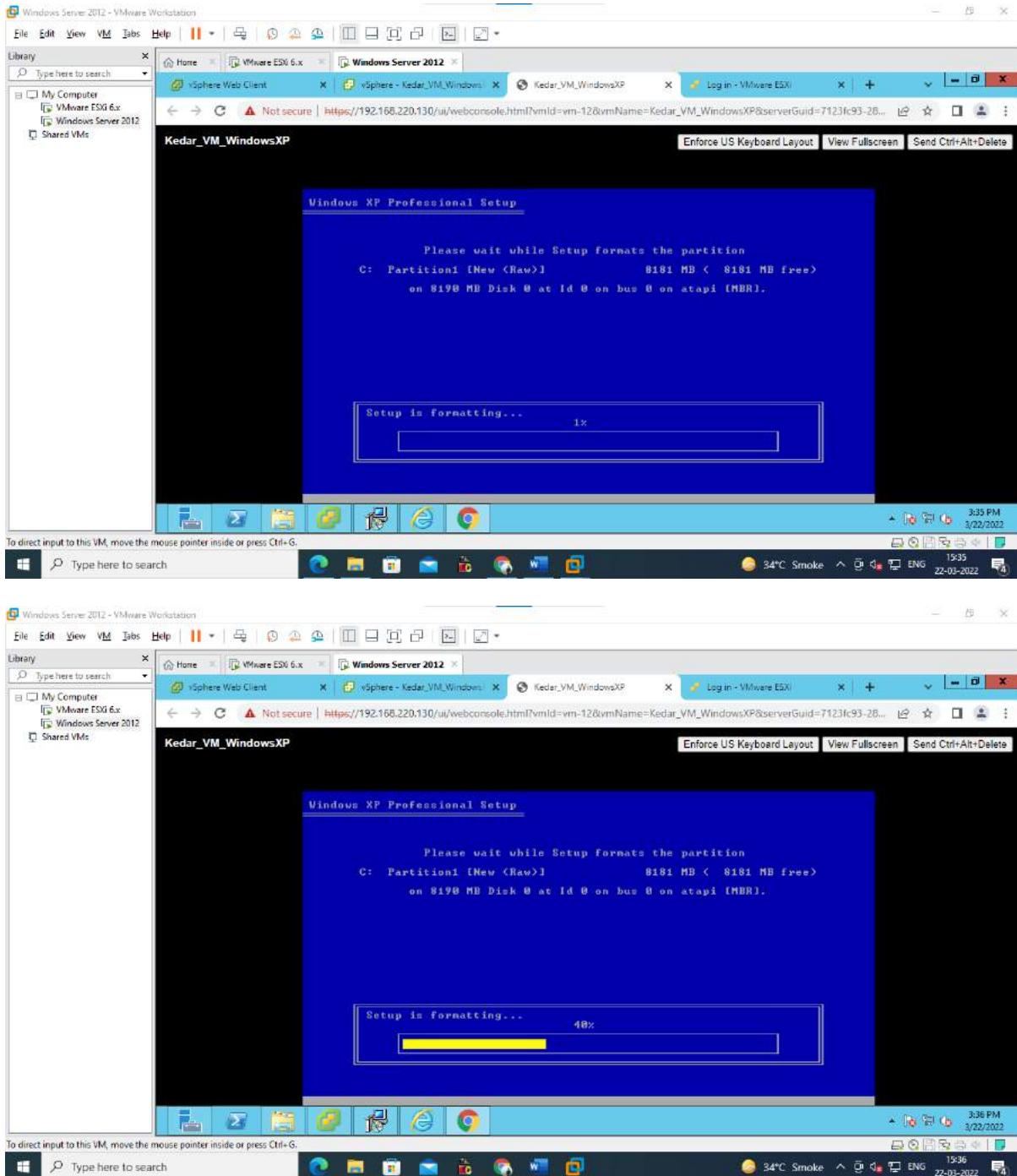


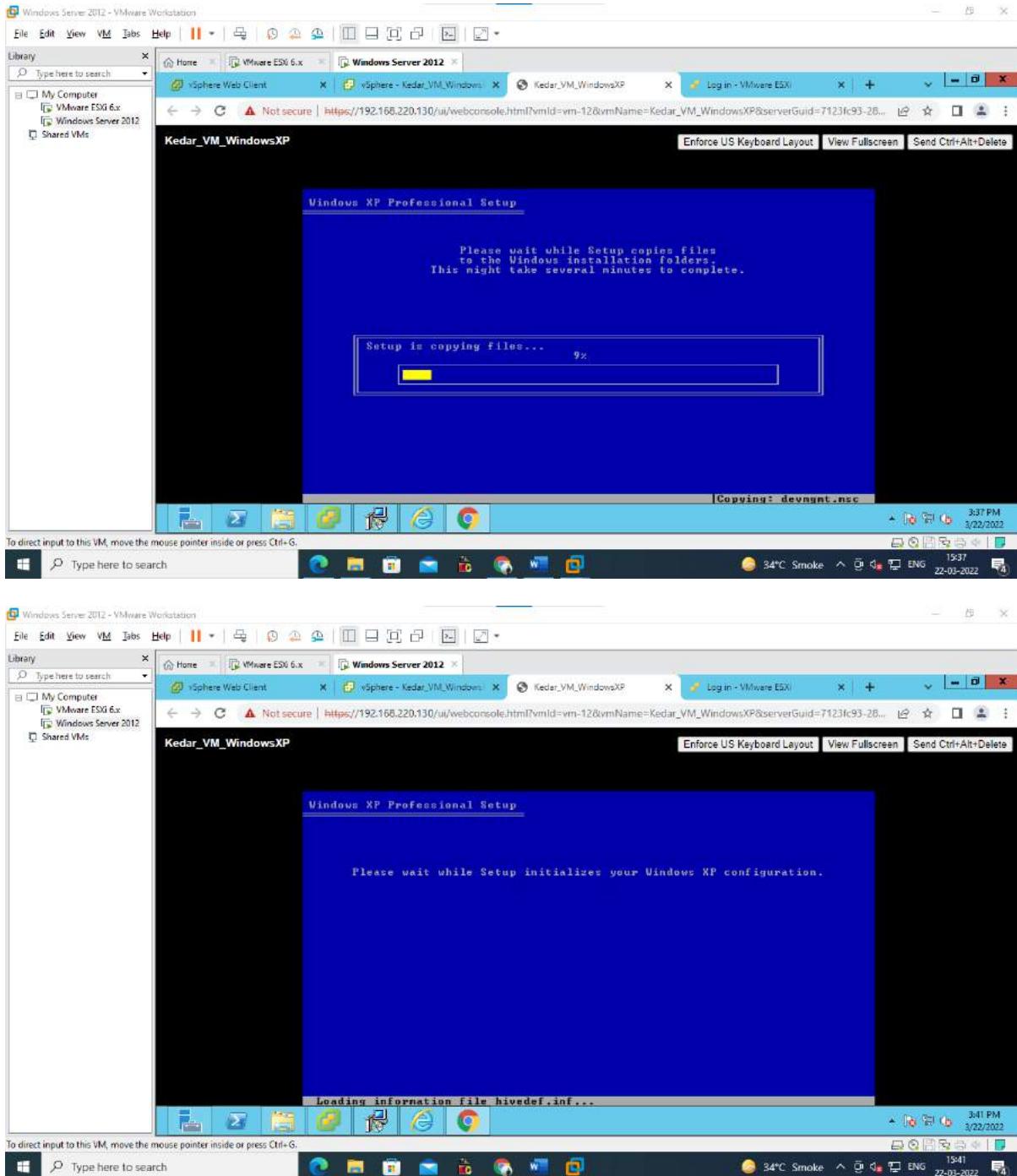
**Step 22:** Press the Enter Key.

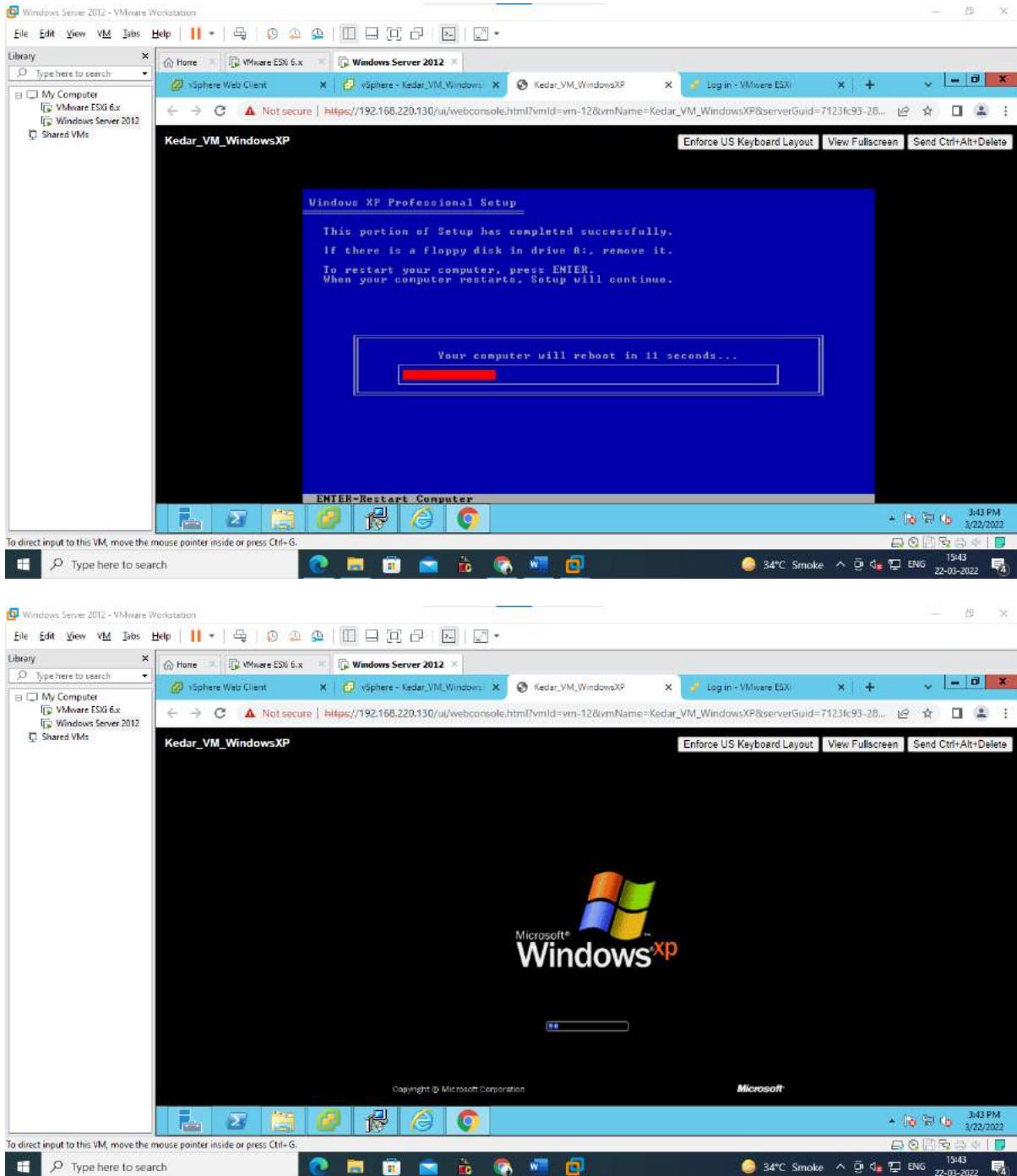


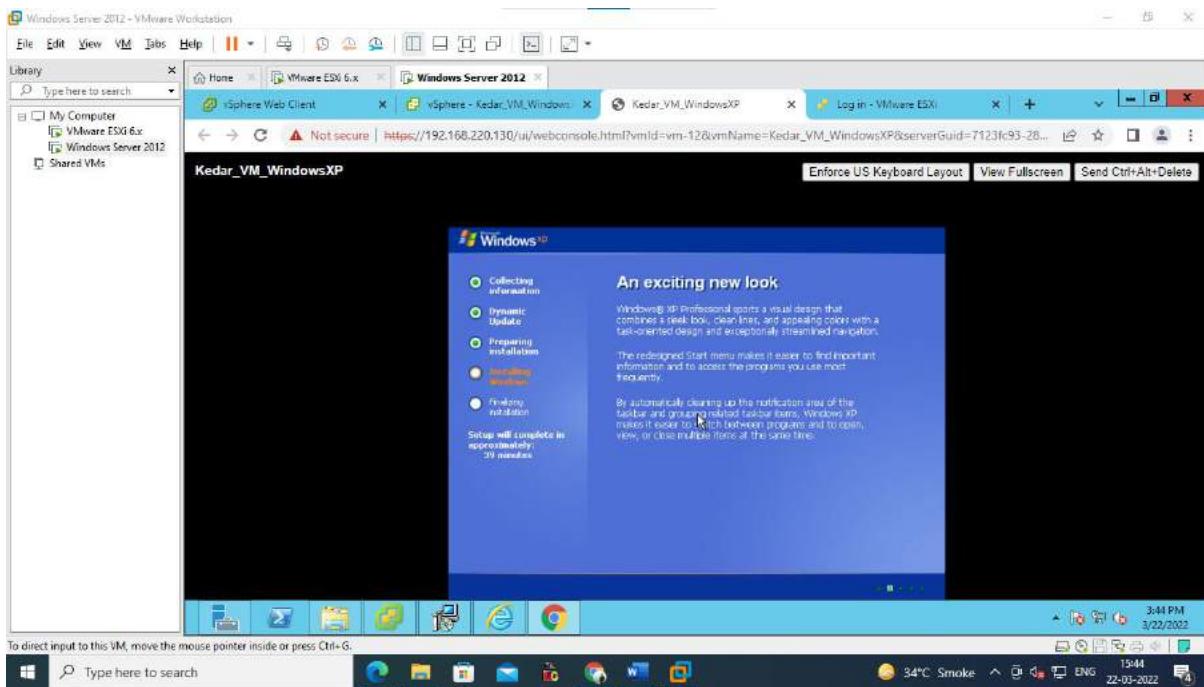
**Step 23:** Press the Enter Key.



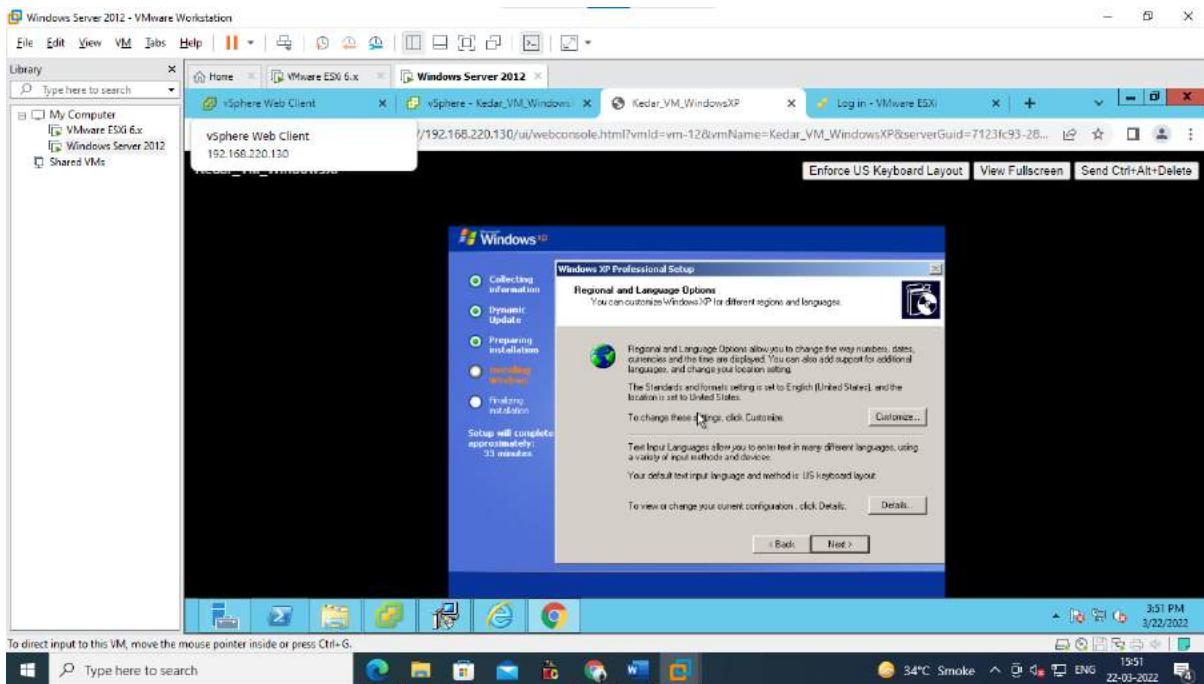




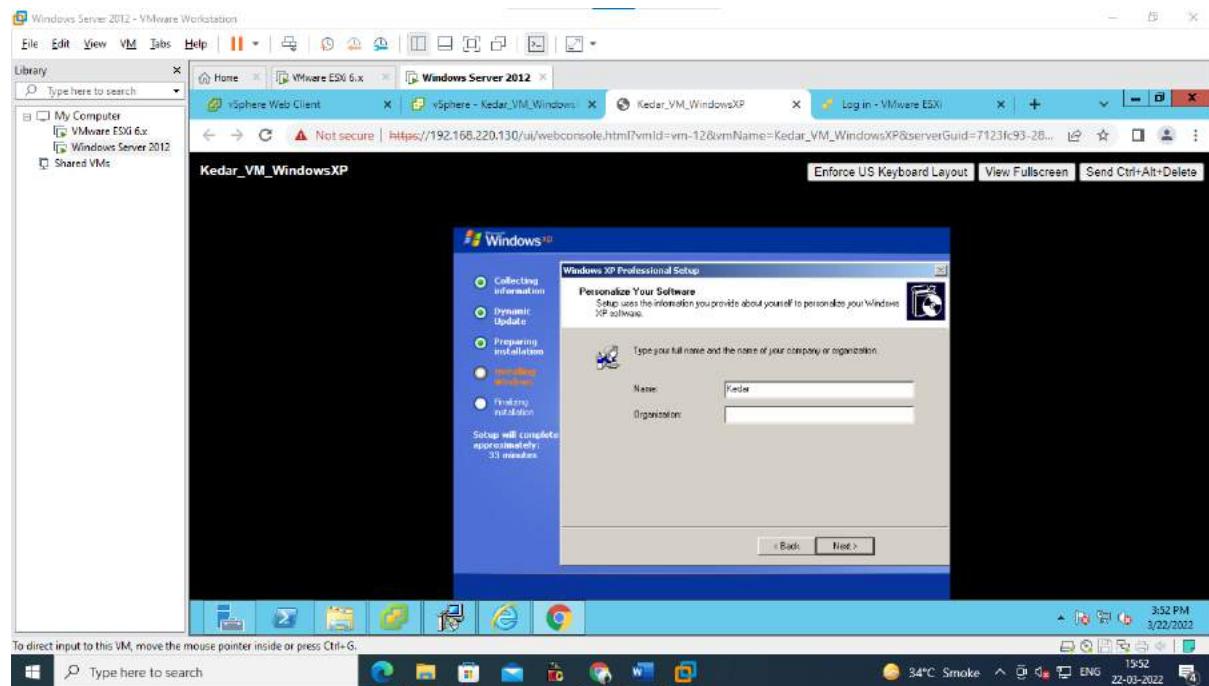




#### Step 24: Click on the Next > button.

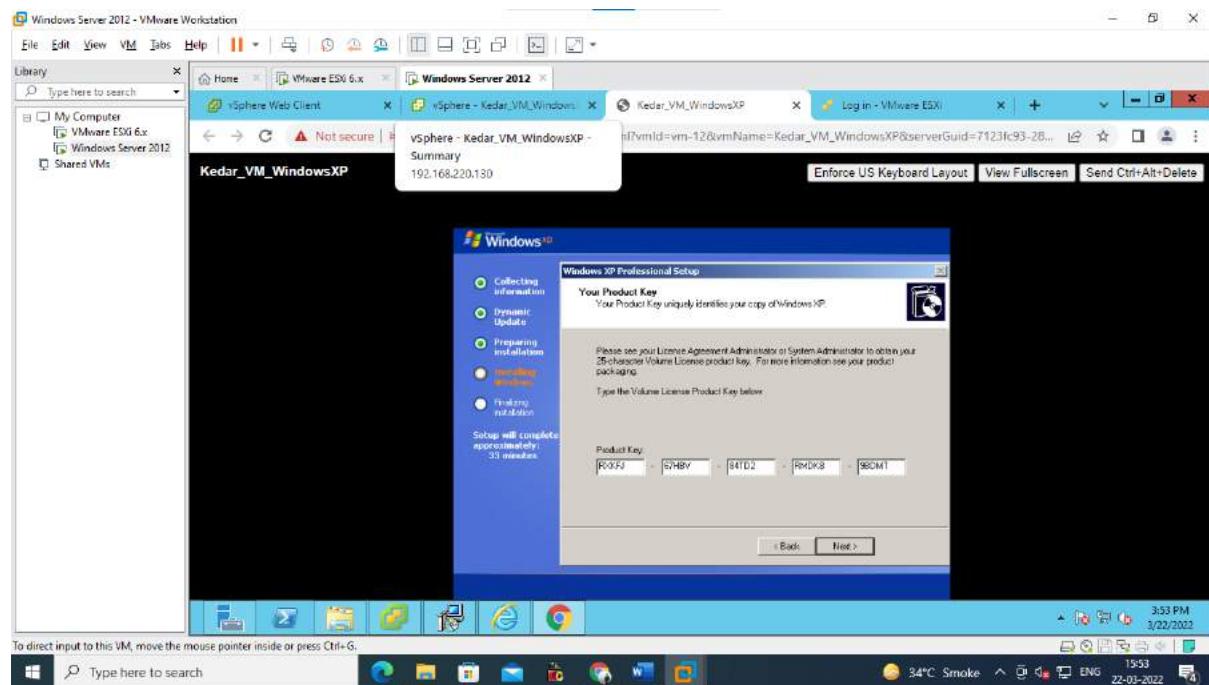


**Step 25:** Enter the Name and click on the **Next >** button.

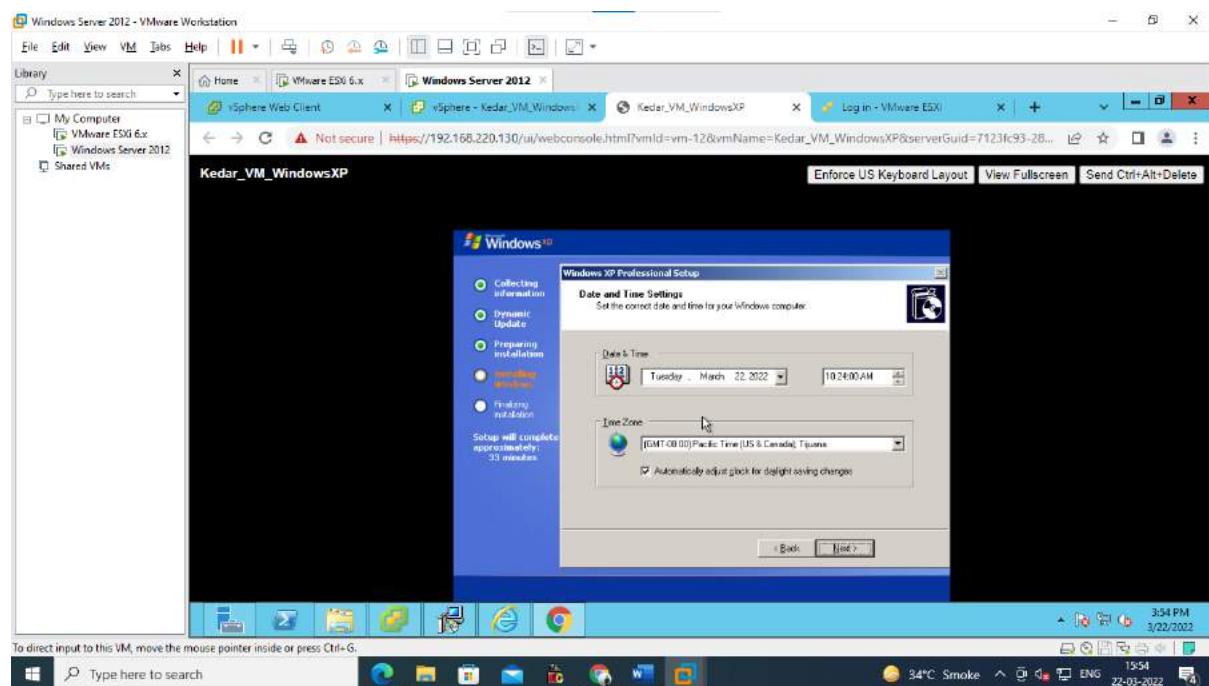
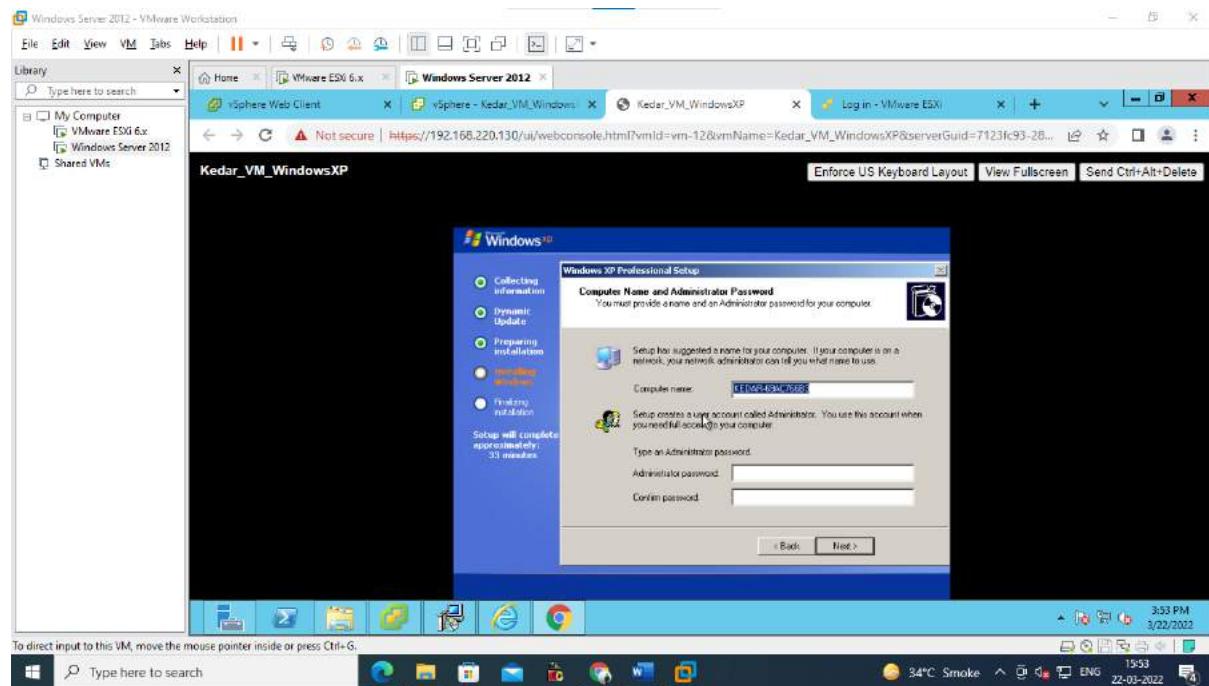


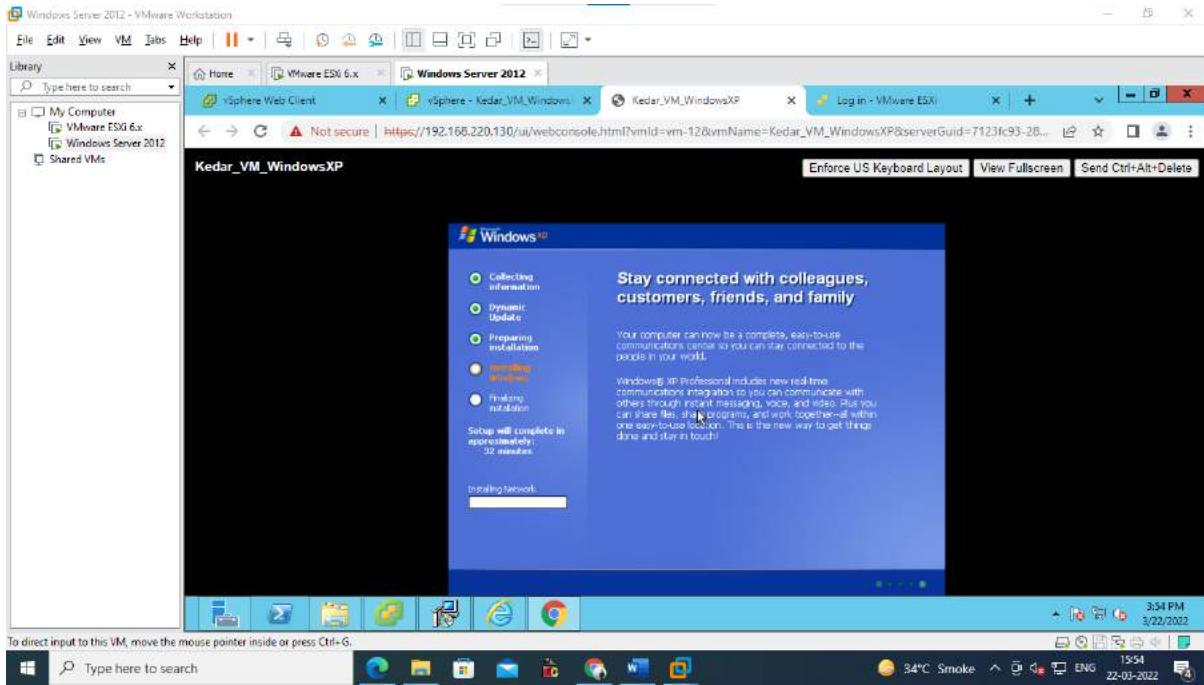
**Step 26:** Enter the Product Key and click on the **Next >** button.

RXKFJ-67HBV-84TD2-RMDK8-9BDMT

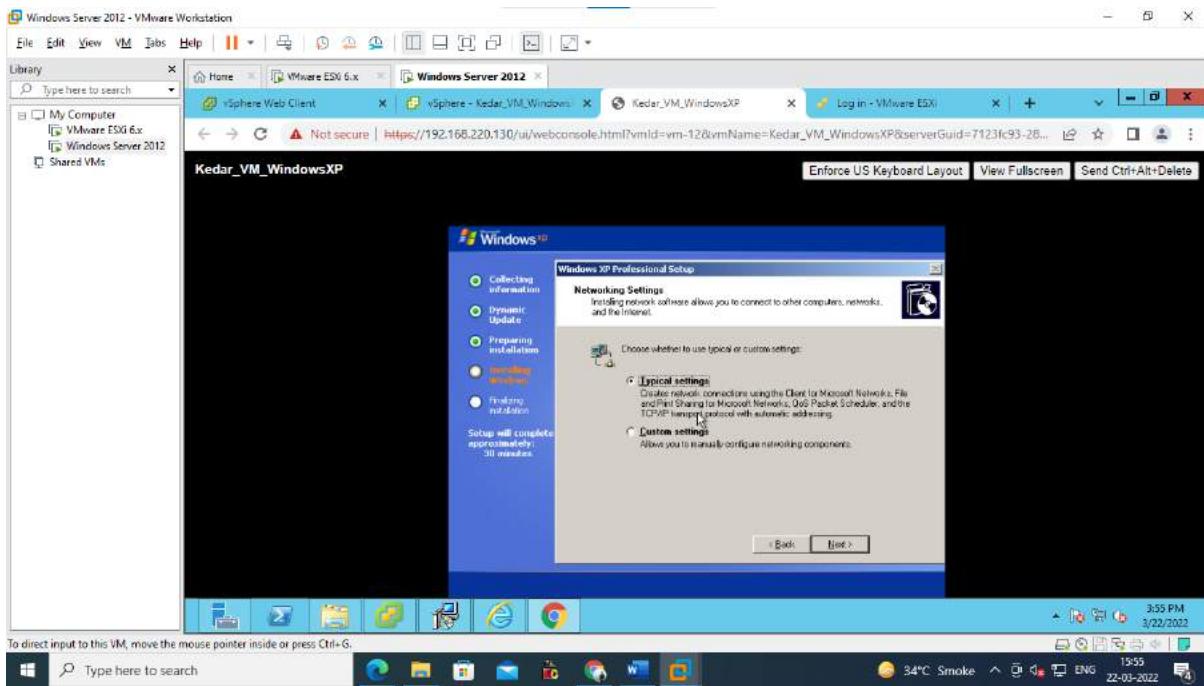


**Step 27:** Click on the **Next >** button.

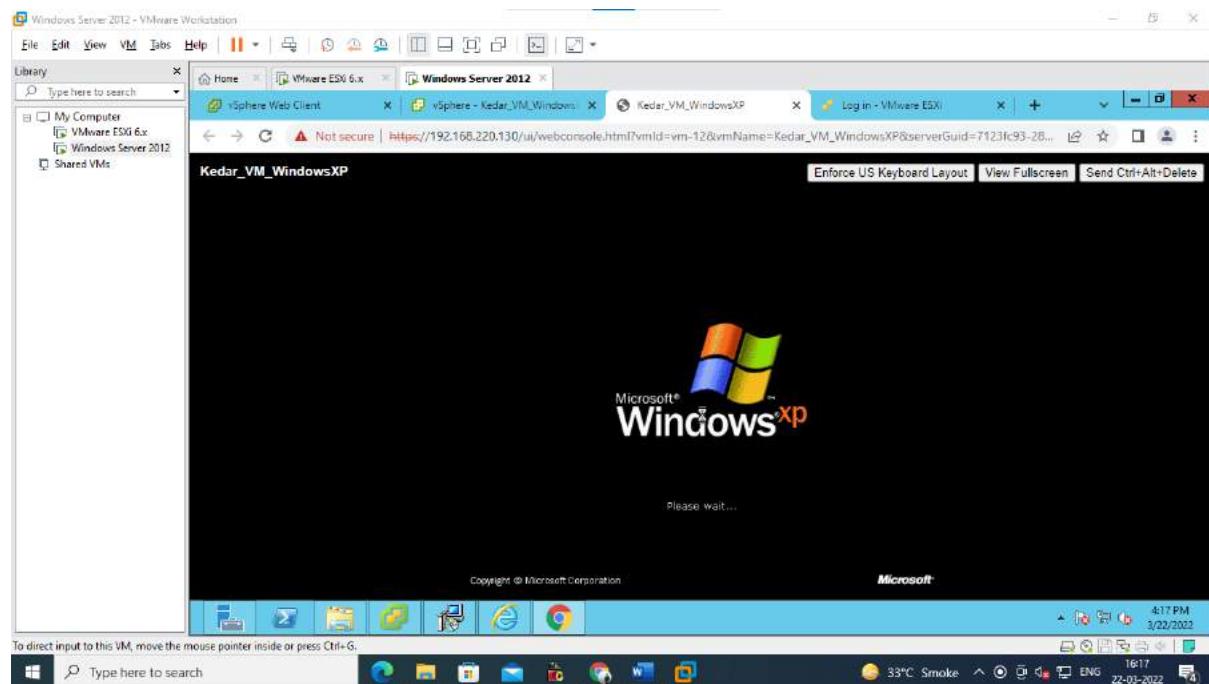
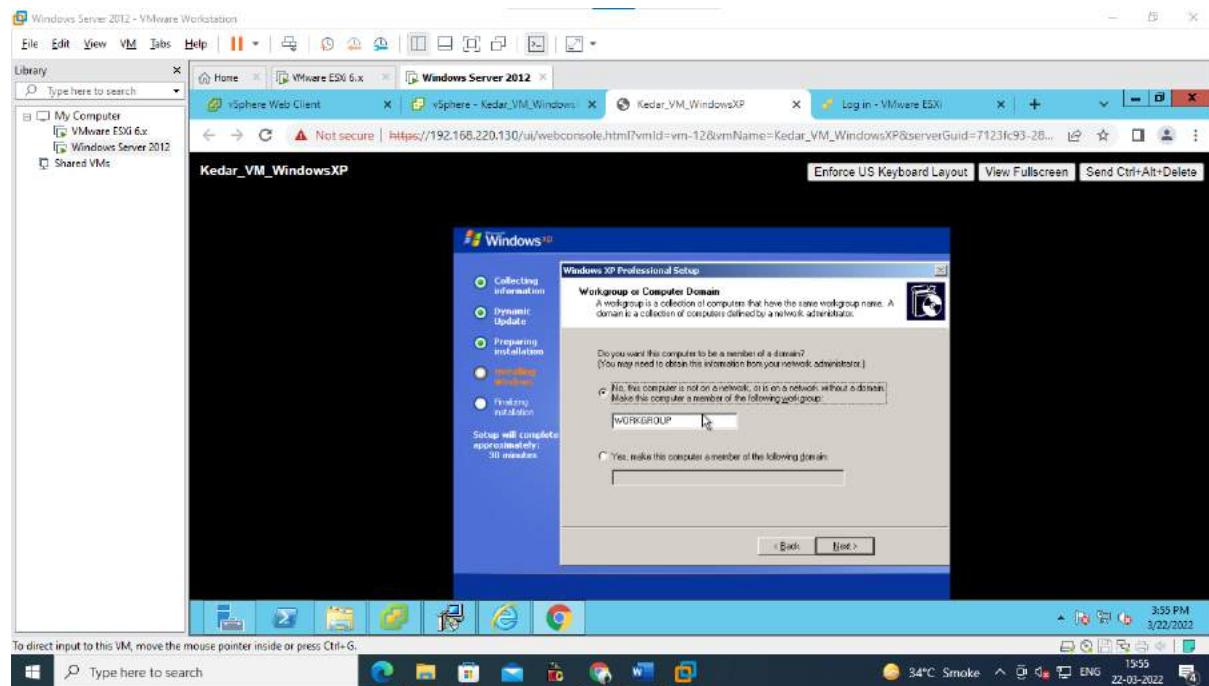


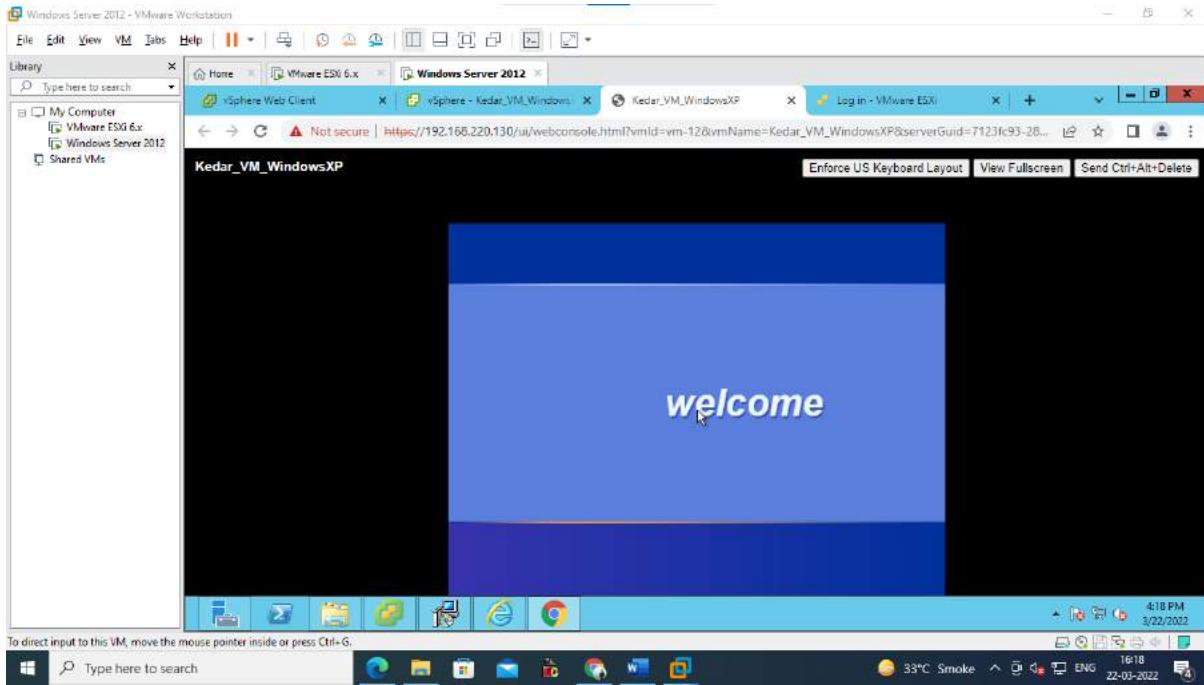


**Step 28:** Select Typical settings option and click on the Next > button.

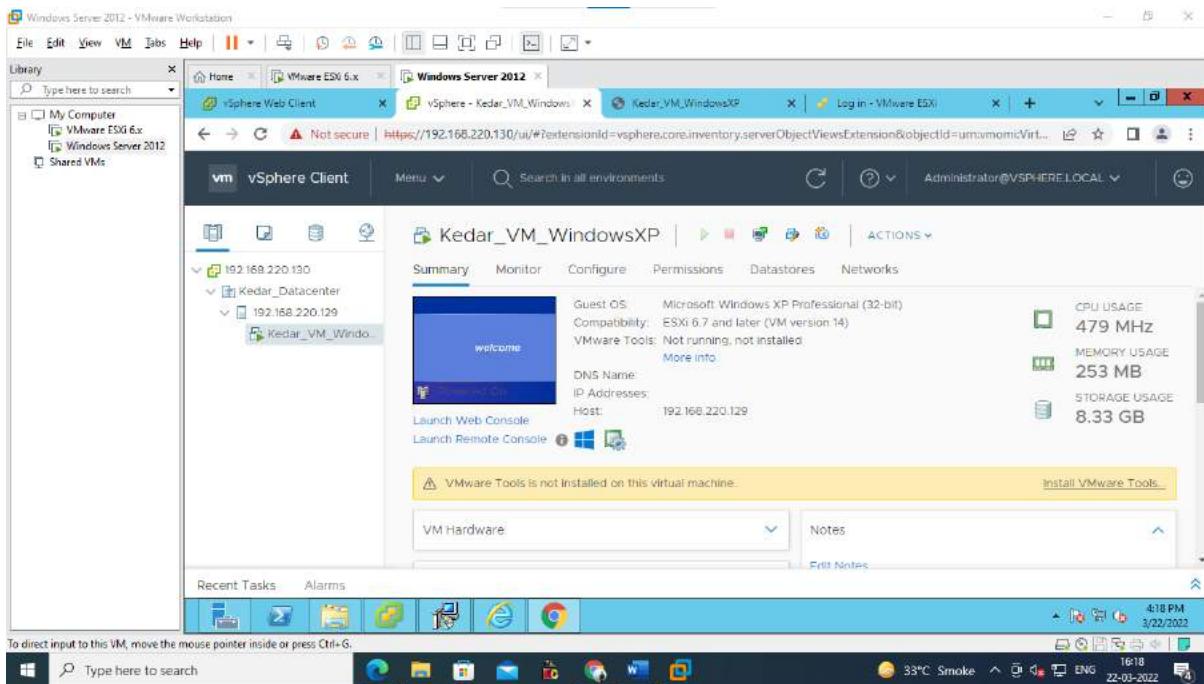


**Step 29:** Select **First option No** option and click on the **Next >** button.





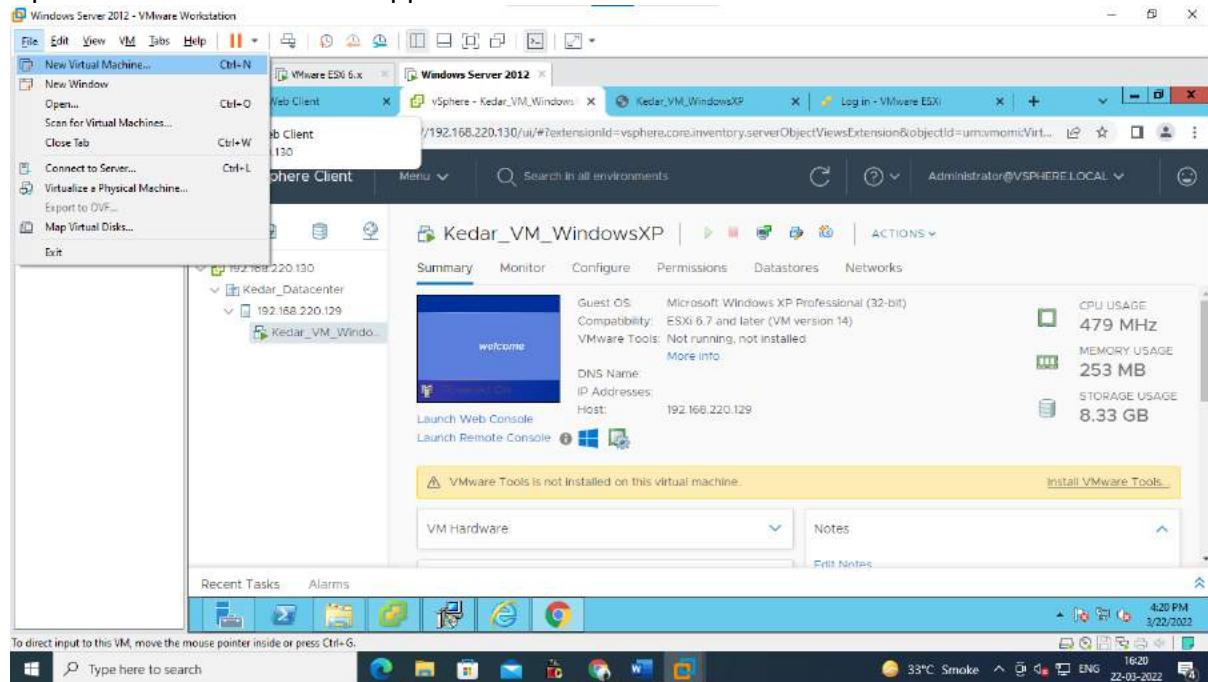
Go to the vSphere tab in chrome and check the Windows XP started.



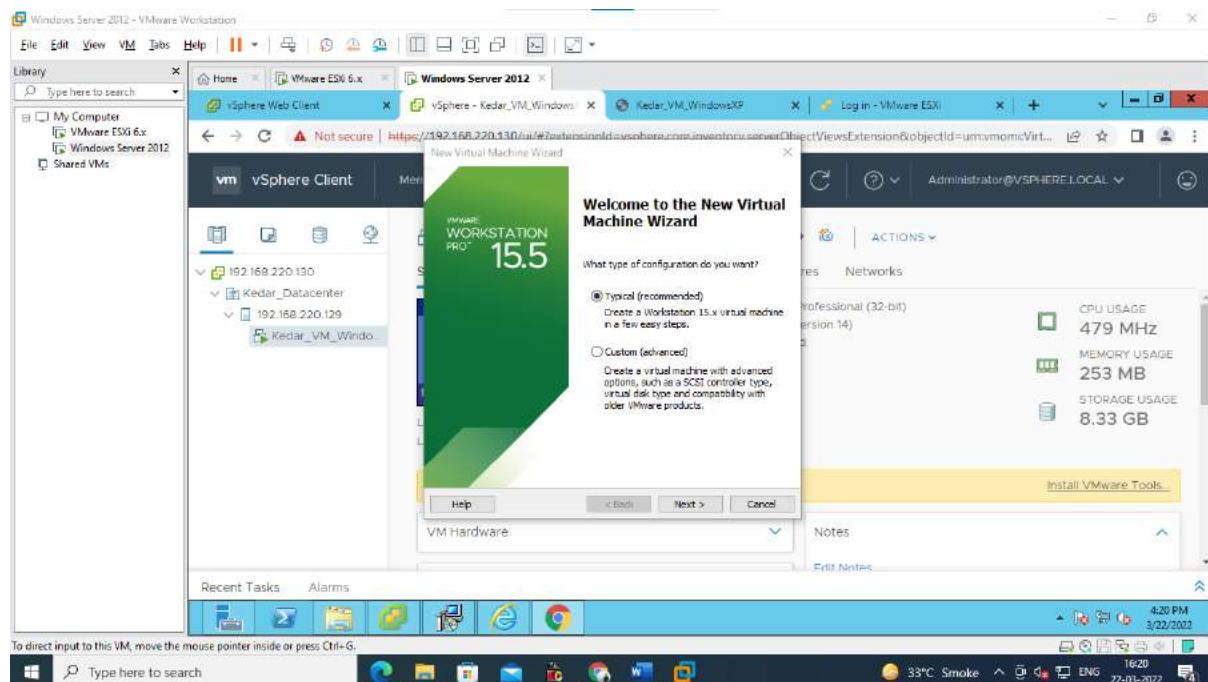
## B. Migrate the virtual machine from one ESXi server to another ESXi server

**Step 1:** Create a new virtual machine in VMWare Workstation.

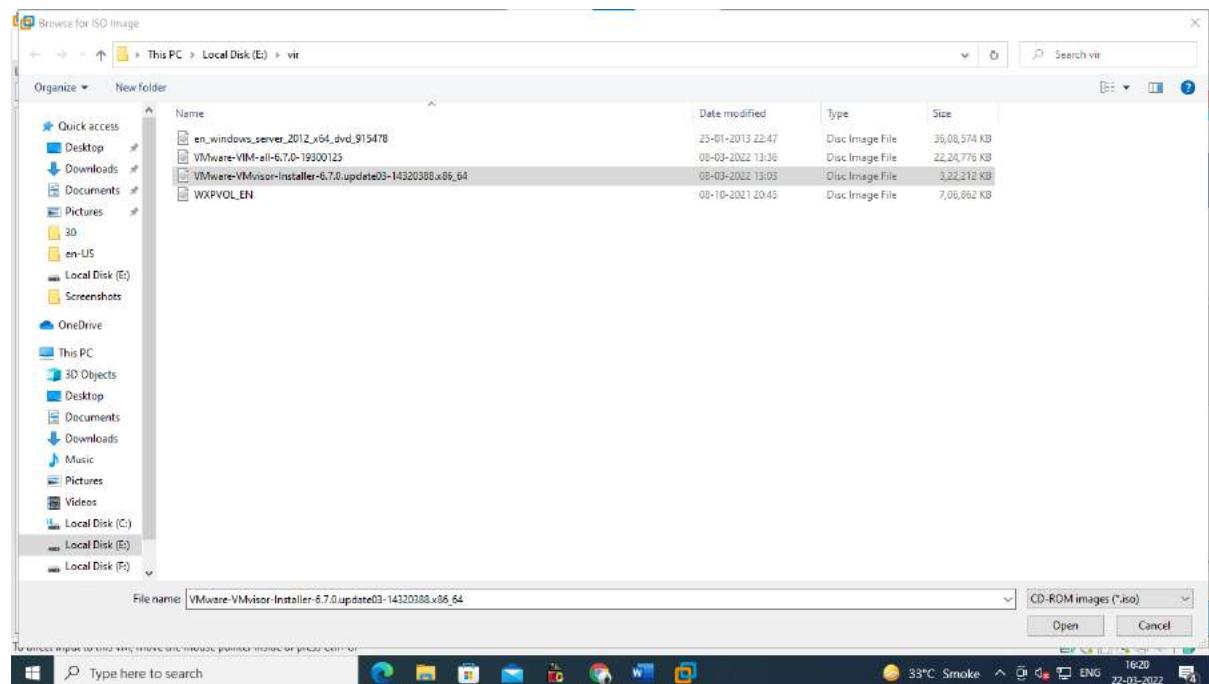
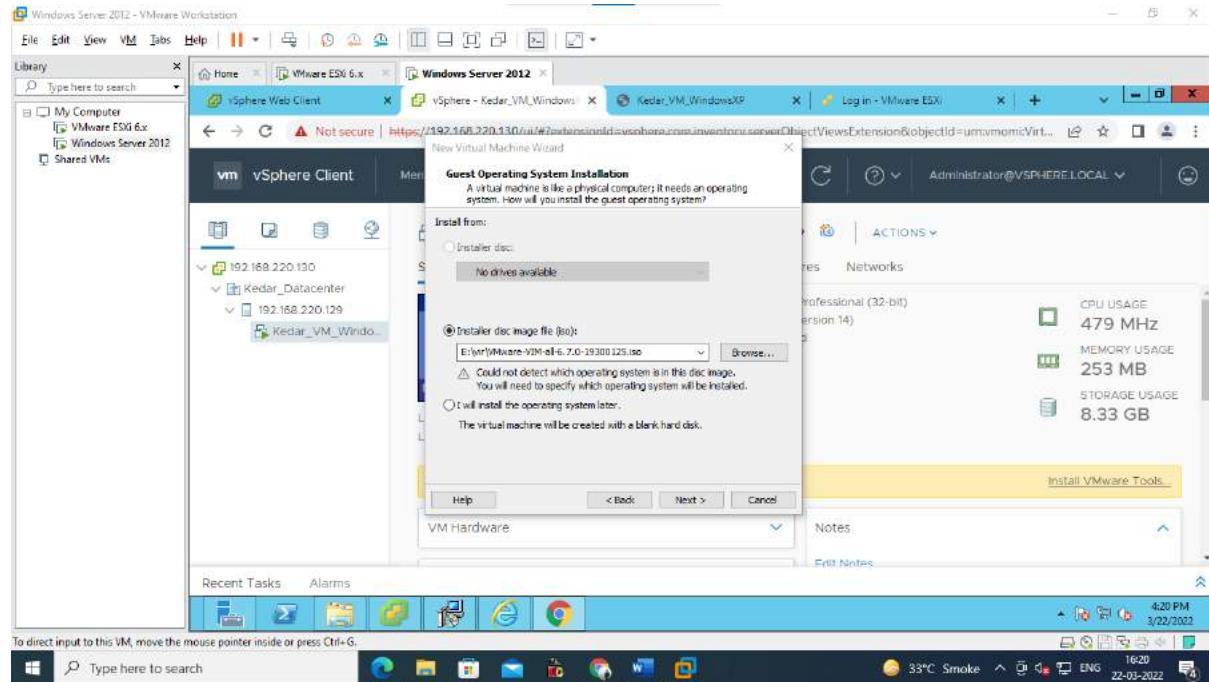
Open VMware Workstation application and then Click on **File -> New Virtual Machine...**

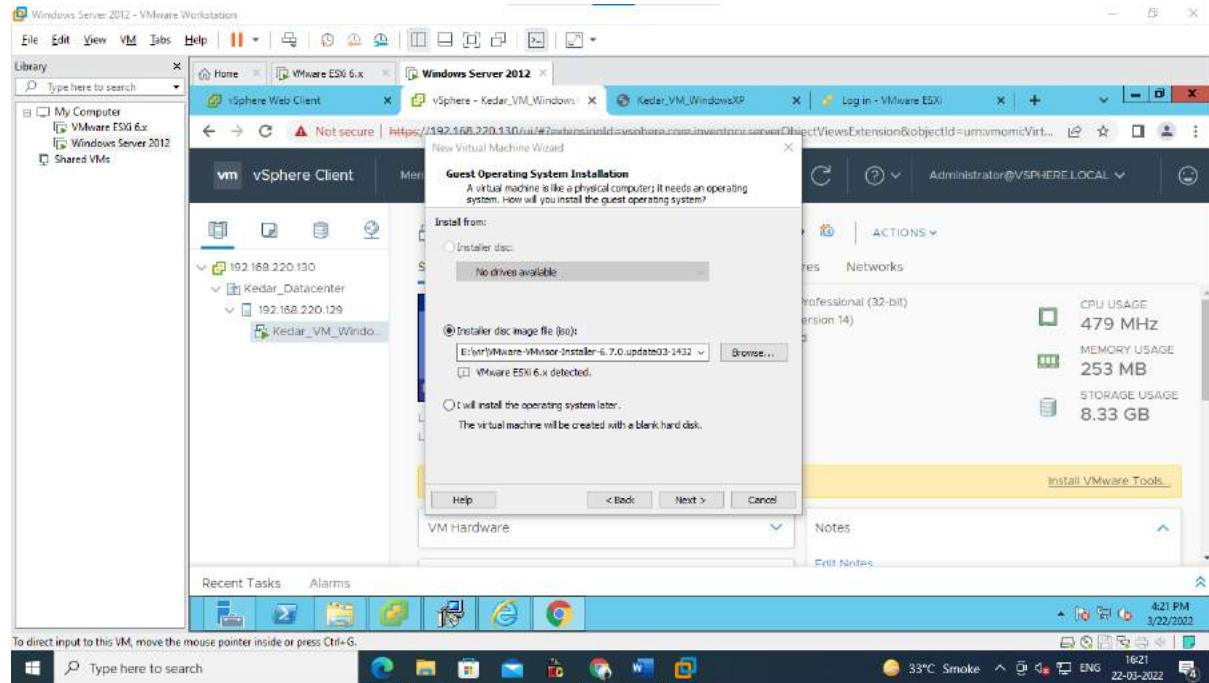


**Step 2:** Select first option - **Typical(recommended)** and Click on **Next >** button.

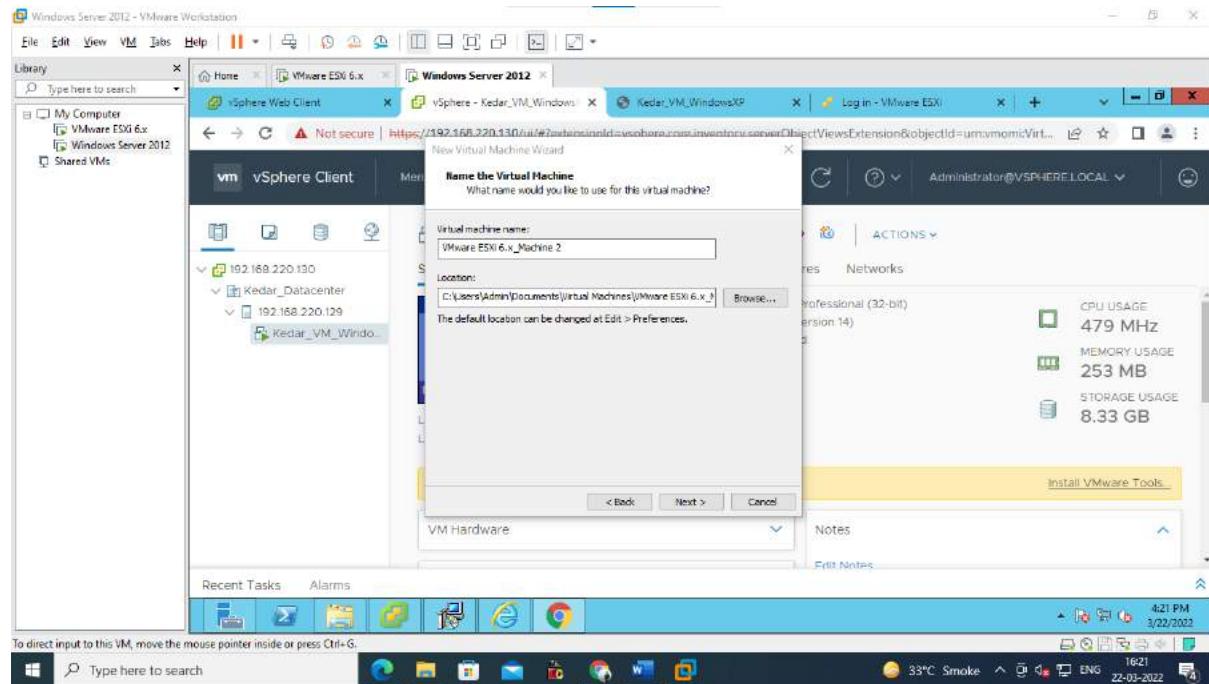


**Step 3:** Select **VMware VMvisor installer disc image file (iso)** option and browse **Virtual machine iso file** and then click on **Next >** button.

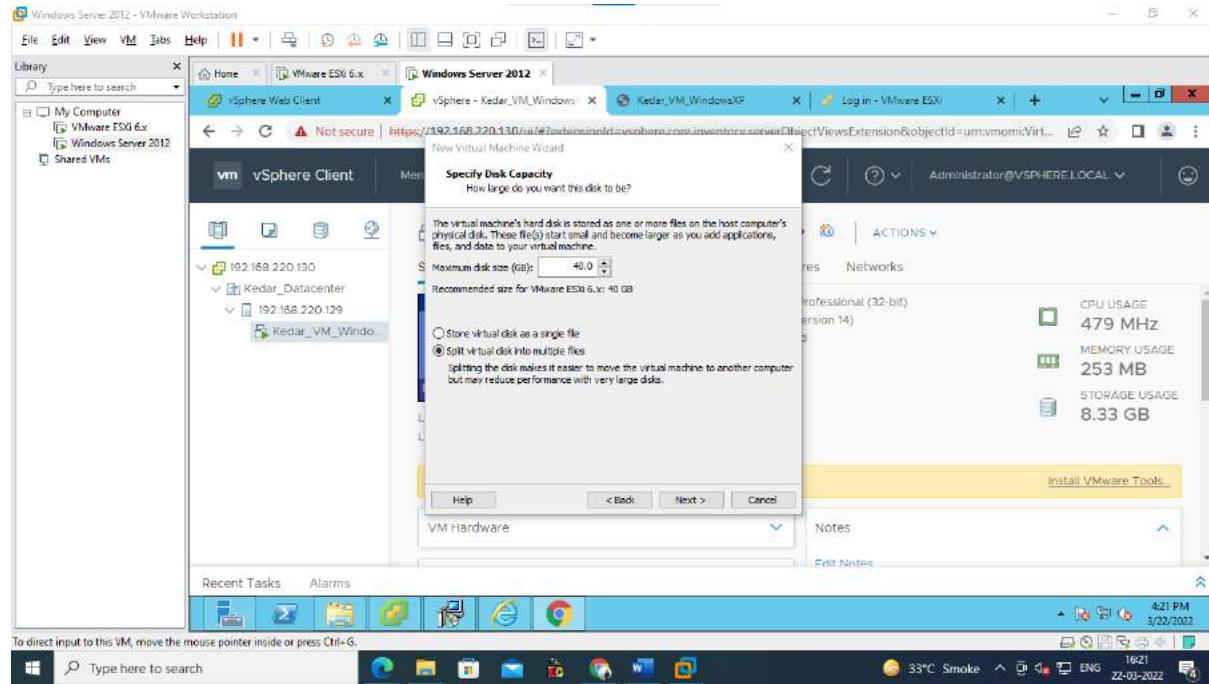




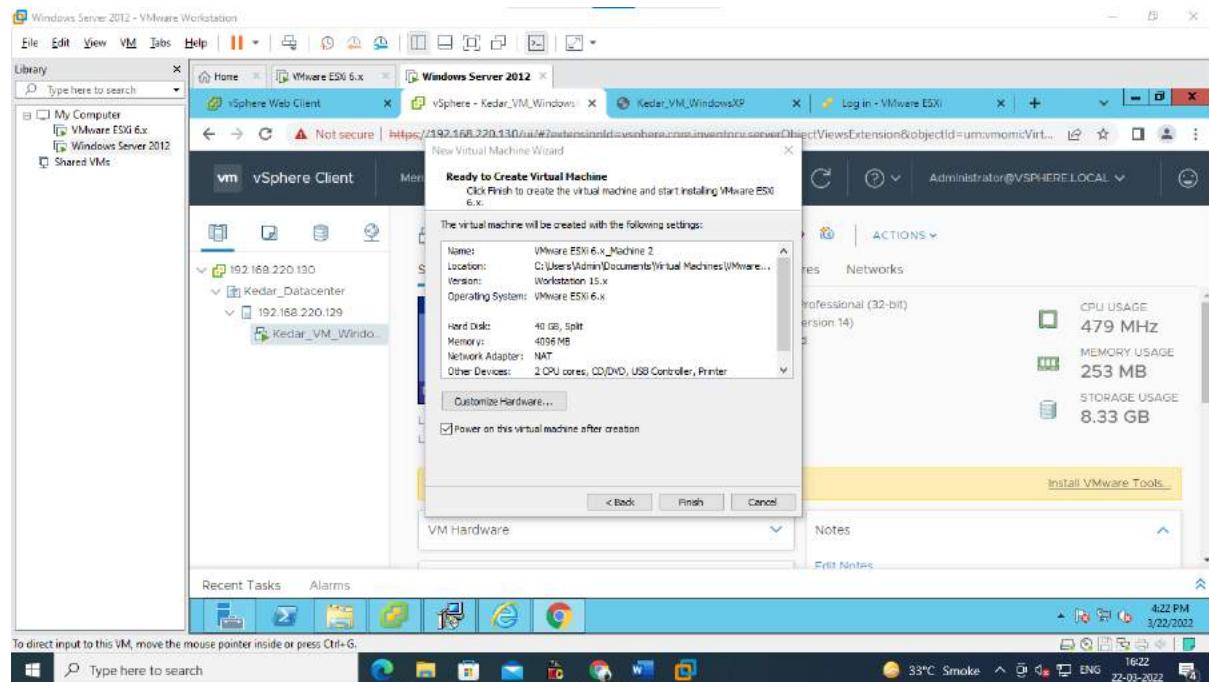
**Step 4:** Enter Virtual machine name and Click on Next > button.

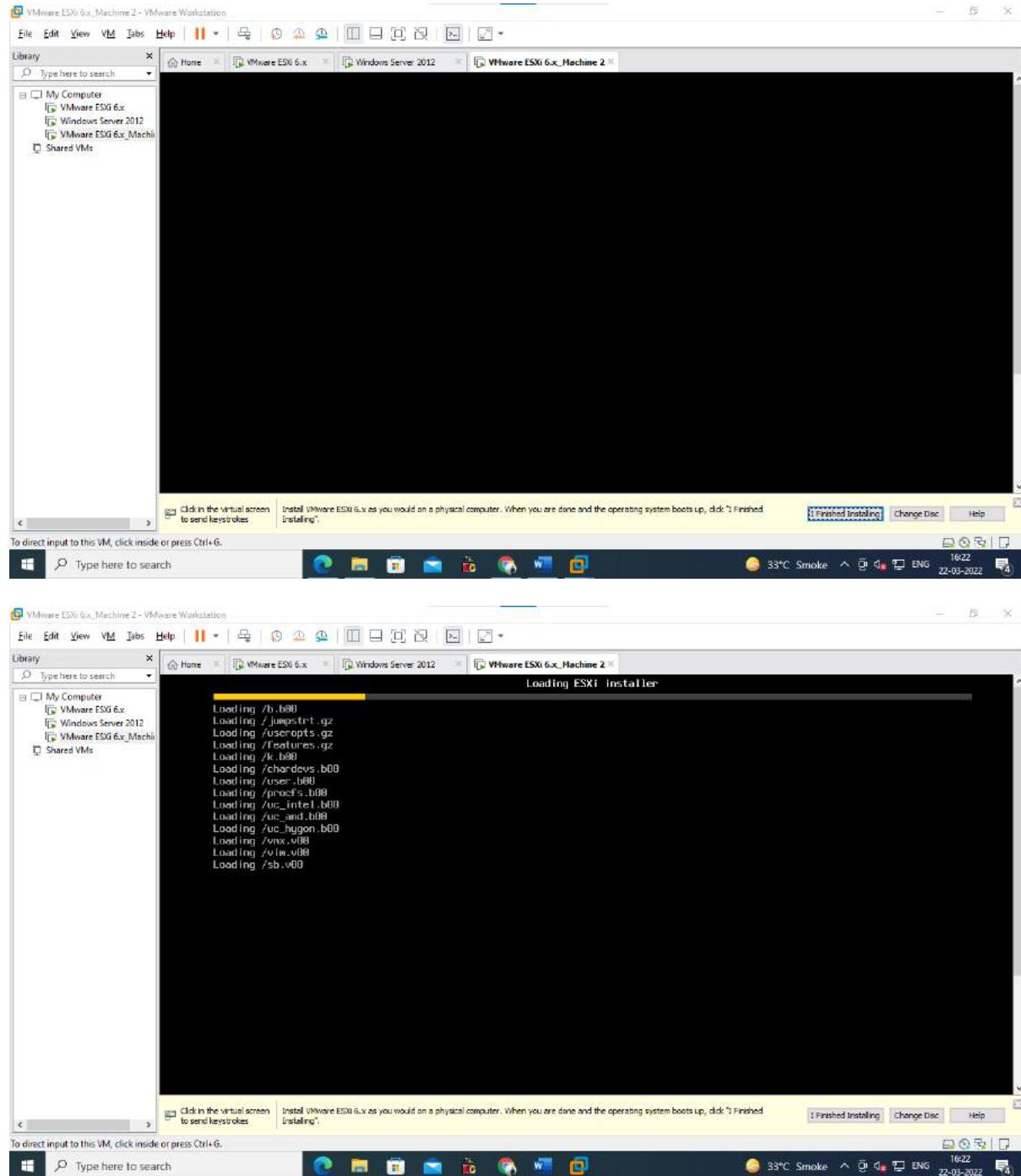


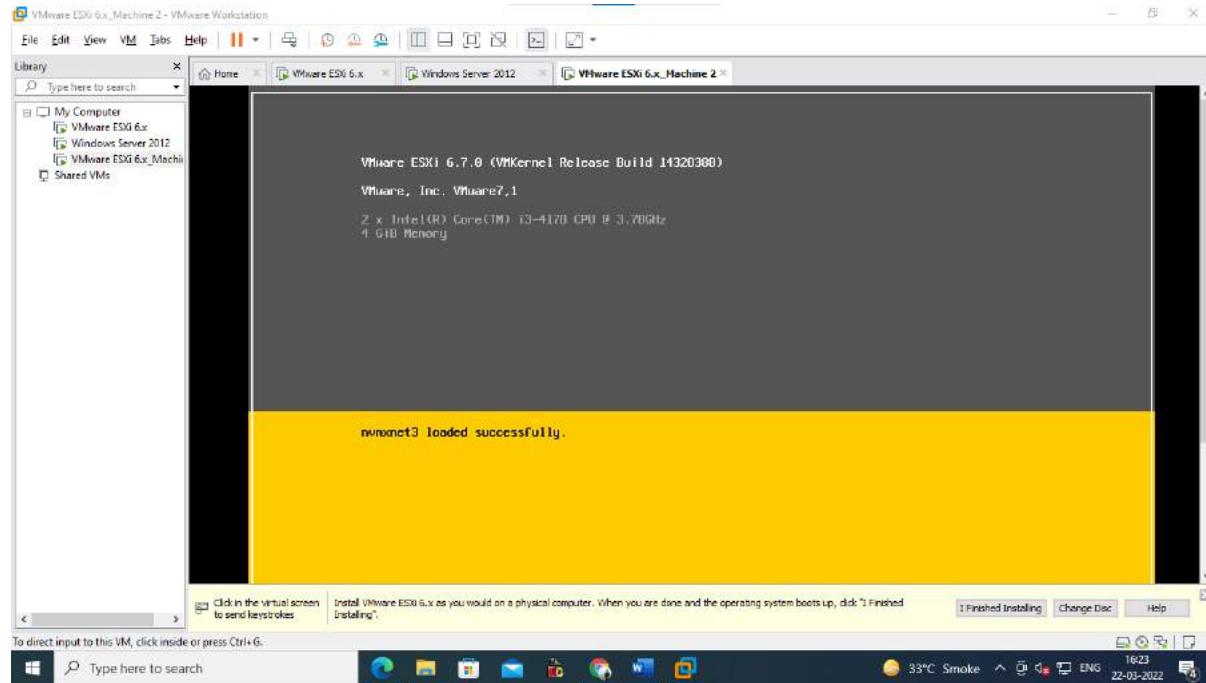
**Step 5:** Enter Maximum disk size (GB) as 40.0 and select Split virtual disk into multiple file option and Click on Next > button.



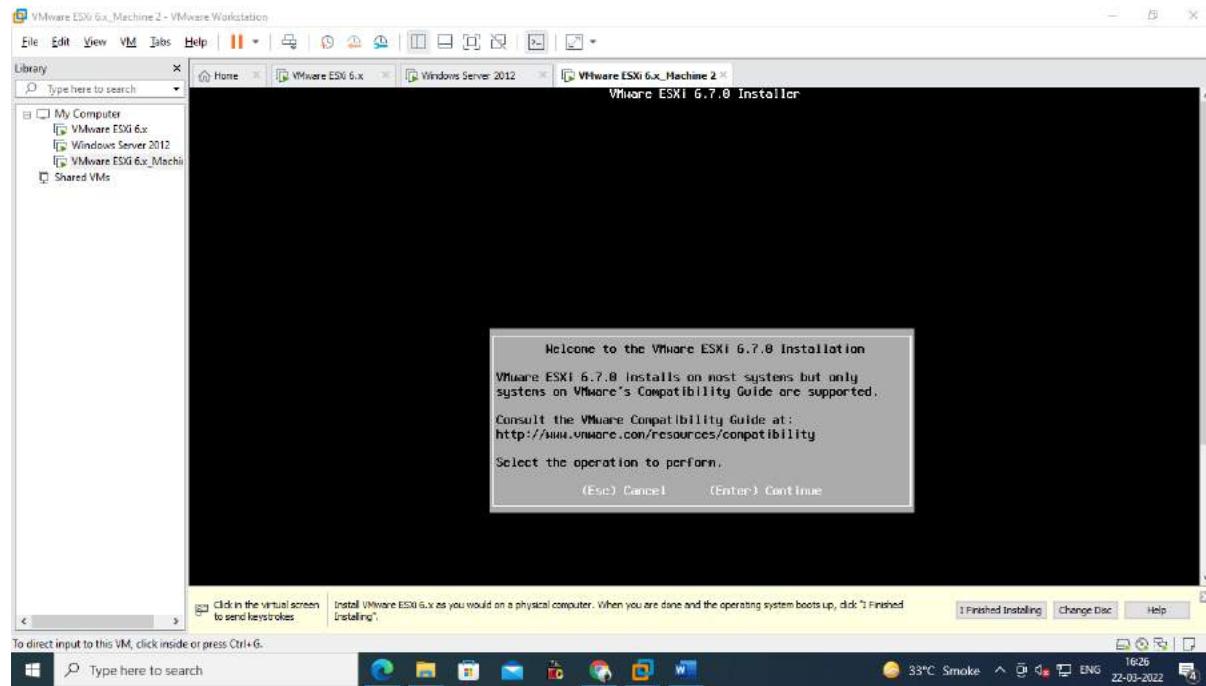
**Step 6:** Click on Finish button.

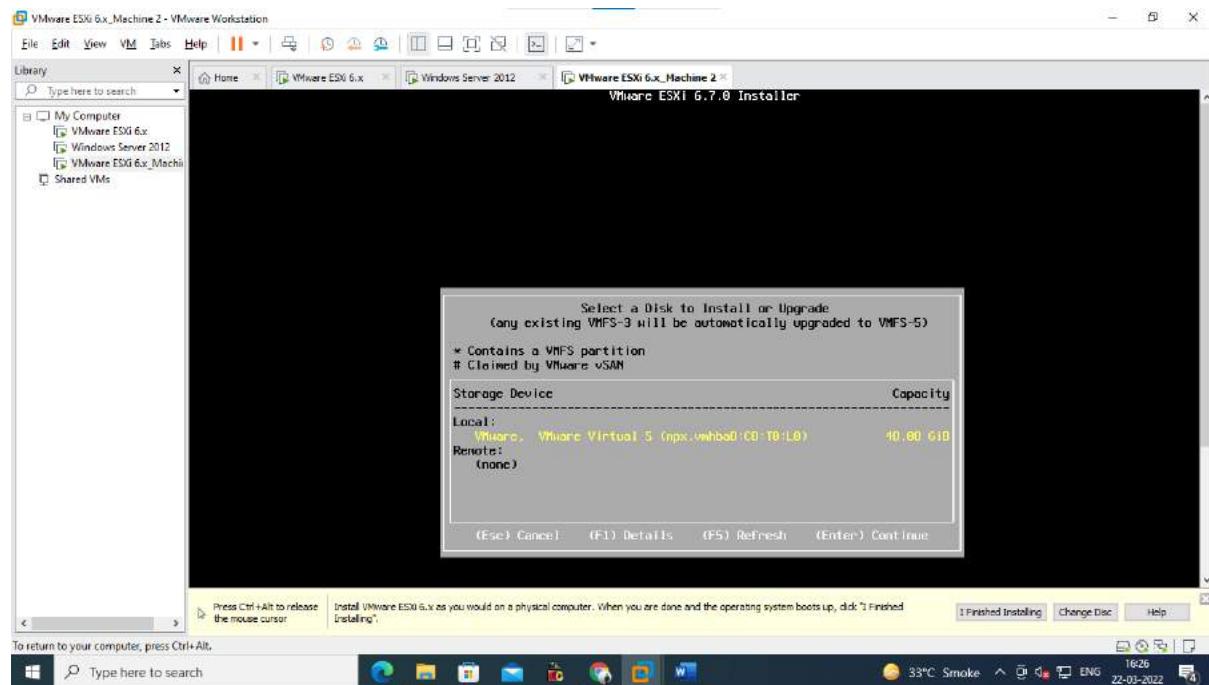






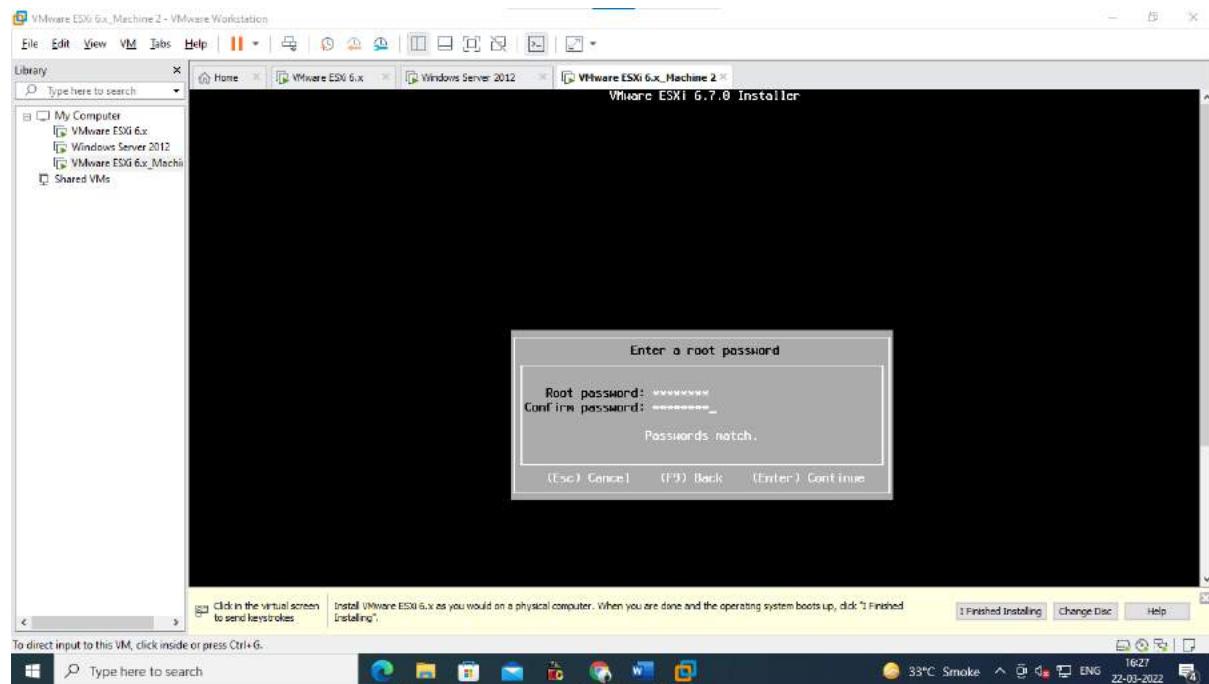
### Step 7: Click on Continue or Press Enter.



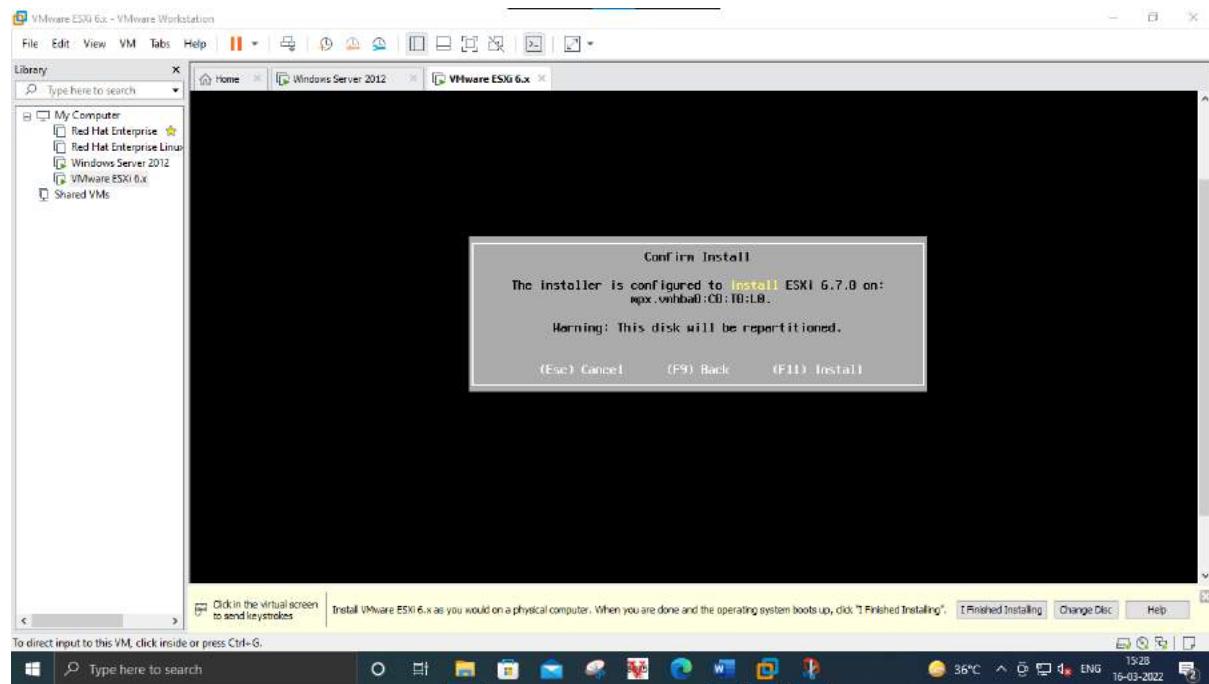


**Step 8:** Enter a **Root password** and **Confirm password** and click on **Continue** or Press **Enter**.

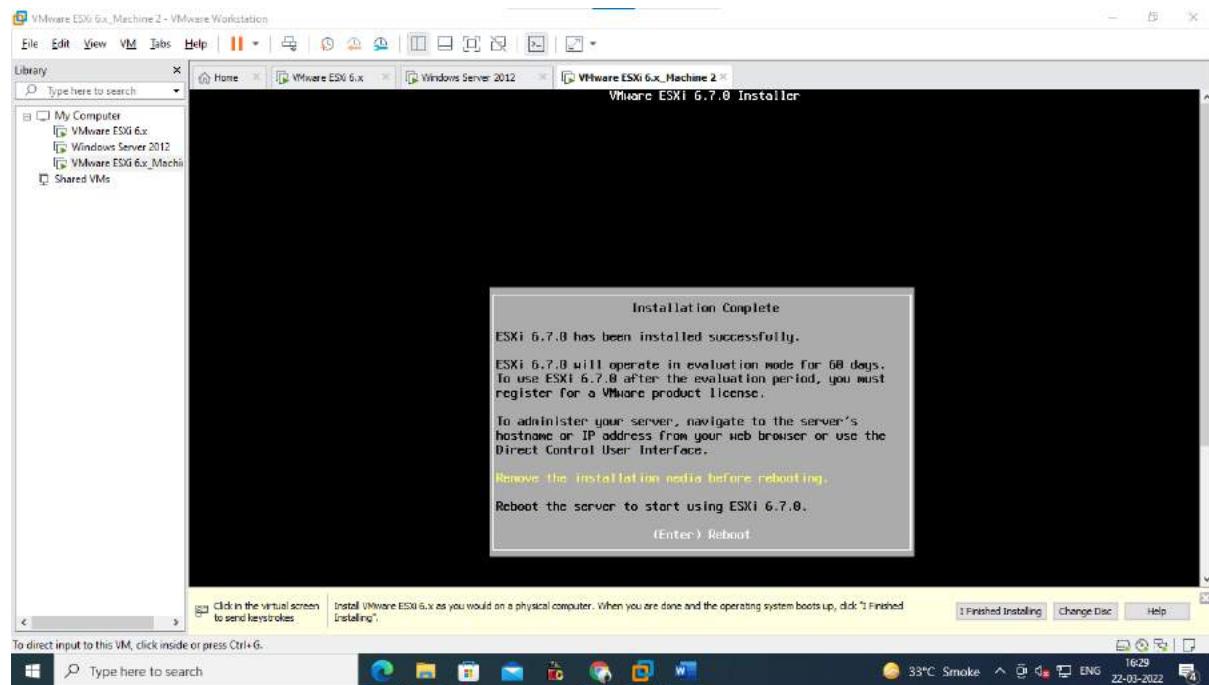
**Root password:** It@13579 -> Press Tab -> **Confirm password:** It@13579

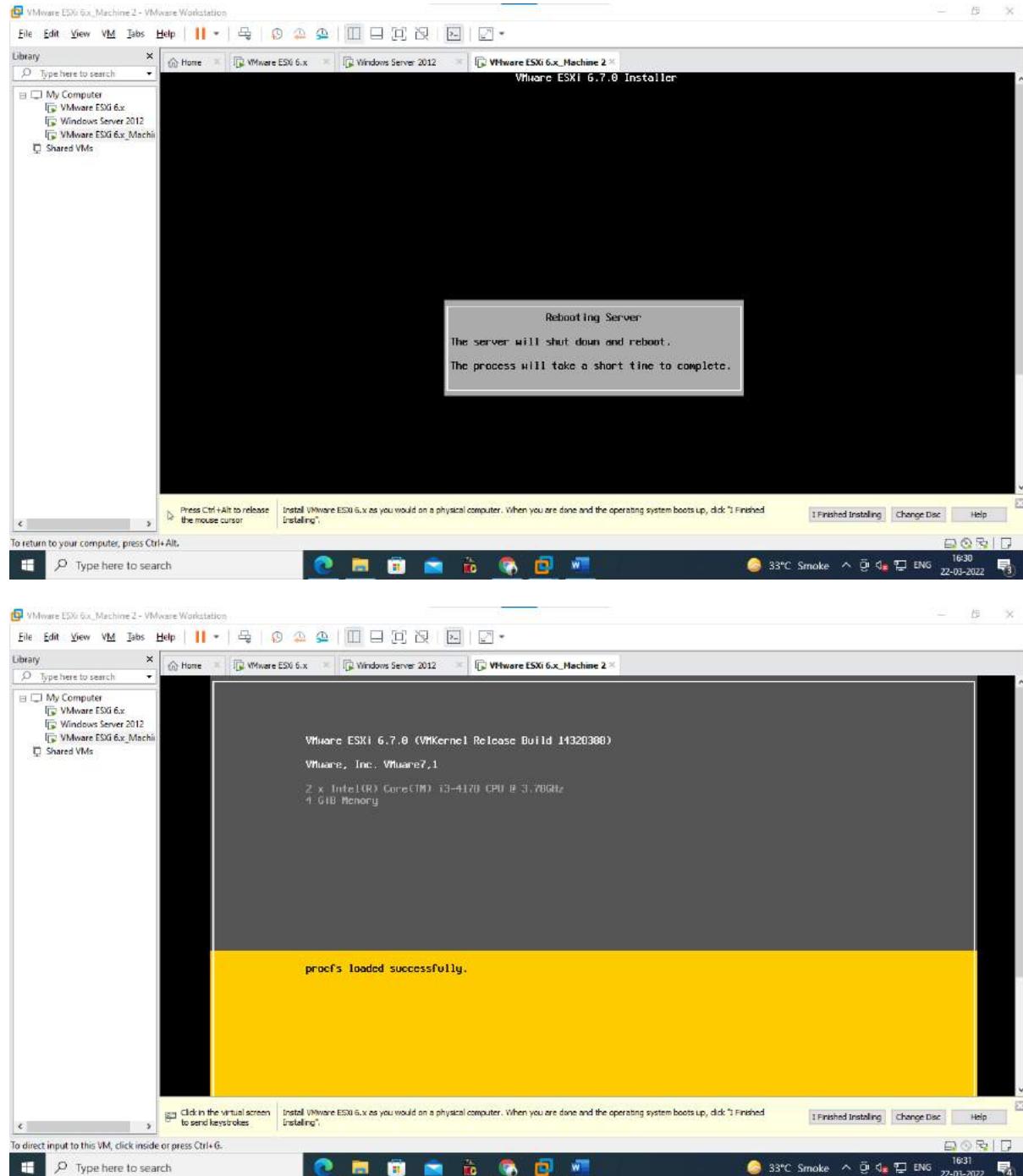


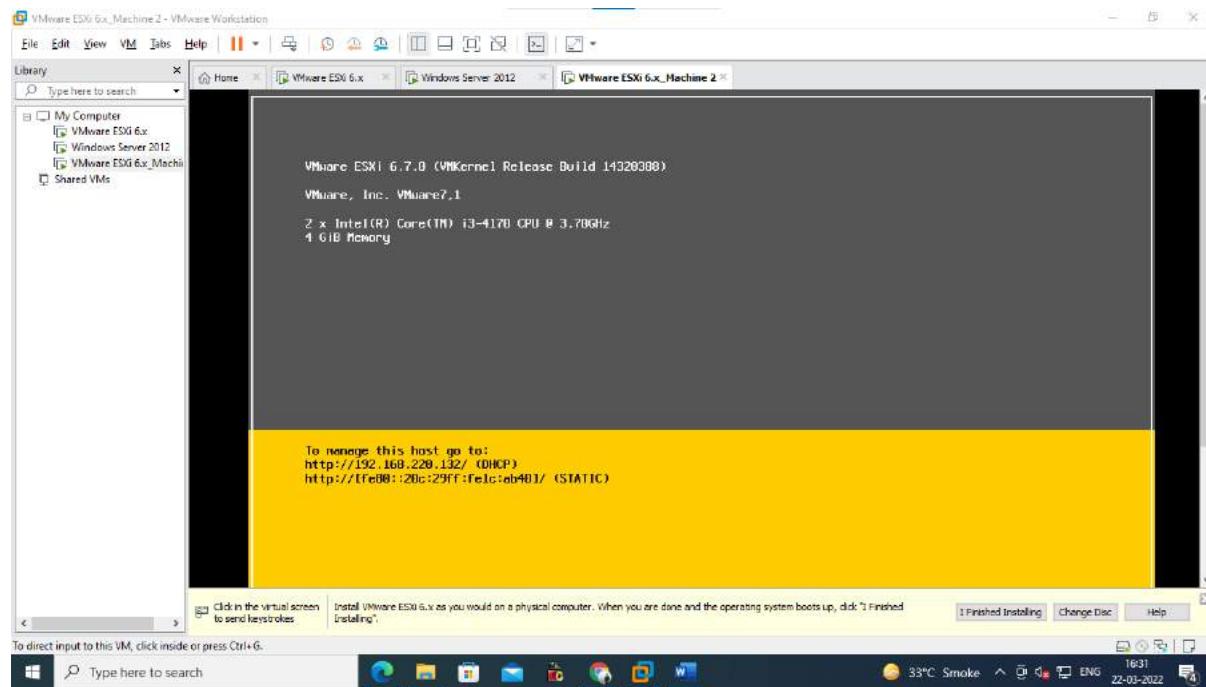
**Step 9: Click on Install or Press F11.**



**Step 10: Click on Reboot or Press Enter.**



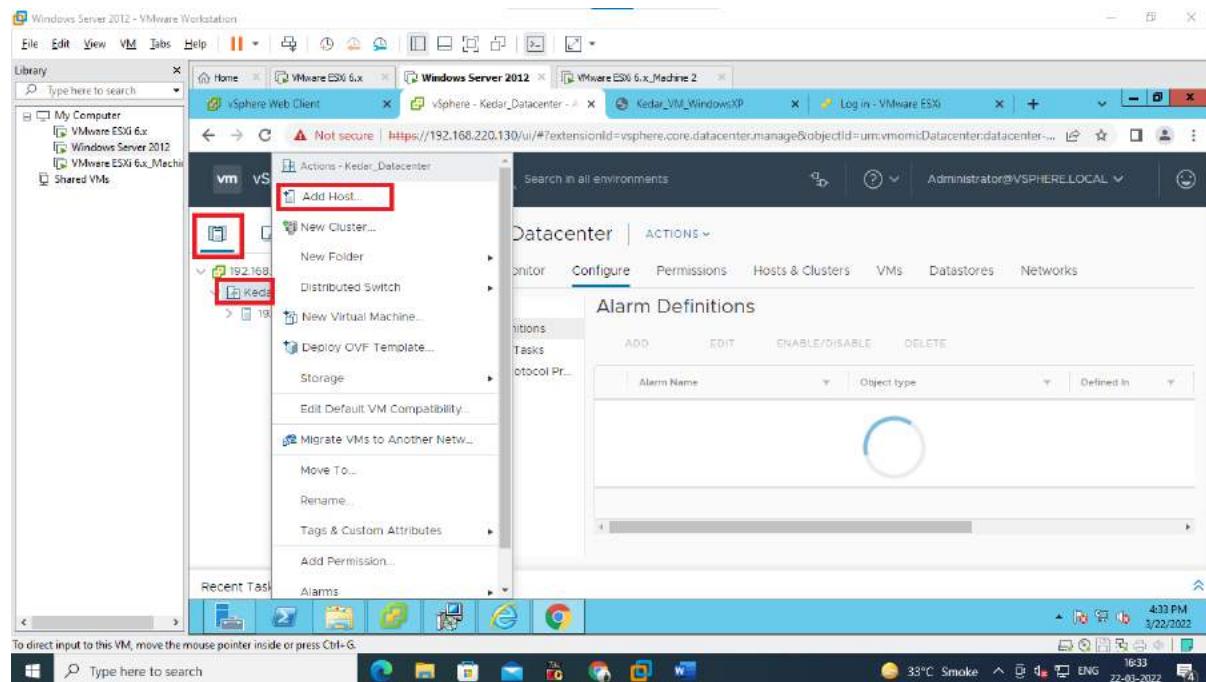




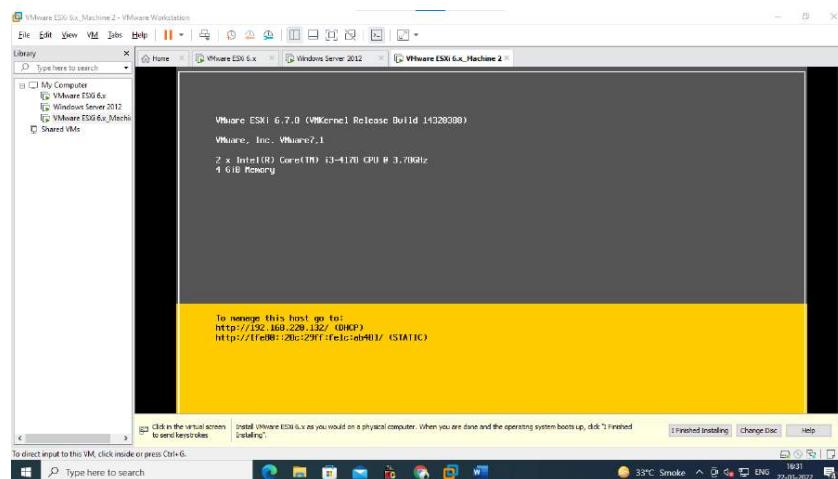
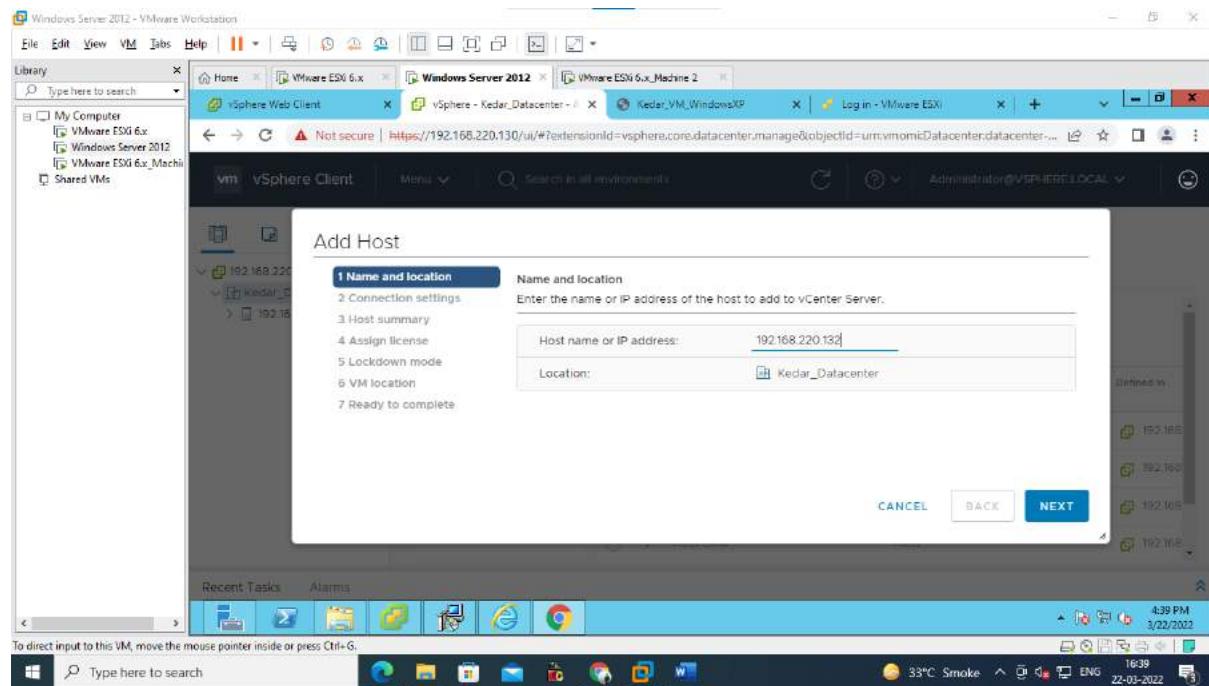
Copy or note down the IP address. Will use this IP address (192.168.220.132) for new host creation.

### Step 11: Create a New Host.

Right click on **Datacenter** and Select **Add Host...** option.



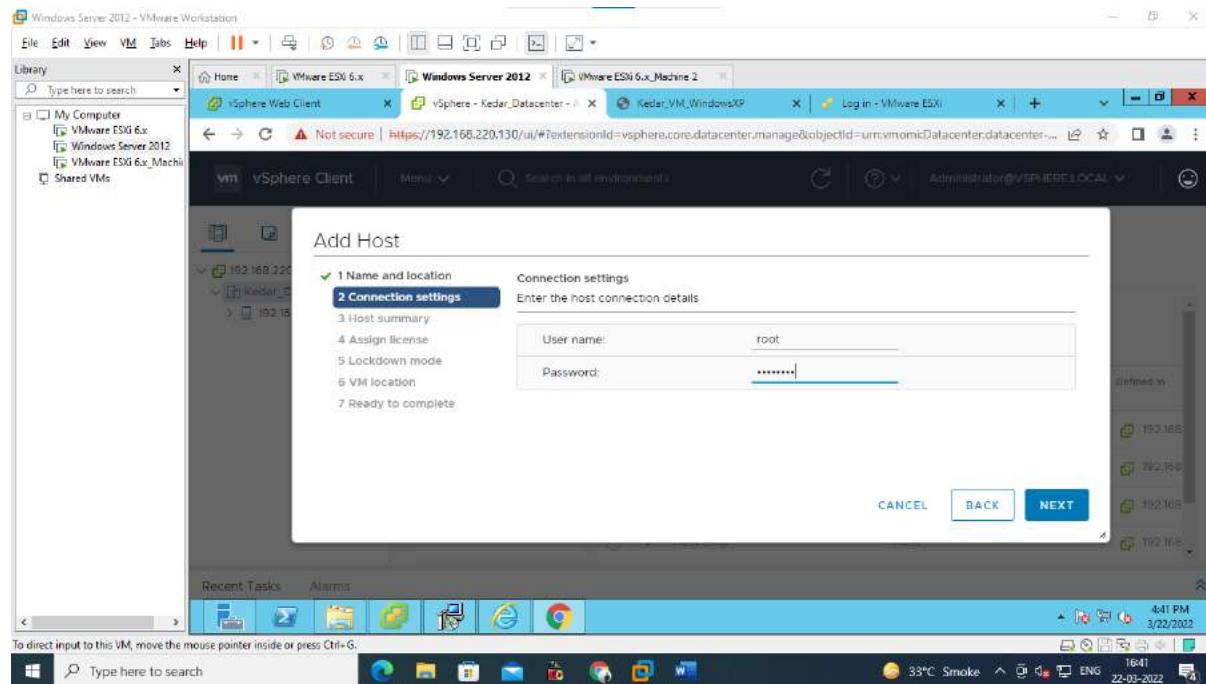
**Step 12:** Enter the copied IP address in host name or IP address field and Click on **Next** button.



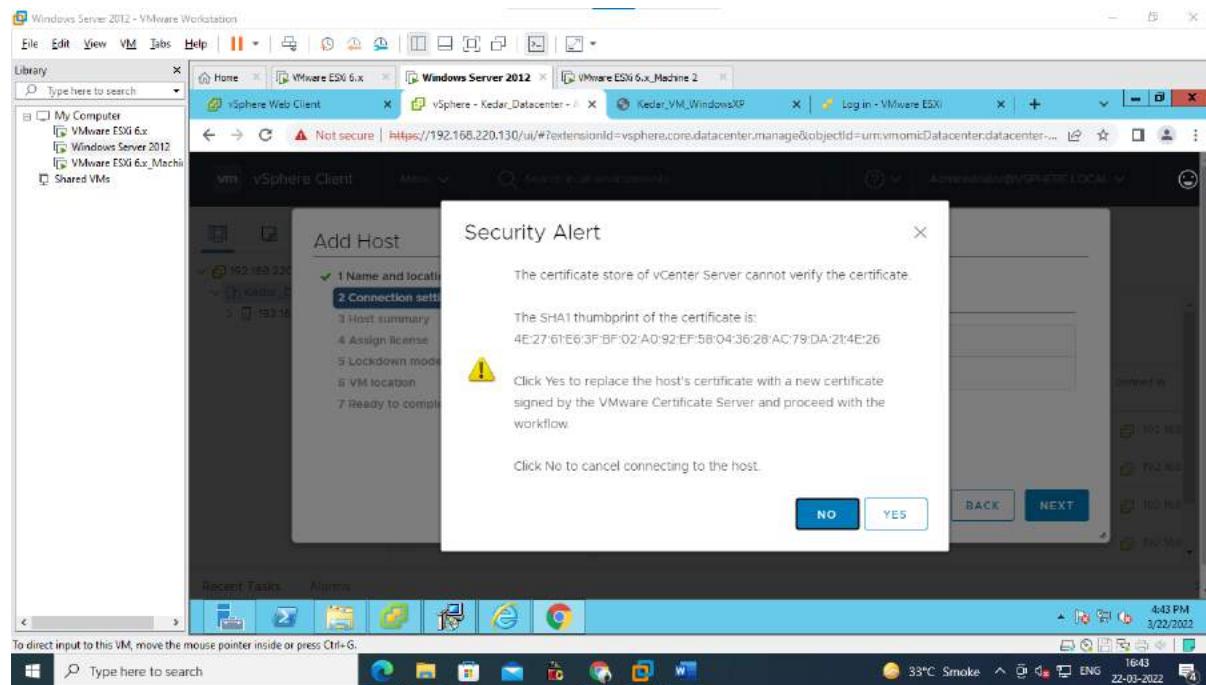
**Step 13:** Enter User name and Password and Click on Next button.

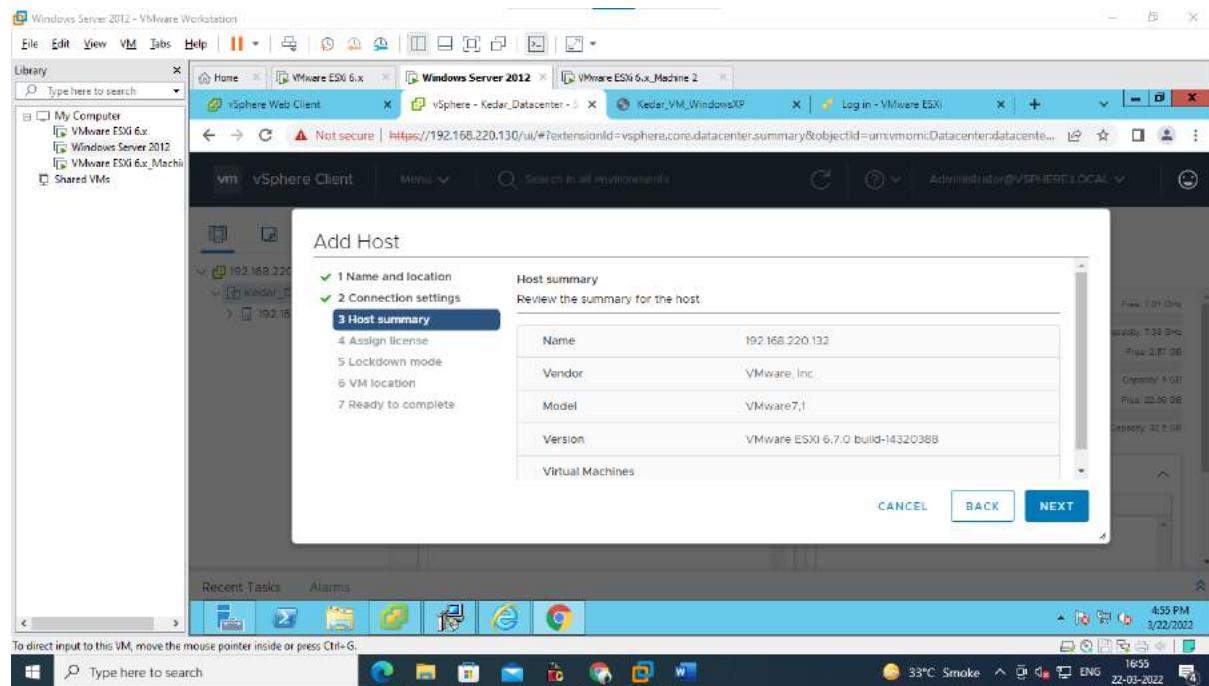
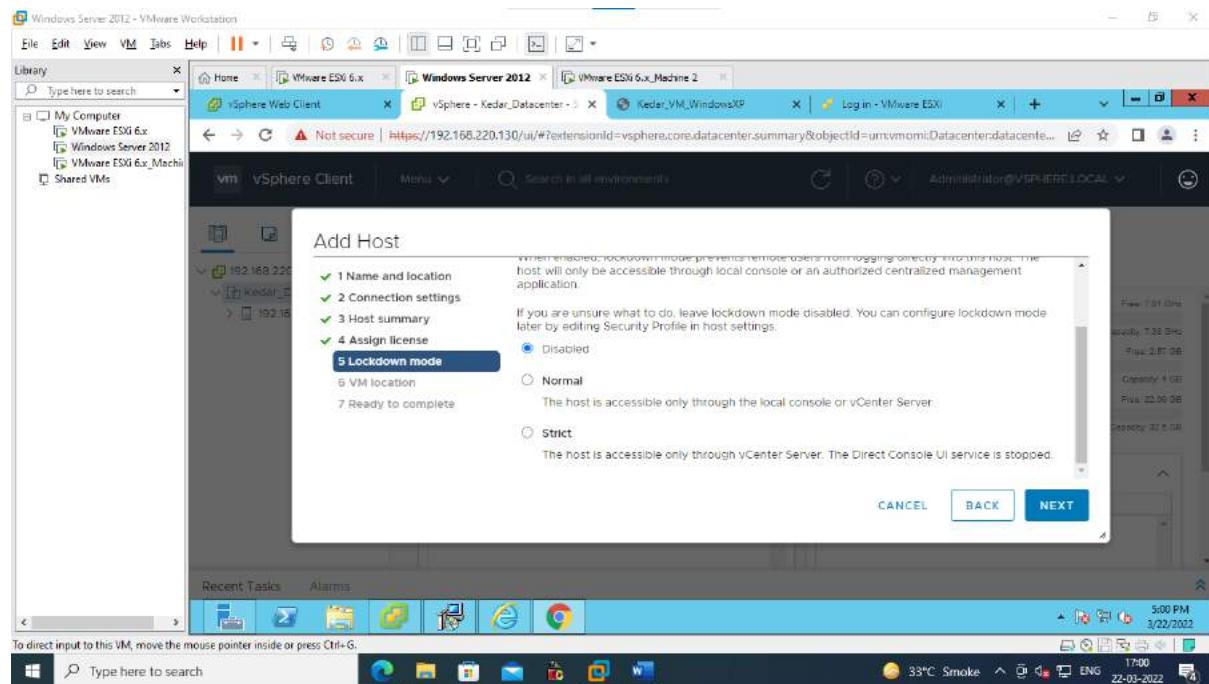
**User Name:** root

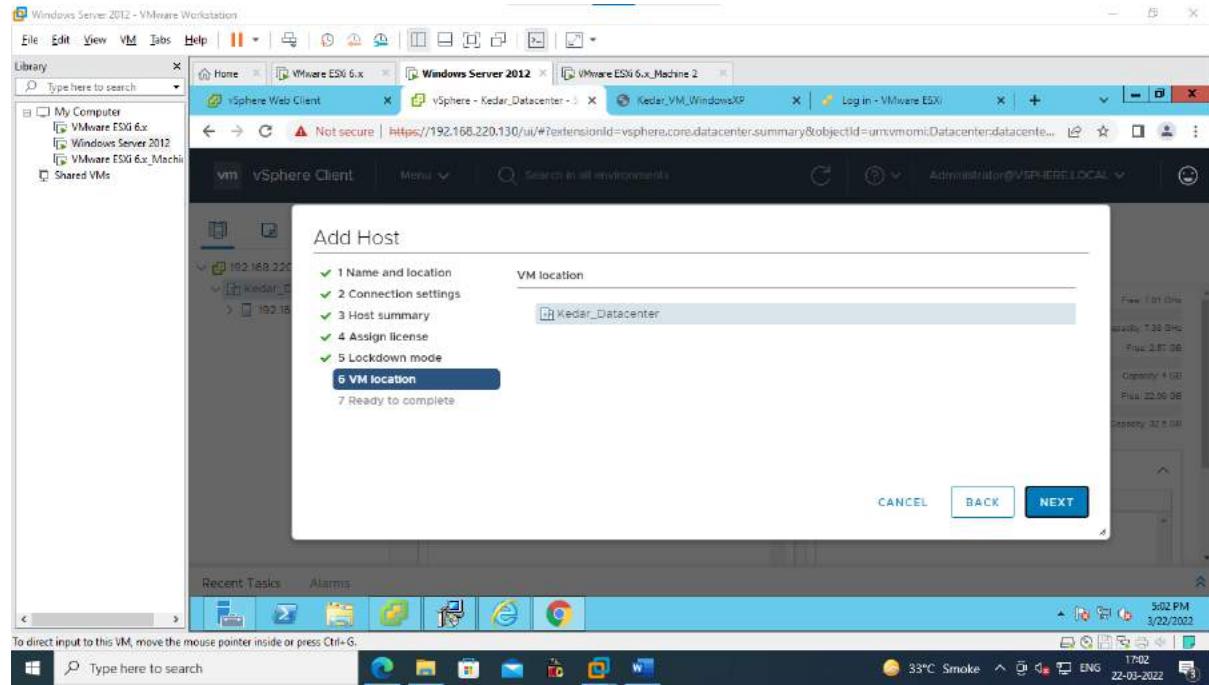
**Password:** lt@13579



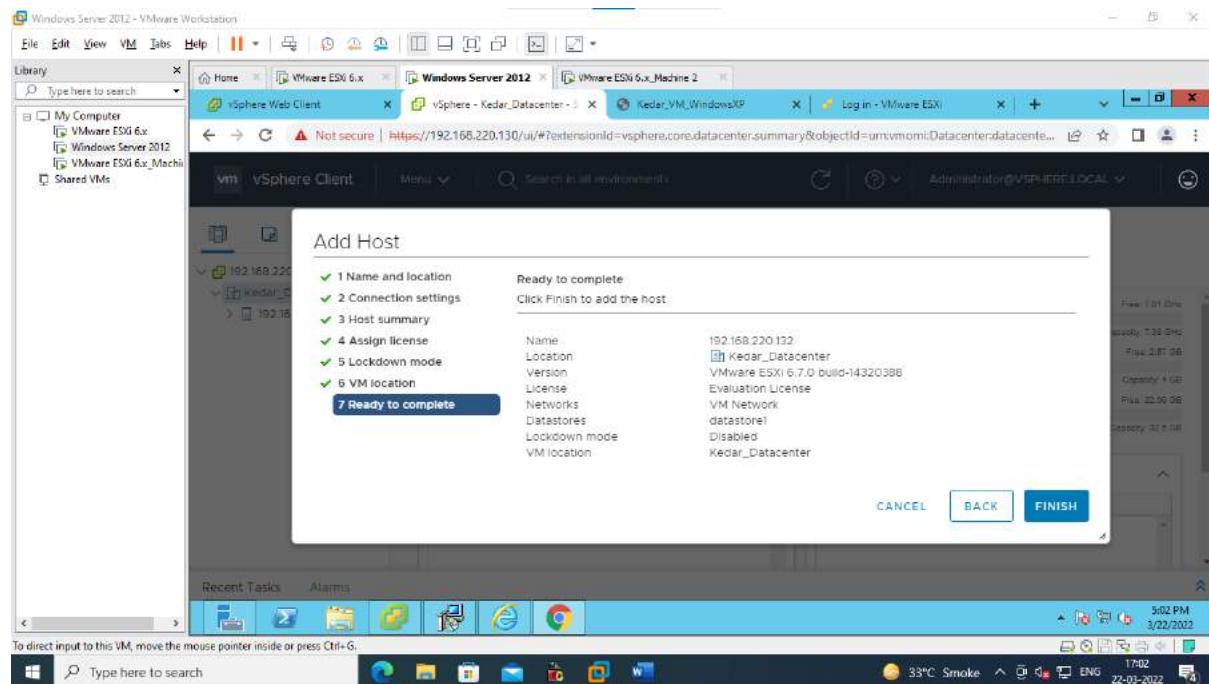
Click on Yes button



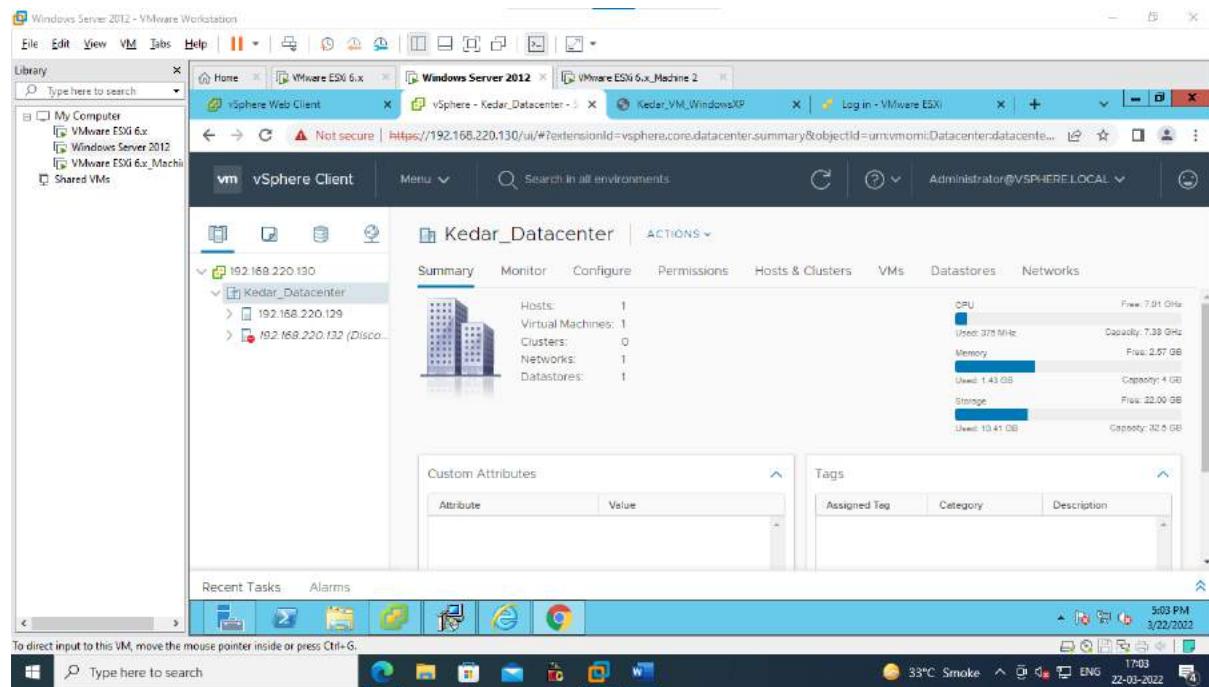
**Step 14:** Click on **Next** button.**Step 15:** Select the disable option and click on **Next** button.



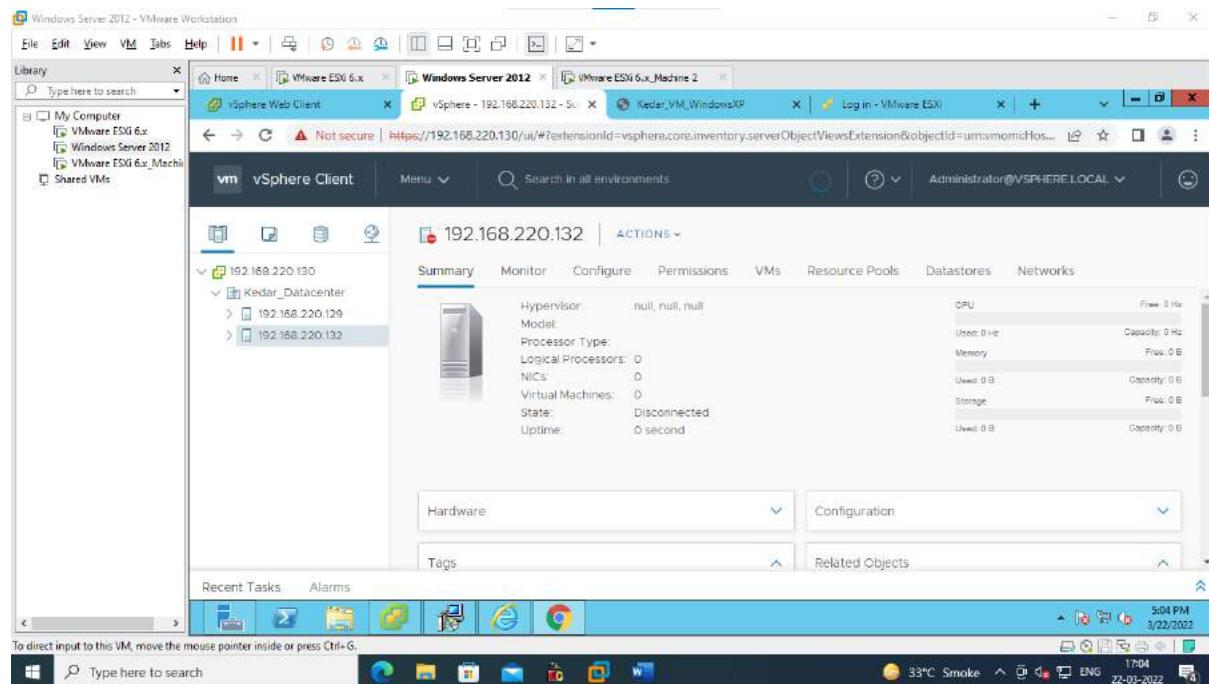
### Step 16: Click on Finish button.



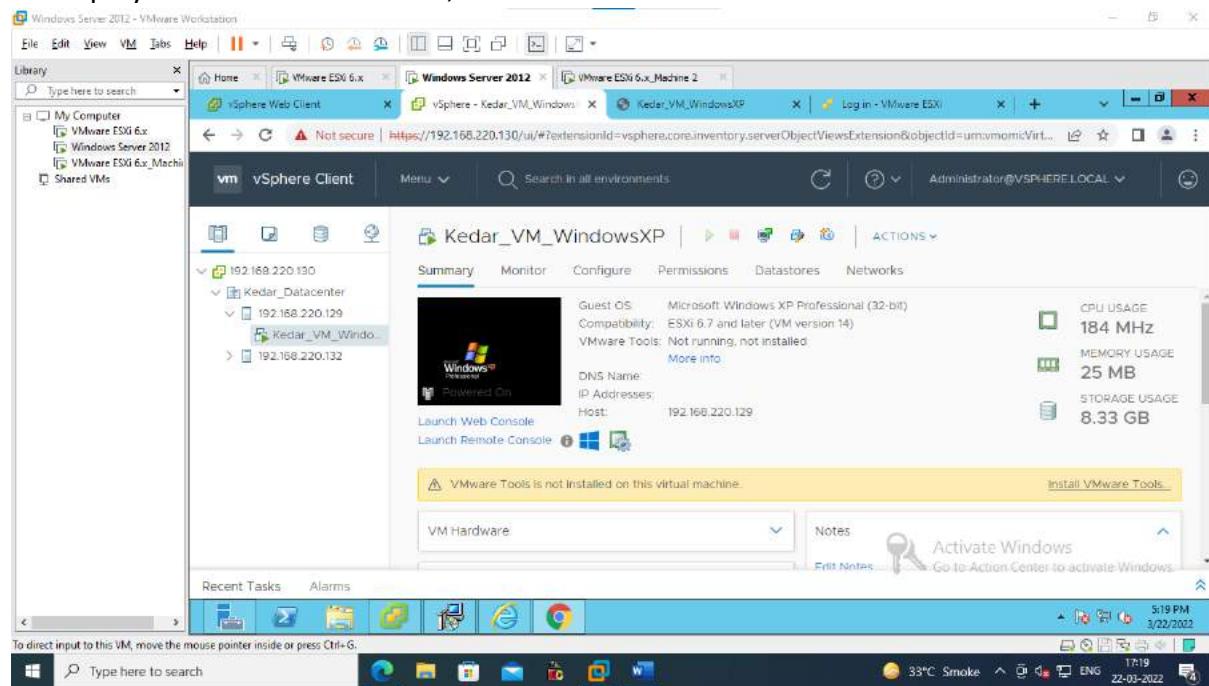
New Data host appear under the datacenter tab.



Click on refresh tab.

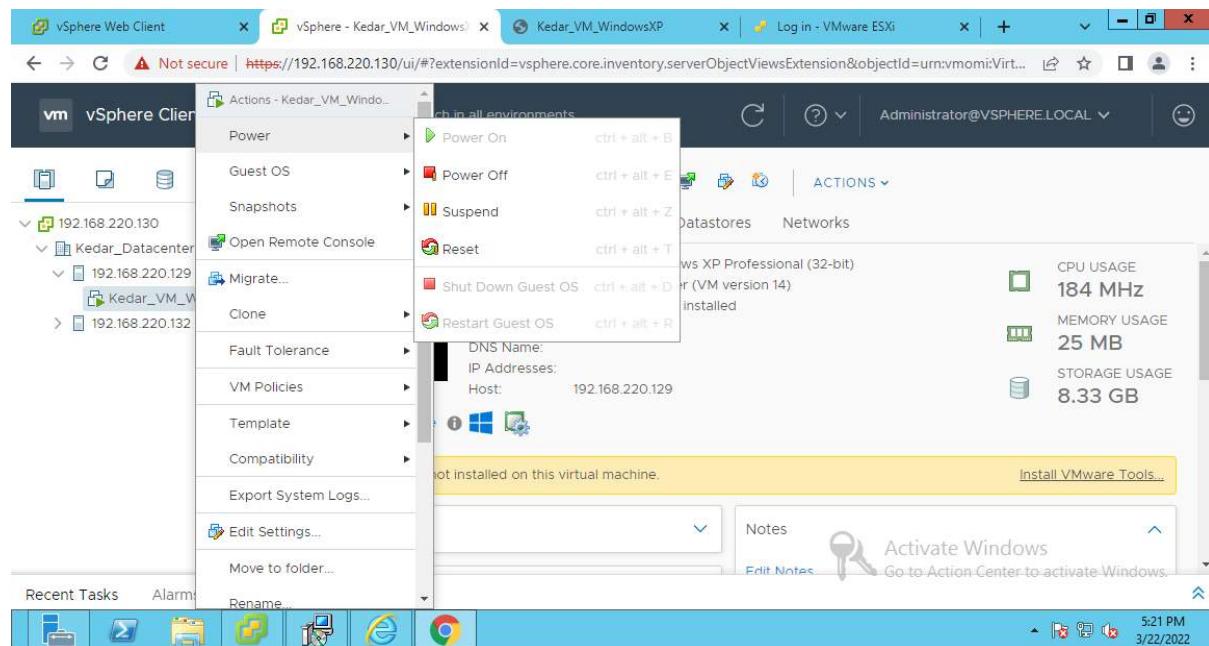


**Step 17:** After adding new host, Select the first host then select the virtual machine which we deployed on the first host. i.e., VMware ESXi 6.x.

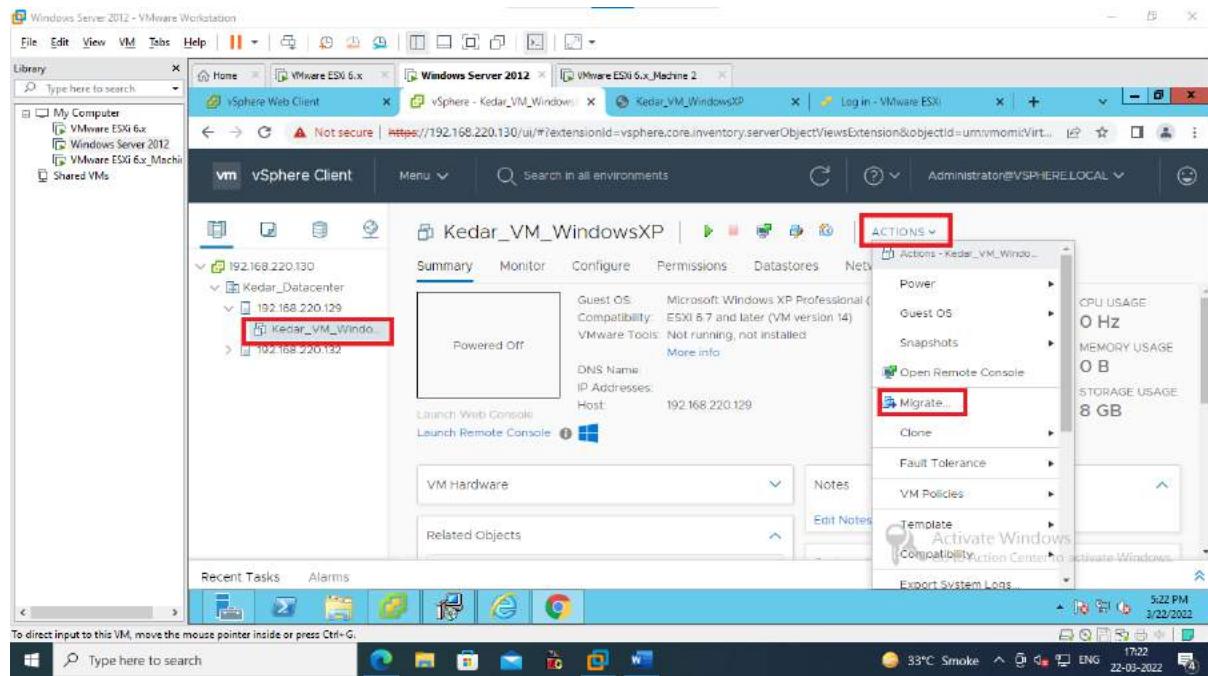


**Step 18:** Power off the machine.

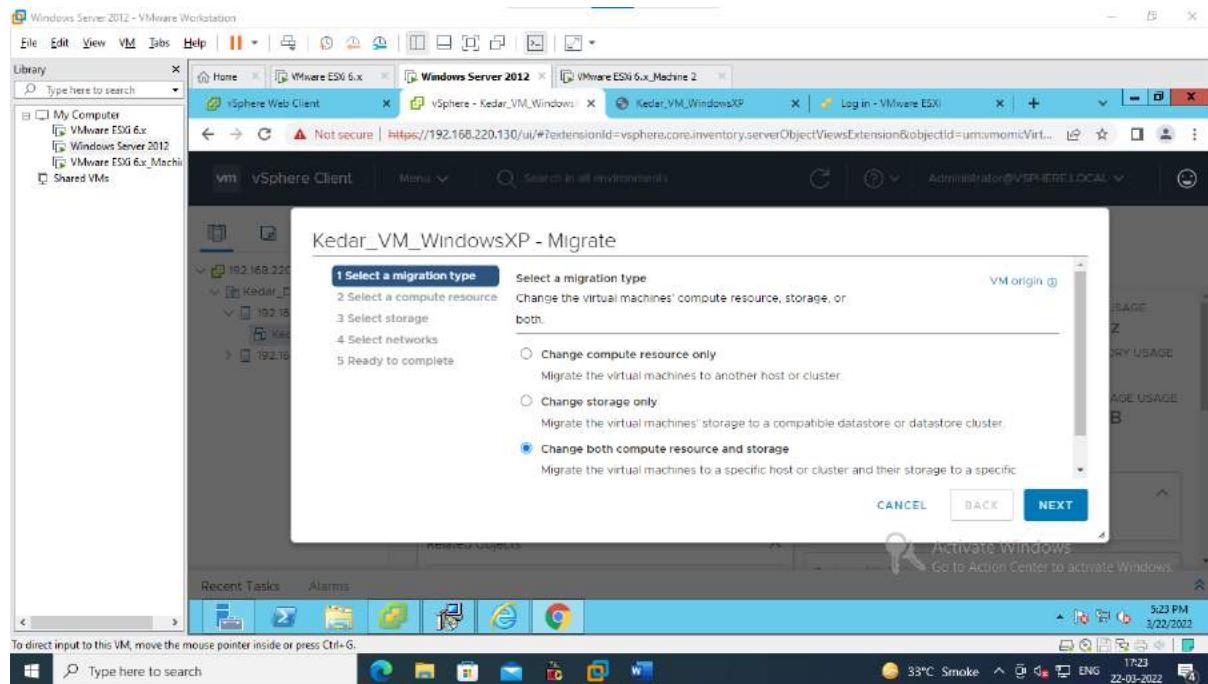
Right click on Virtual machine -> Power -> Power Off



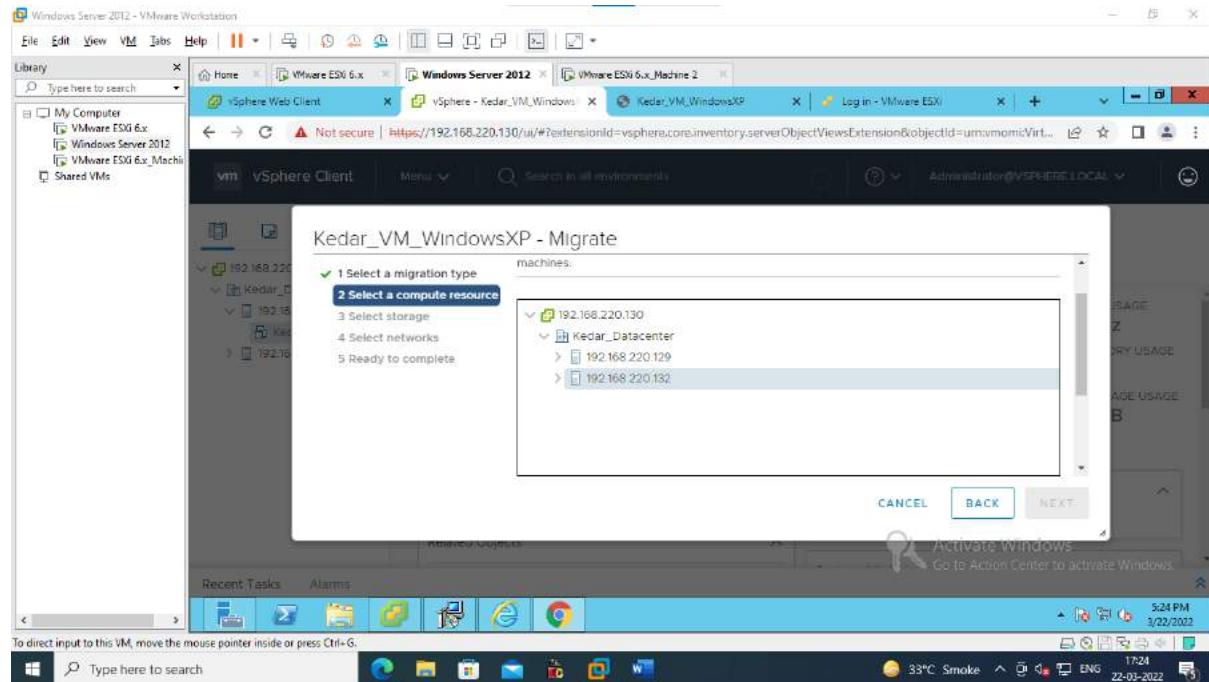
**Step 19:** Select the virtual machine from **first host** (192.168.220.129) and the go to the **Action** tab -> select the **Migrate** Option.



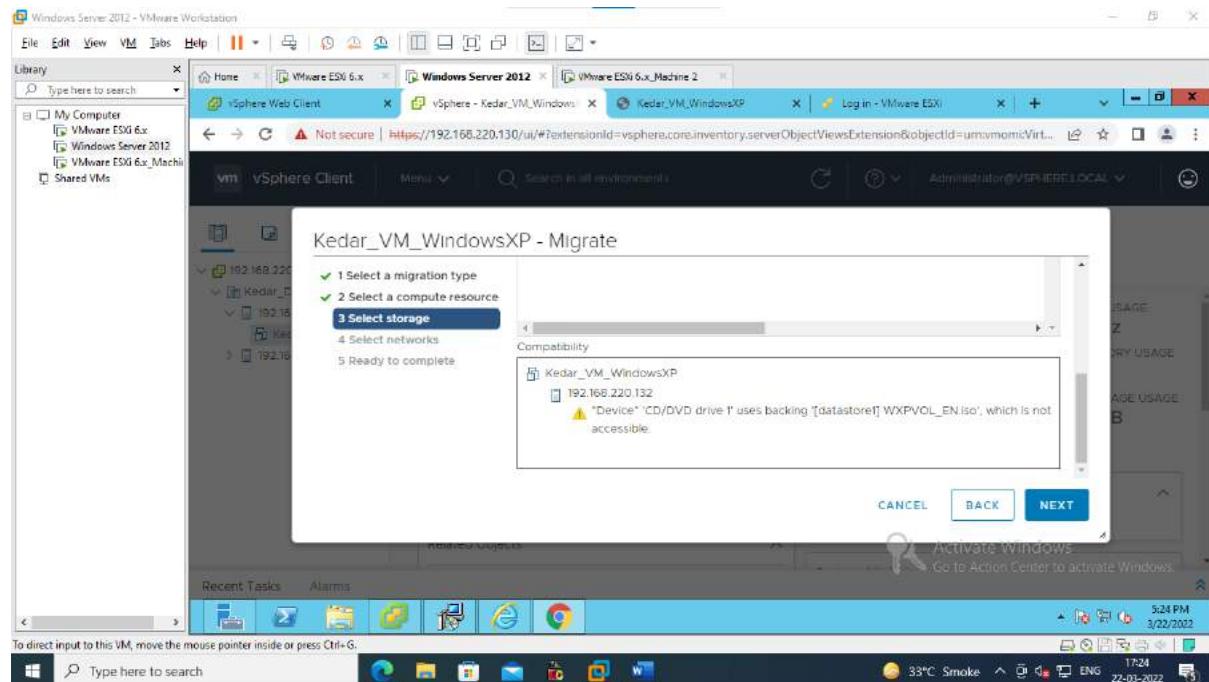
**Step 20:** Select a Migrate type **Change both compute resource and storage** and click on **Next** button.



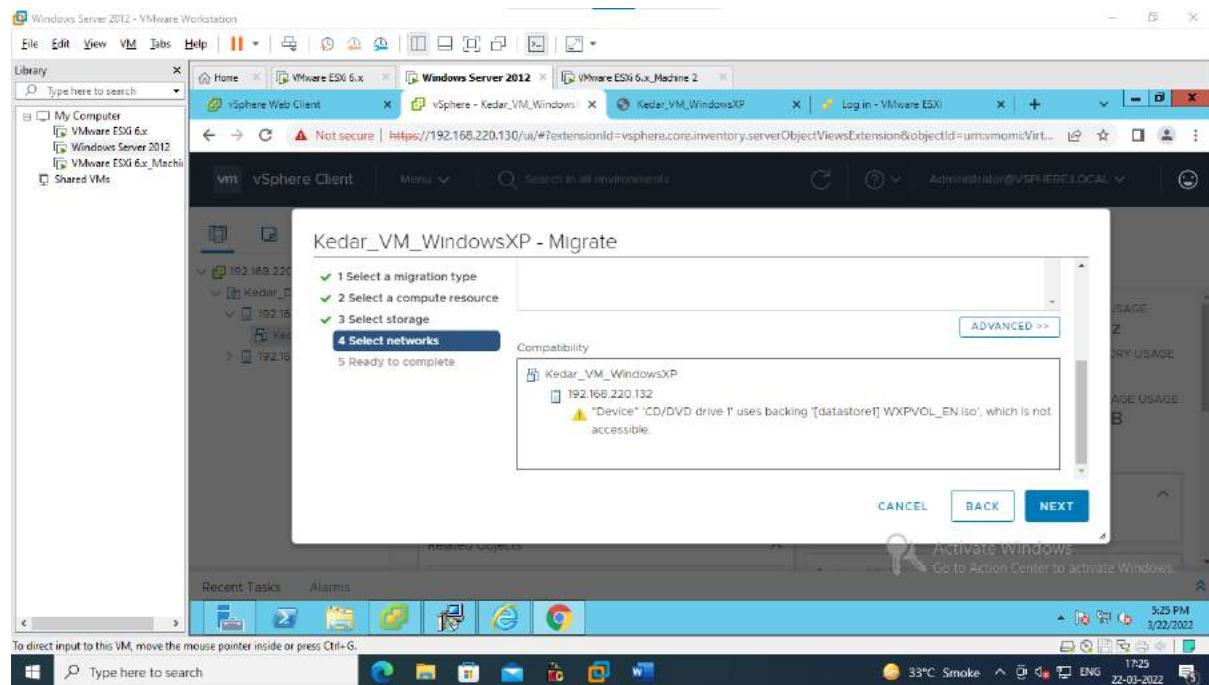
**Step 21:** Select a Compute resources **192.168.220.132** (Second Host) and click on **Next** button.



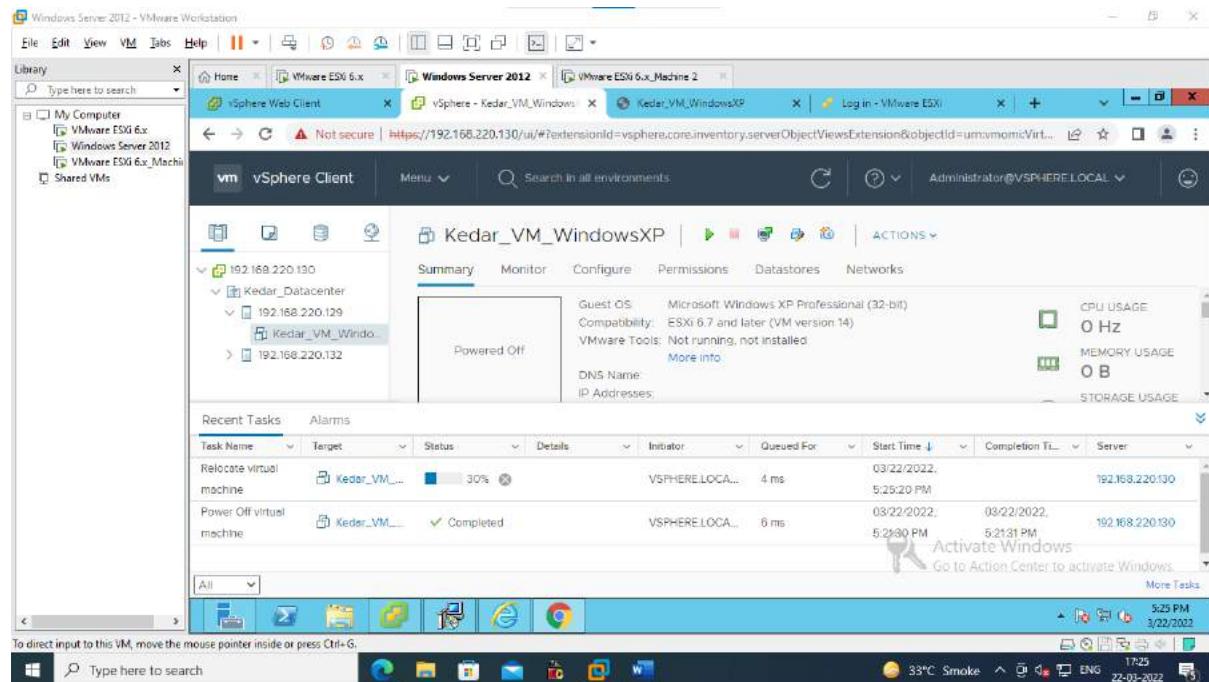
**Step 22:** Click on **Next** button.

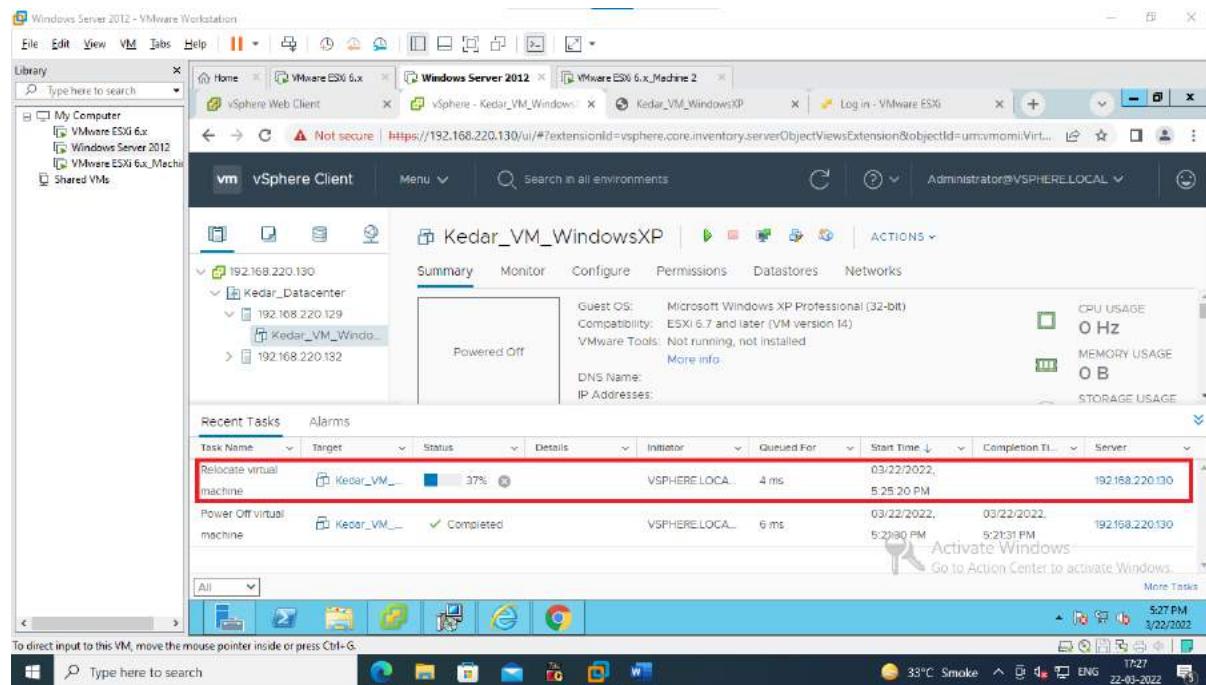


**Step 23: Click on Next button.**

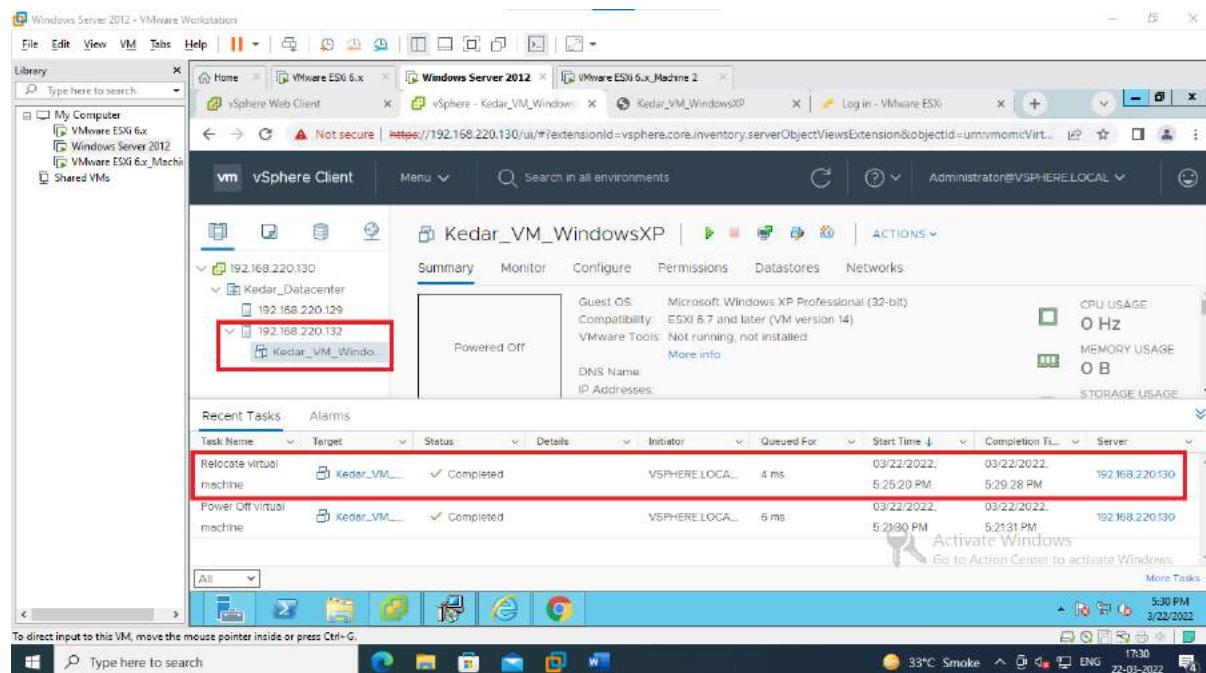


New Virtual machine will relocate and visible in recent task.

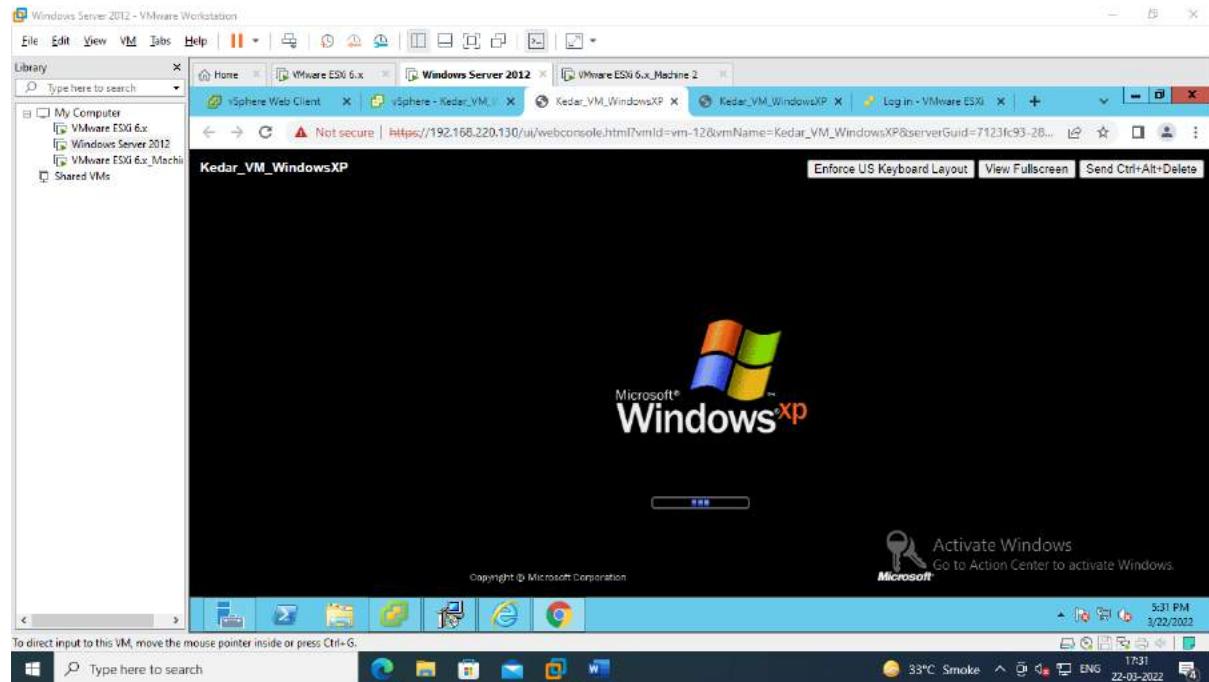




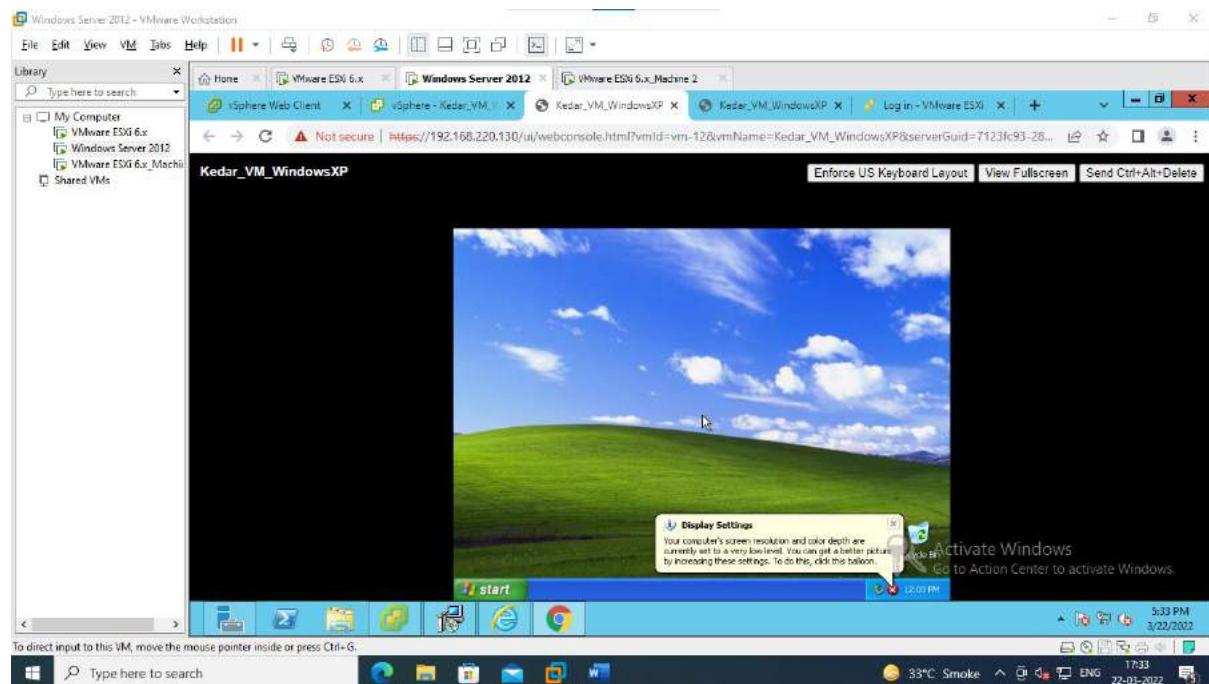
After completing it will appear in second host and under resent task also.



**Step 24:** Select the Virtual machine under second host, go to summary tab and the power on the machine.



Windows will appear in google chrome browser.

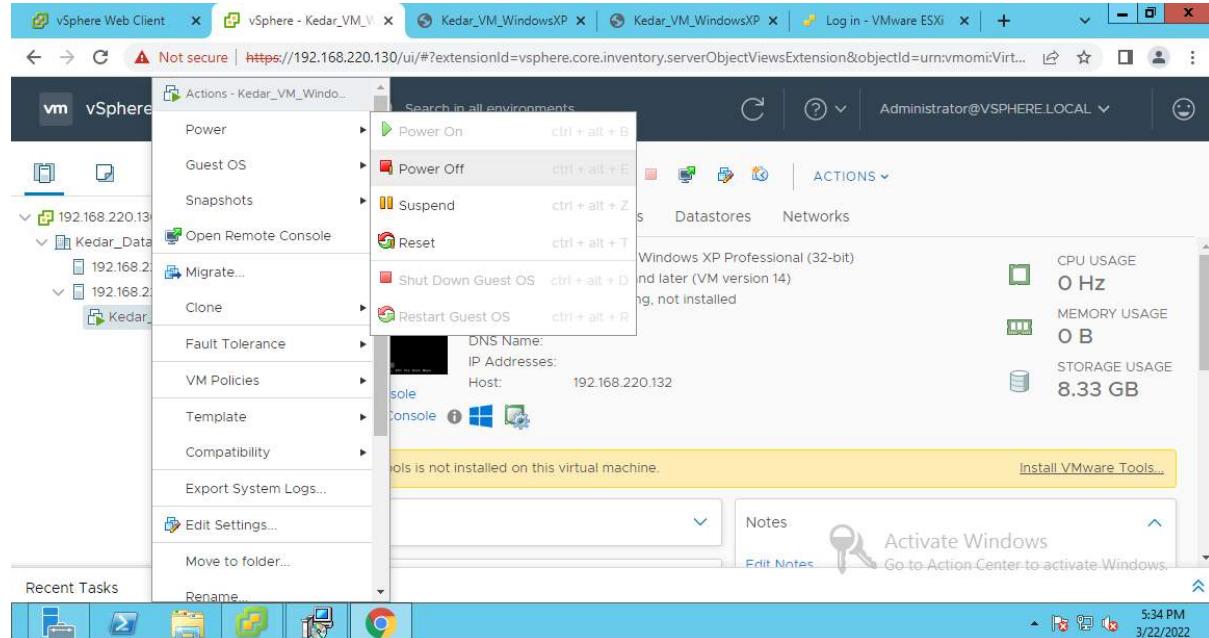


## Practical 3: Create a Template in the vSphere Client

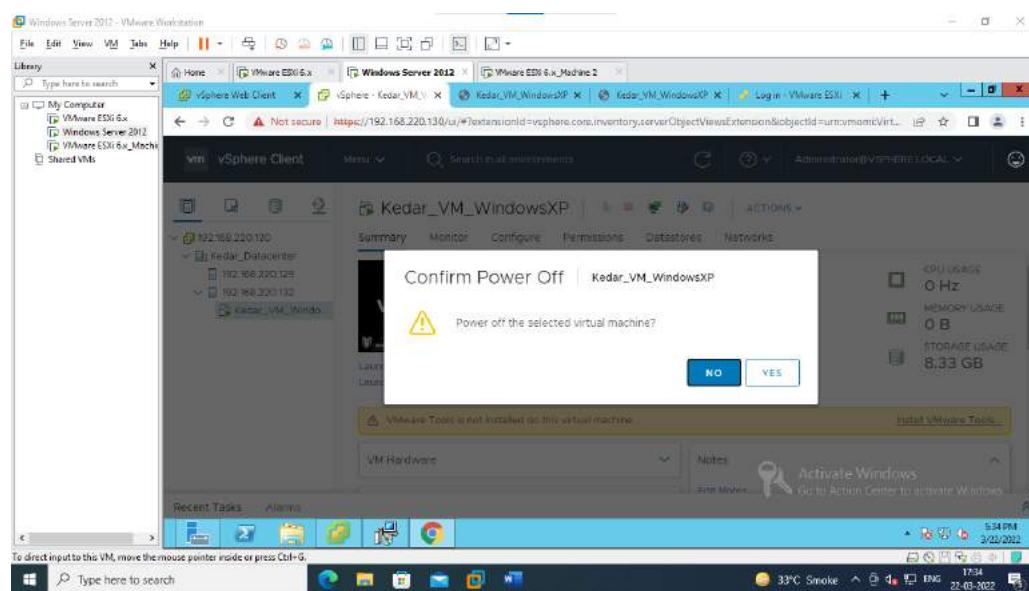
### A. Convert a Virtual Machine to a Template in the vSphere Client.

**Step 1:** First power off the second virtual machine.

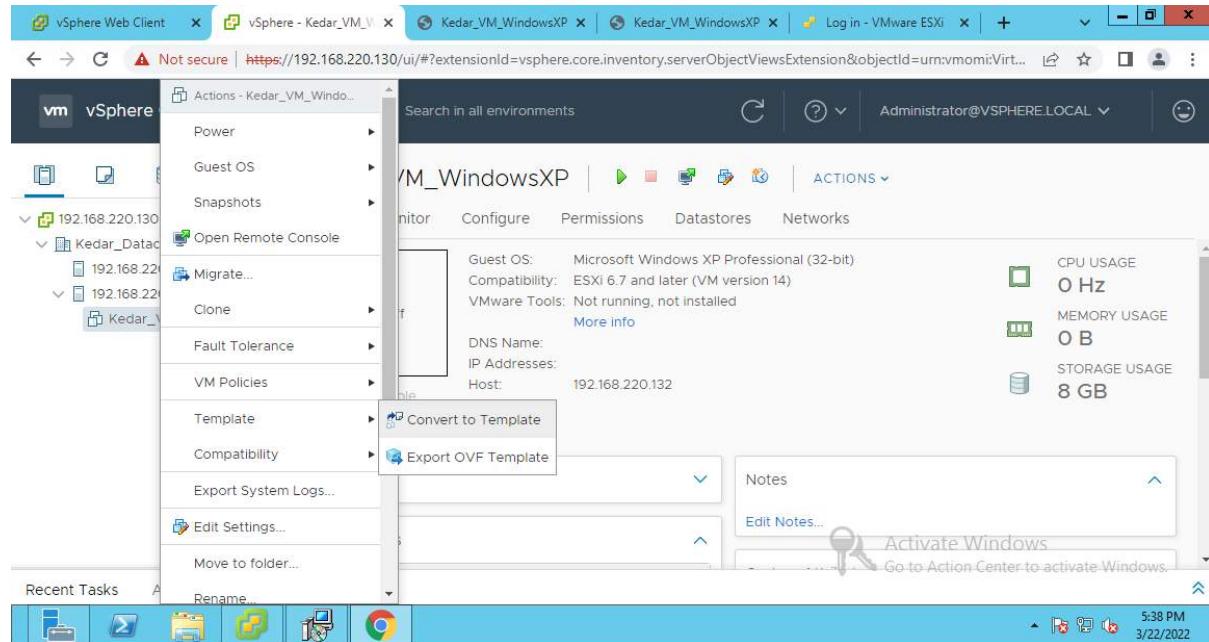
Second Host -> Virtual machine -> Power -> Power off



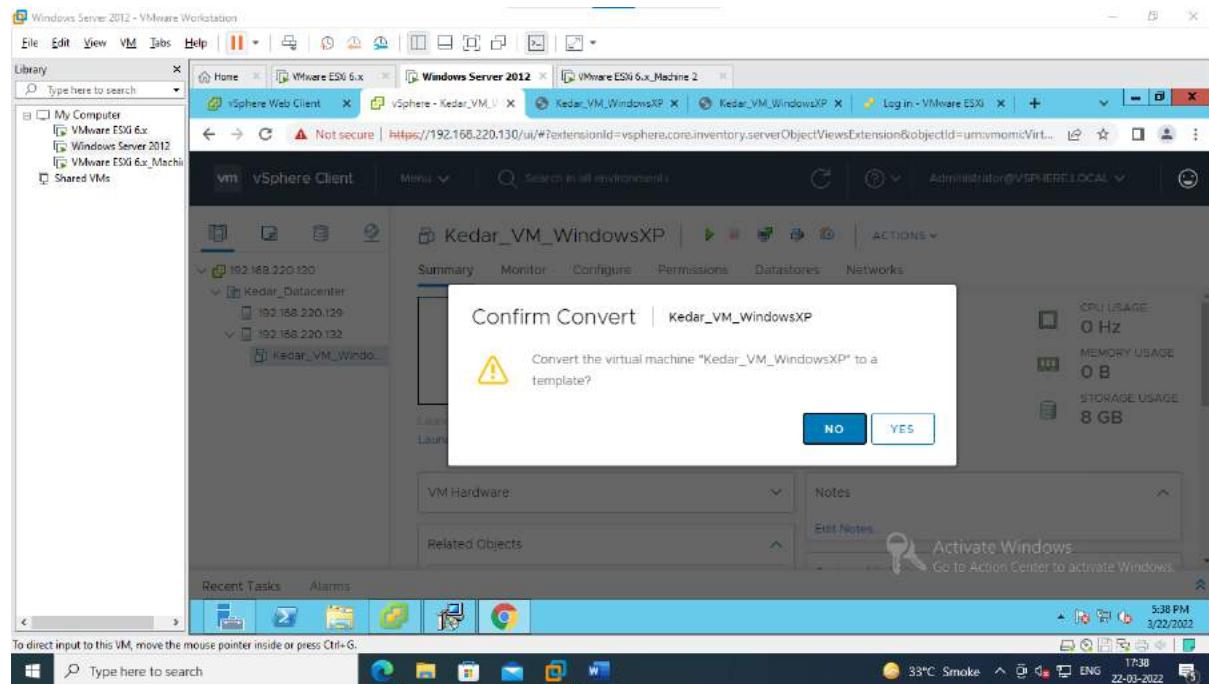
Click on Yes button.



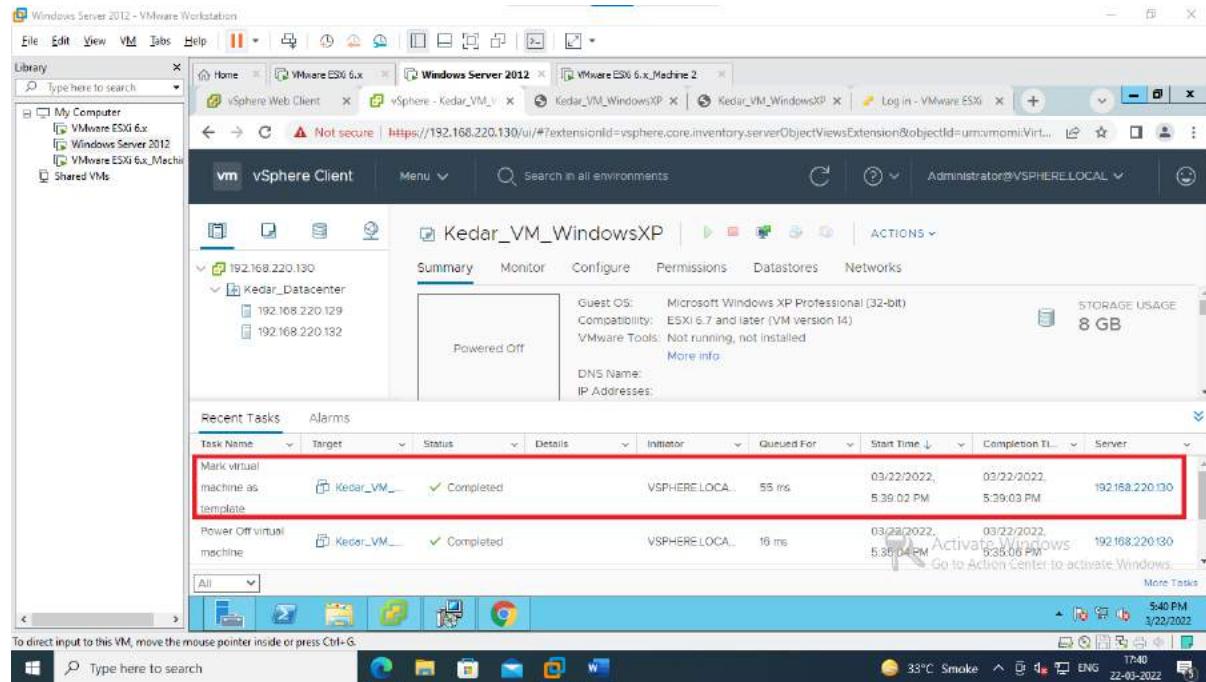
**Step 2:** Right click on virtual machine under second host and click on **Convert to Template** option.



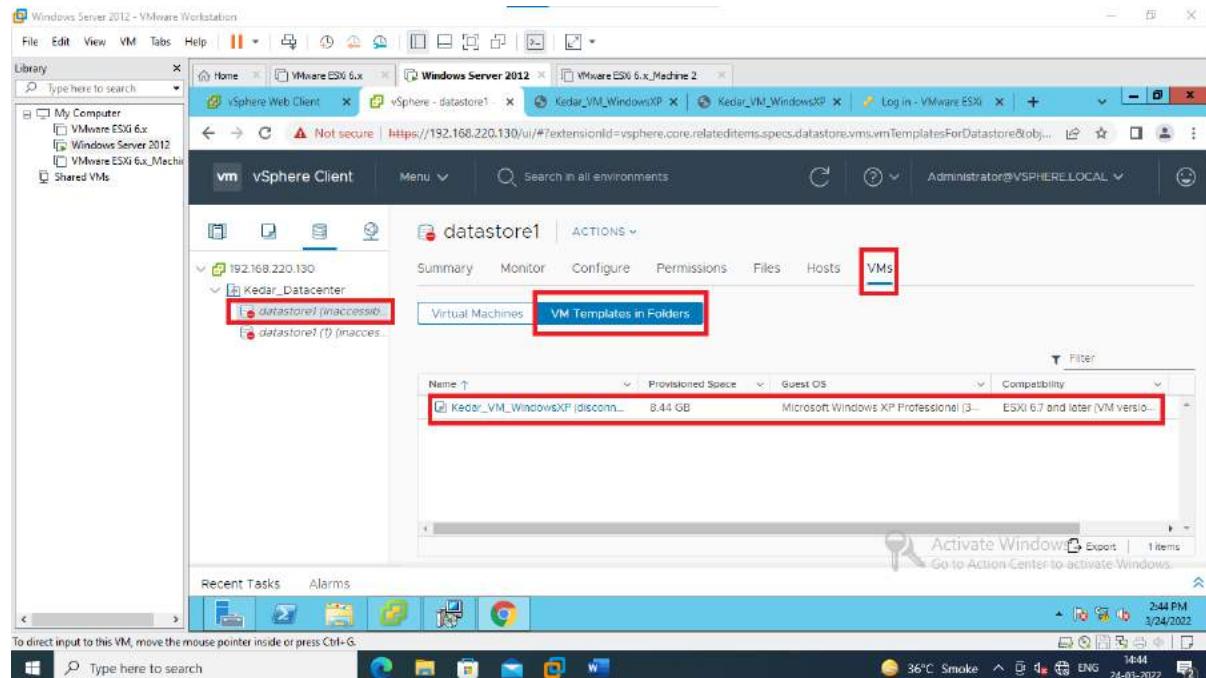
**Step 3:** Click on **Yes** button.



Template is created and visible under the Recent task.

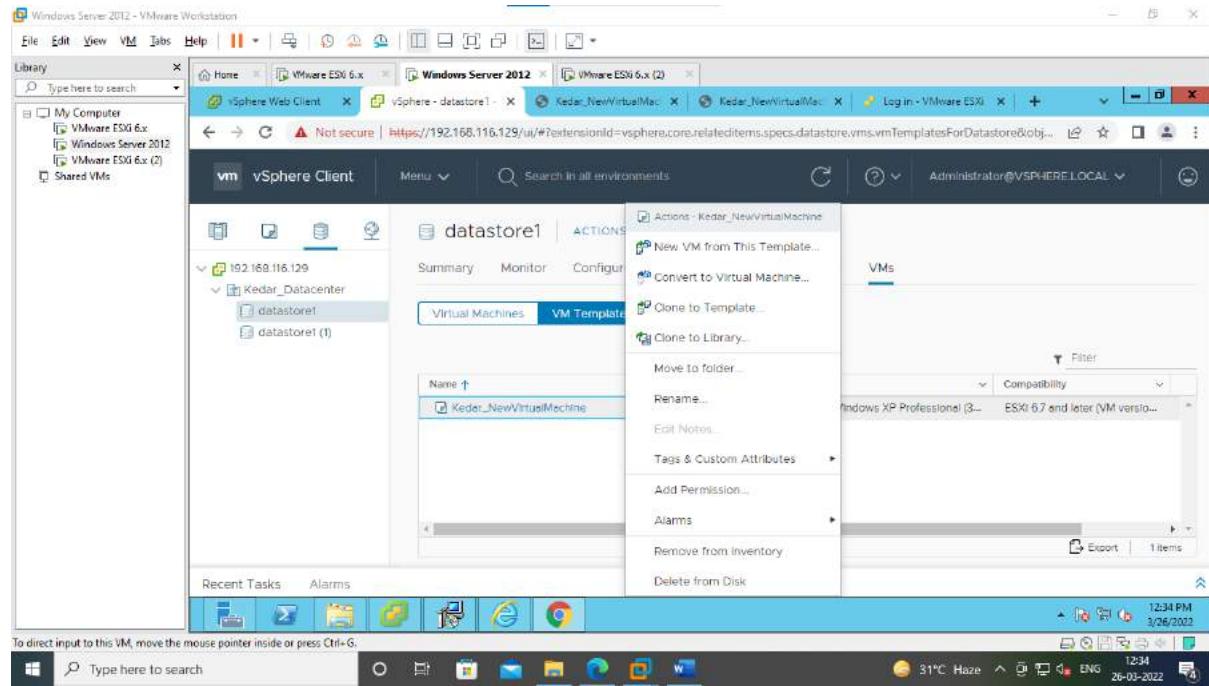


Go to the **Datastore Tab** and Click on the **VMs tab** and tab on the **VM Template in Folders**. Here VM Template created successfully.

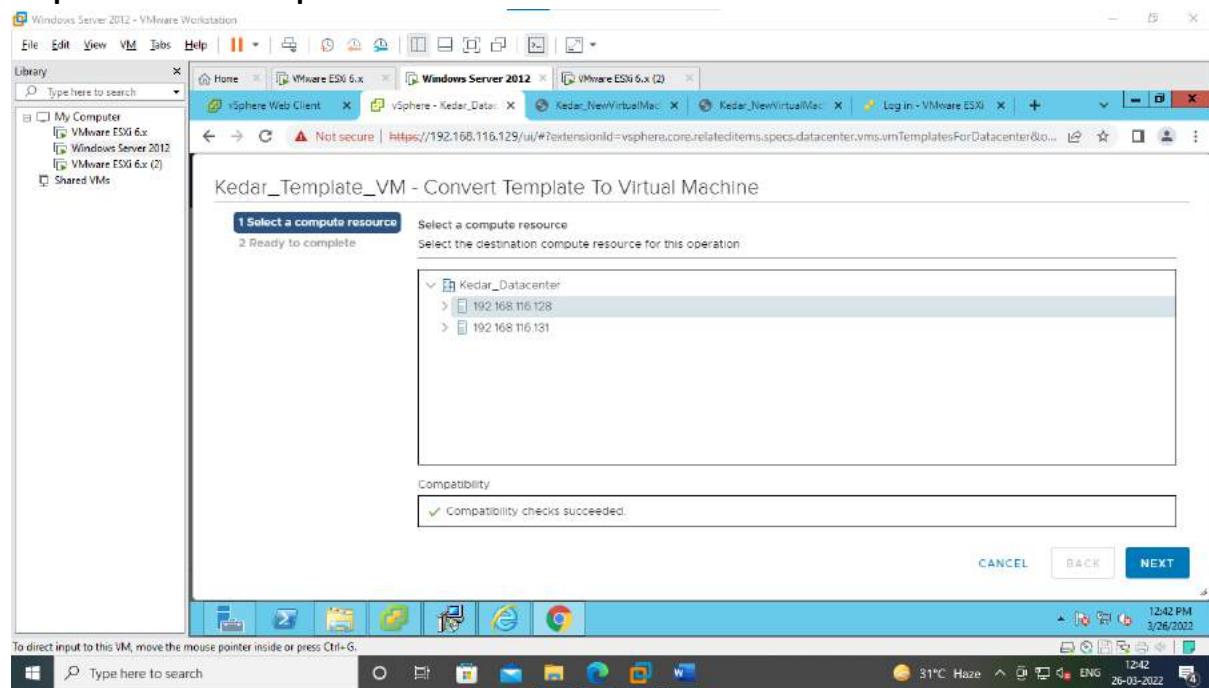


## B. Clone a Template in the vSphere Client

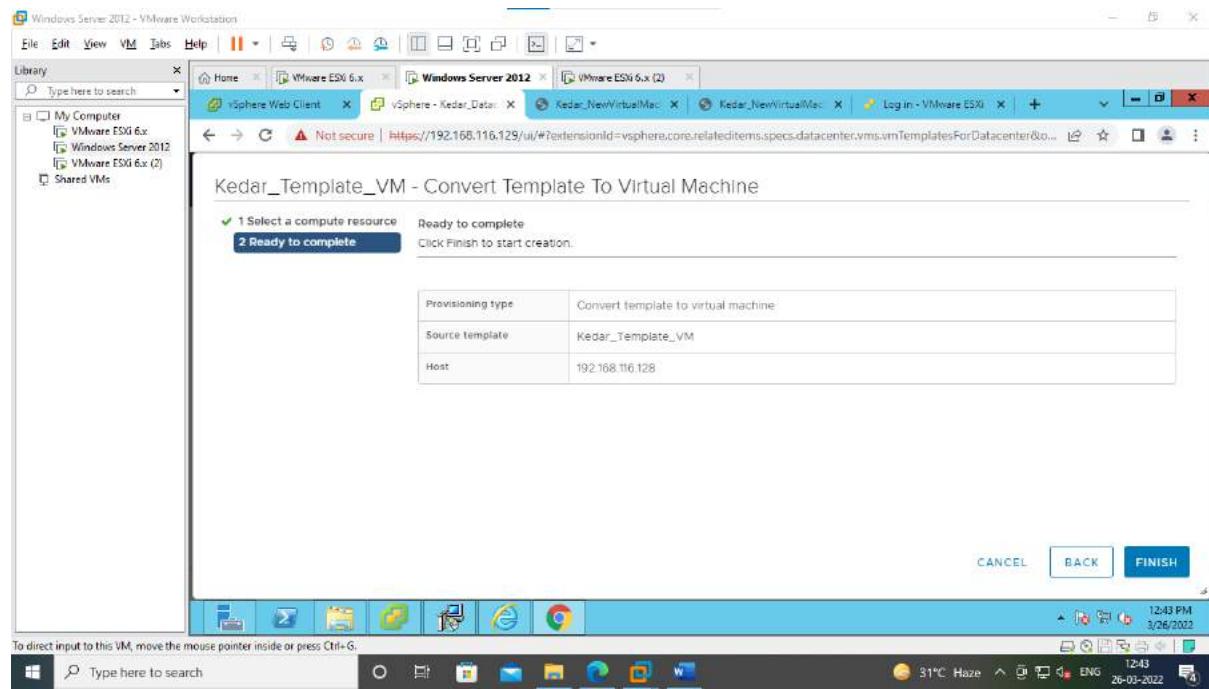
**Step 1:** Right-click on newly created template and click on **Clone to Template** option.



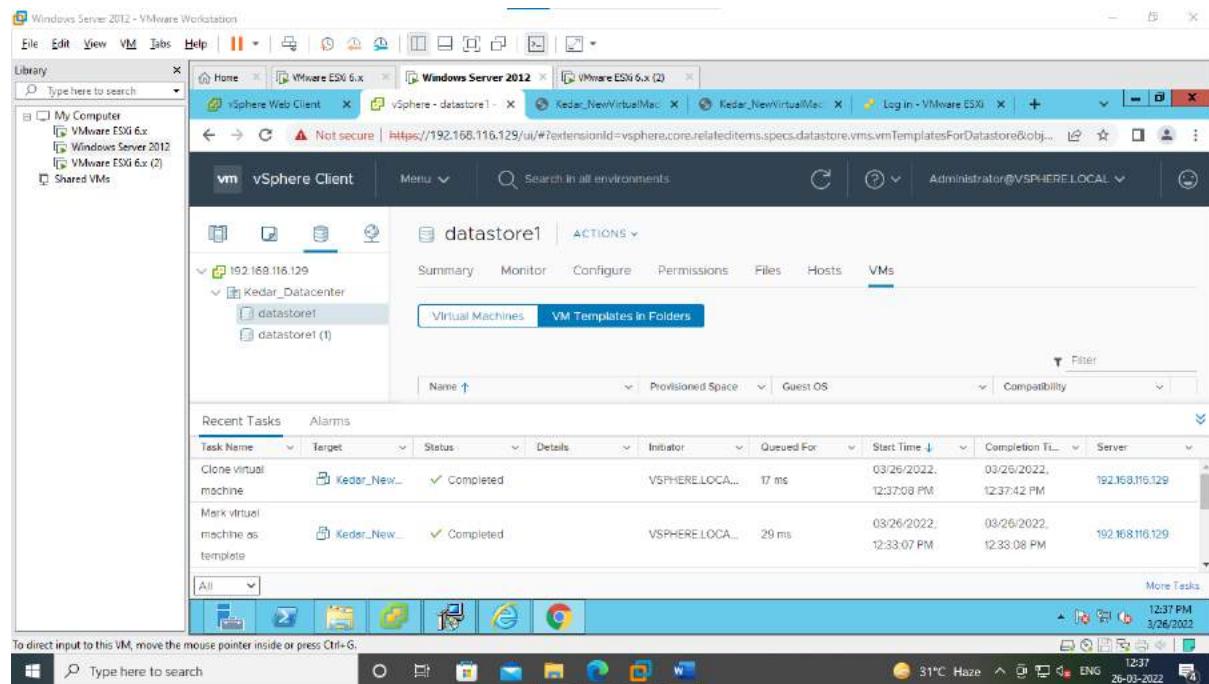
**Step 2:** Enter the **Template Name** and choose the **location** and click on the **Next** button.



**Step 3:** Click on the **Next** button and then click on **Finish** button..

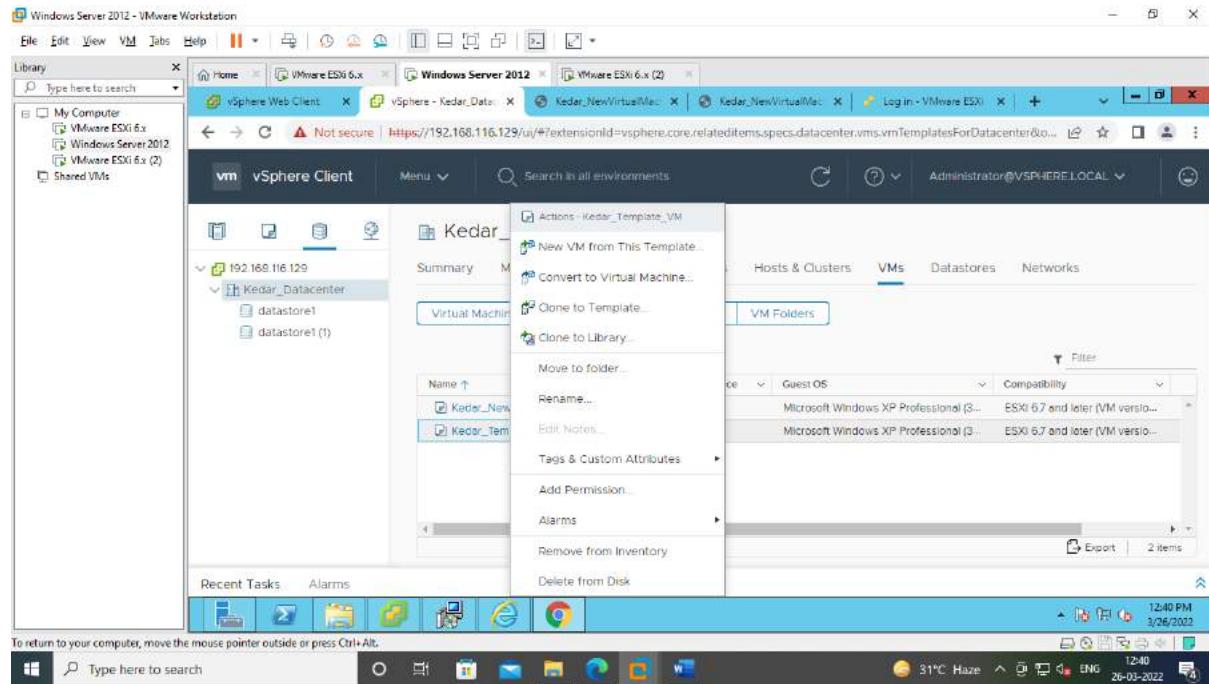


In below screen, you can see Template (Template Clone) is cloned from Template (Windows XP)

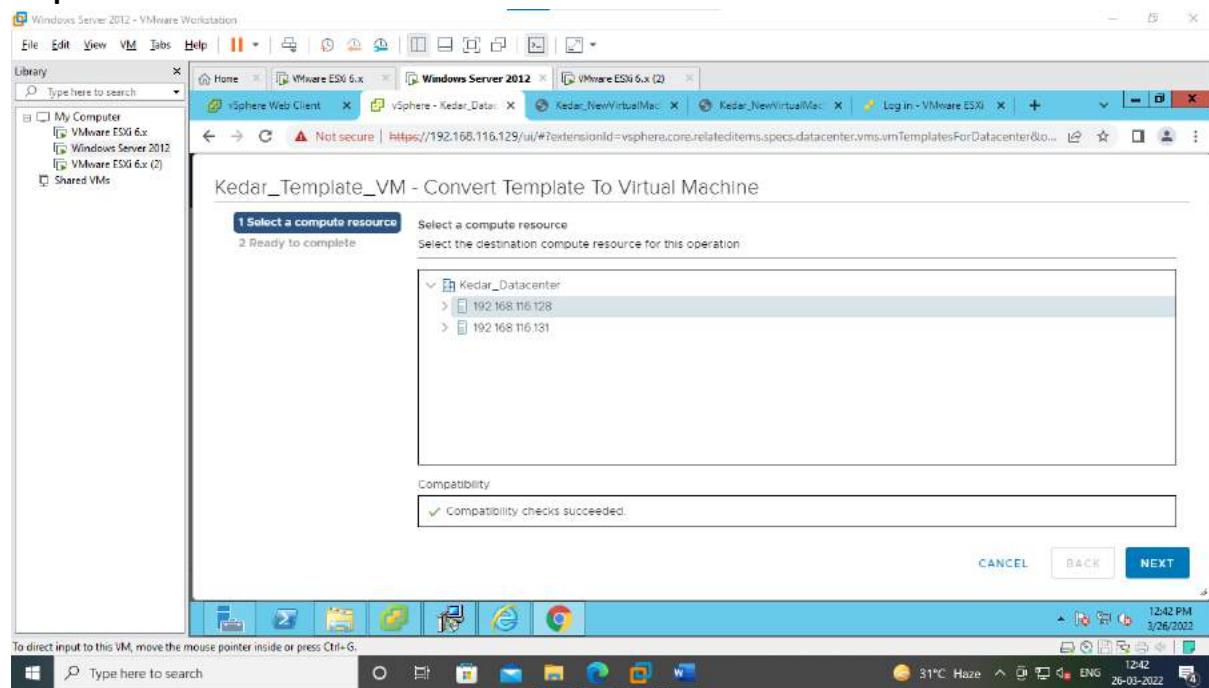


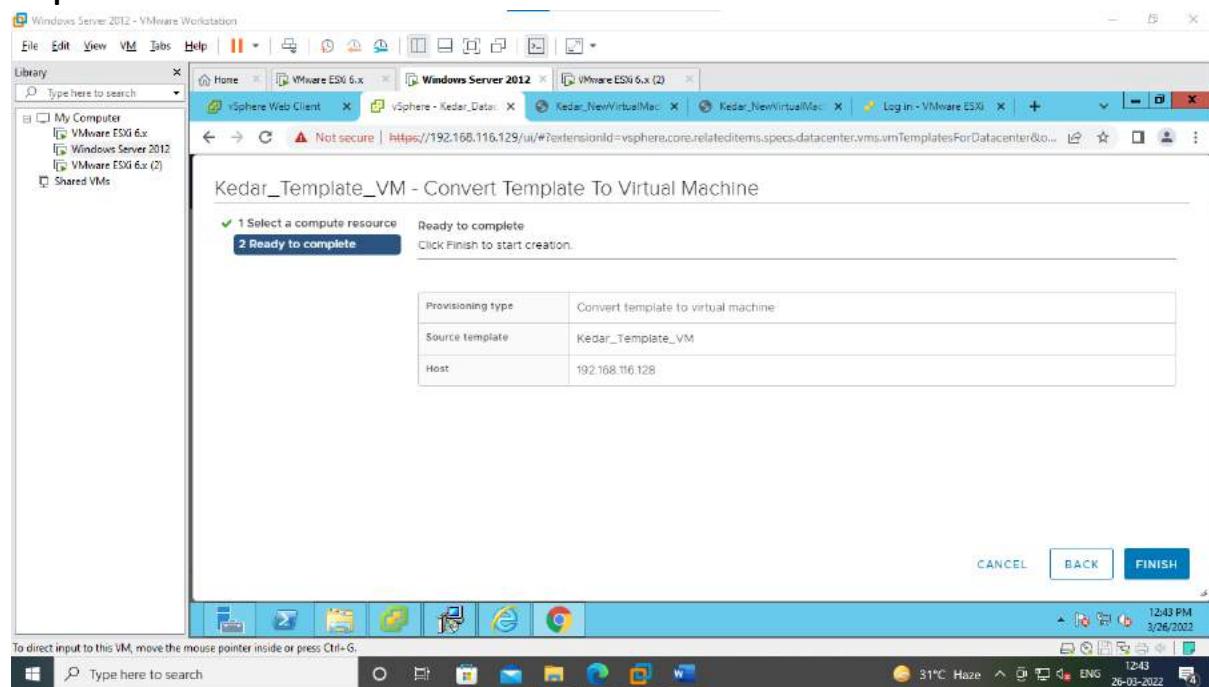
## C. Convert a Virtual Machine from a Template in the vSphere Client

**Step 1:** Right click on the **template** then click on the **Convert to Virtual Machine** option.

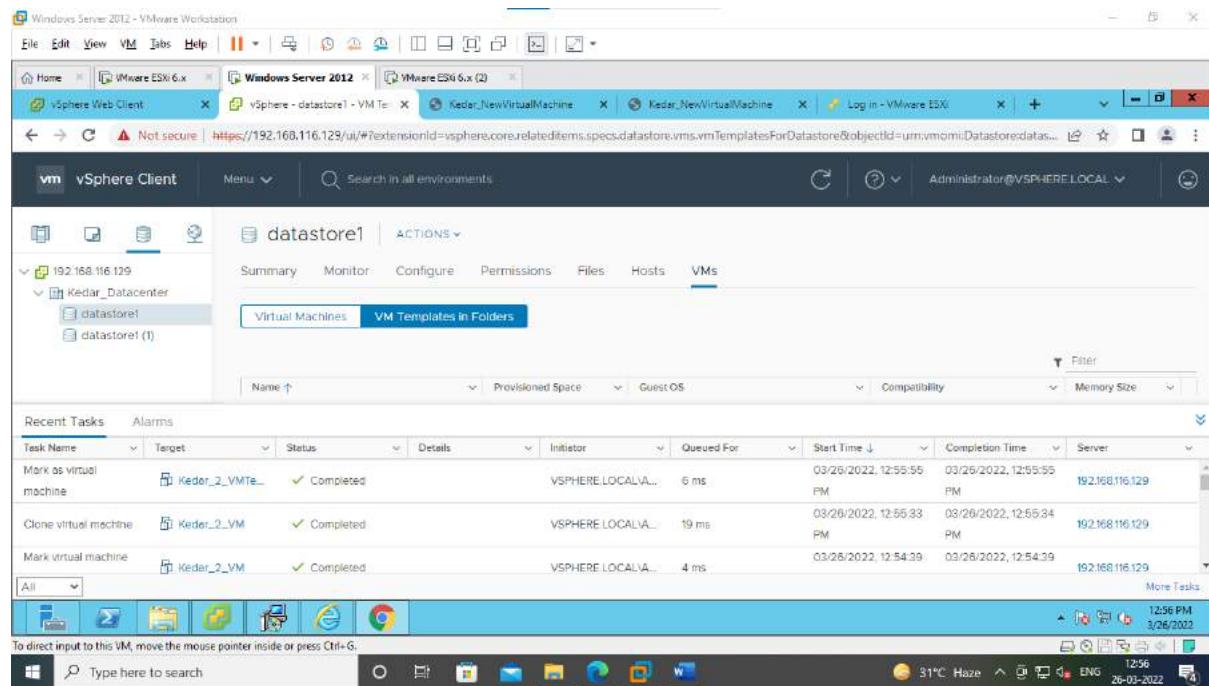


**Step 2:** Select the **Host** and click on the **Next** button.



**Step 3: Click on the Finish button.**

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

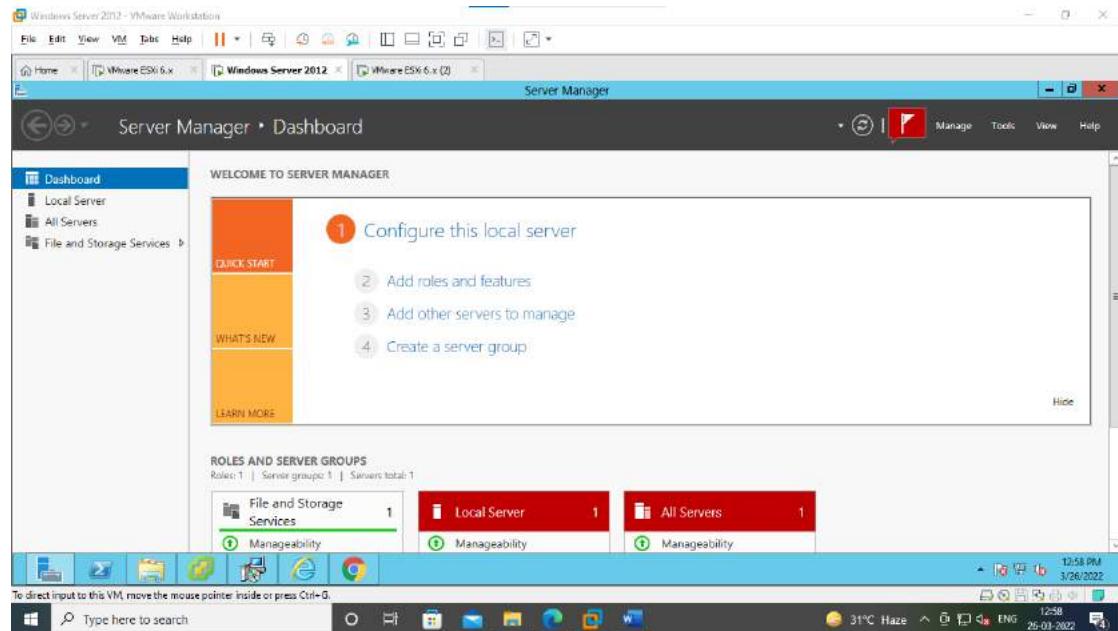


## Practical 4: Manage the storage and Security of VMware ESXi server.

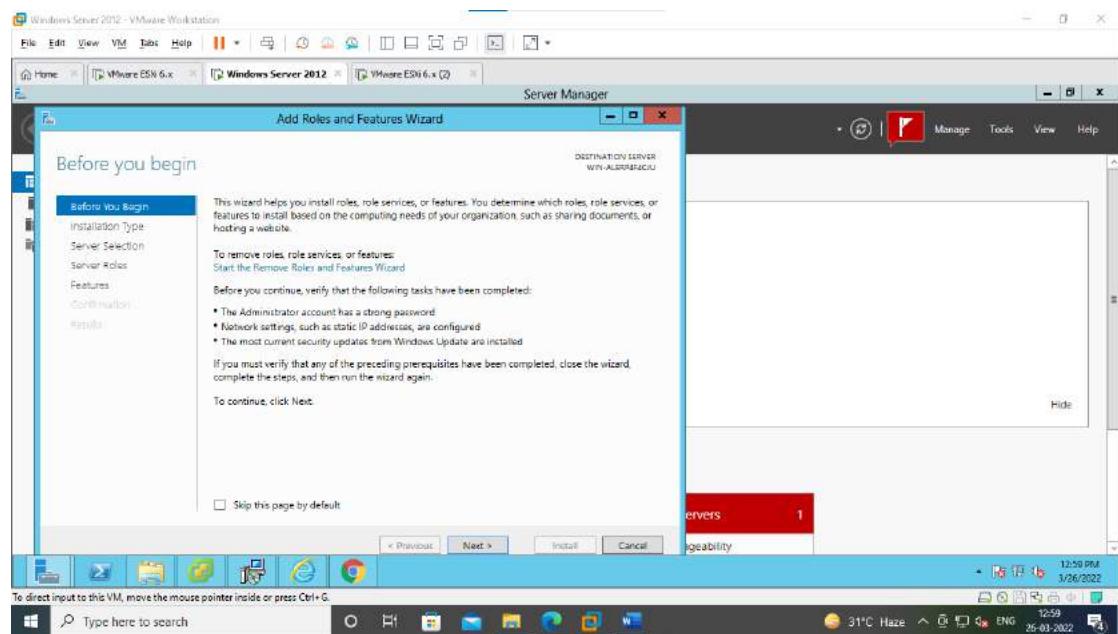
### A. Add Virtual storage in VMware ESXi Server with vSphere Client.

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

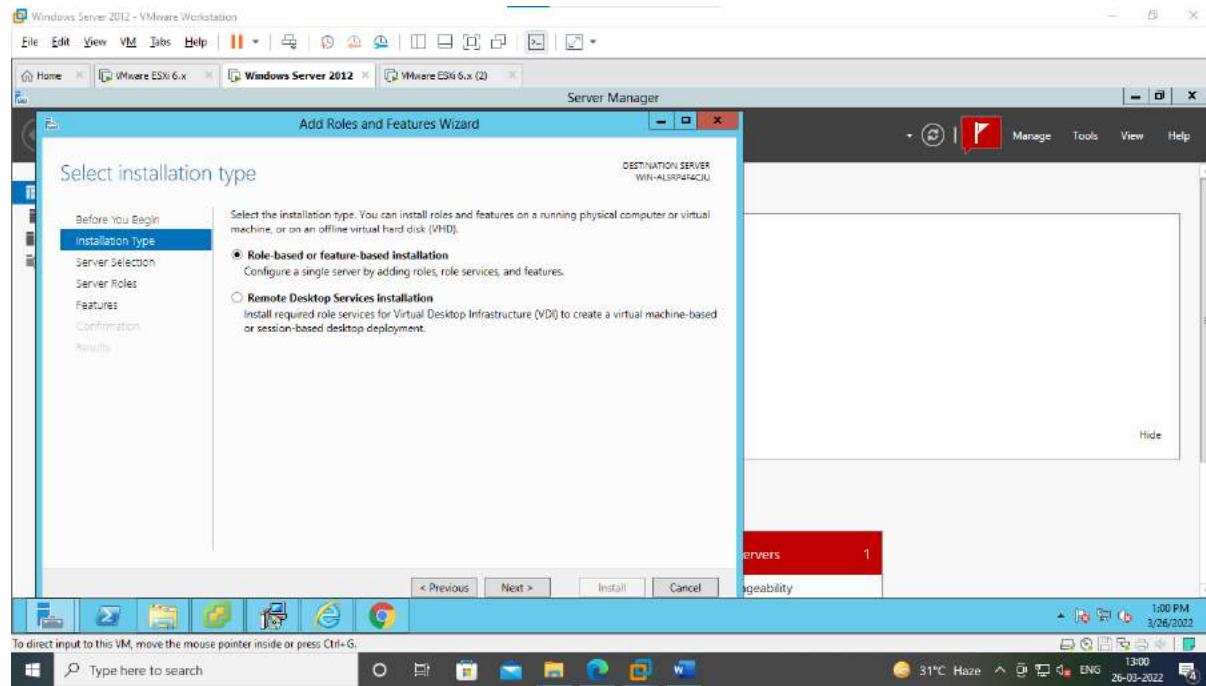
**Step 1:** Go to the Windows server Manager and click on **Add Roles and features...**



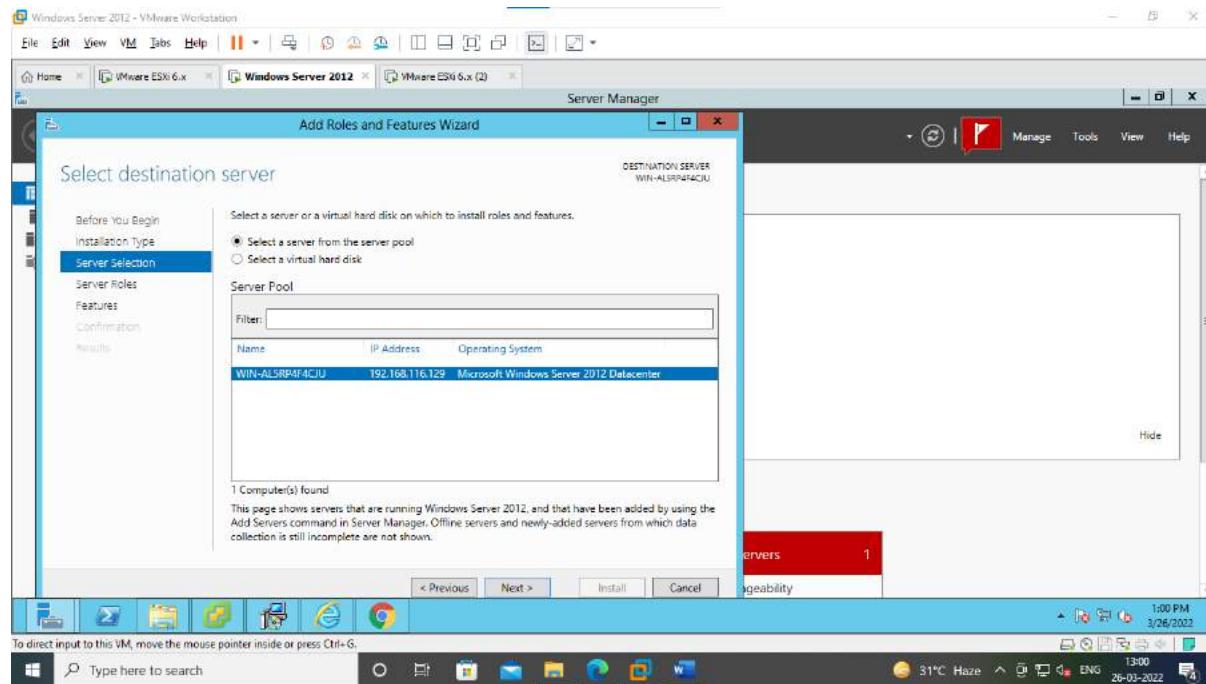
**Step 2:** Click on the **Next** button



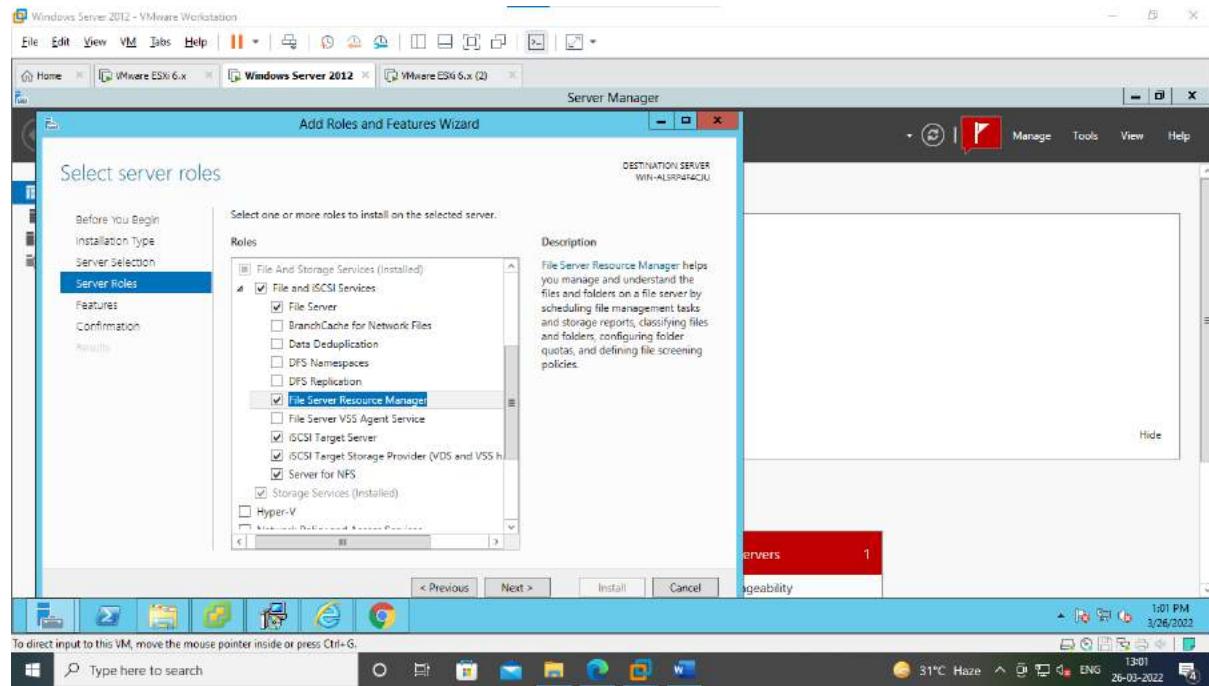
**Step 3:** Select the **Role-based or feature-based installation** and click on the **Next** button.



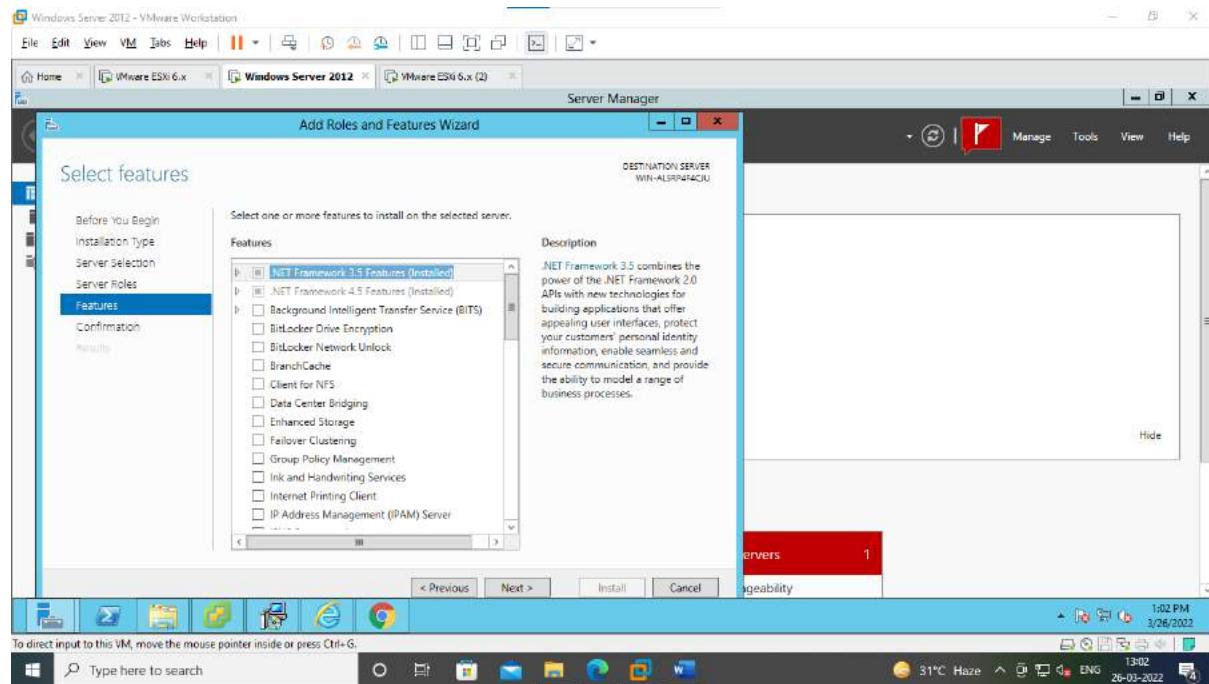
**Step 4:** Select the **Select a server from the server pool option** and click on the **Next** button.



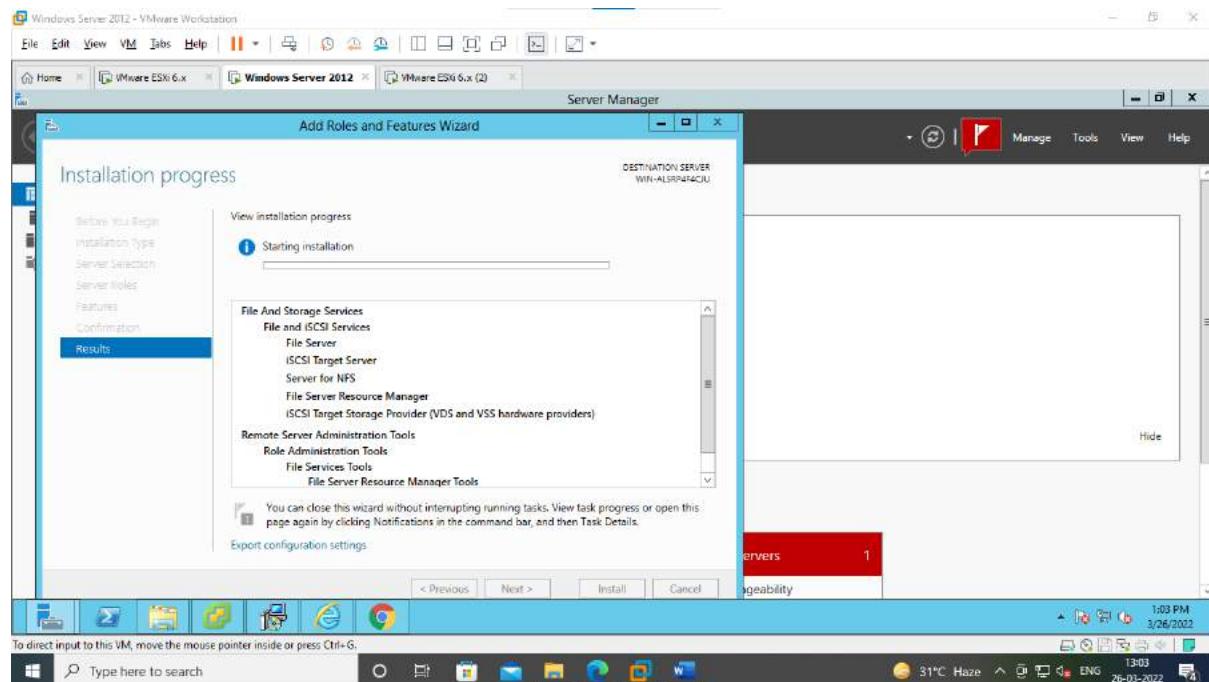
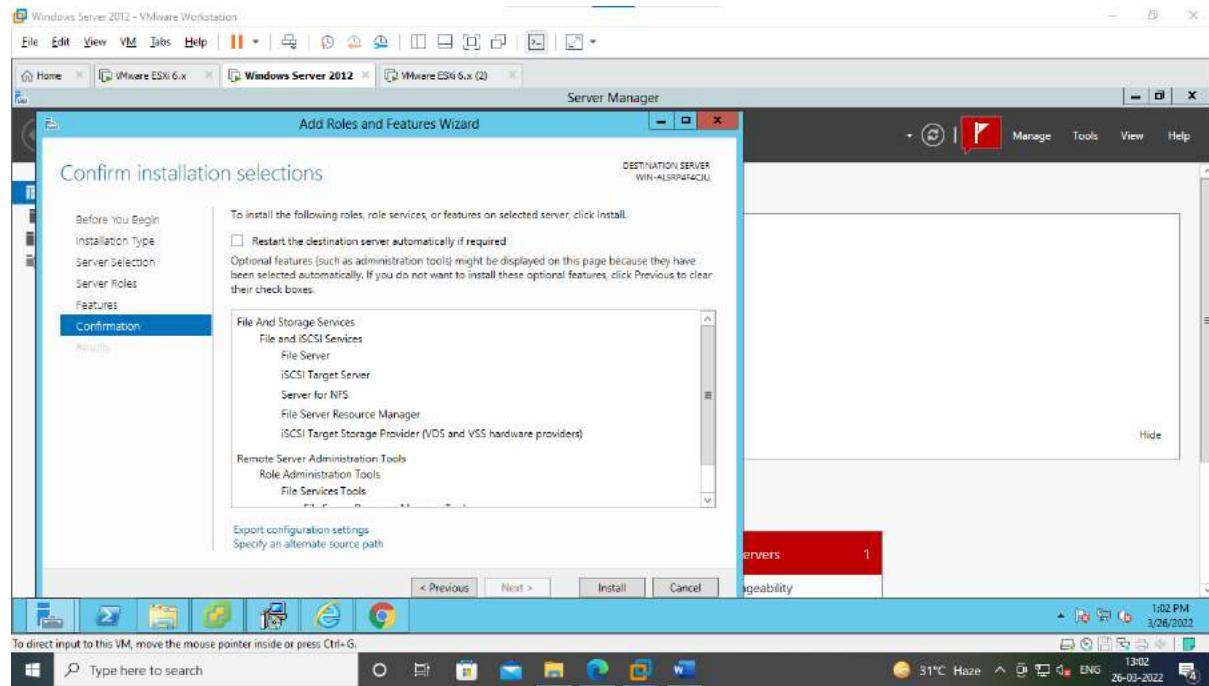
**Step 5:** Select the **File and iSCSI Services** and click on the **Next** button.



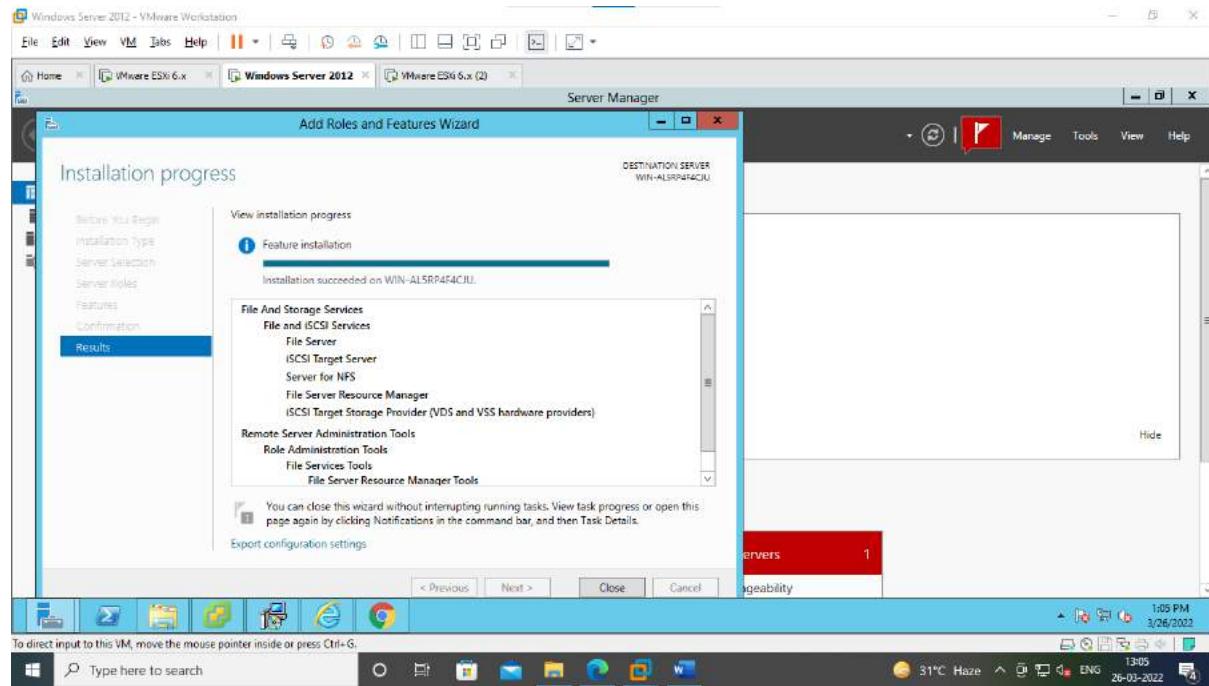
**Step 6:** Click on the **Next** button.



## Step 6: Click on the Install button.

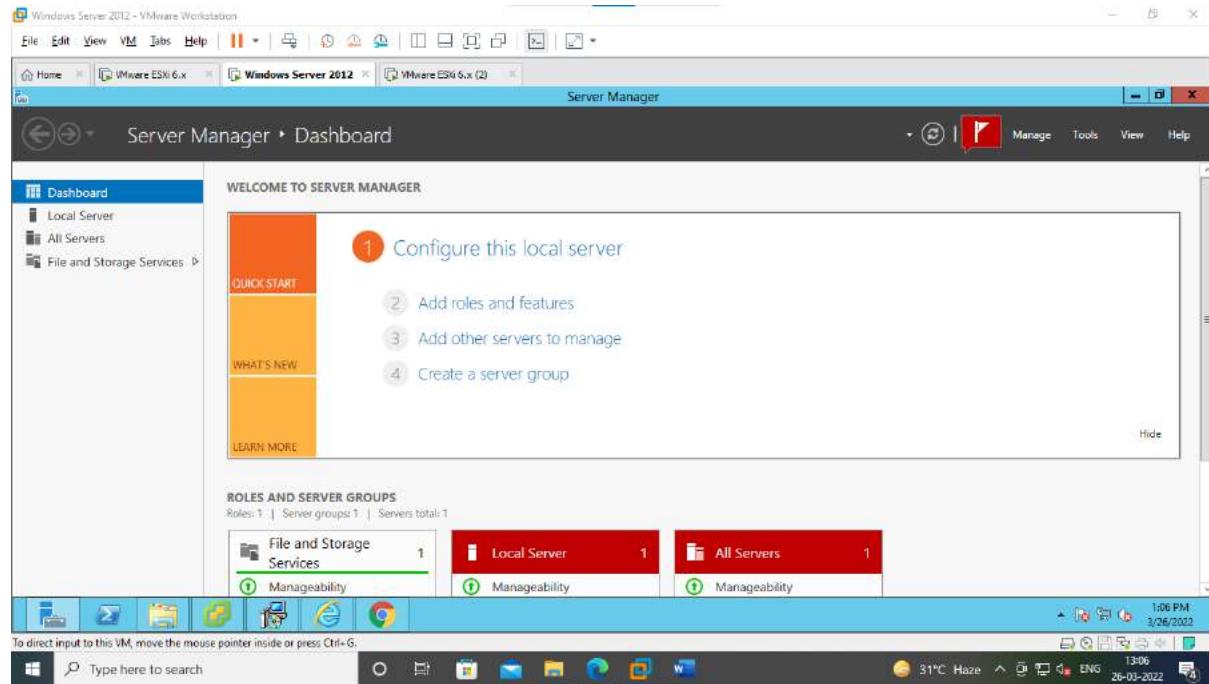


**Step 7:** Click on the Close button.

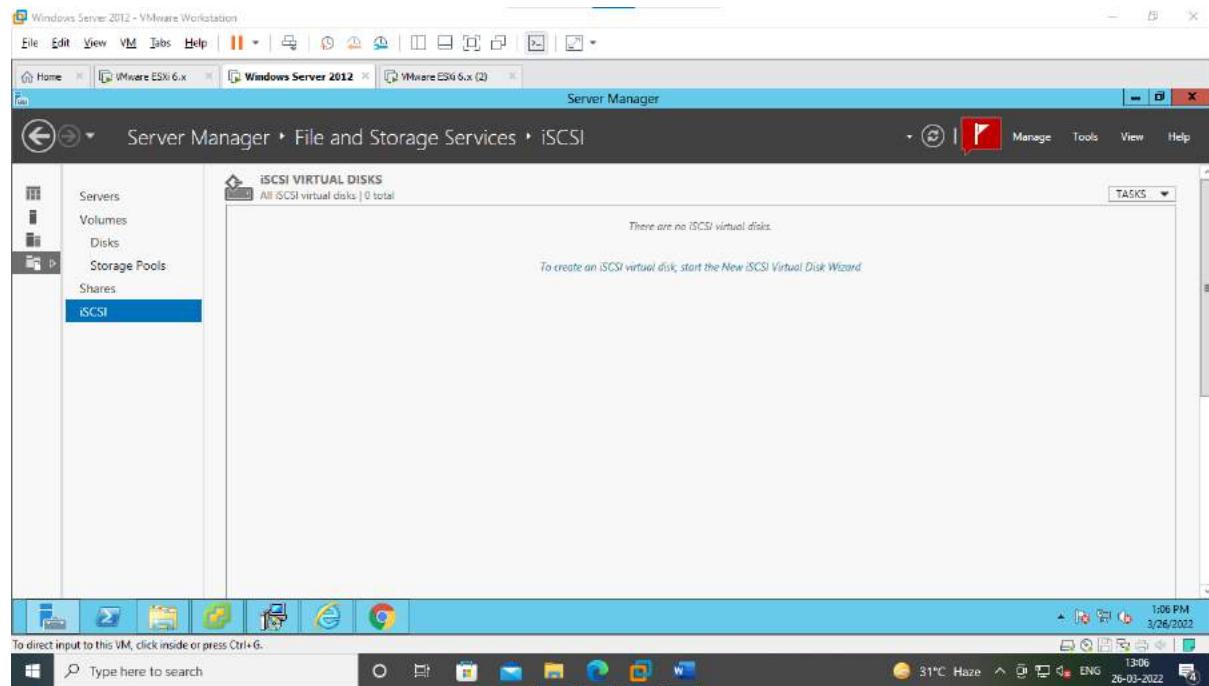


**Step 8:** After adding the role of iSCSI go to the below path.

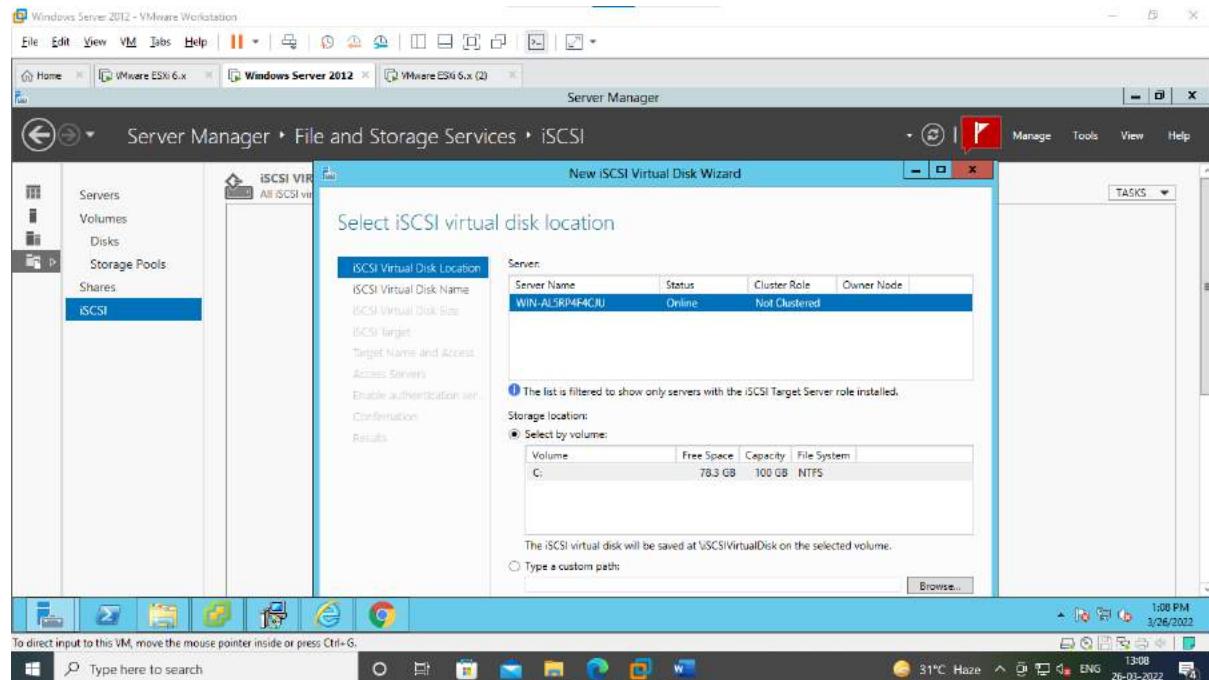
**Server Manager > File and Storage Services > iSCSI**



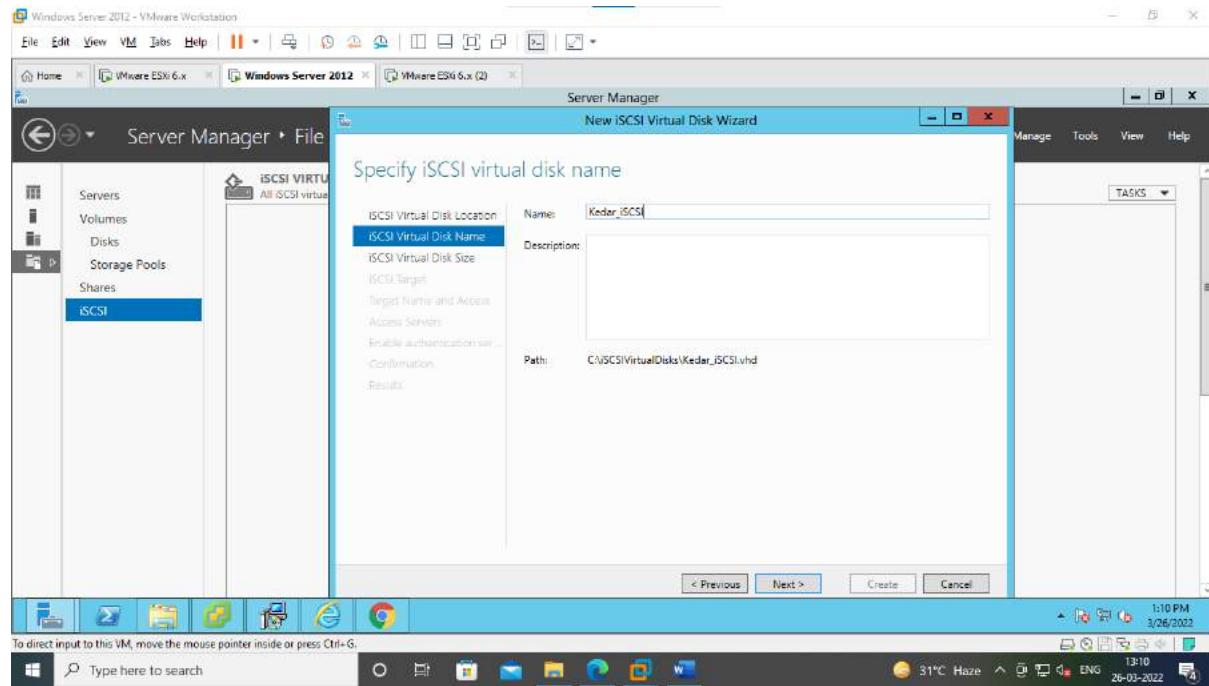
**Step 9:** Select iSCSI option on left pane and then click on **To create an iSCSI virtual disk, start the New iSCSI Virtual Disk Wizard** link.



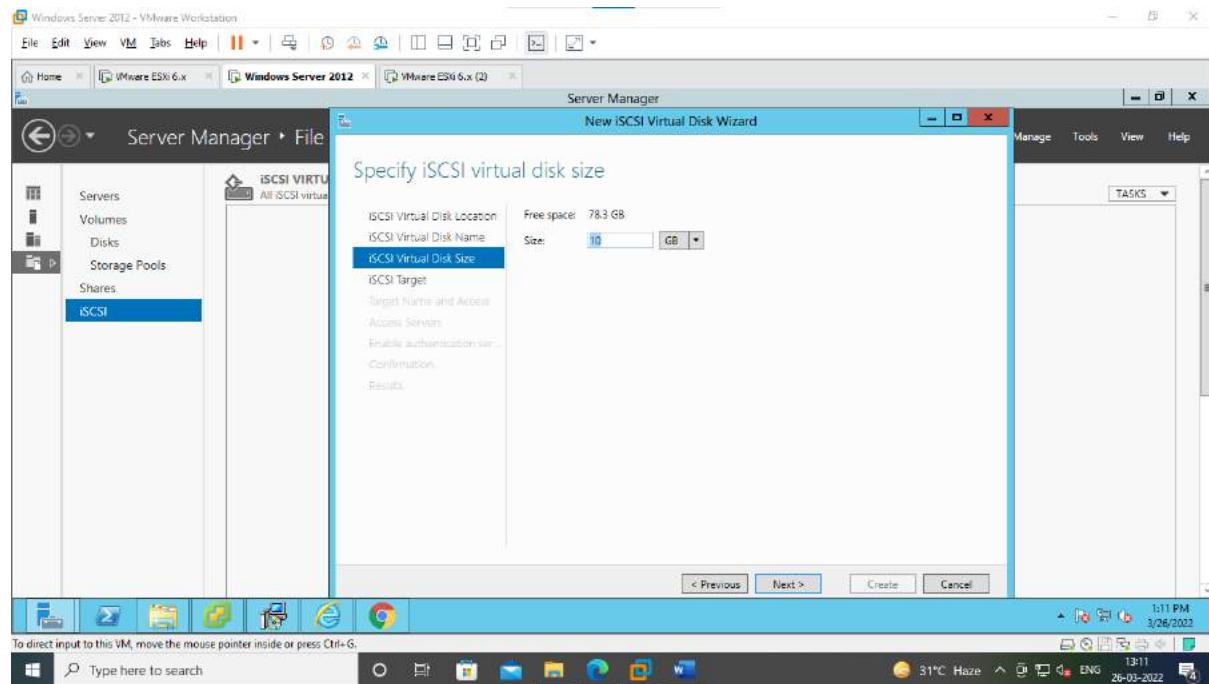
**Step 10:** Click on **Next** button.



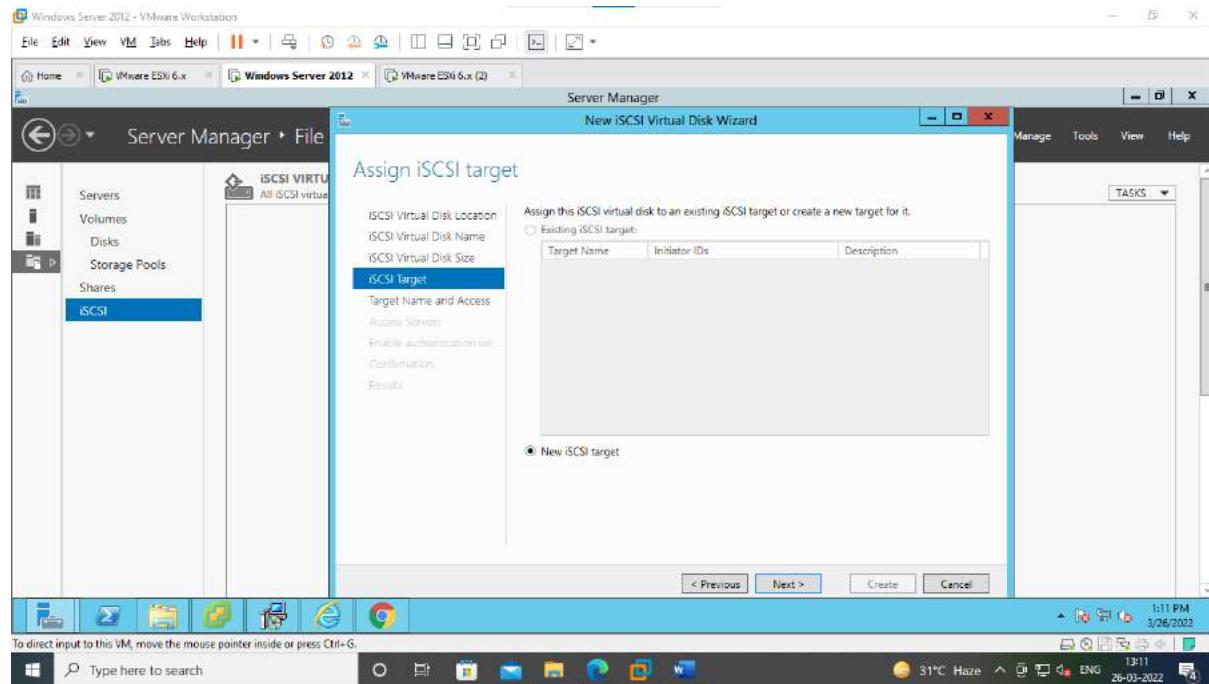
**Step 11:** Enter iSCSI virtual disk **Name** and click on the **Next** button.



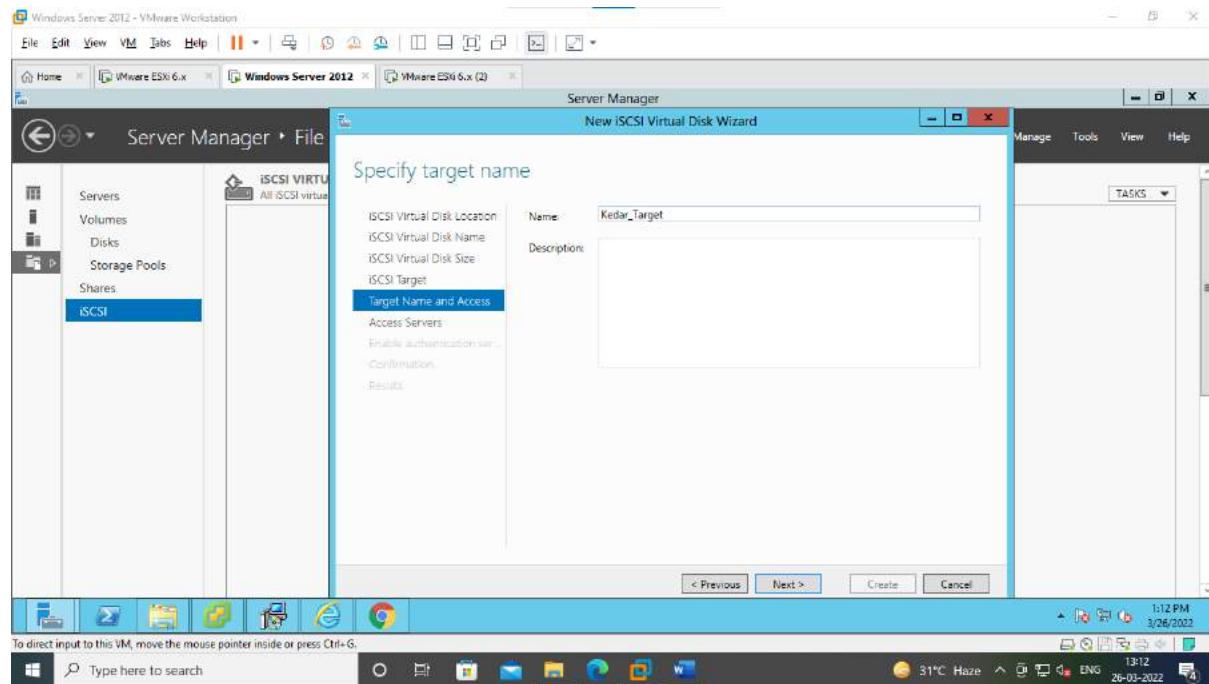
**Step 12:** Enter iSCSI virtual disk **Size** and click on the **Next** button.



**Step 13:** Select **New iSCSI target** option and click on the **Next** button.

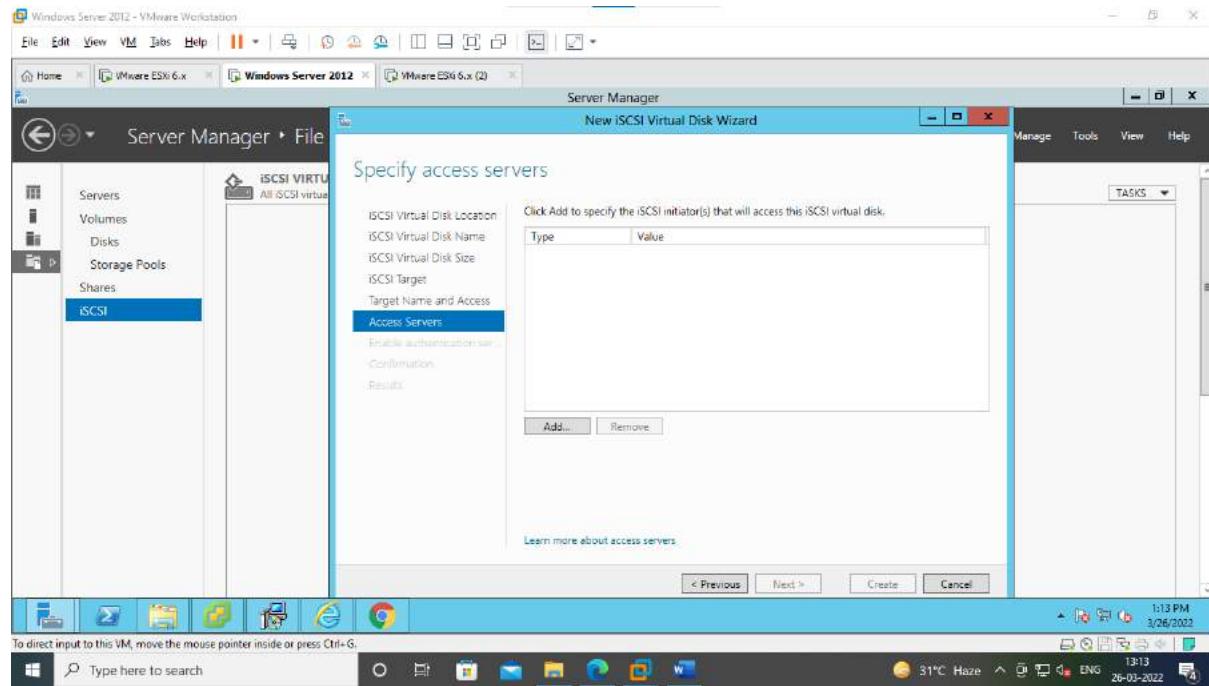


**Step 14:** Enter iSCSI virtual disk **Target Name** and click on the **Next** button.

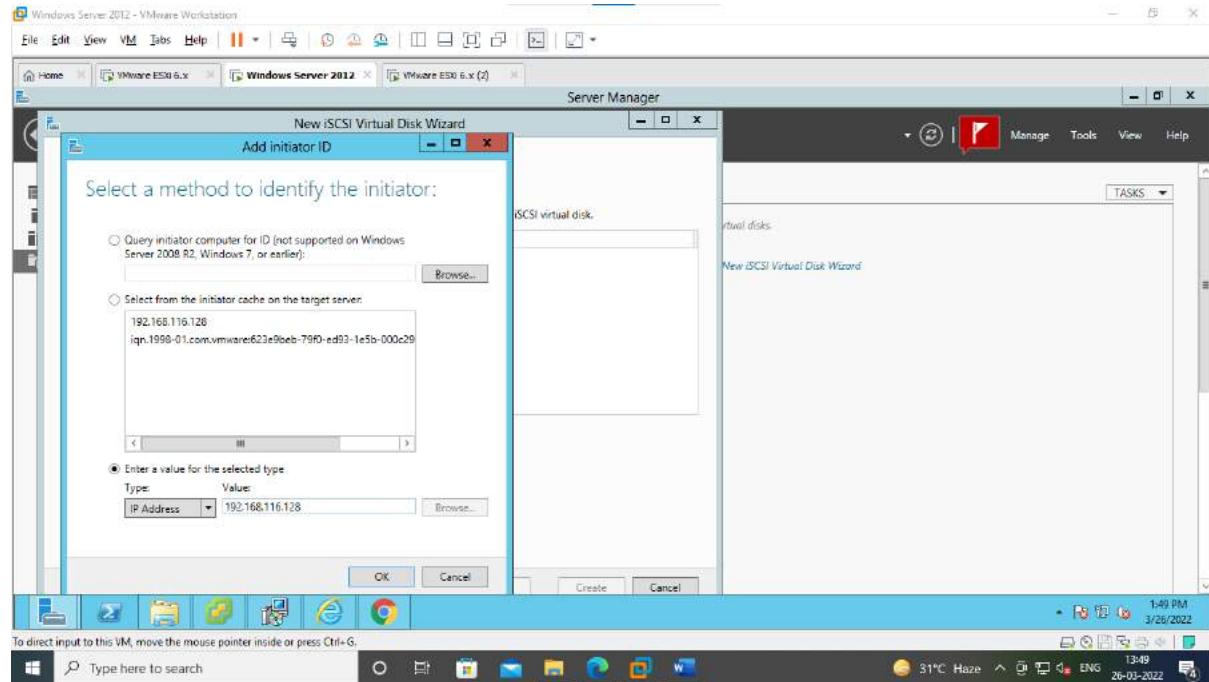


**Step 15:** Here we need to specify which host can access this iSCSI virtual disk for this enter below details.

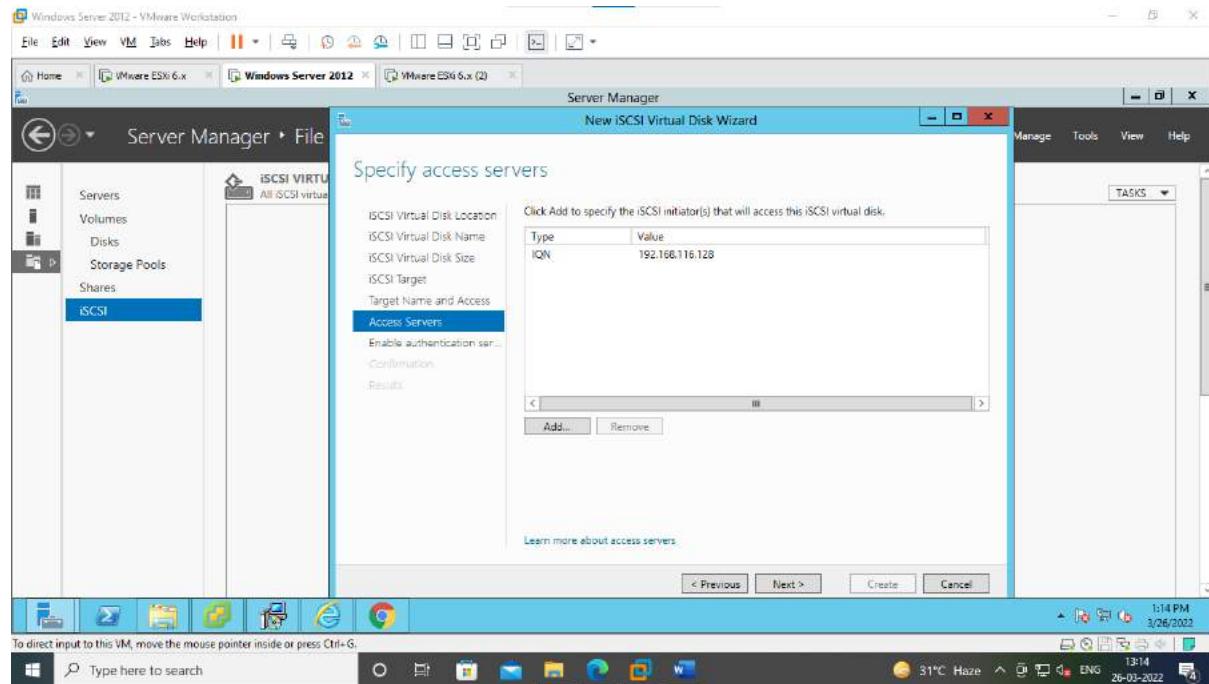
Click on **Add...** button.



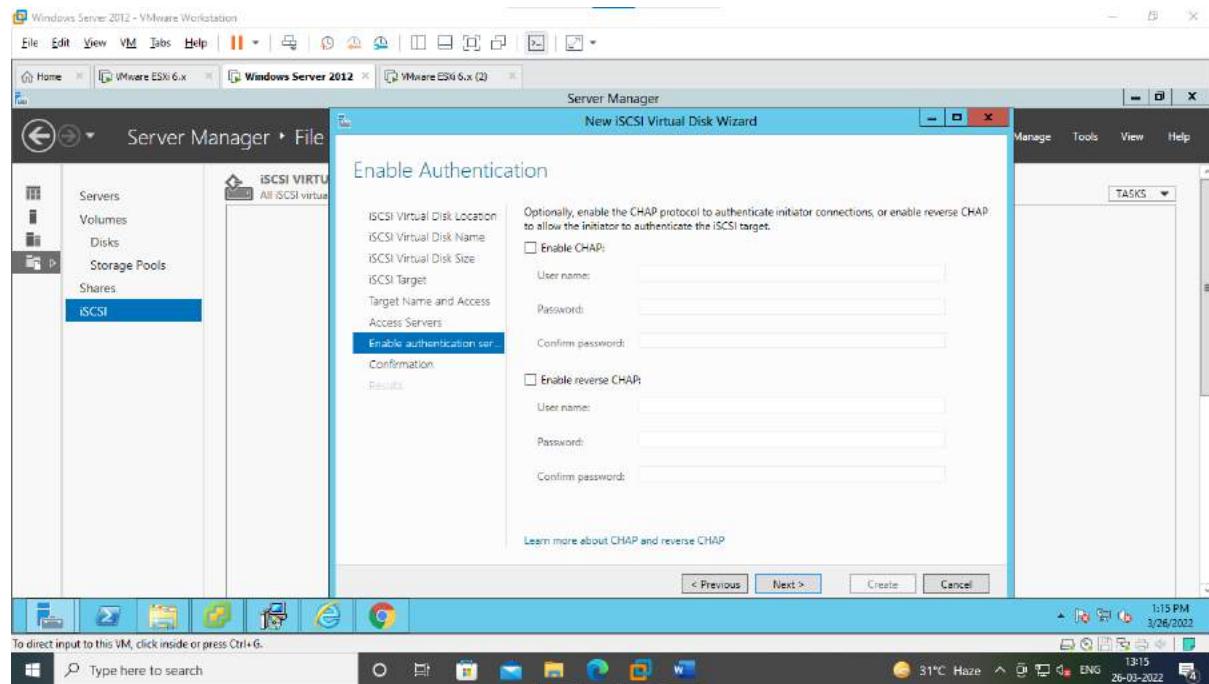
**Step 16:** Select **Enter a value for the selected type** option and type select **IP Address** and add a host IP address and click on **OK** button.

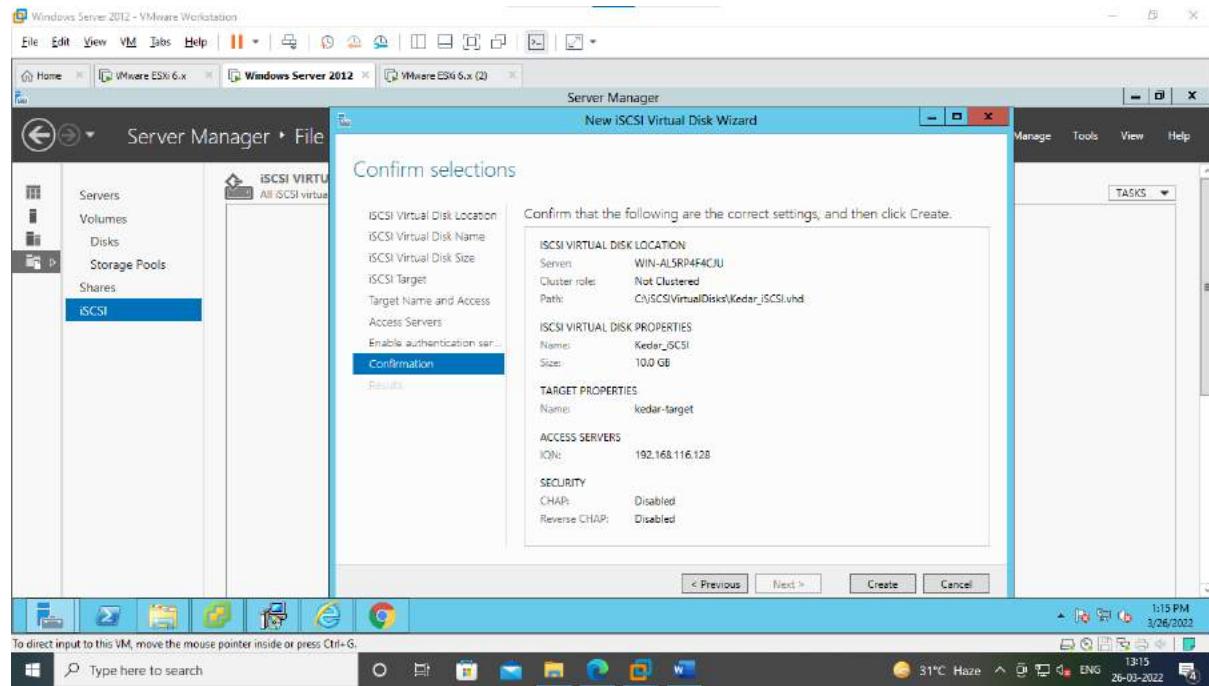


**Step 17:** Click on **NEXT** button.

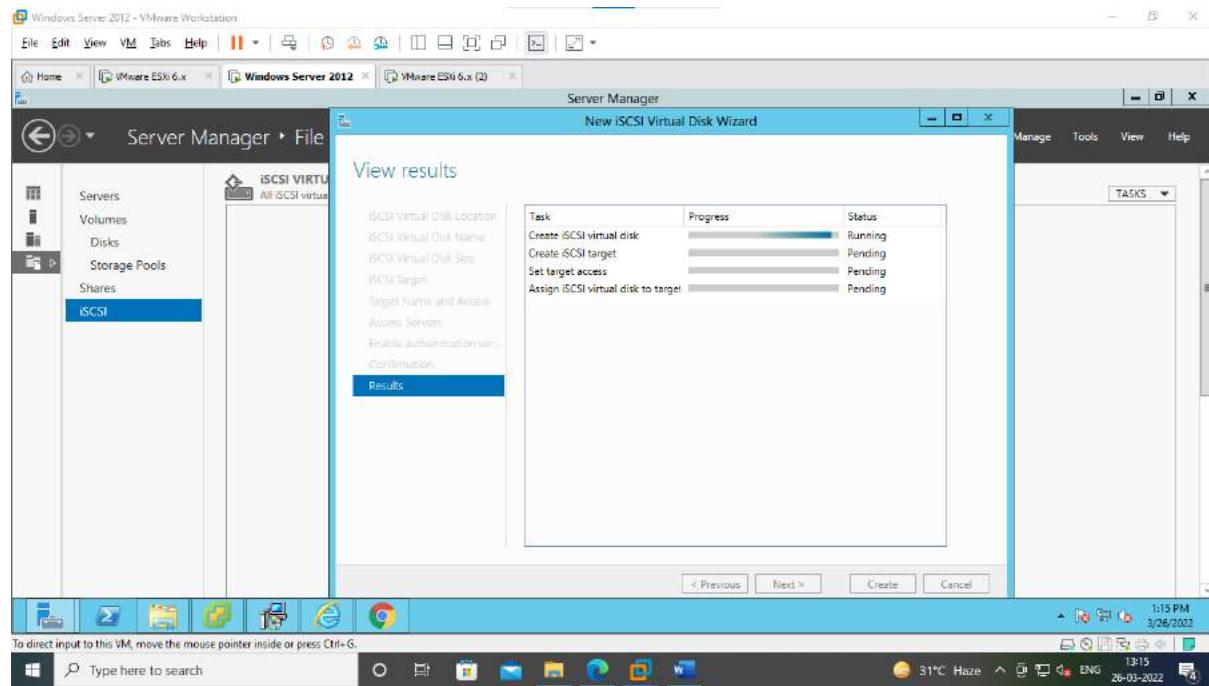


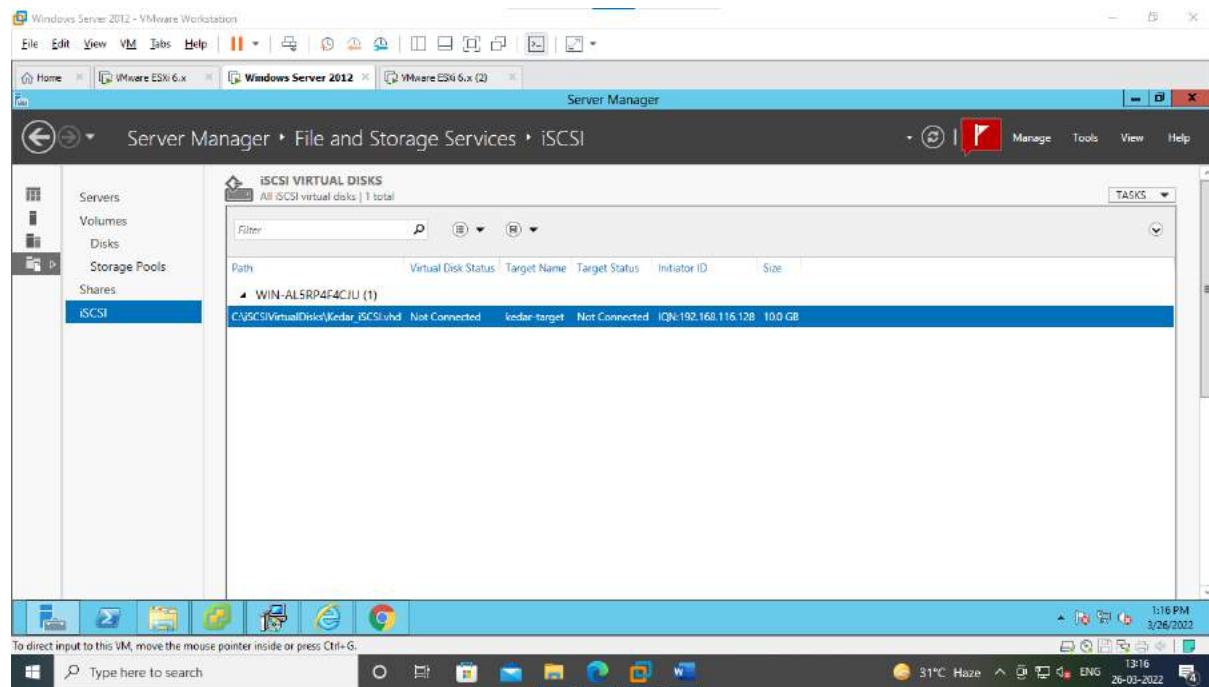
**Step 18:** Click on **Next** button.



**Step 19:** Click on **Create** button.

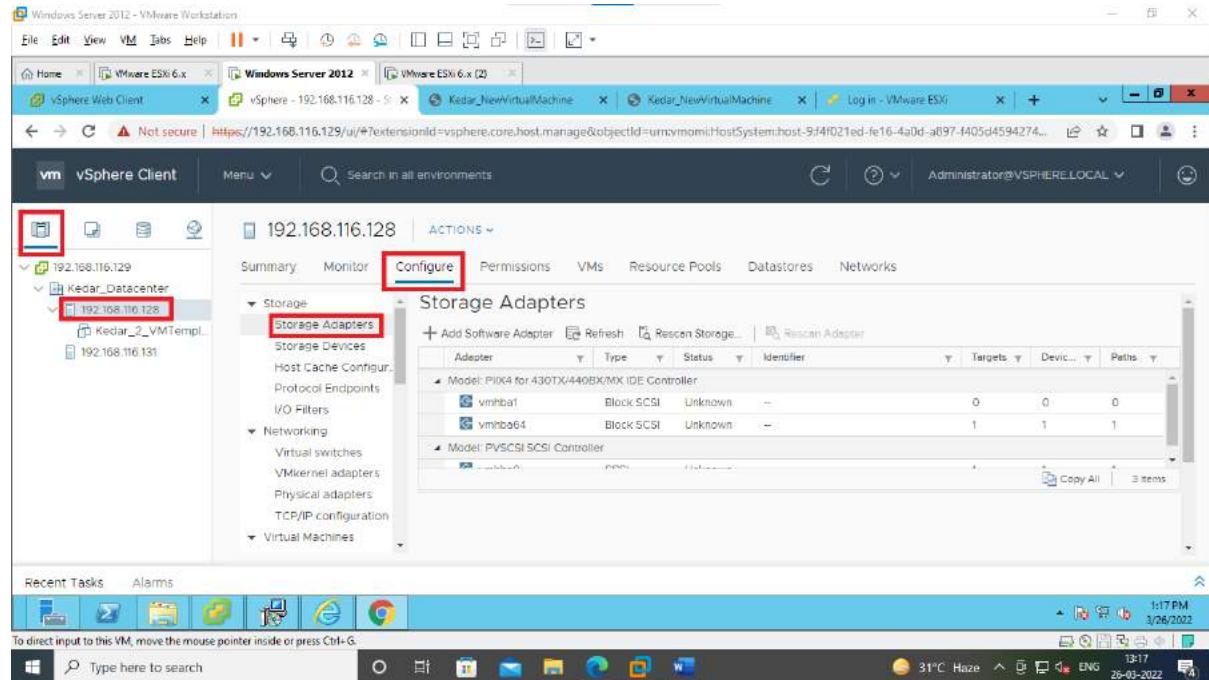
In below image you can see iSCSI disk has been created successfully.



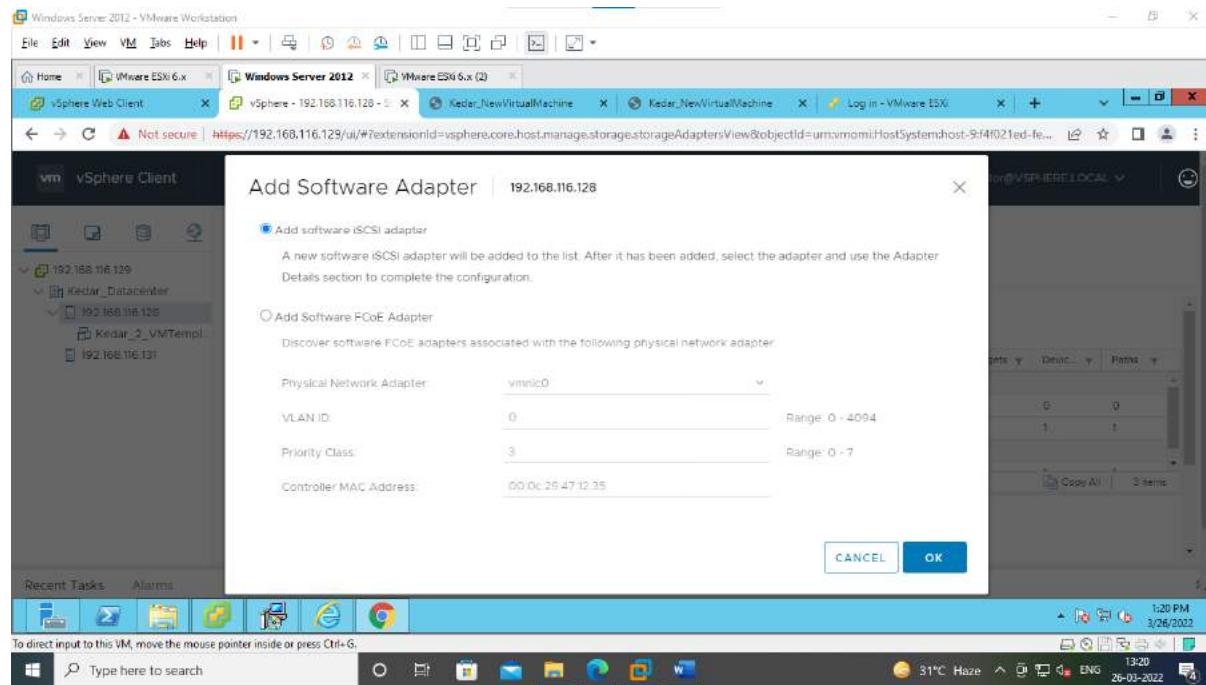


Create an iSCSI Adapter and configure an iSCSI adapter with the server.

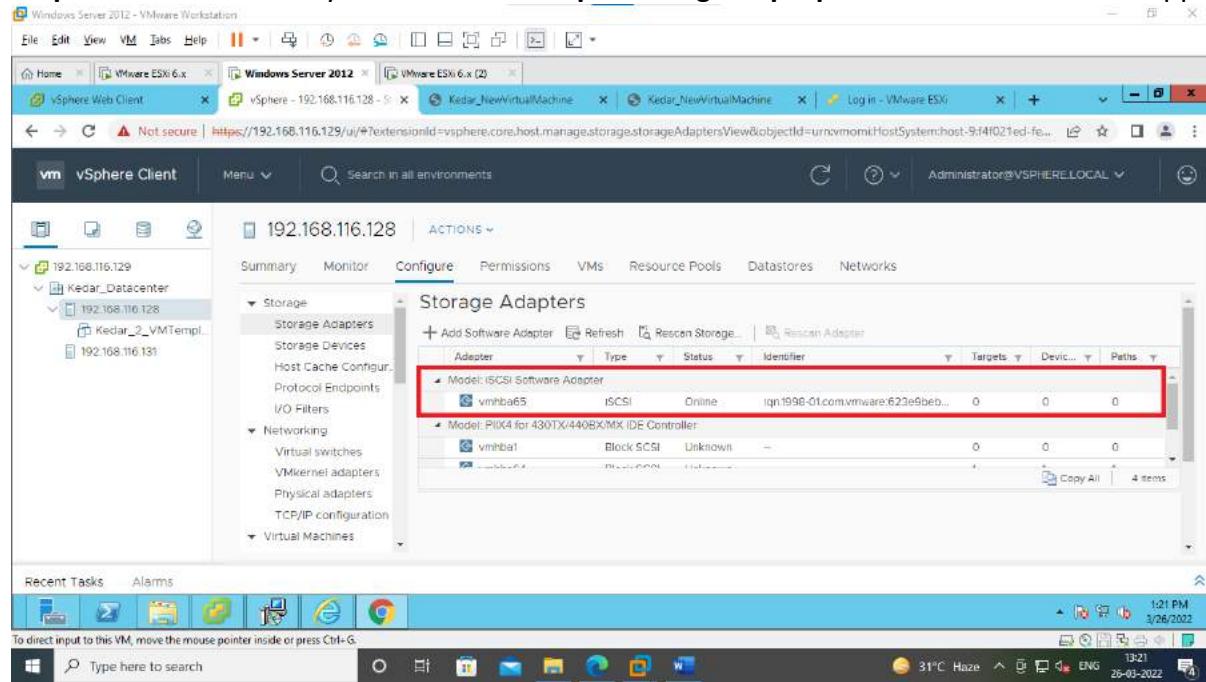
**Step 20:** Login into vSphere client and go to the **Configuration tab** of the host where you want to add an iSCSI virtual disk.



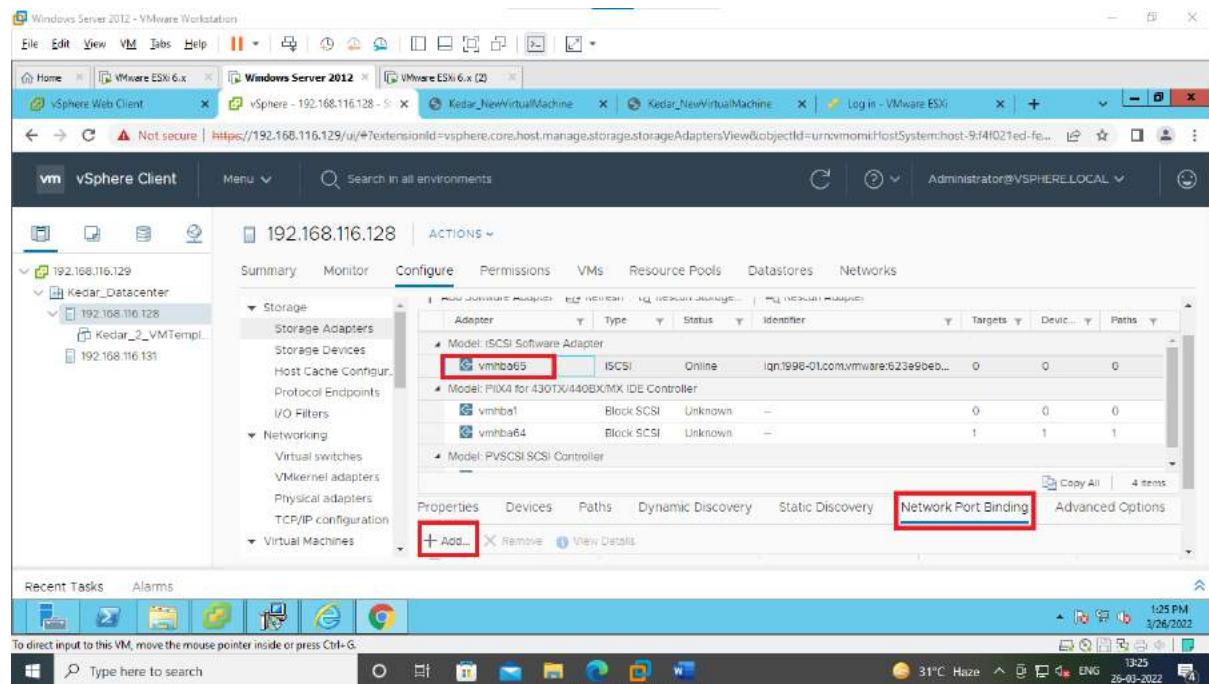
**Step 21:** Select the **Add Software iSCSI Adapter** option and click on the **OK** button.



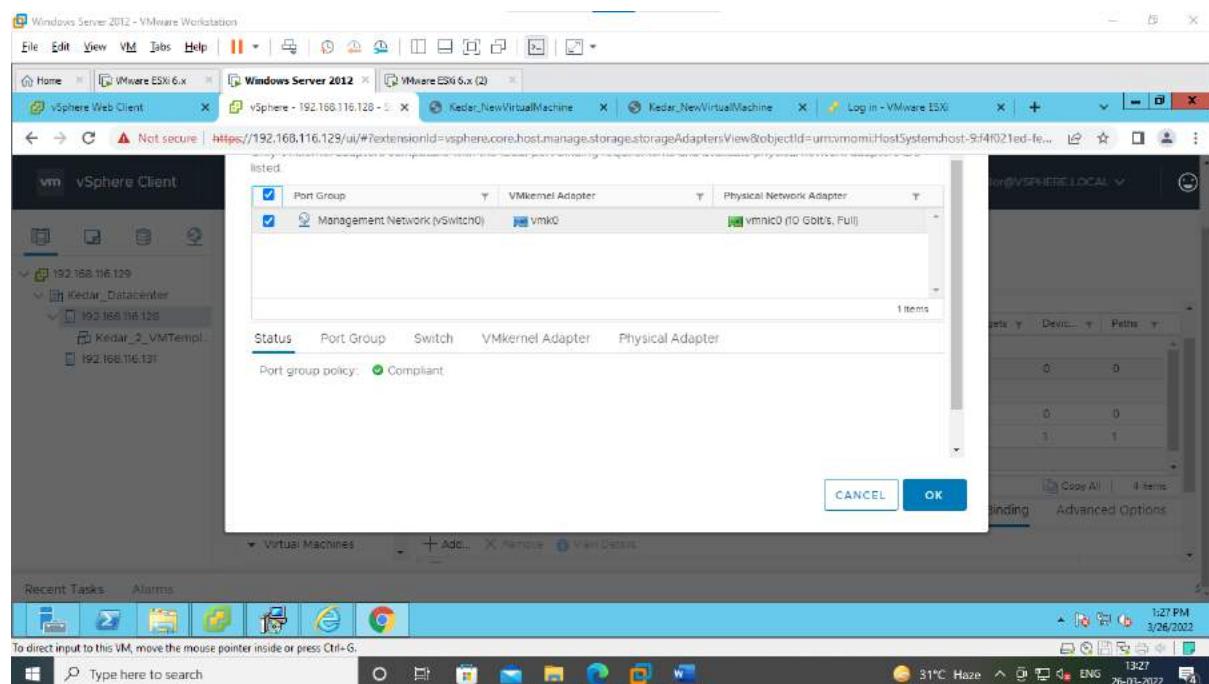
**Step 22:** Select the newly created **iSCSI Adapter** and go to **properties** below wizard will appear.

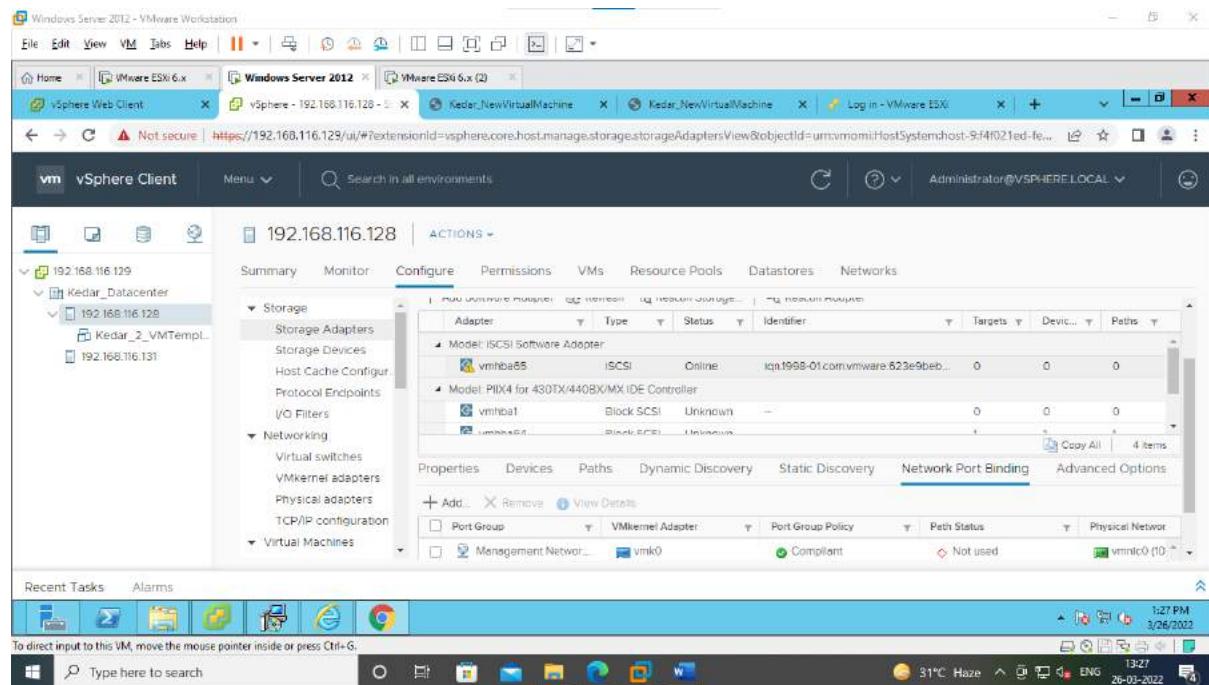


**Step 23:** Now go to the **Network Port Binging** tab and click on the **+ Add** button.

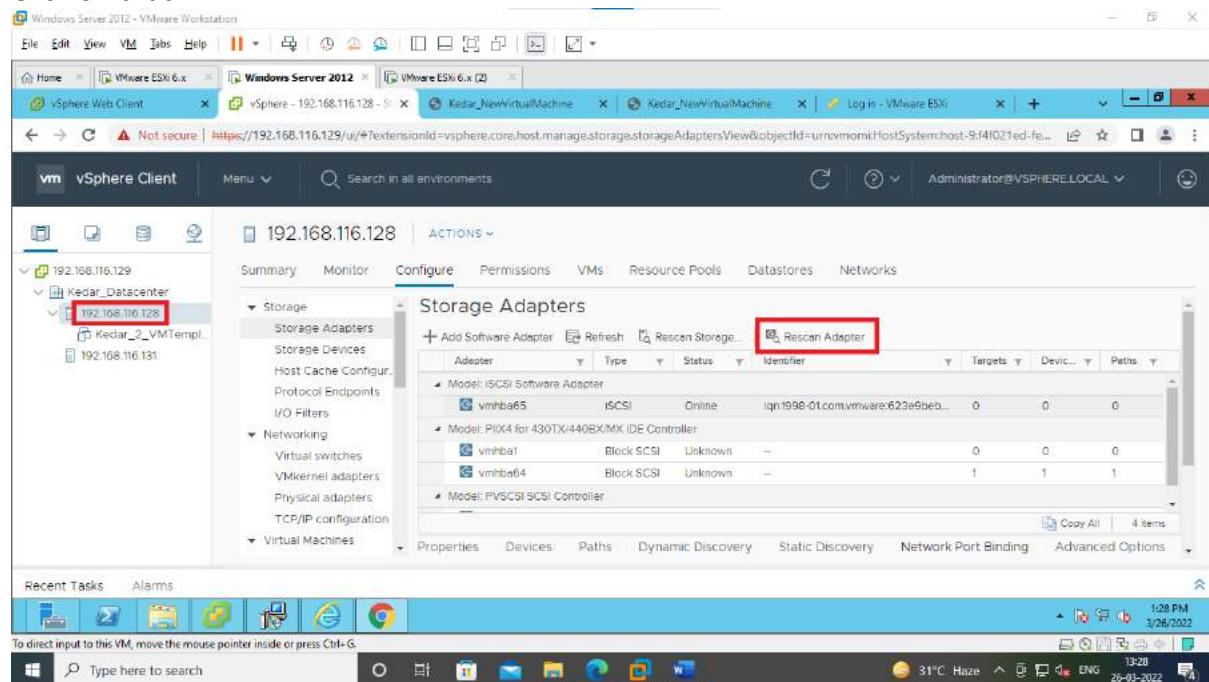


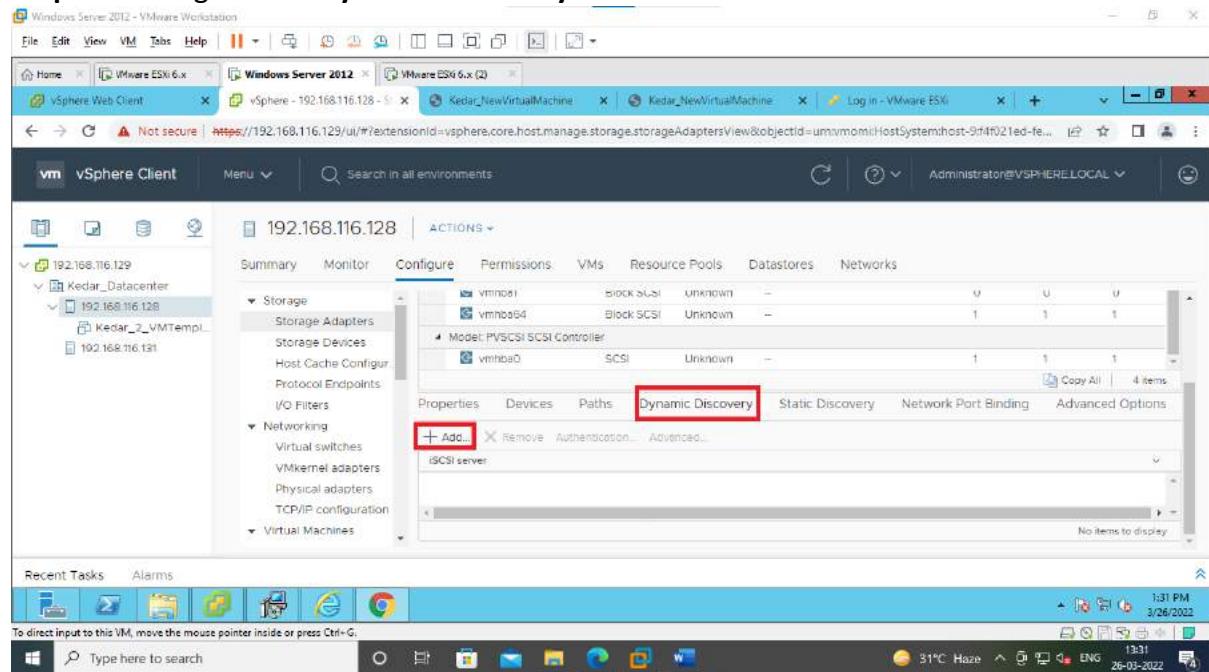
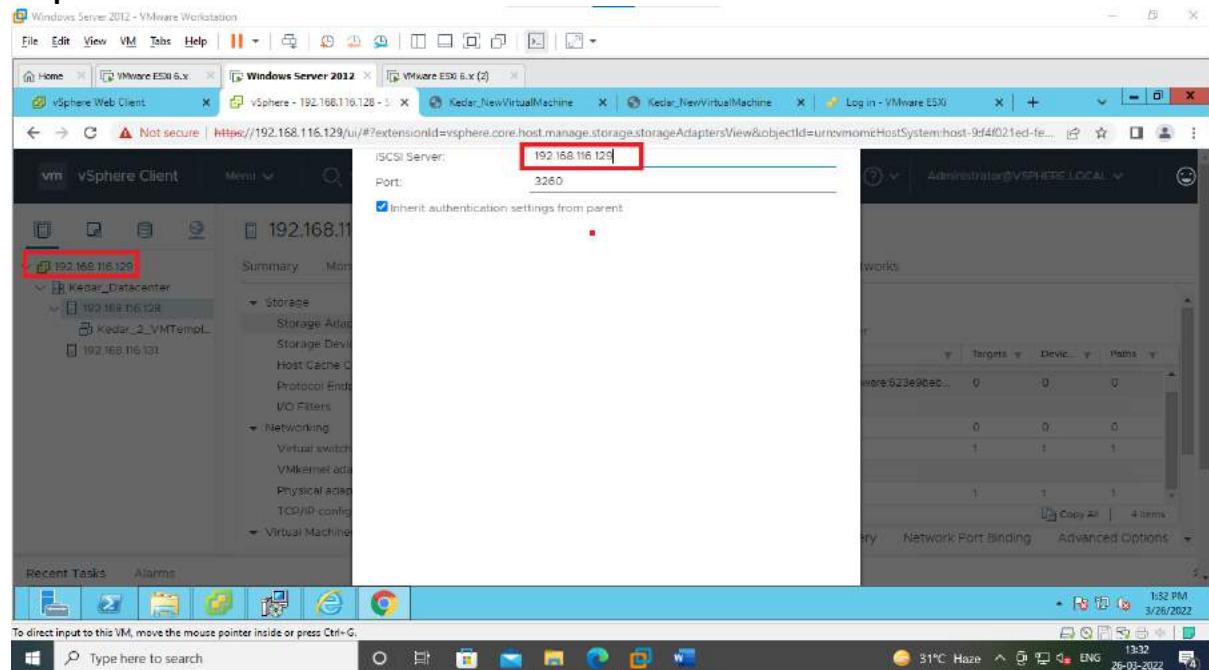
**Step 24:** Check the all-Port Group option and click on **OK** button.

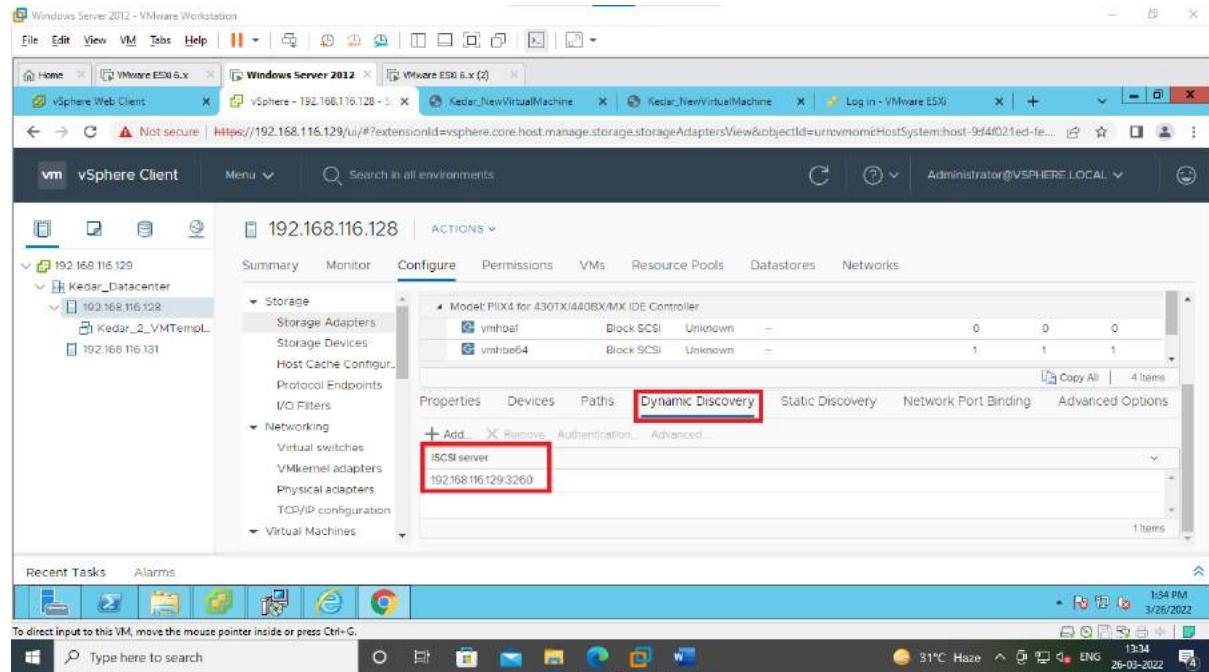




**Step 24:** After click on OK button then refresh the Host and Here enable the **Rescan Adapter**. Click on that.

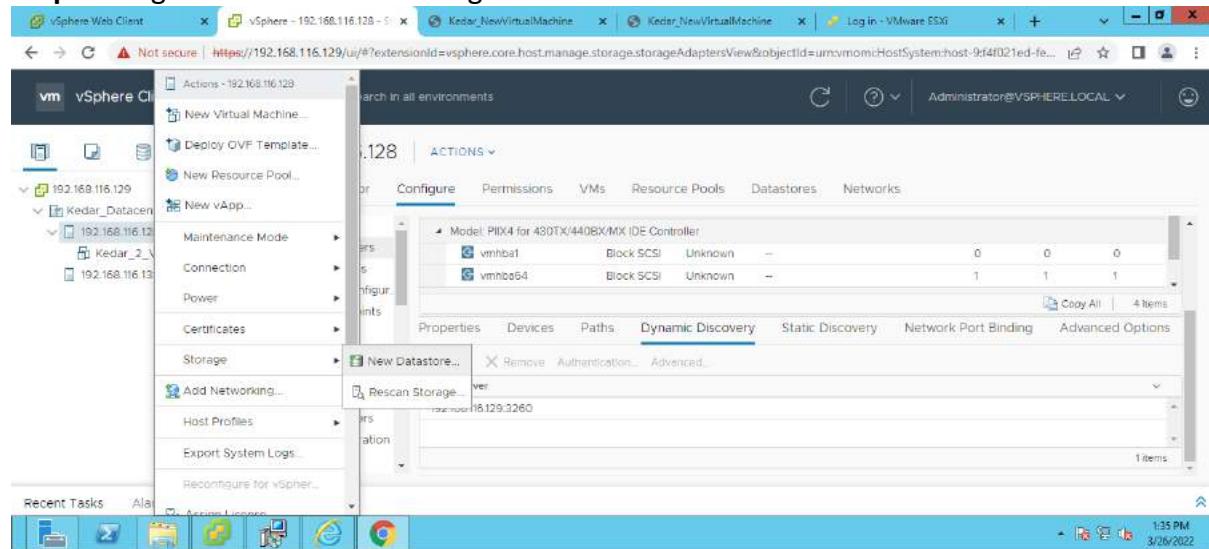


**Step 25:** Now go to the **Dynamic Discovery** tab and **+ Add** button.**Step 26:** Enter the iSCSI Server details and Click on the **OK** button.

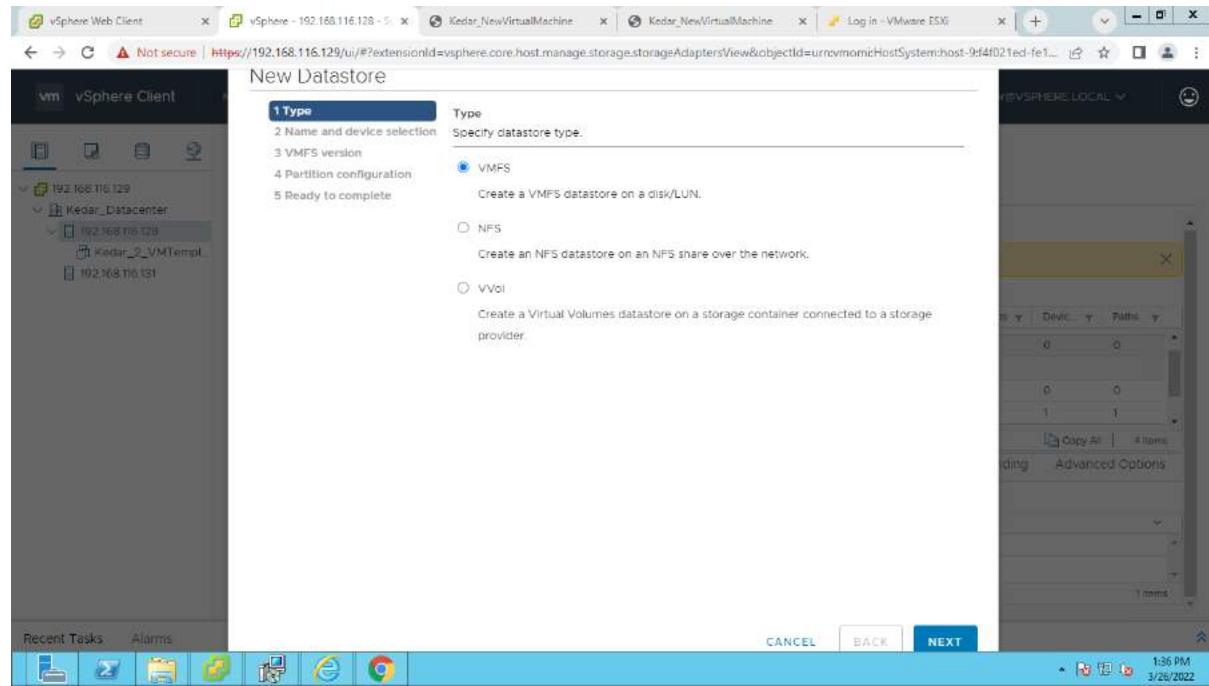


### Create iSCSI Storage to Host.

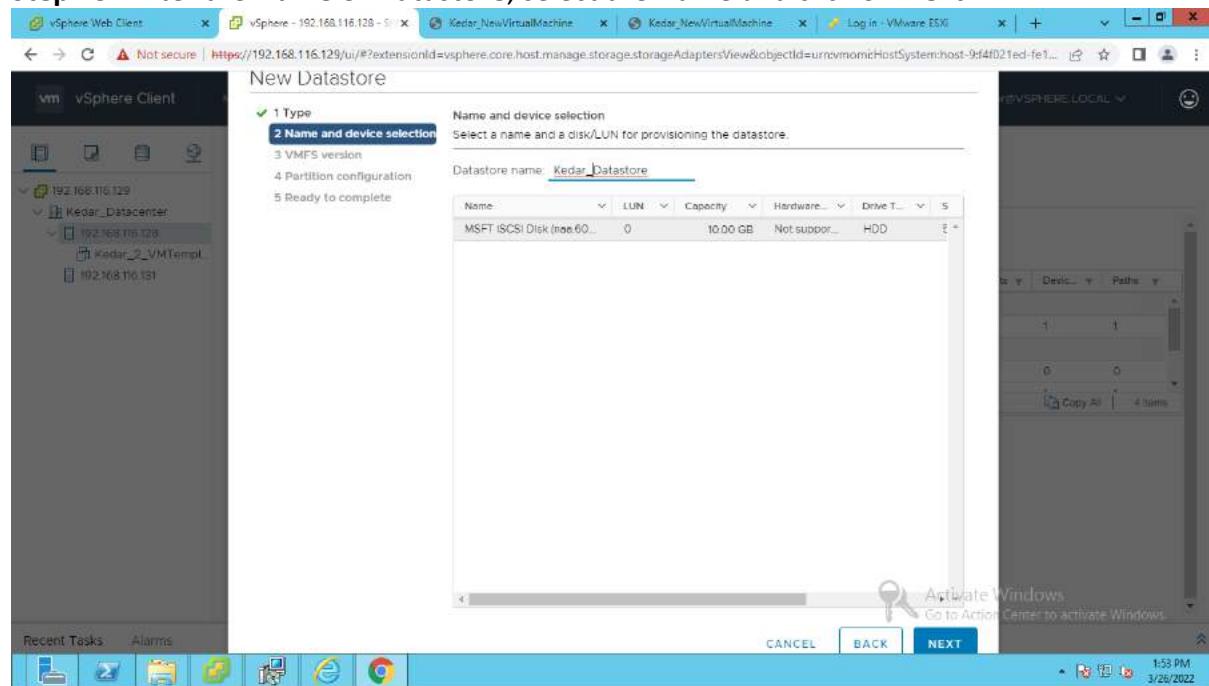
#### Step 27: Right Click on Host > Storage > New Database



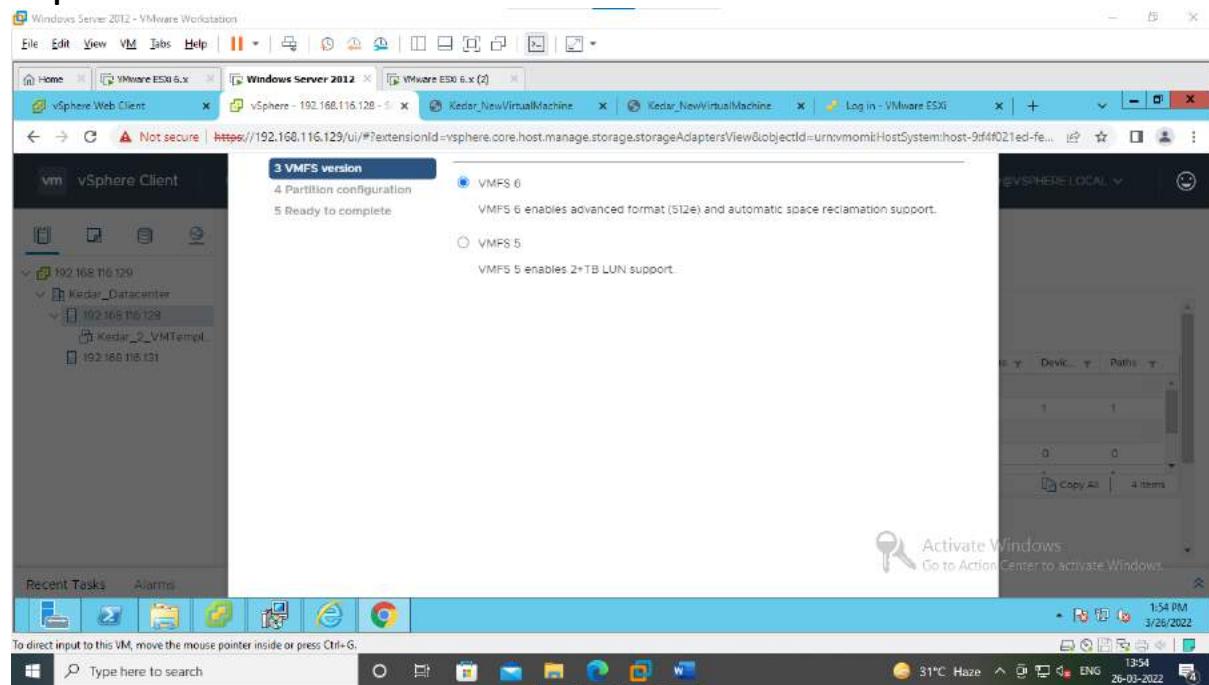
**Step 28:** Select type as VMFS option and click on **Next**.



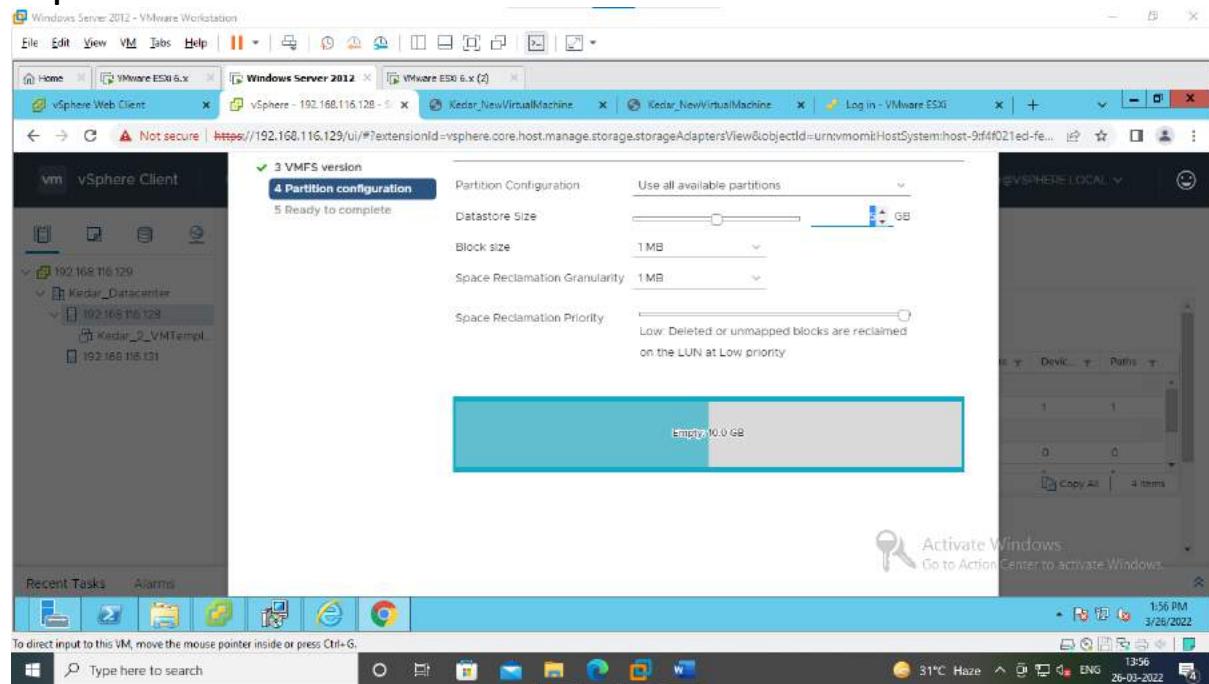
**Step 29:** Enter the **Name of Datastore**, select the Name and click on **Next**.



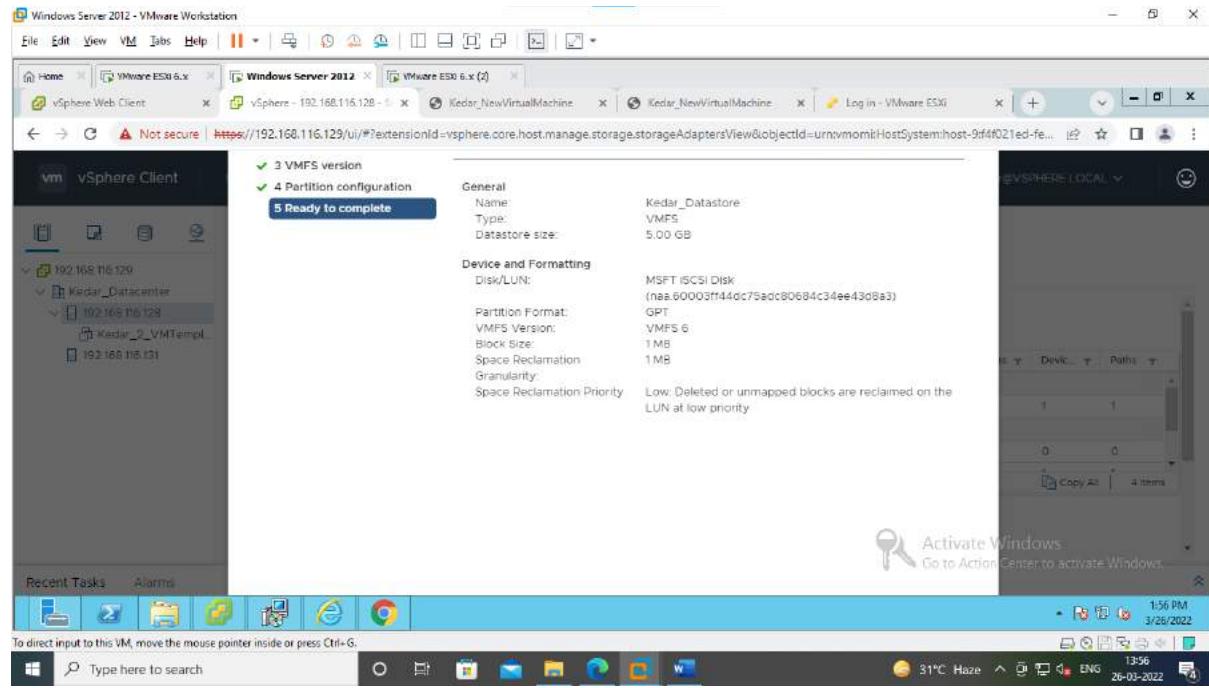
**Step 30: Select the VMFS version -> VMFS 6 and click on Next.**



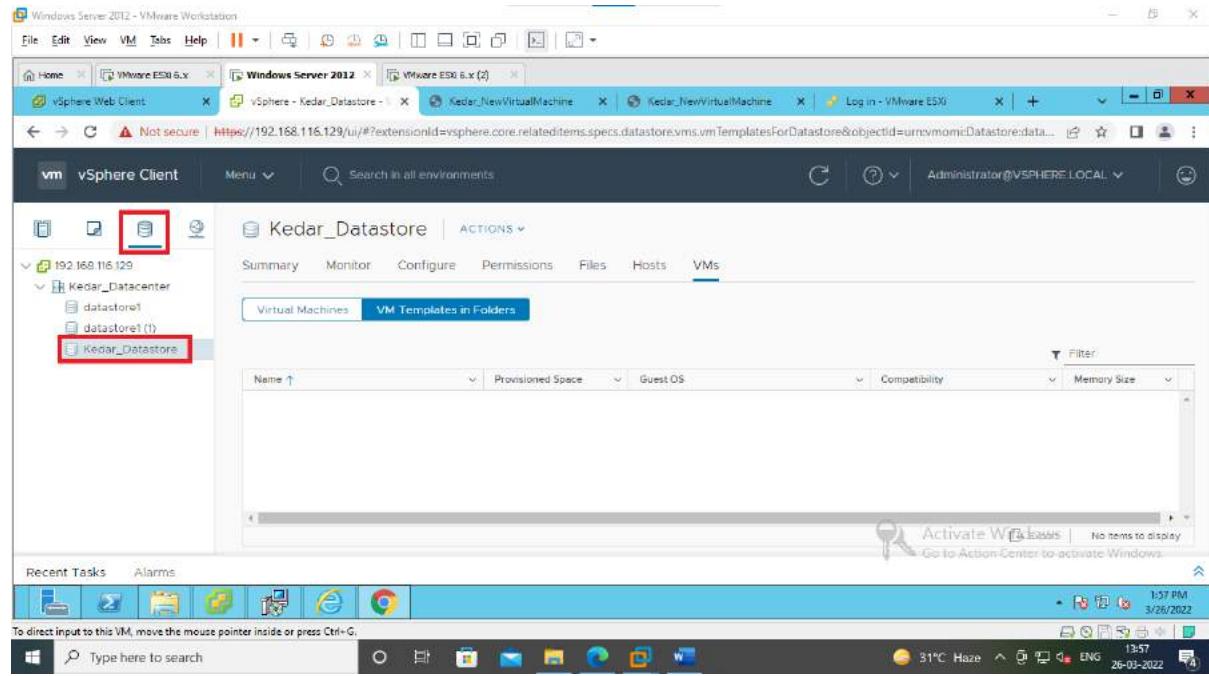
**Step 31: Click on Next.**



### Step 32: Click on the Finish.



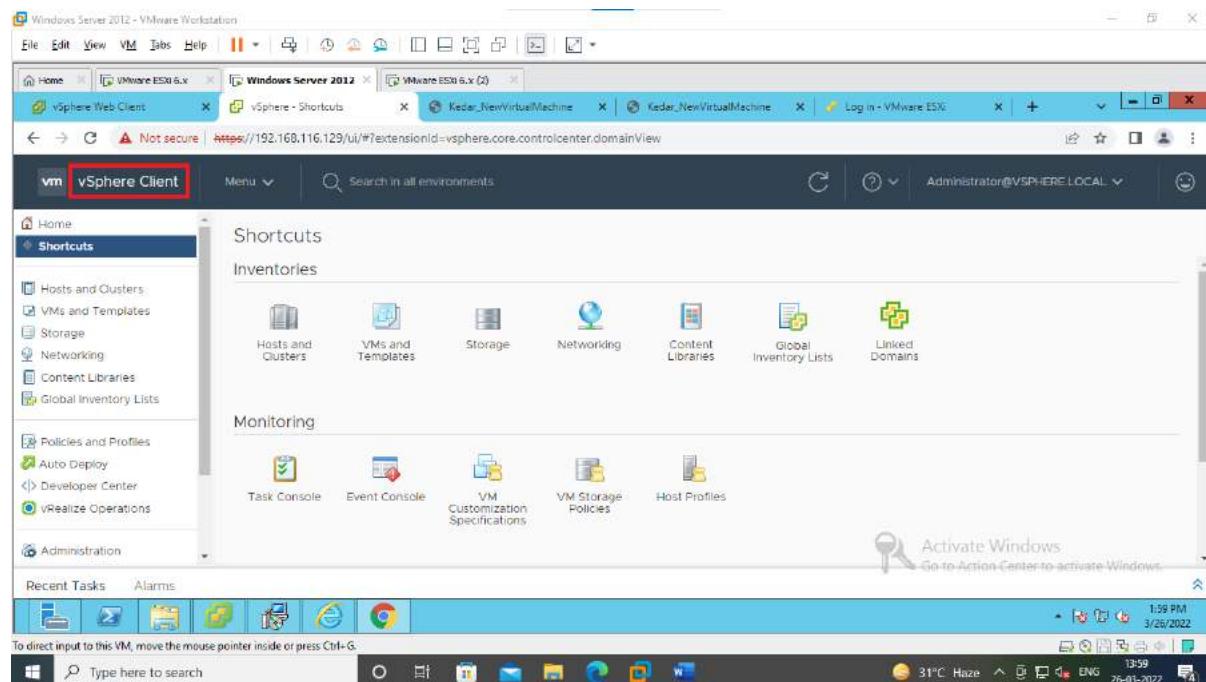
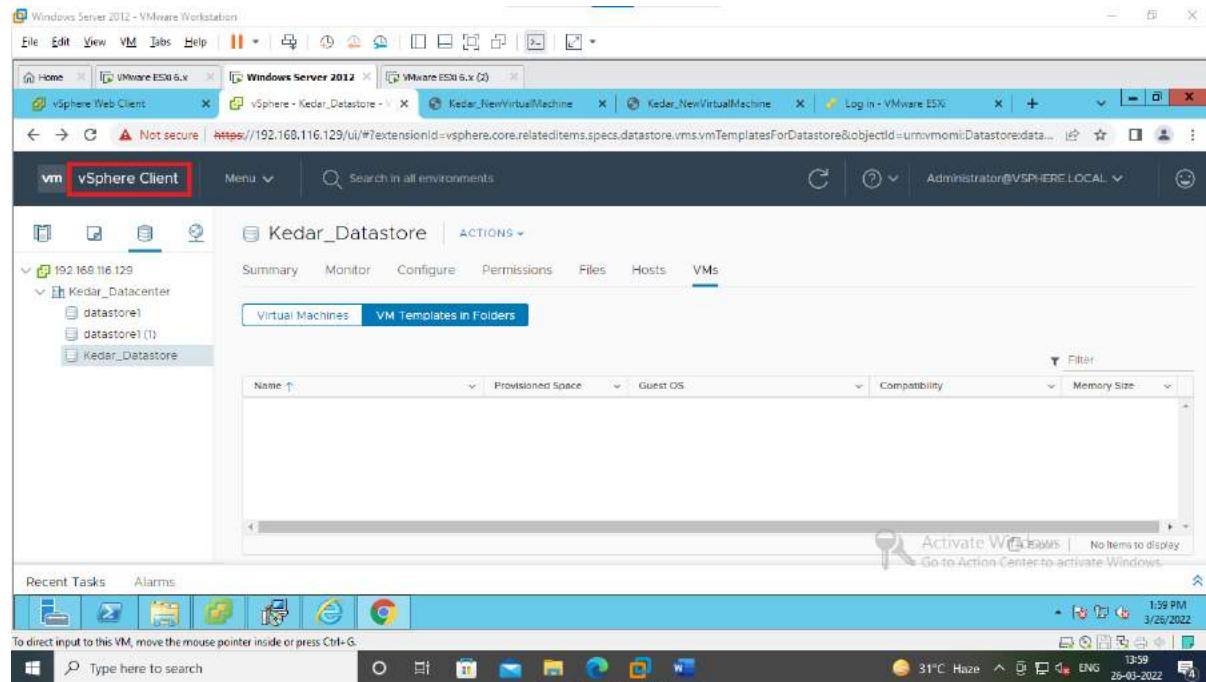
You can see iSCSI storage has been created into the ESXi host in below image.



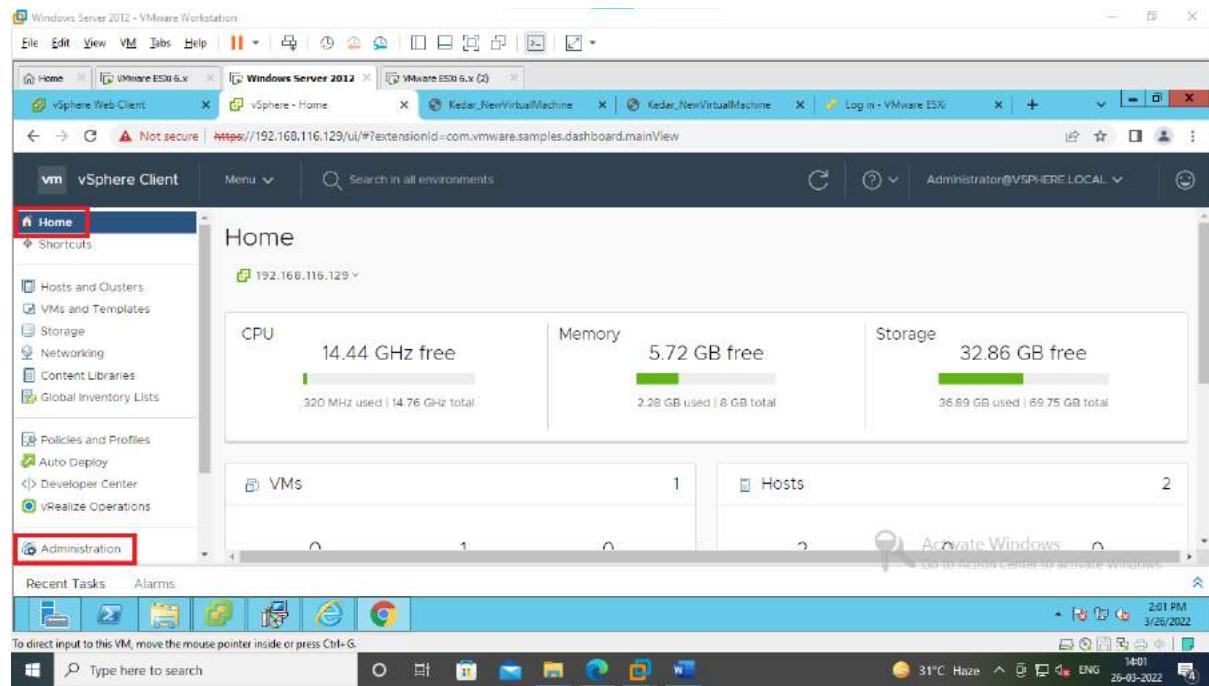
## B. Create a one user account of VMware ESXi server using vSphere WebClient application.

**Step 1:** Login into vSphere server from Web Client application.

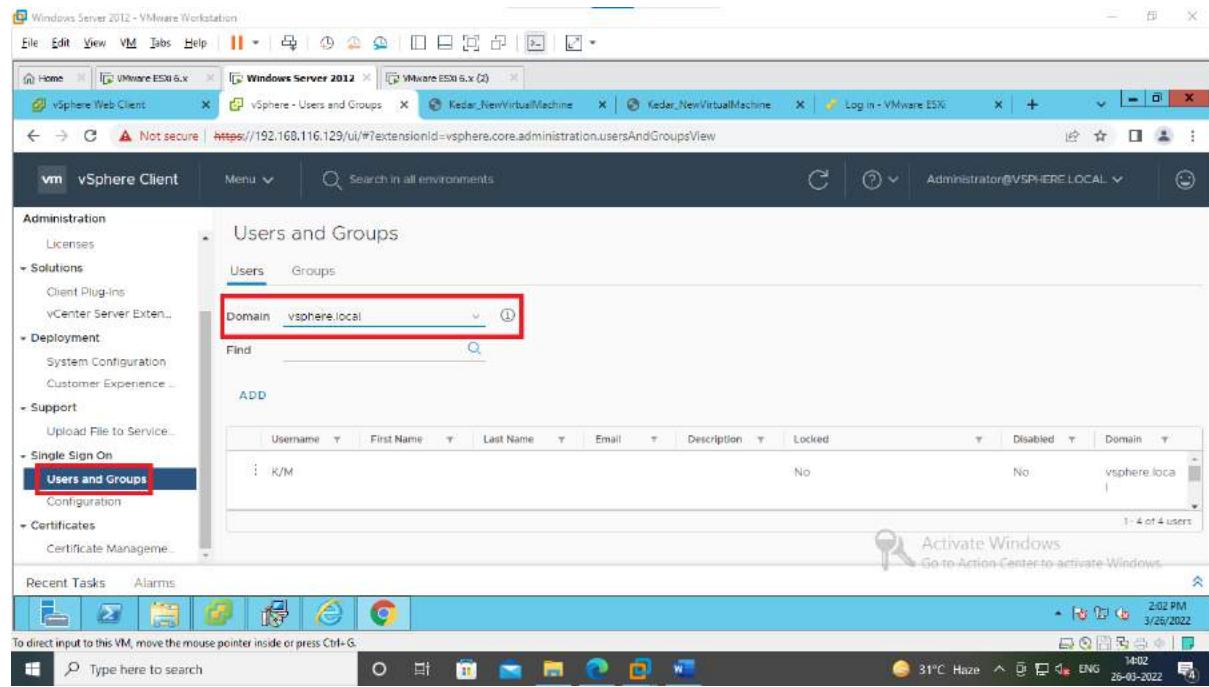
Click on the vSphere Client like below image.

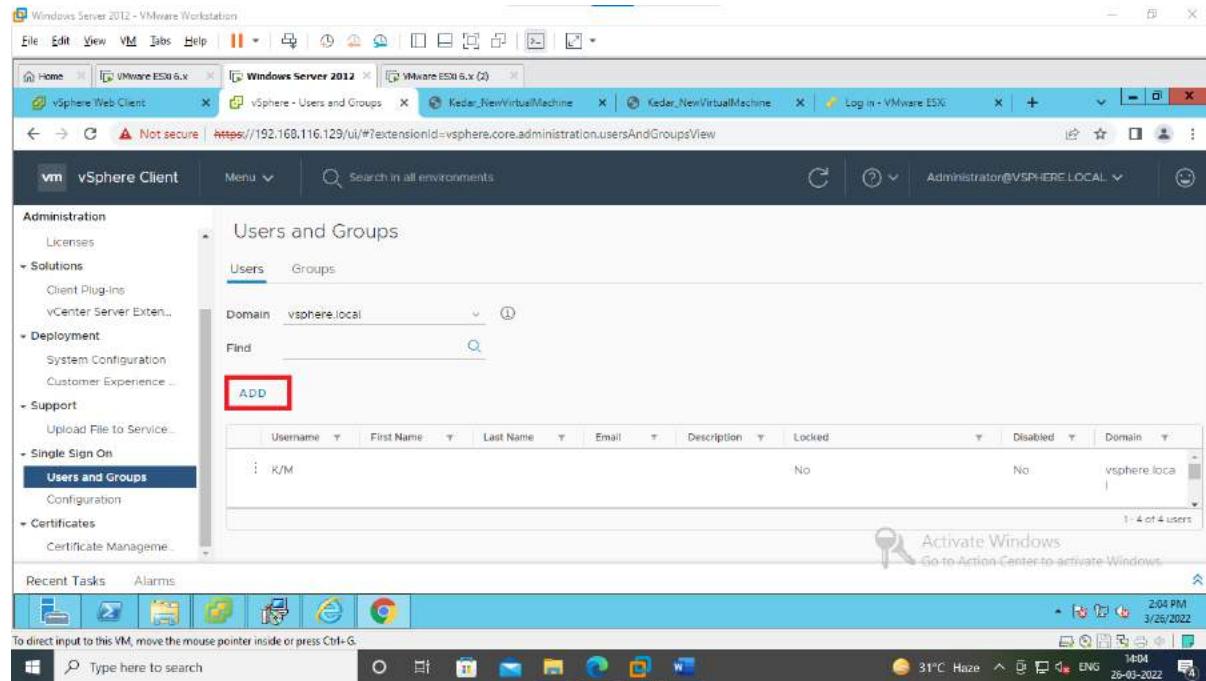


**Step 2:** Go to Home and click on the Administration tab.

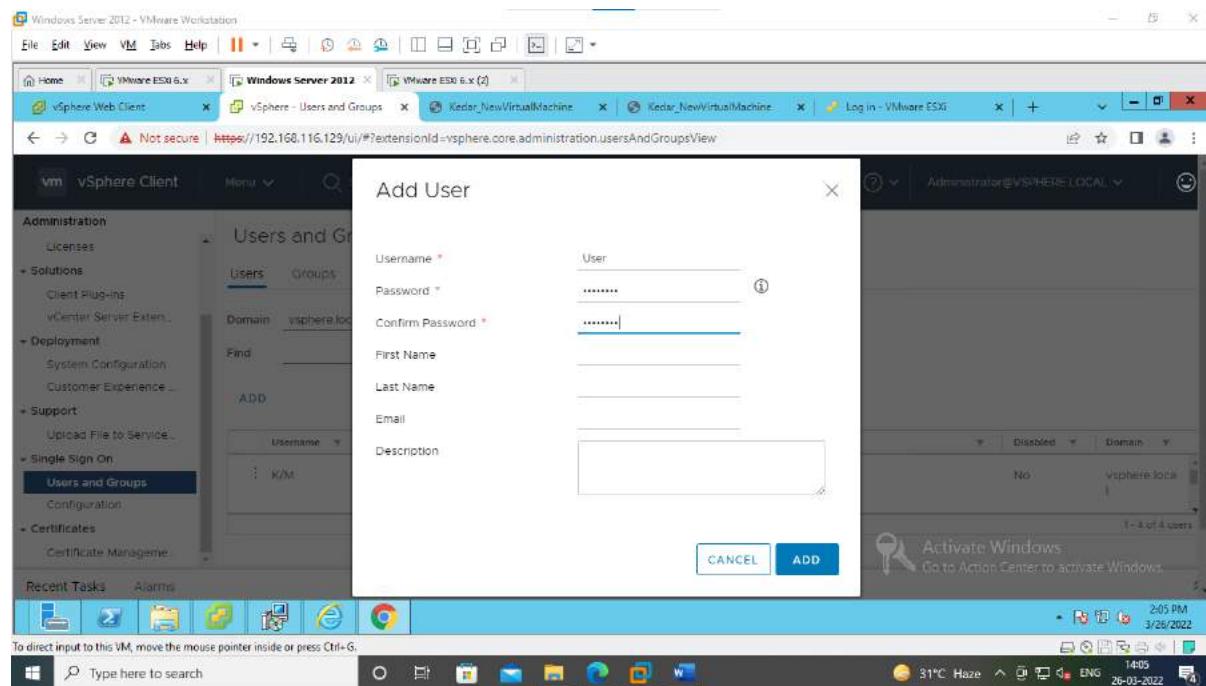


**Step 3:** Go to the User and Groups tab select domain as vsphere.local and click on Add button.



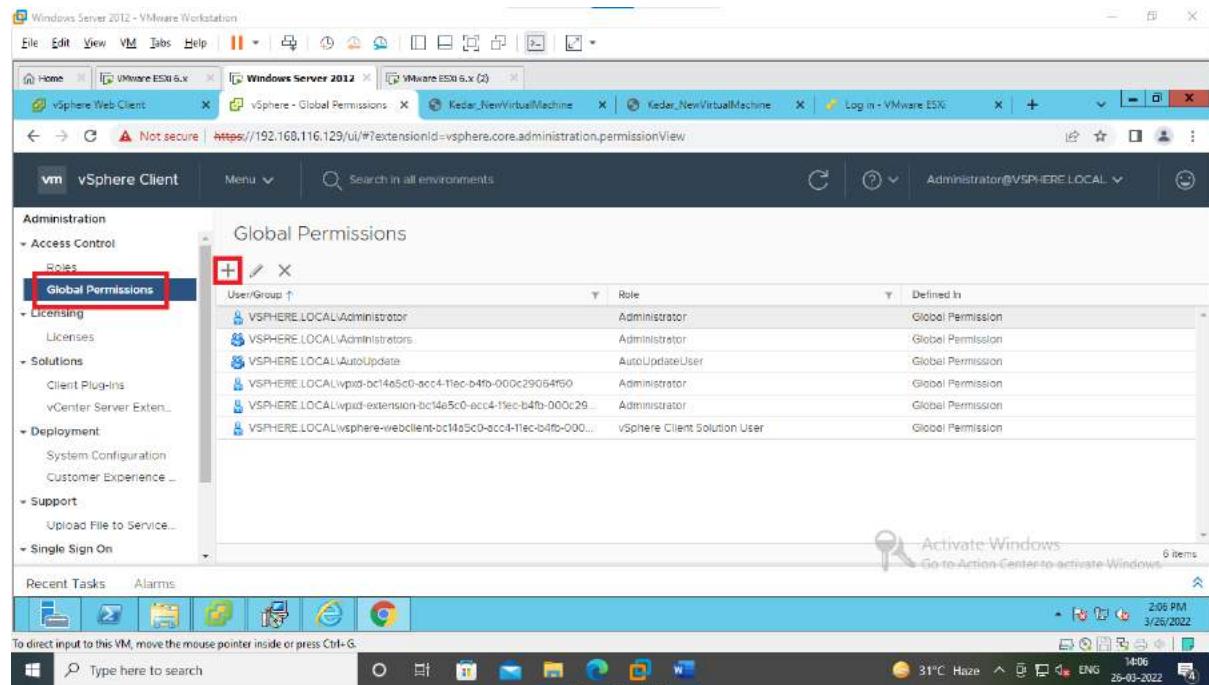


#### Step 4: Add User details like Username & Password and Click on the Add button.

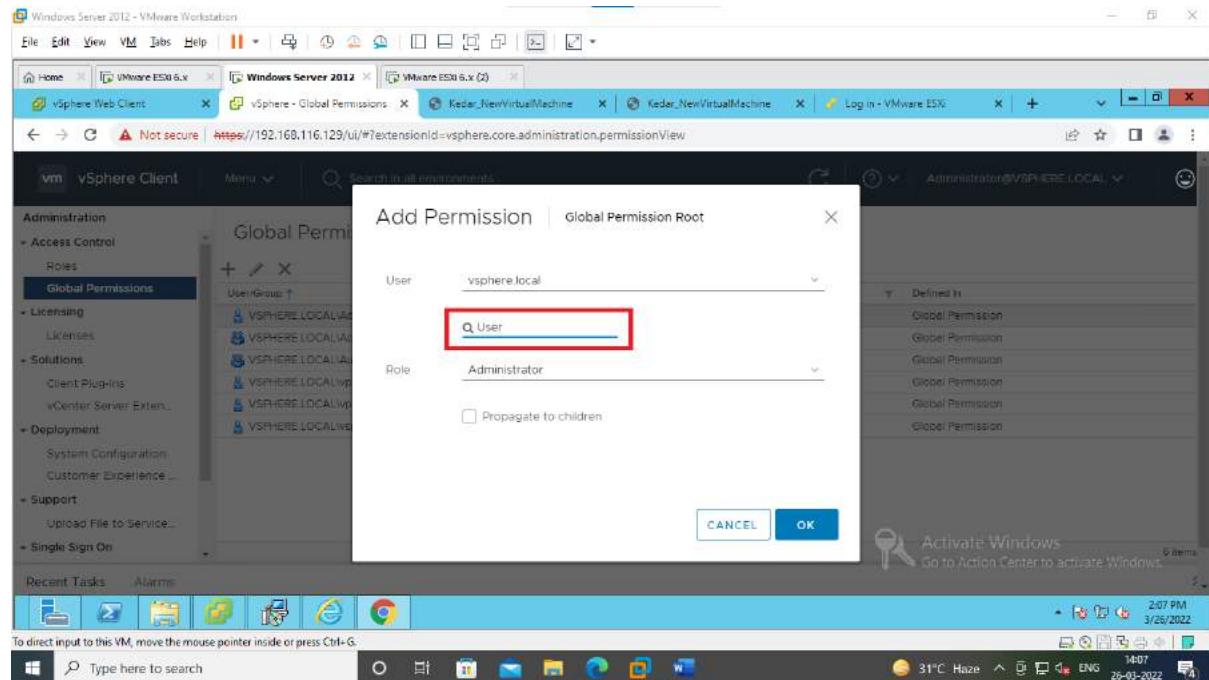


**Step 5:** Now it's required to give permission to the newly created user.

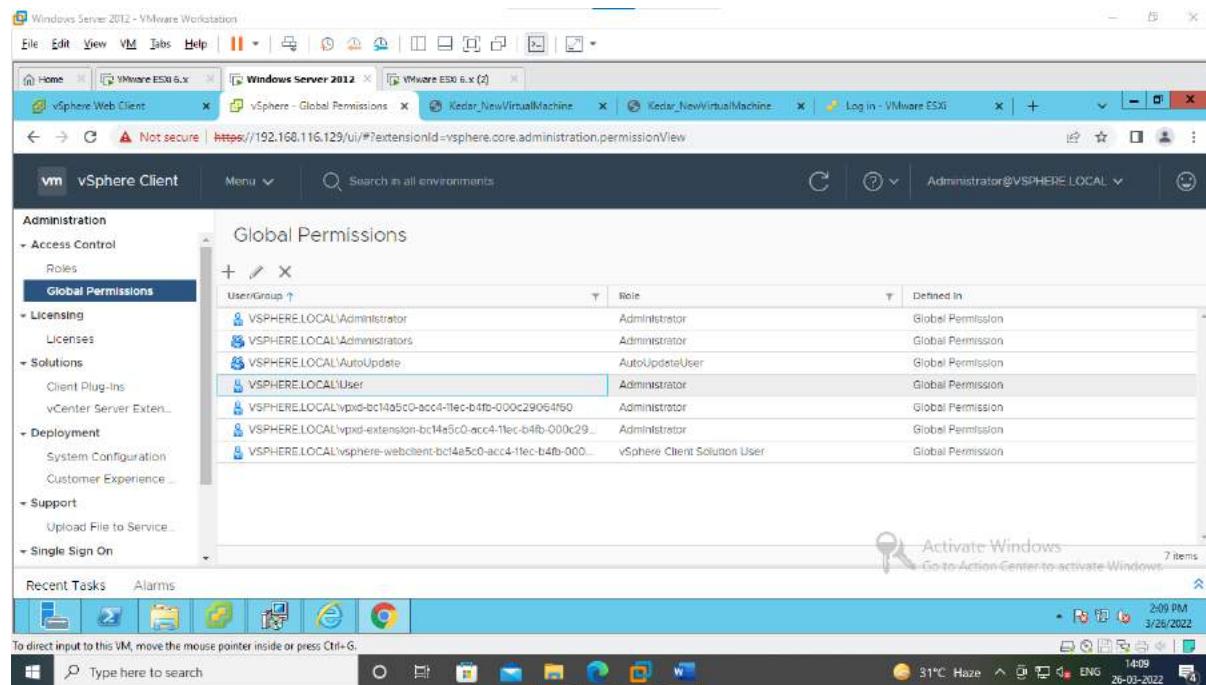
Go to **Global Permissions** and click on **Add** button.



**Step 6:** Select the new created **User** and choose a **Role** for the user and click on the **OK** button.



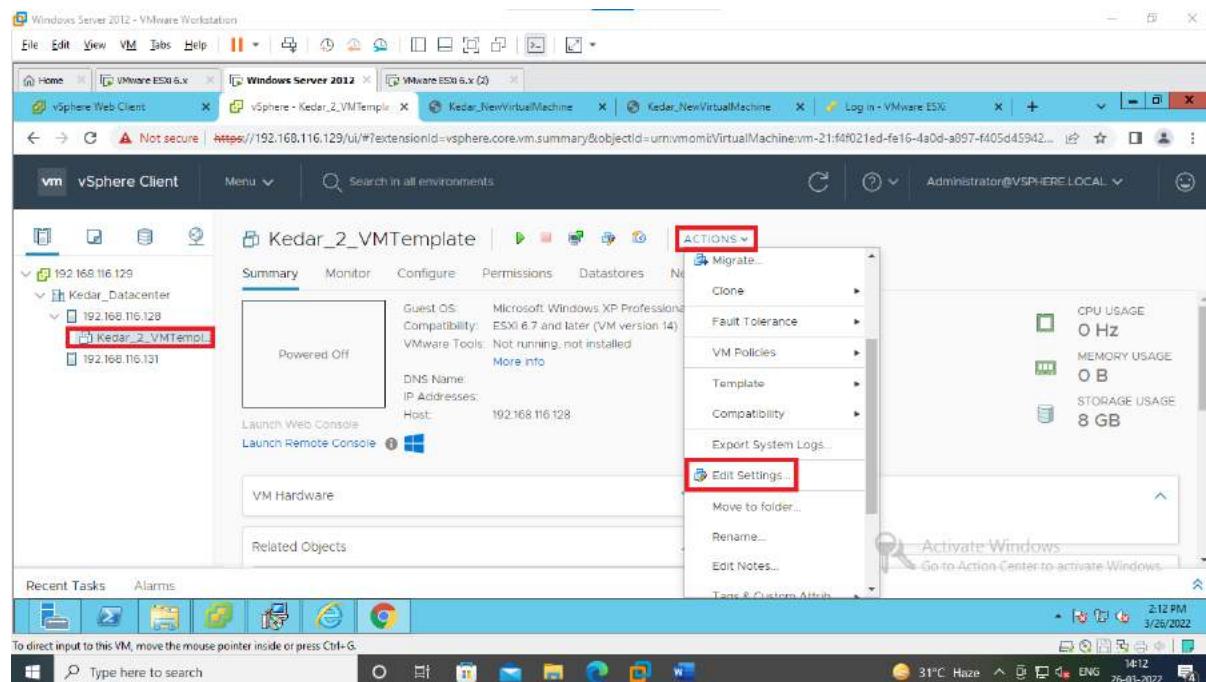
Here we are selected as the **Administrator** role to the **User** (Which we are created). Note:  
Here we not check the **Propagate to children**.



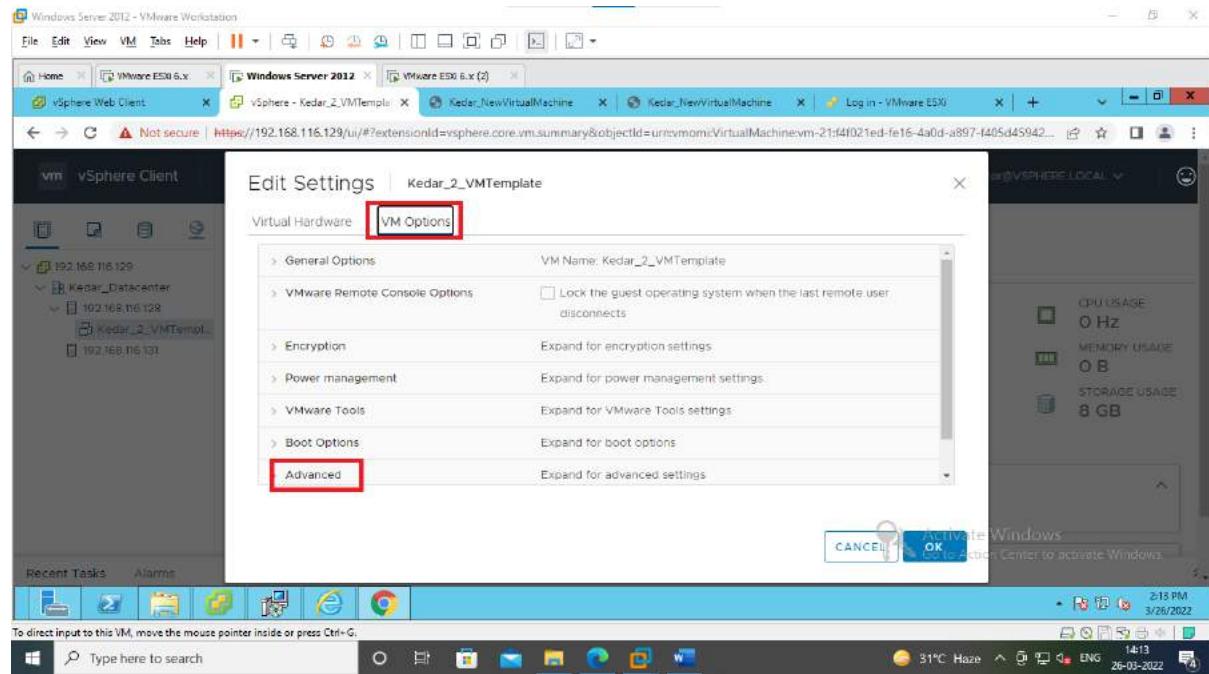
## C. Prevent Users from Spying on Remote Console Sessions.

**Step 1:** Login into vSphere server from Web Client application.

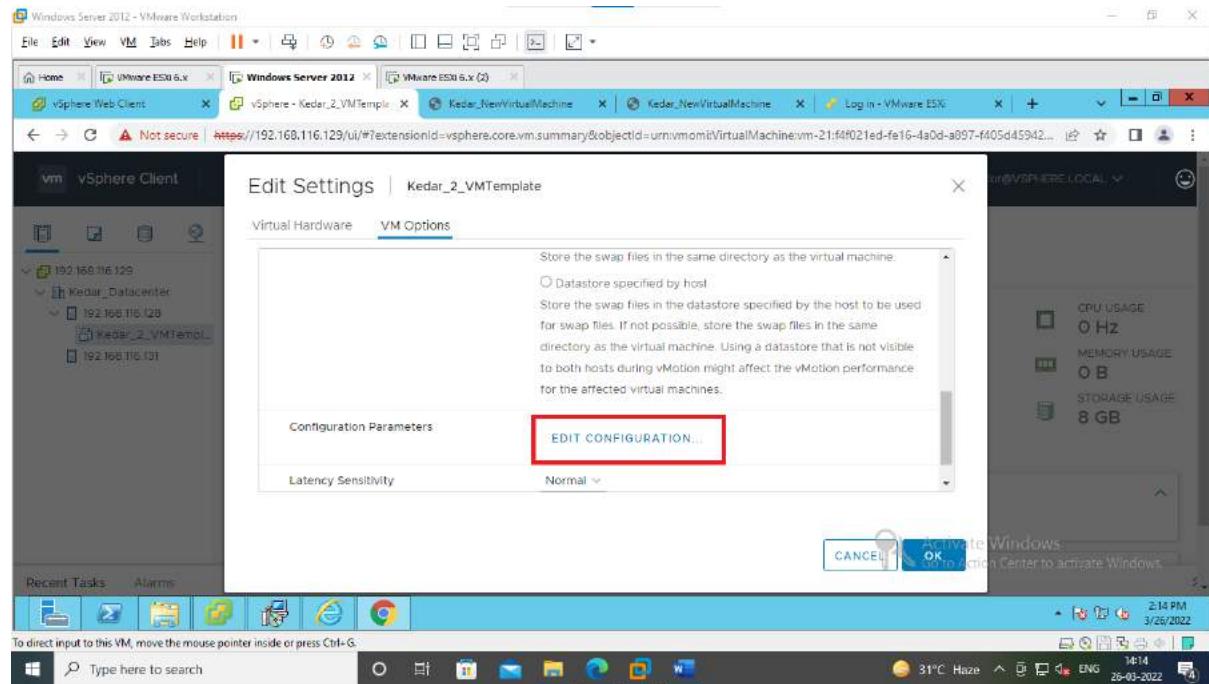
Select the **Virtual machine** template, click on the **Actions** button then click on **Edit Settings...** option.



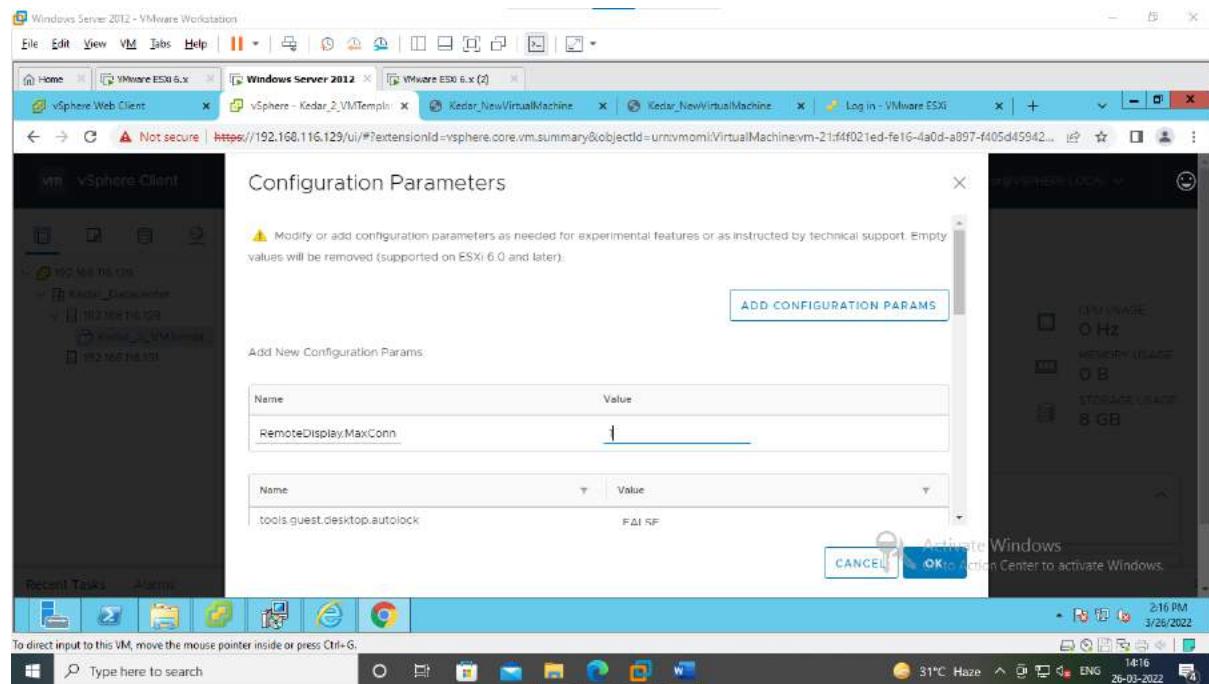
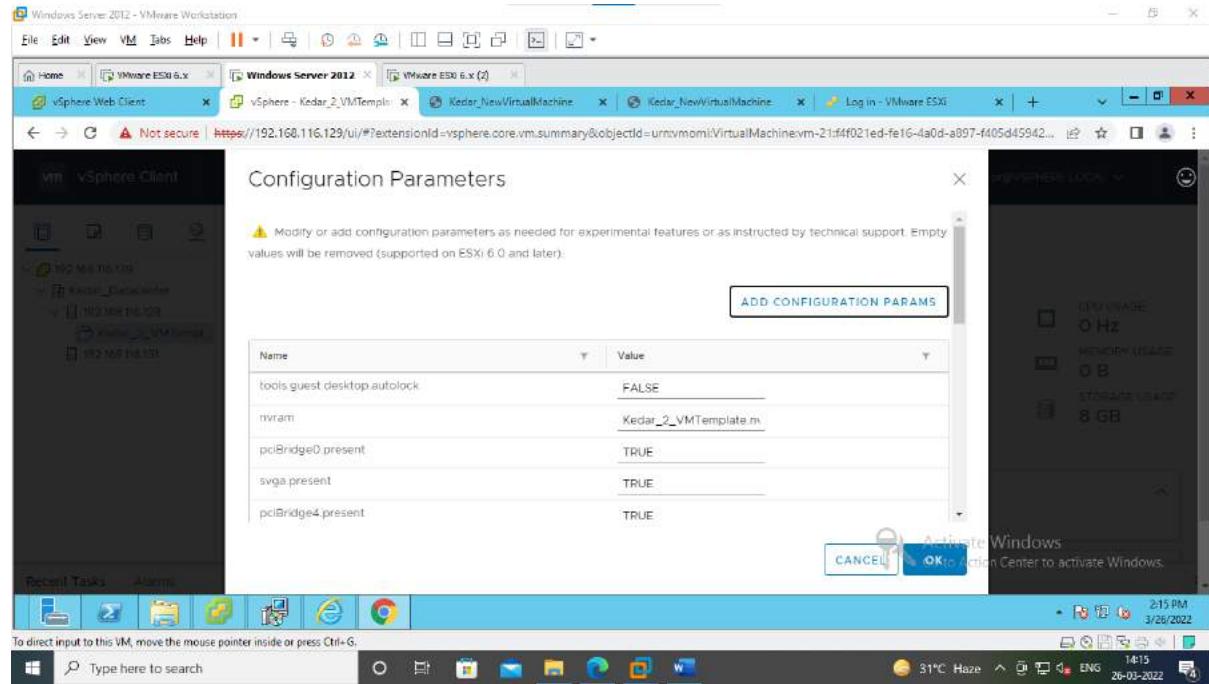
**Step 2: Click on VM Options, then go to Advanced.**

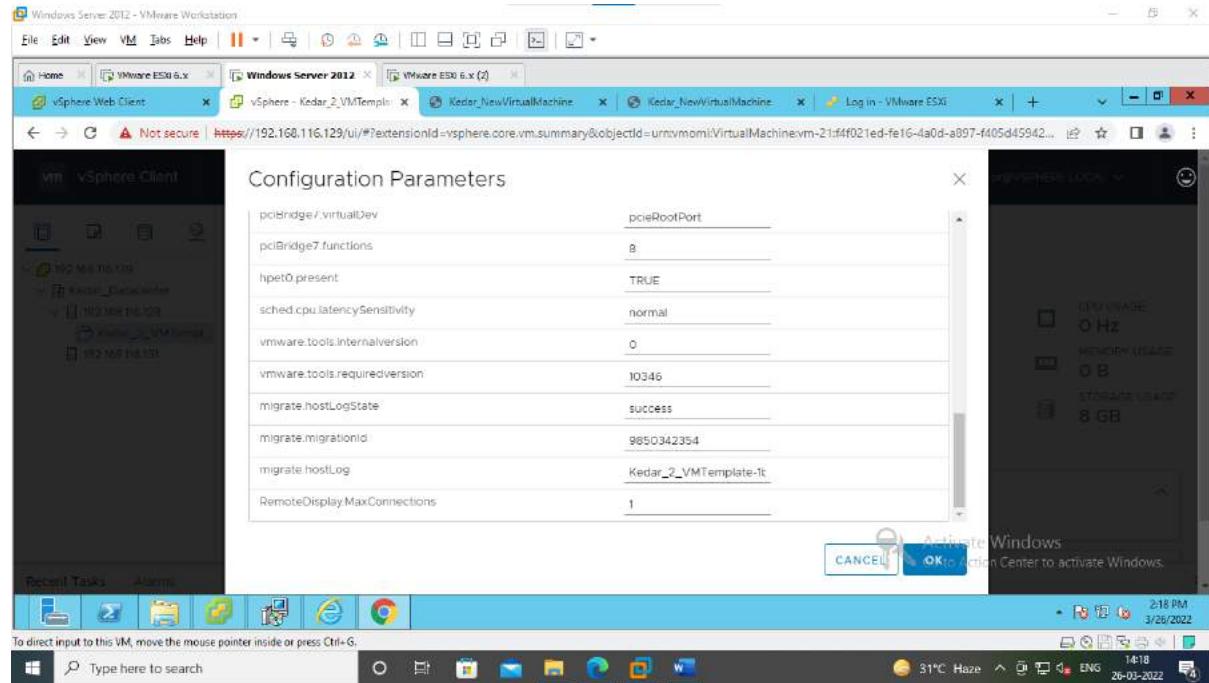


**Step 3: Expand Advanced the click on EDIT CONFIGURATION...**



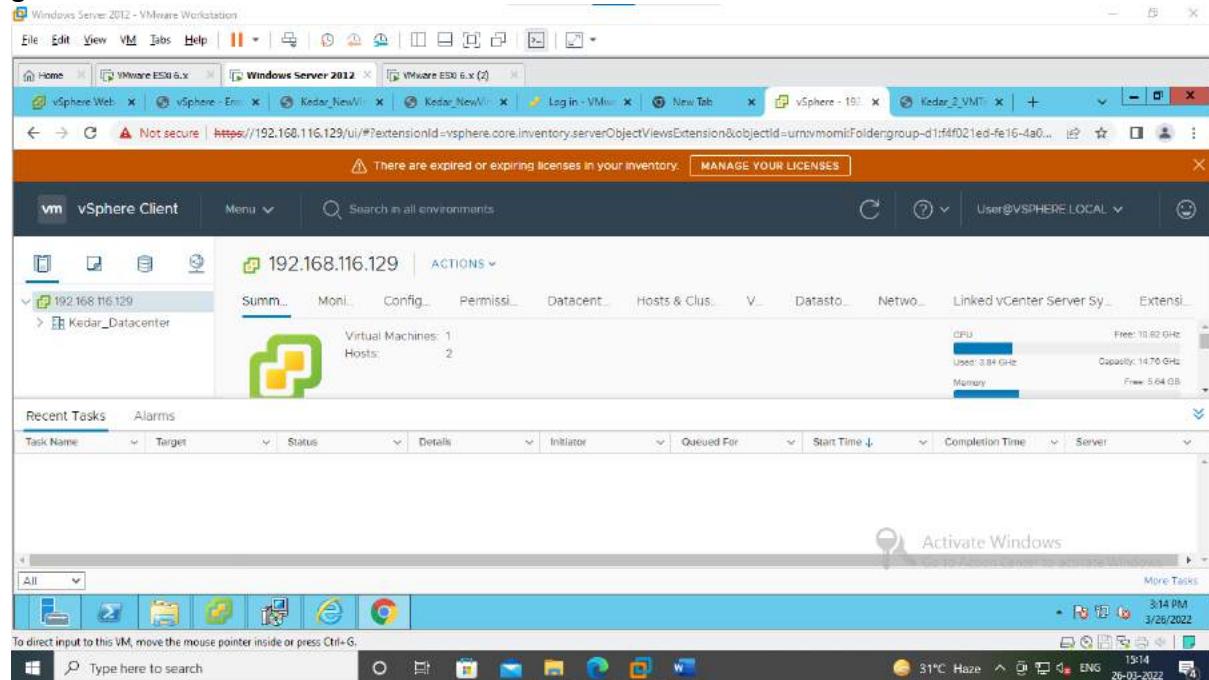
**Step 4:** Click on the **Add Configuration Params** button and enter below details and **No. of connections** you required and then click on the “**OK**” button. Add row with Name as **RemoteDisplay.MaxConnections = 1**

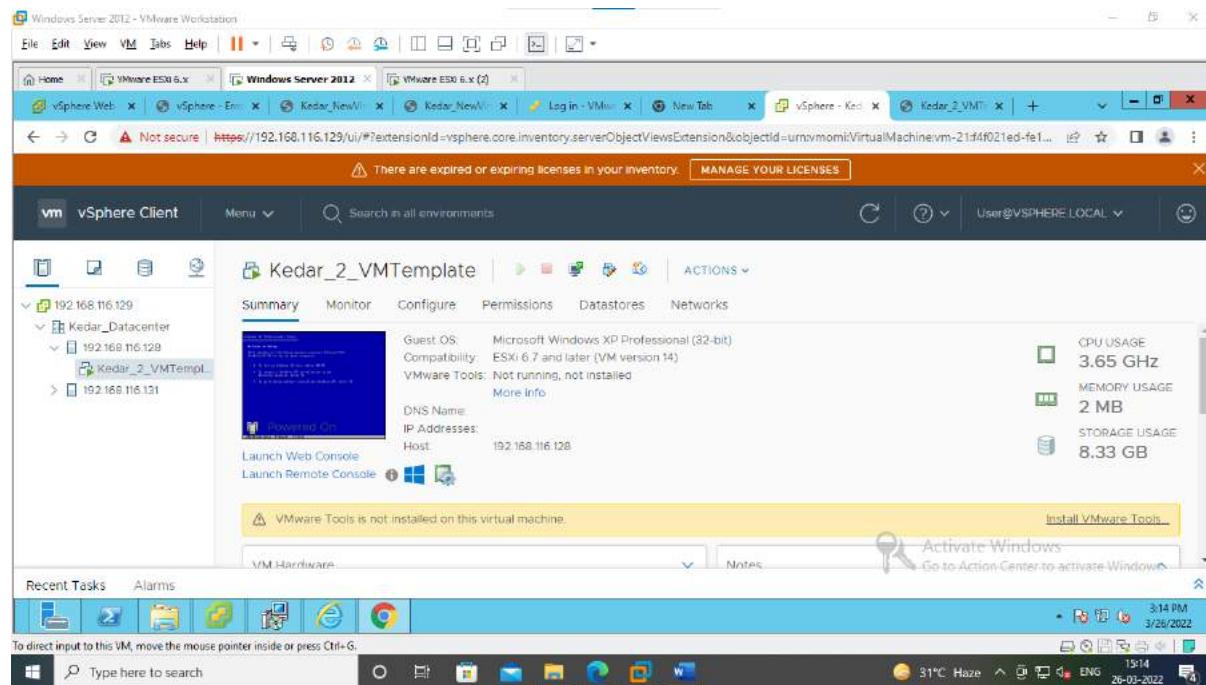




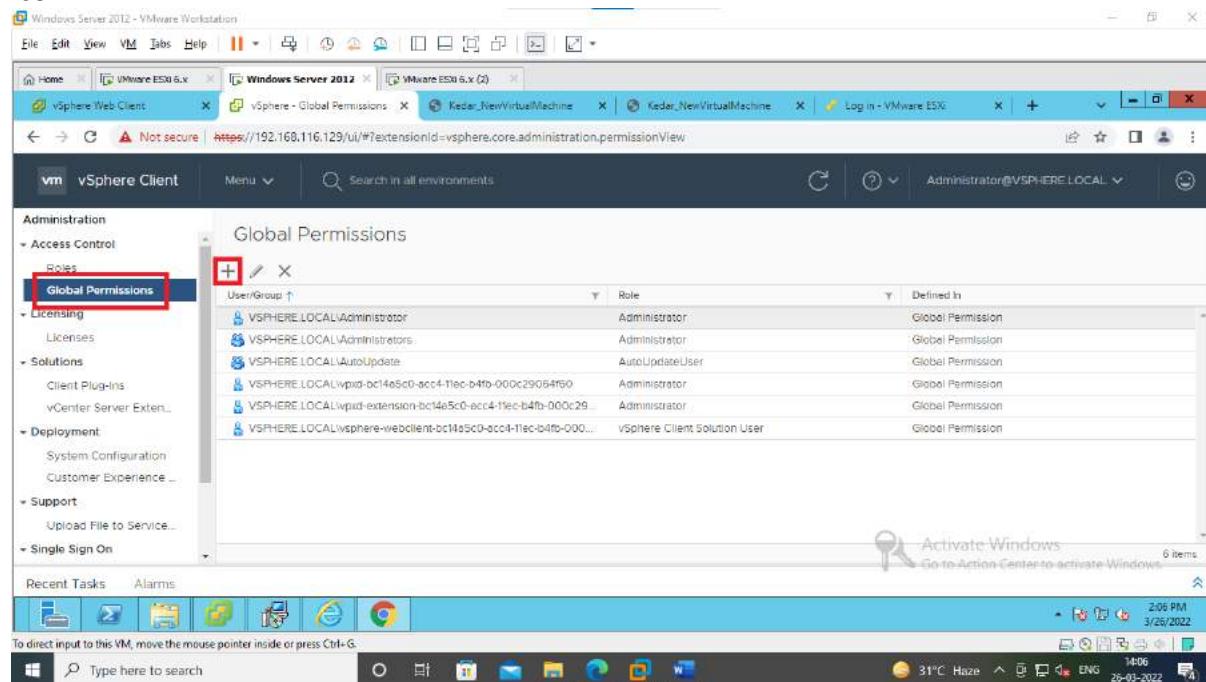
Now power-on of the virtual machine.

**Step 5:** 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.

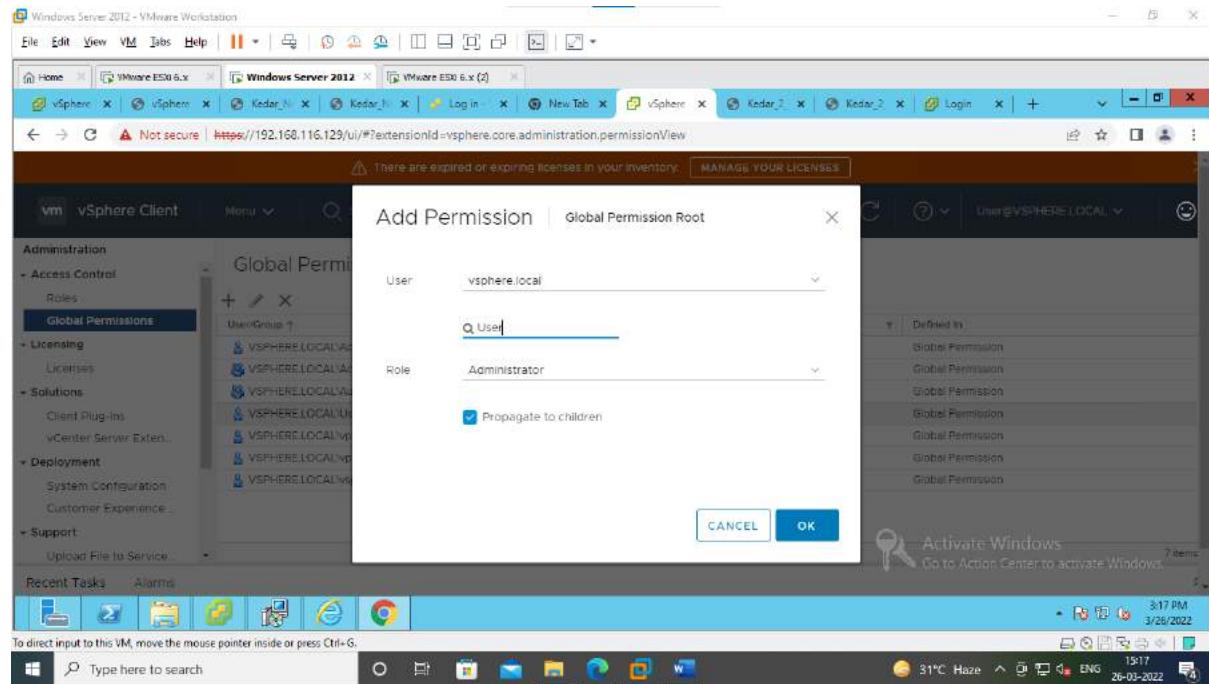




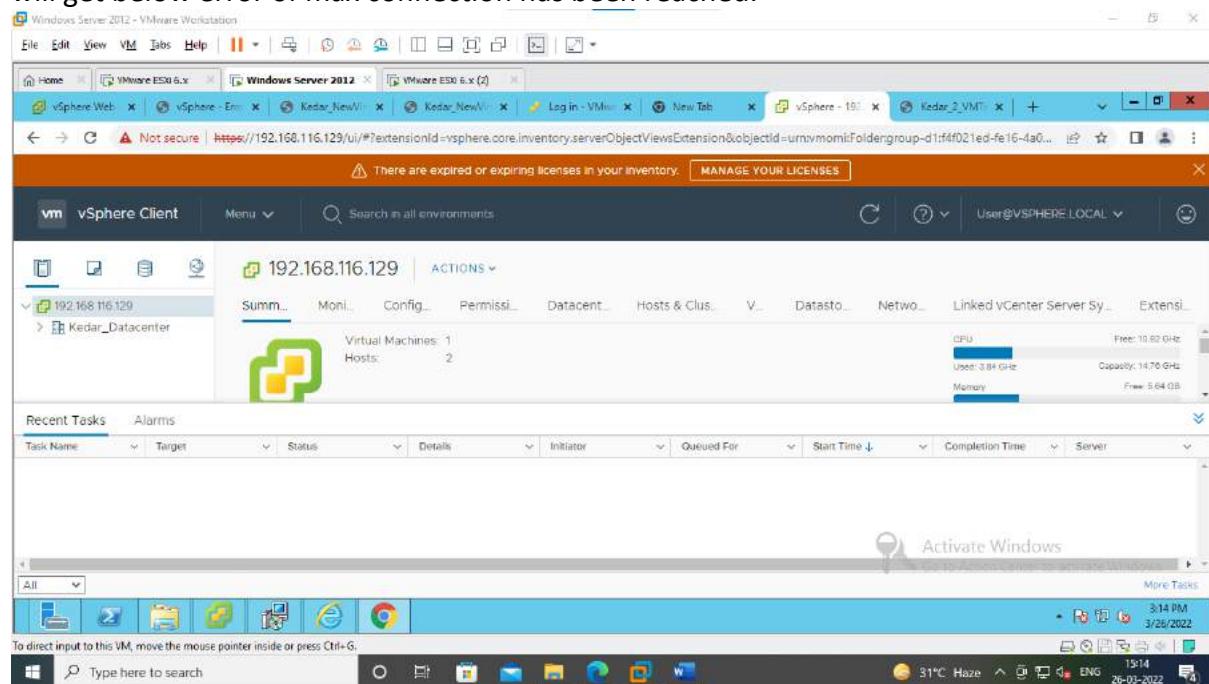
**Step 6:** Administrator change the Permission of the User then first login by administrator. Go to the **vSphere Client > Global Permission** then select the user and Click on the Edit button icon.



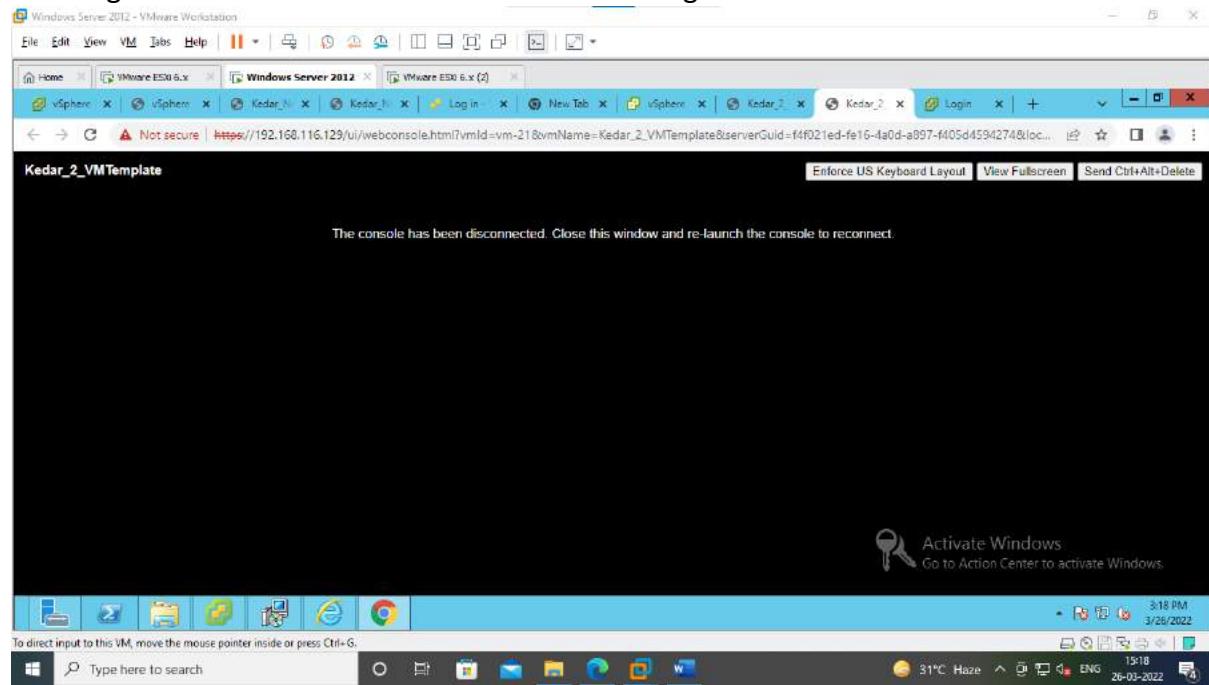
**Step 7: Check the Propagate to Children and Click on the OK button.**



**Step 8: 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.**



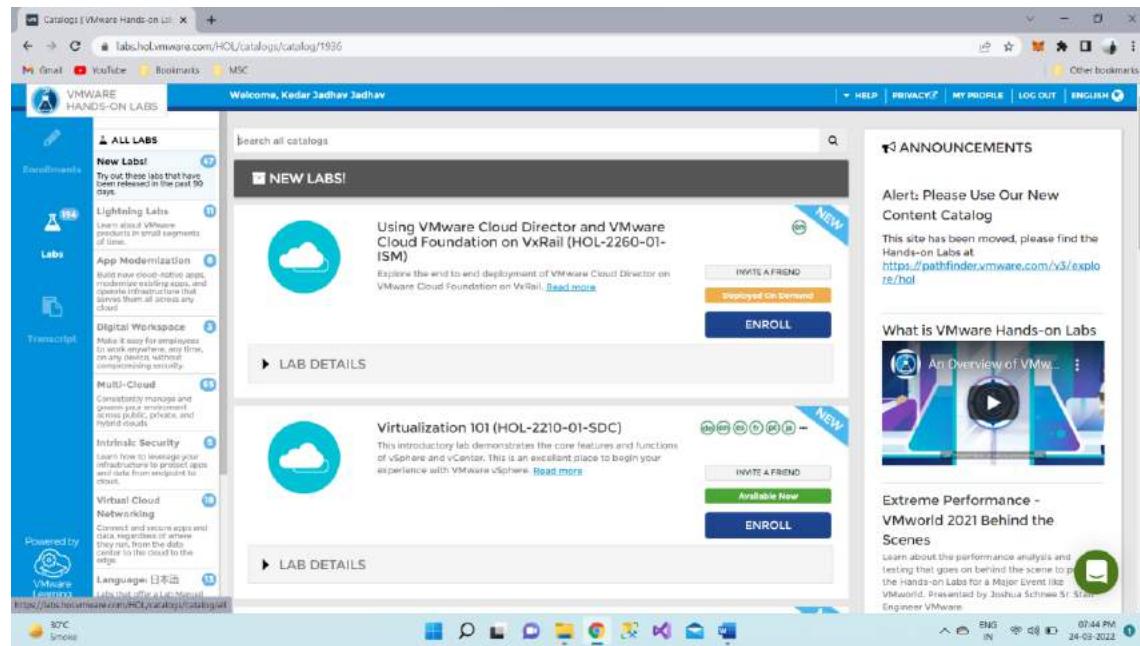
If we login with other account then show the message the console will be disconnected.



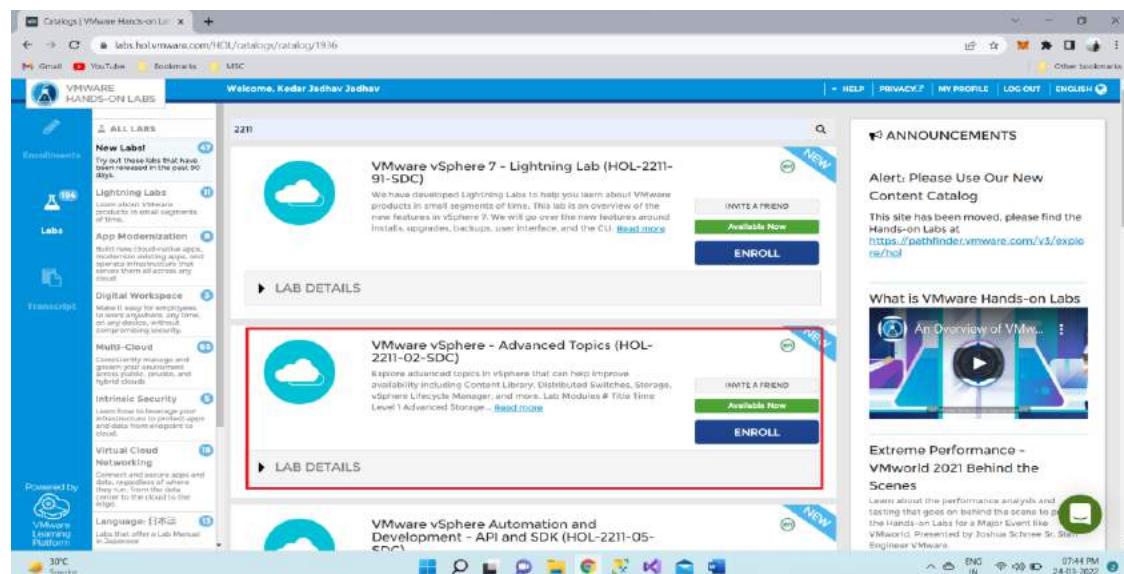
## Practical 5: Upgrade the VMware ESXi server 6.7 to 7.0 using simple installation.

**Step 1:** Go to below URL.

<https://labs.hol.vmware.com/HOL/catalogs/>



**Step 2:** Select VMware vSphere – Advance Topic (HOL -2211-02-SDC)



### Step 3: Click on Enroll Button.

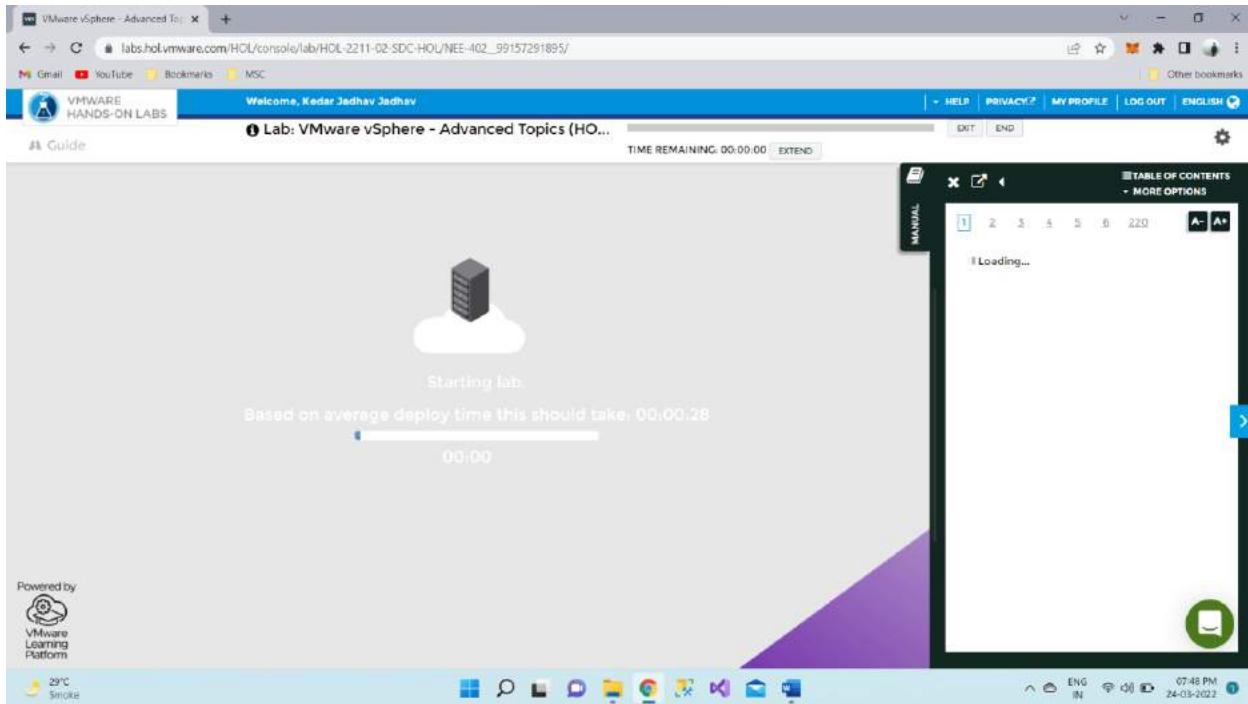
The screenshot shows the VMware Hands-on Labs catalog interface. On the left sidebar, there are several lab categories: New Labs!, Lightning Labs, App Modernization, Digital Workspace, Multi-Cloud, Intrinsic Security, Virtual Cloud Networking, and Languages. The main content area displays three lab details cards:

- 91-SDC**: Describes a lab to help learn about VMware products in small segments of time. It includes a green "Available Now" button and a blue "ENROLL" button.
- VMware vSphere - Advanced Topics (HOL-2211-02-SDC)**: Describes advanced topics in vSphere. It includes a green "Available Now" button and a blue "ENROLLING..." button.
- VMware vSphere Automation and Development - API and SDK (HOL-2211-05-SDC)**: Describes the vSphere Automation API and SDK. It includes a green "Available Now" button and a blue "ENROLL" button.

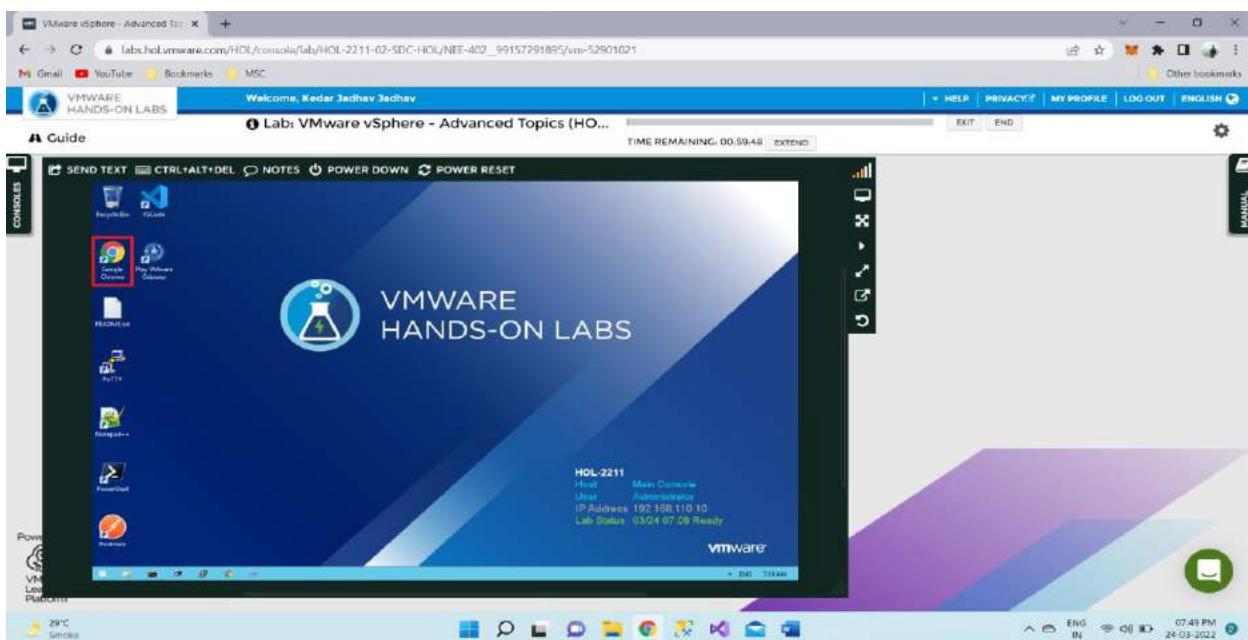
A right-hand sidebar contains an alert about the site being moved to a new Content Catalog, followed by sections for "What is VMware Hands-on Labs" and "Extreme Performance - VMworld 2021 Behind the Scenes".

### Step 4: Click on START THIS LAB Button.

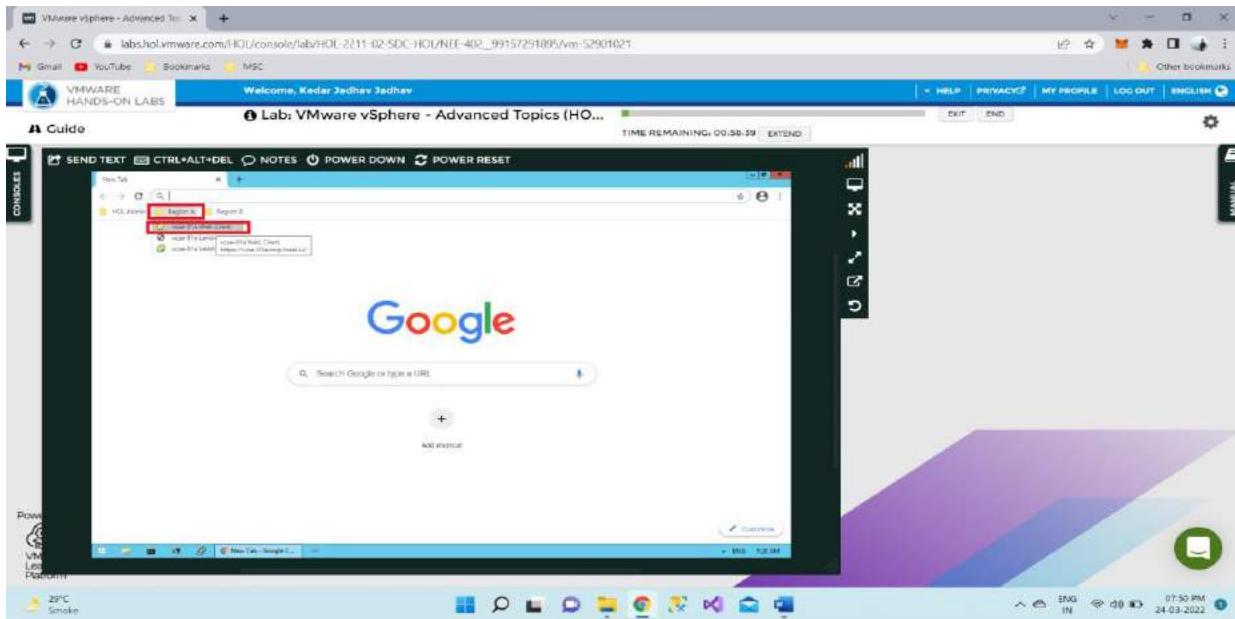
The screenshot shows the same VMware Hands-on Labs catalog interface as the previous step, but the top navigation bar now shows the URL as [https://labs.hol.vmware.com/HOL/catalogs/enrollments/lab/NEE-402/\\_99157291195](https://labs.hol.vmware.com/HOL/catalogs/enrollments/lab/NEE-402/_99157291195). The main content area now shows a progress bar indicating "PROGRESS: TIME REMAINING: 1 hour" above the lab details card for "VMware vSphere - Advanced Topics (HOL-2211-02-SDC)". The blue "START THIS LAB" button is highlighted with a red border.



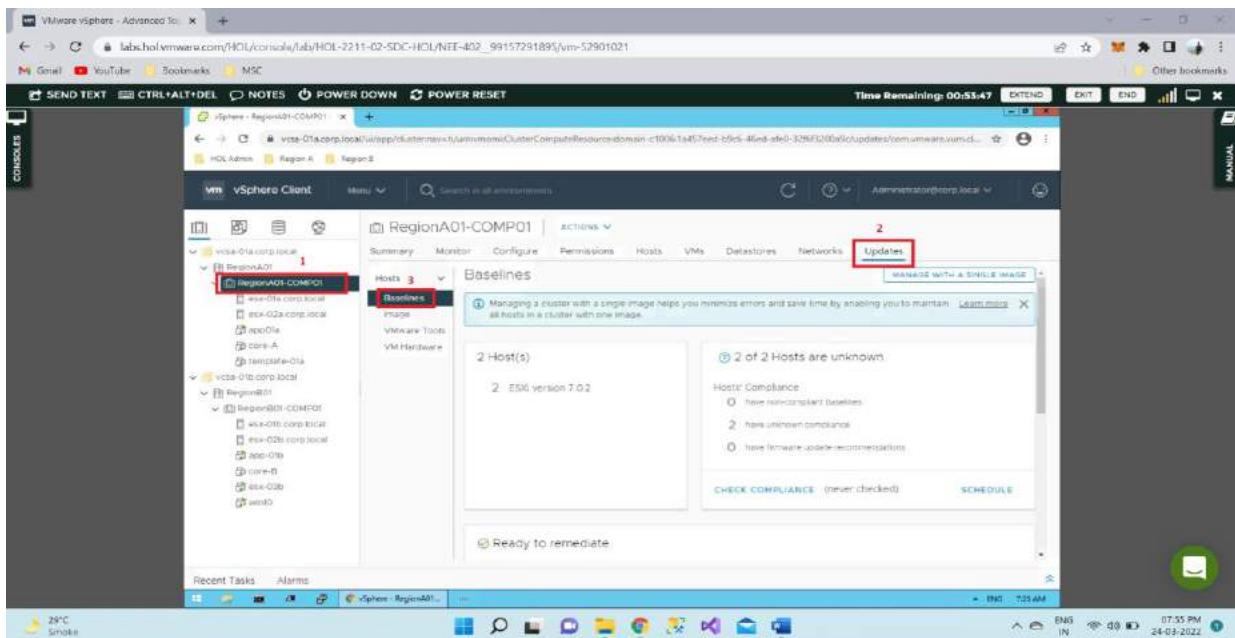
### Step 5: Open Google Chrome browser.



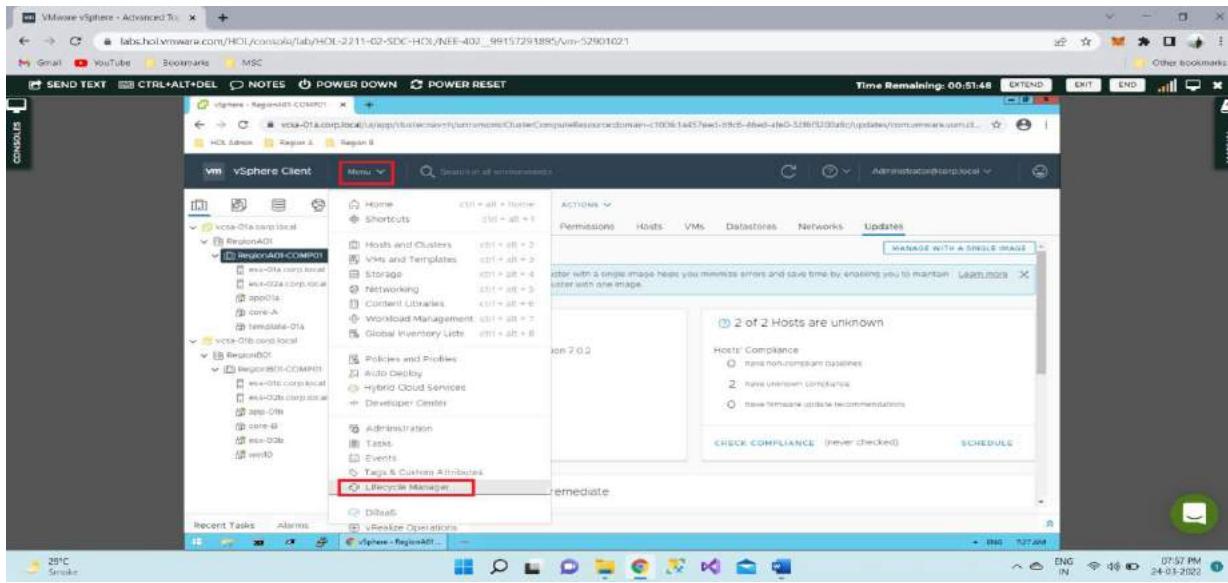
**Step 6:** Click on **Region A** folder then select **vcsa-01a Web Client**.



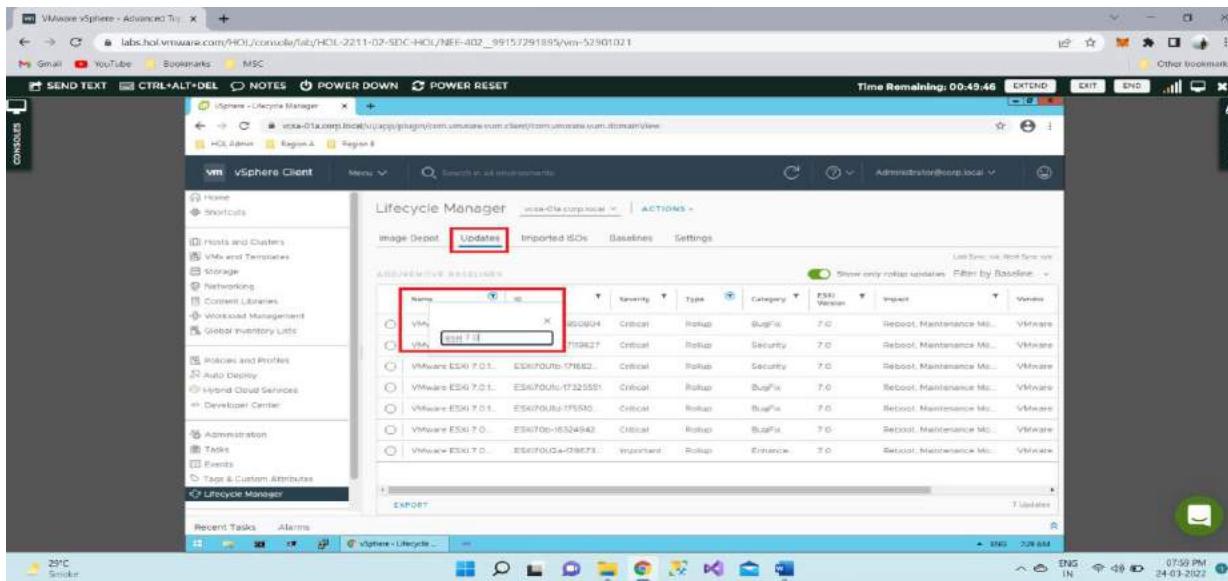
**Step 7:** Select **Region AO1-COMP01** then click on **Updates tab** -> **Select Baseline**.

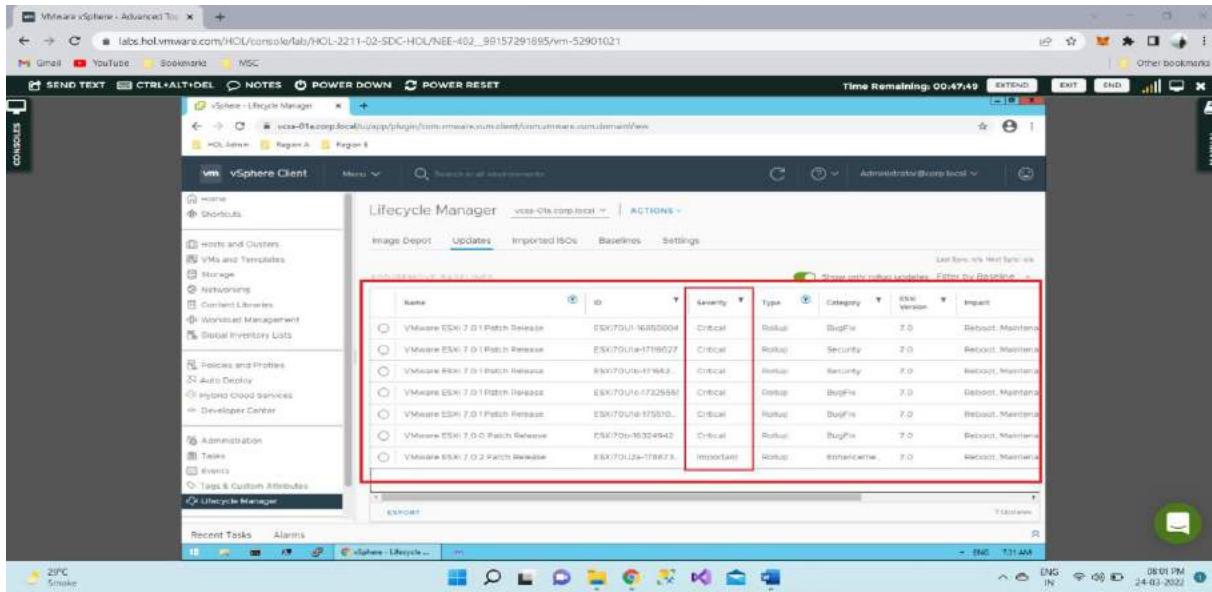


### Step 8: Click on Menu -> Select Lifecycle Manager.

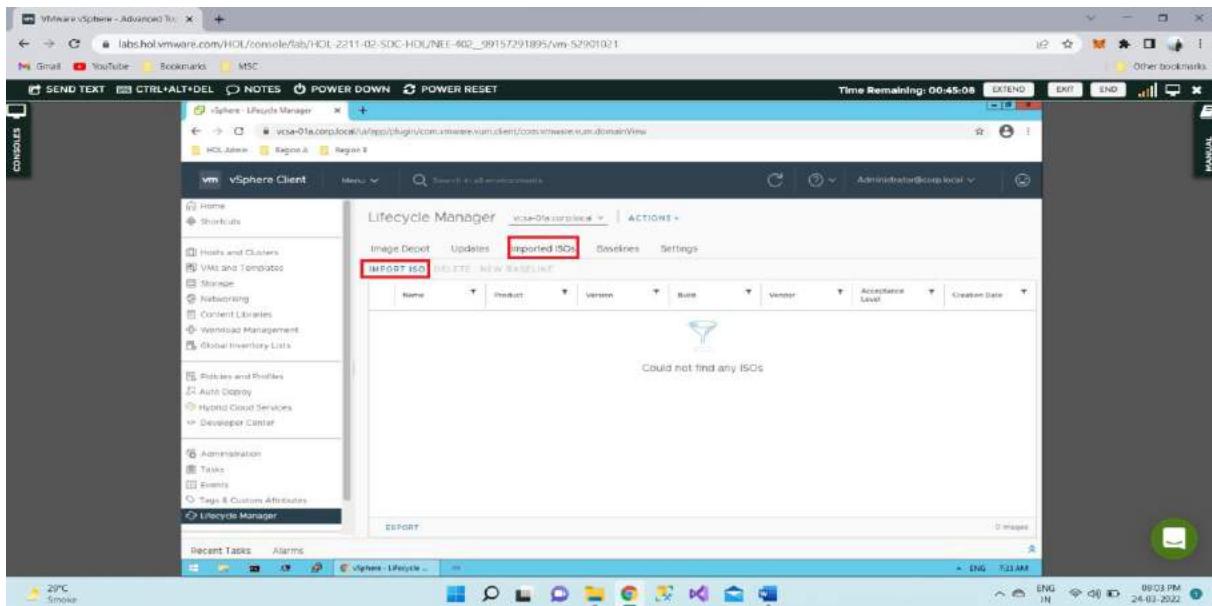


### Step 9: Click on Update -> Search for -> ESXi 7.0



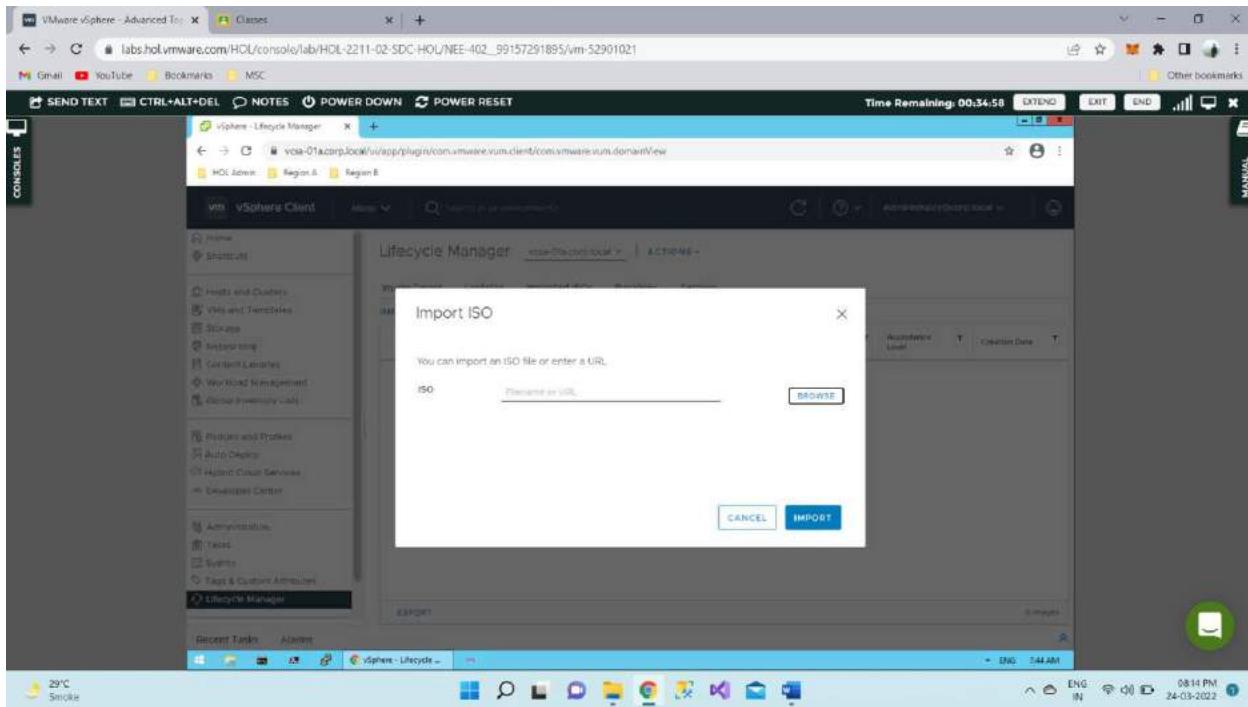


**Step 10:** Select imported isos tab and click on IMPORT ISO button.

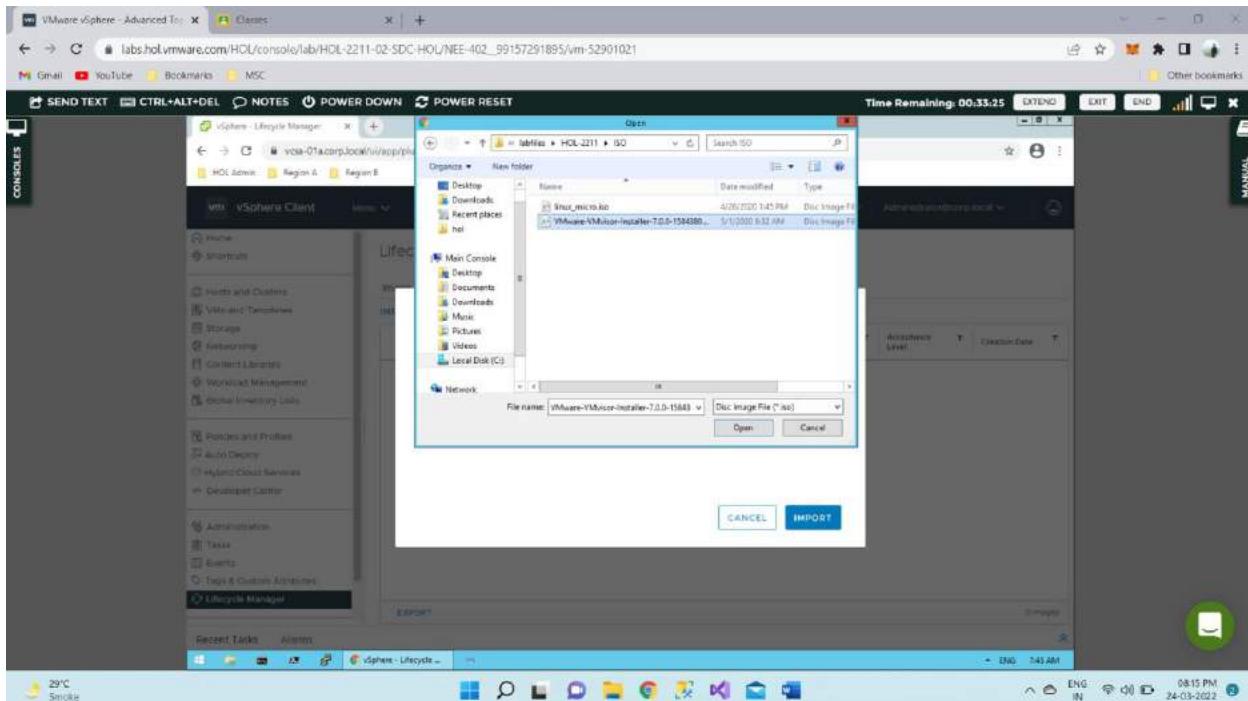


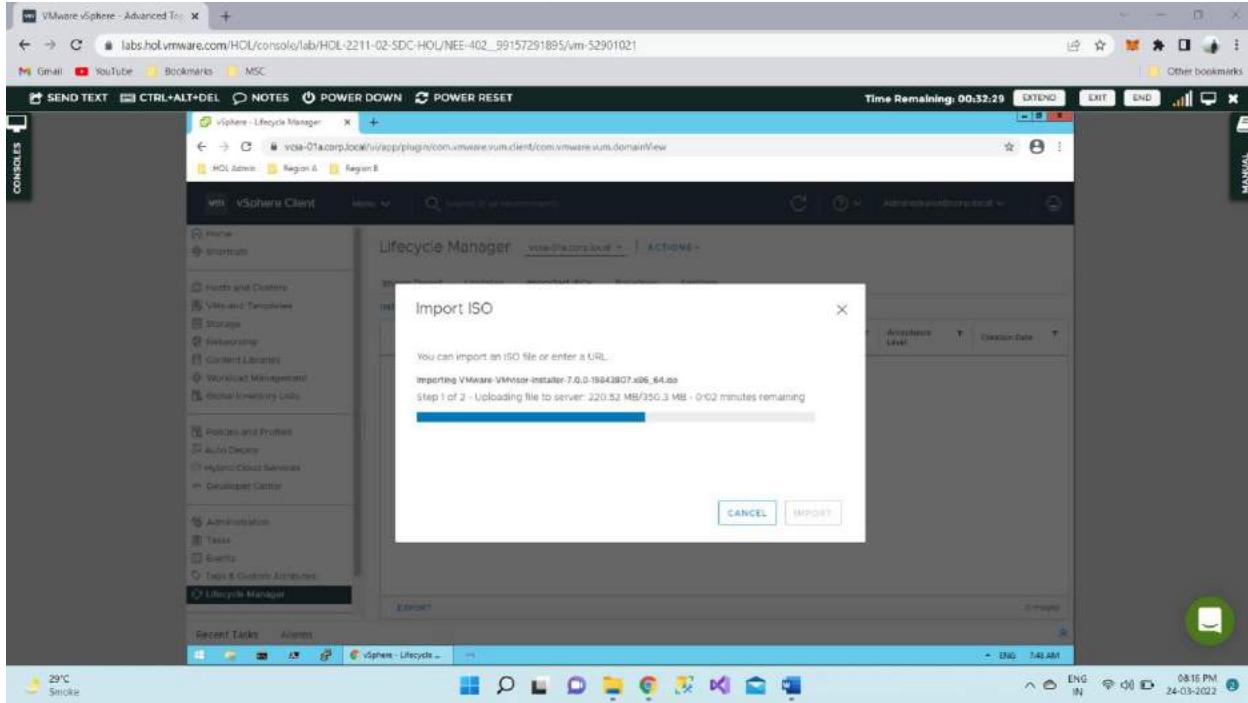
**Step 11:** Click on **Browser** button and go to the below path then click on **IMPORT** button.

**Path:** C:\labfiles\HOL-2211\ISO

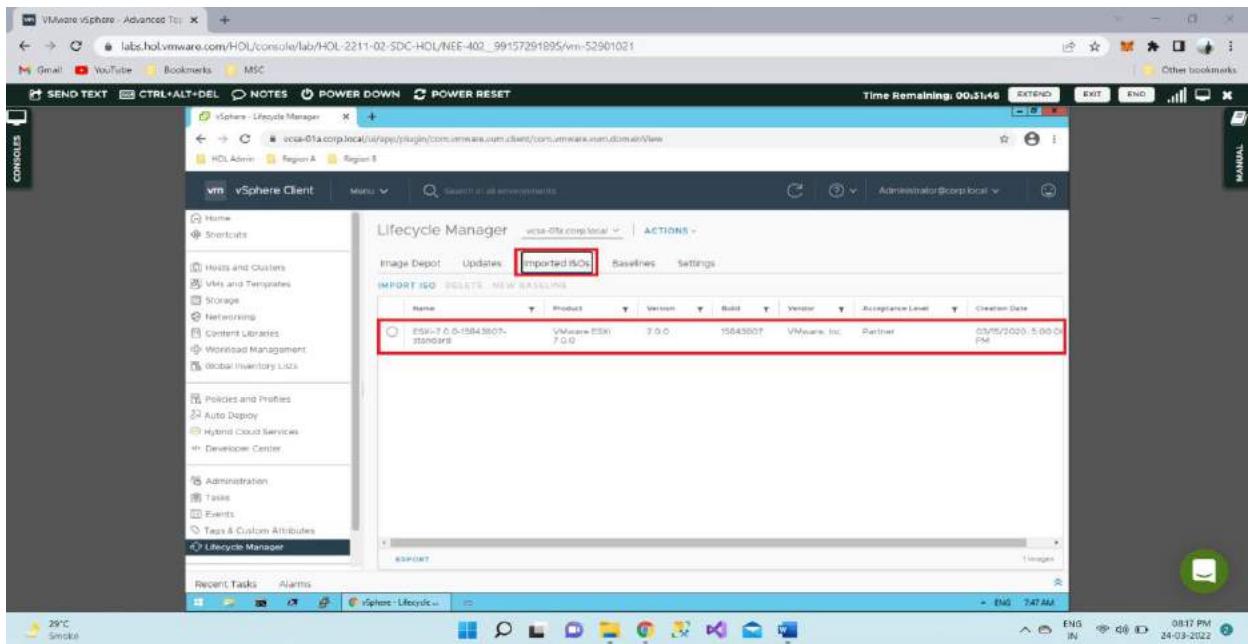


**Step 12:** Select VMWare vSphere installer file then click on **Open** button.

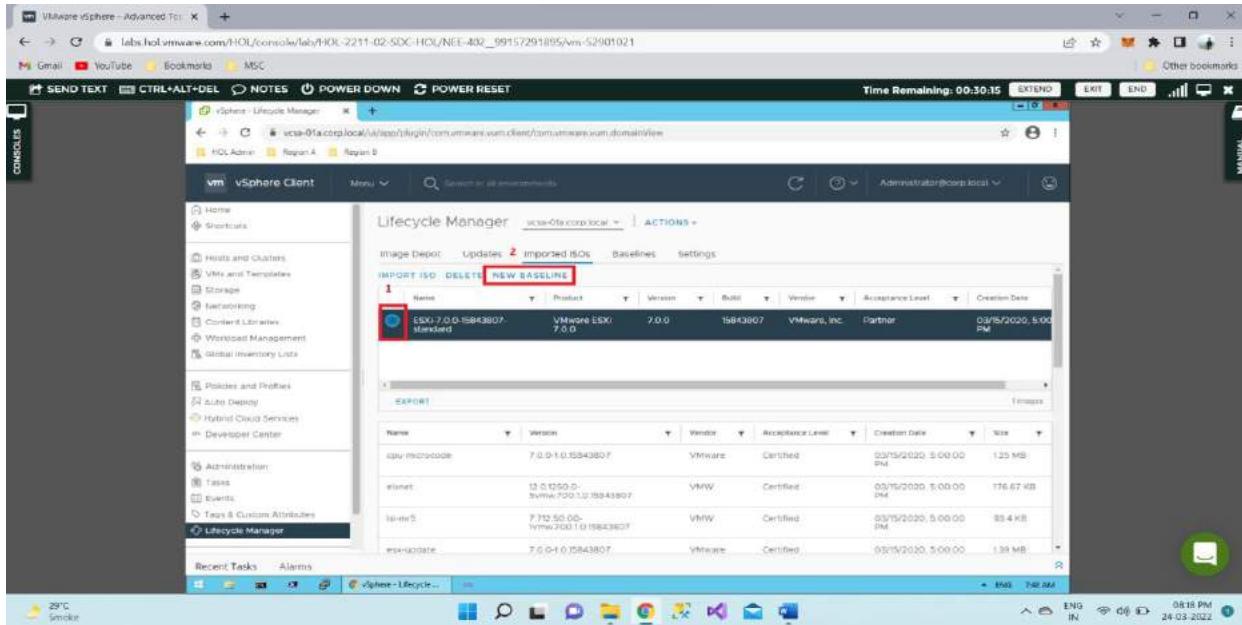




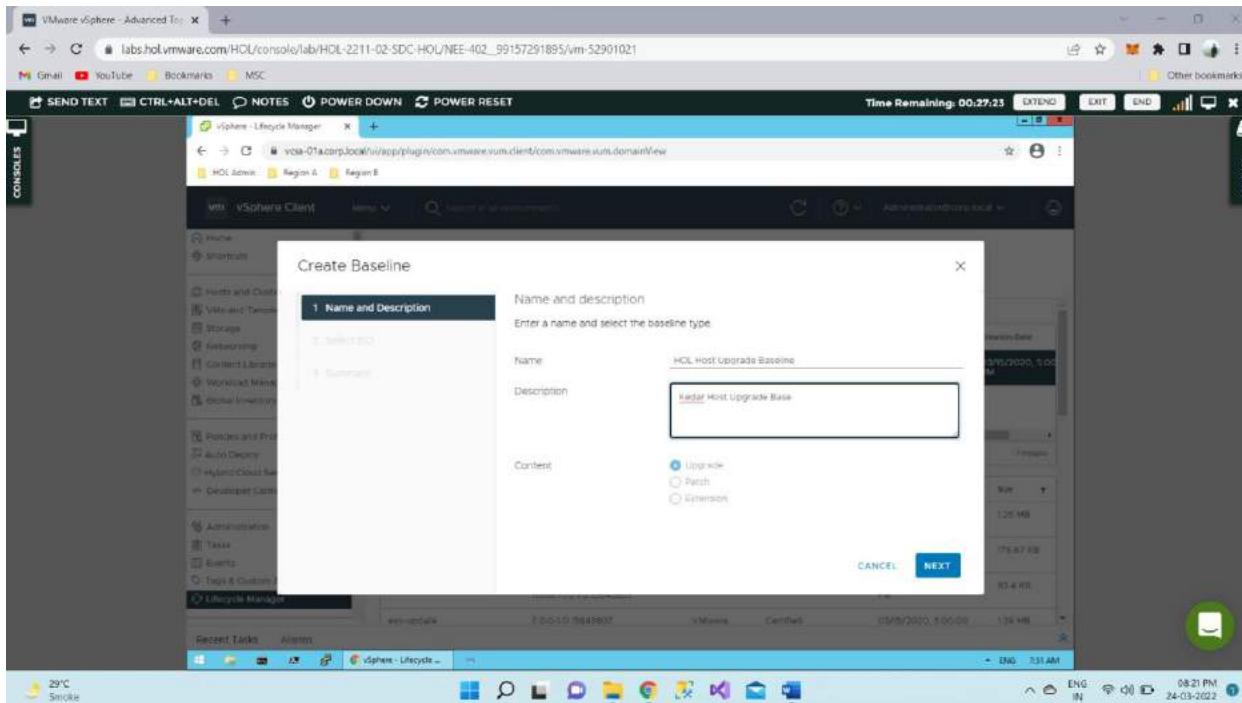
**Step 13:** Click on Imported iSOs tab then select recently installed file under Name column.



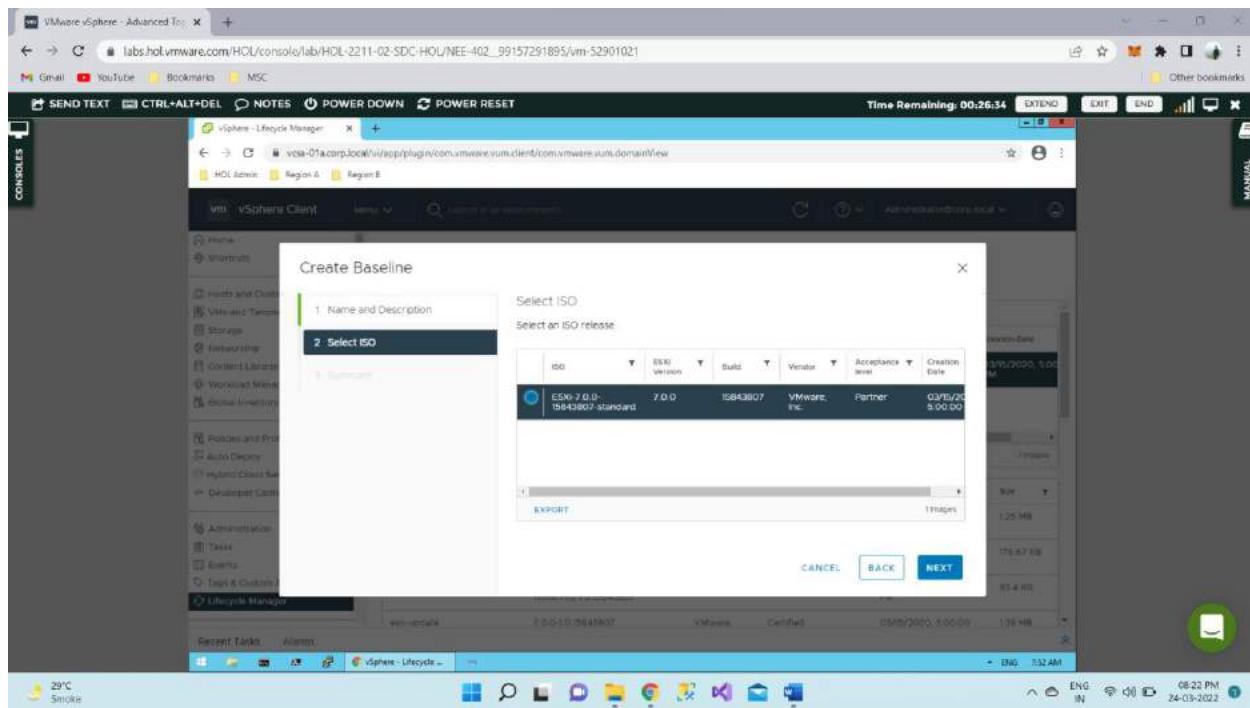
**Step 14:** Select recently installed file under Name column and then click on **NEW BASELINE** button.



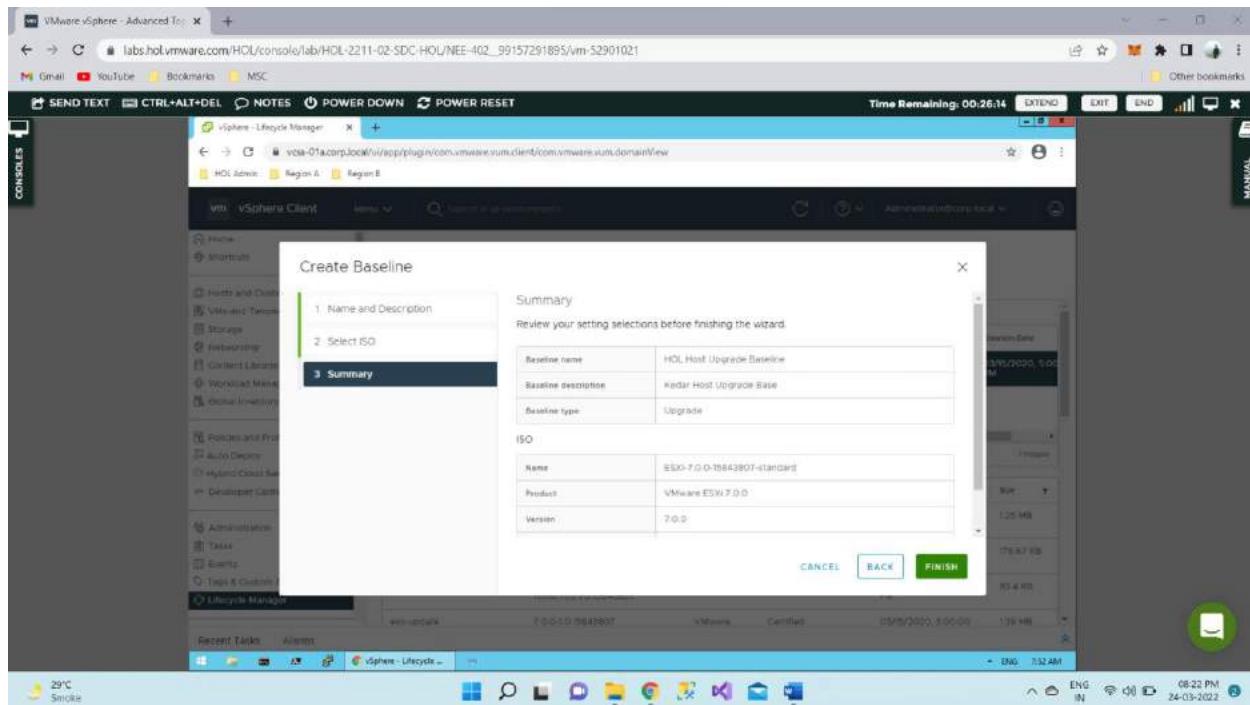
**Step 15:** Enter the Name, Description and Select content as Upgrade and click on **NEXT** button.



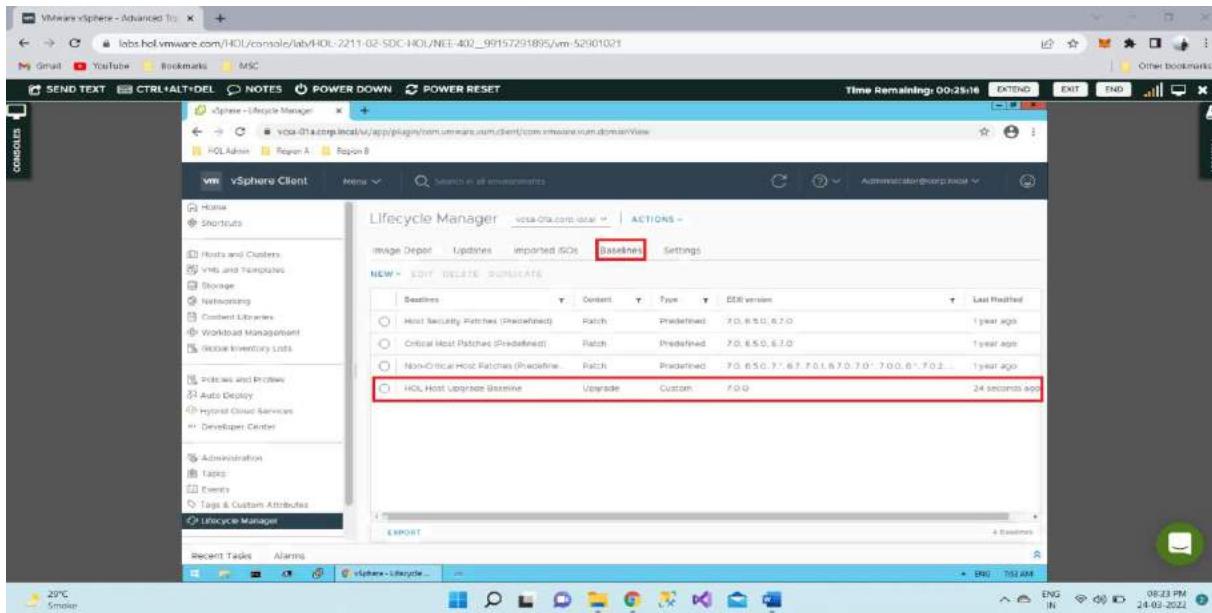
**Step 16:** Select the ESXi 7.0.0 file under ISO column then click on **NEXT** button.



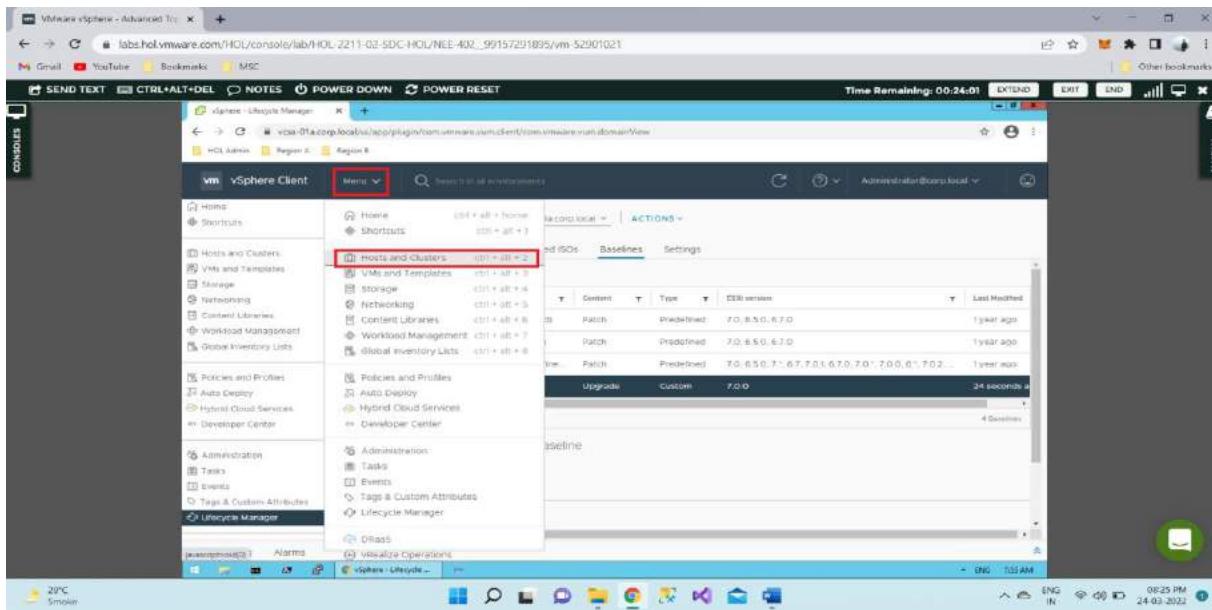
**Step 17:** Click on **FINISH** button.



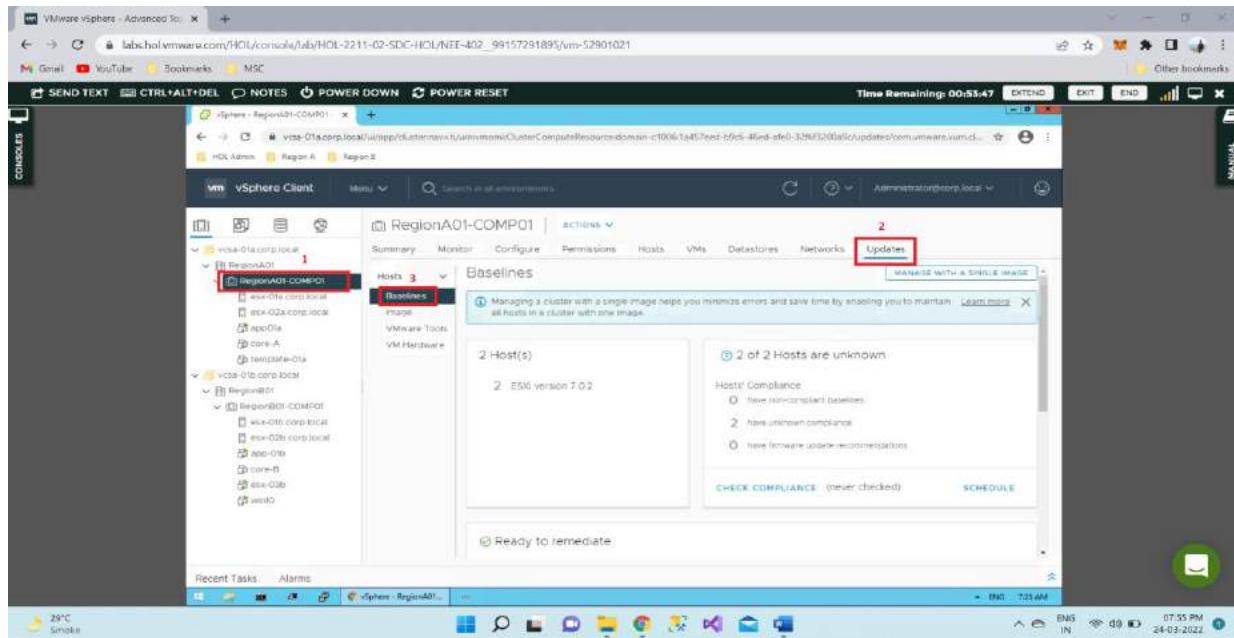
**Step 18:** Go to the Baseline tab and select newly created baseline.



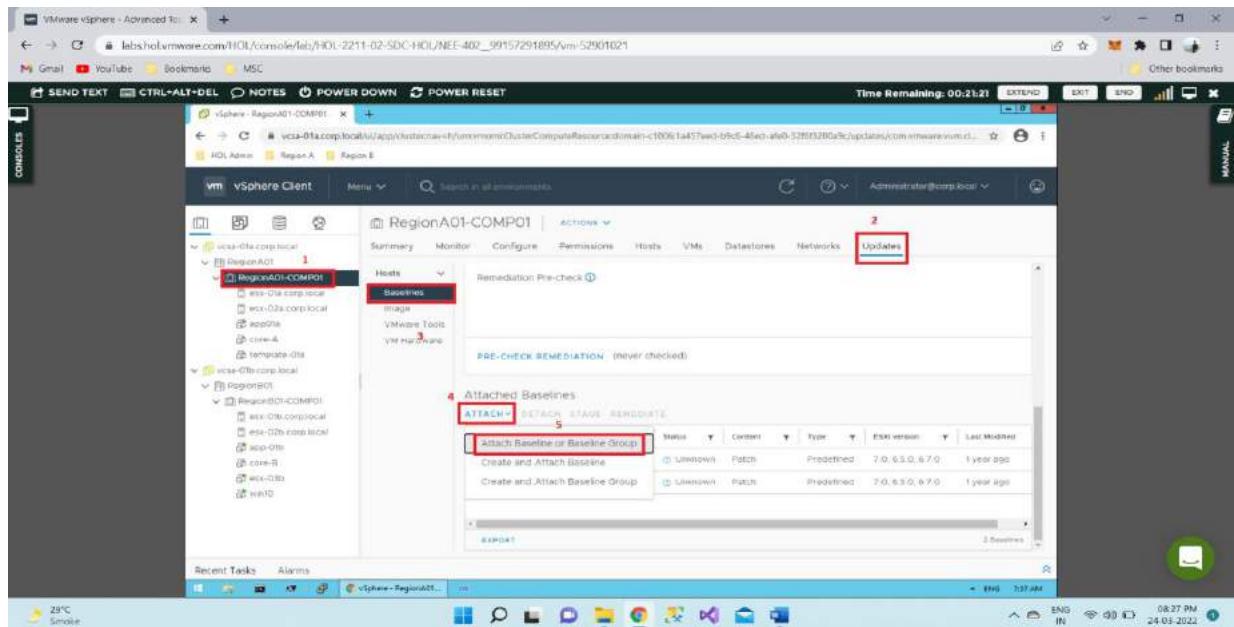
**Step 19:** Click on **Menu** tab and select **Hosts and Clusters** option.



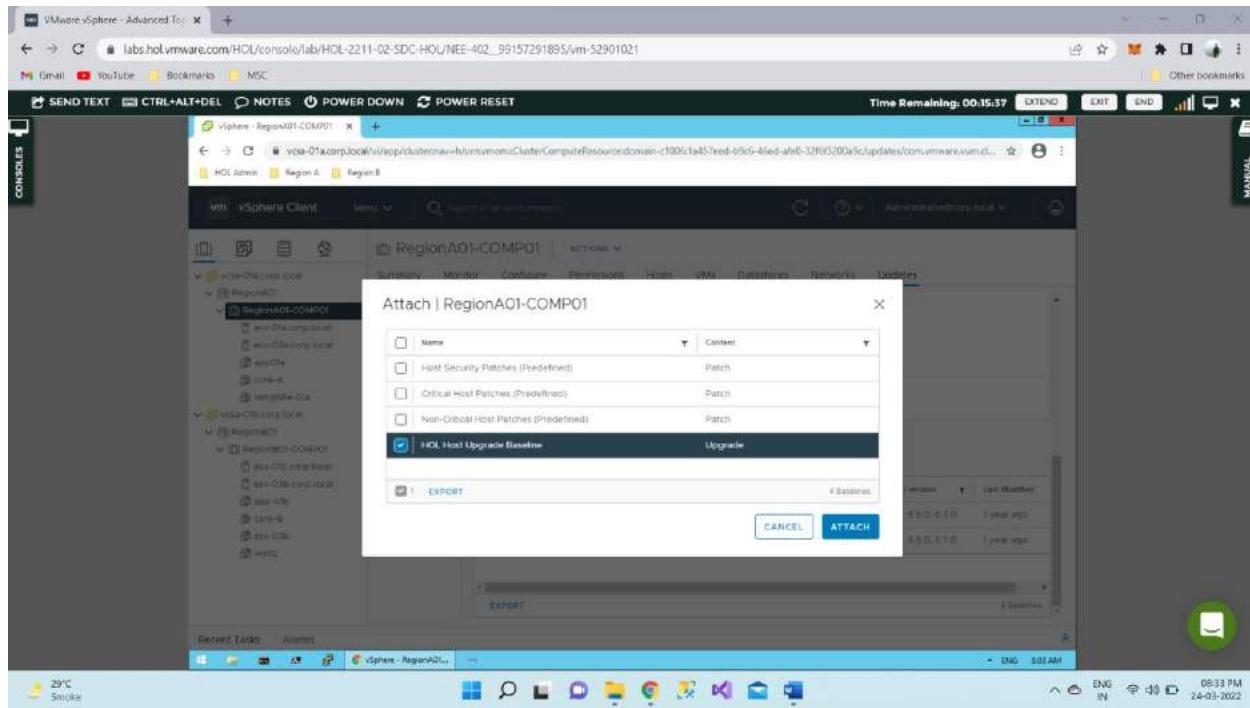
**Step 20:** Click on **RegionAO1-COM01** and then click **Update** tab - > then select **Baselines** option.



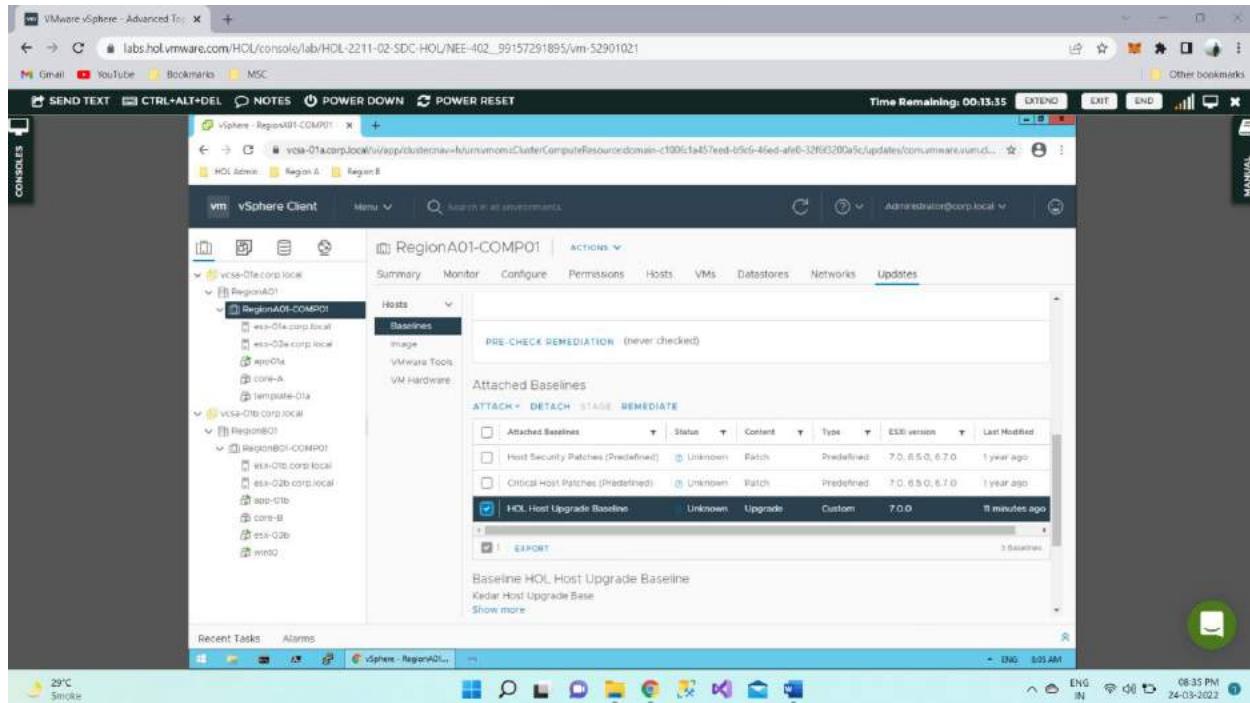
**Step 21:** Click on **RegionAO1-COM01** -> **Update** tab -> then select **Baselines** option then under **Attach Baselines** tab click on **ATTACH** and Select **Attach baseline or Baseline Group** option.



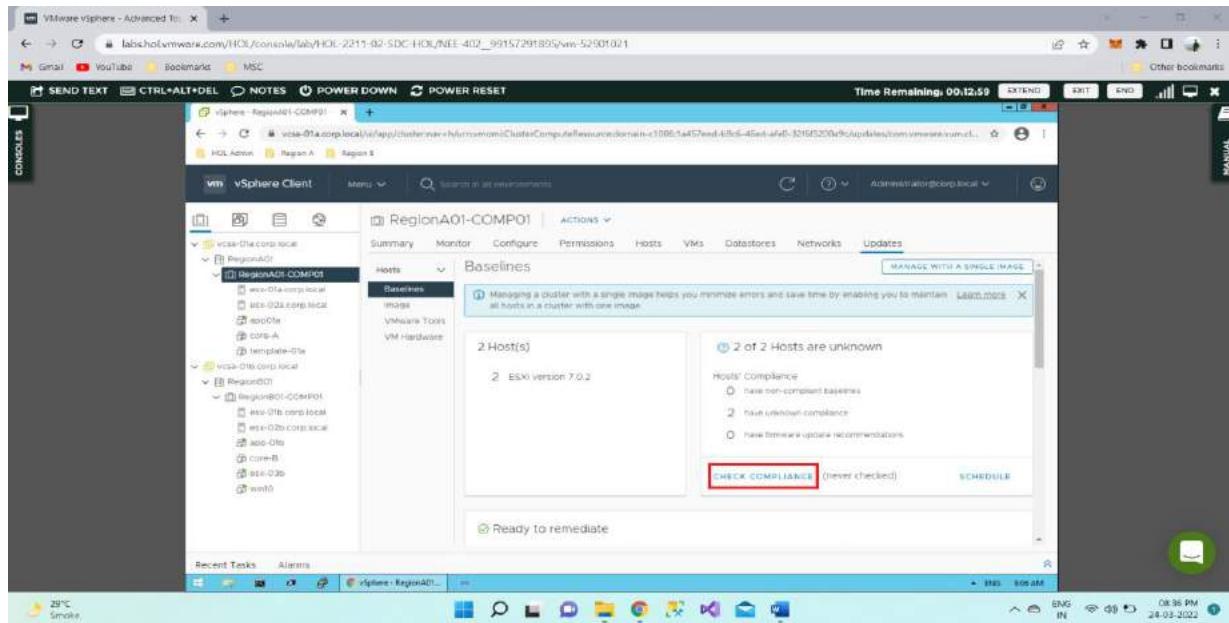
**Step 22:** Select **HOL Host Upgrade Baseline** option and click on **ATTACH** button.



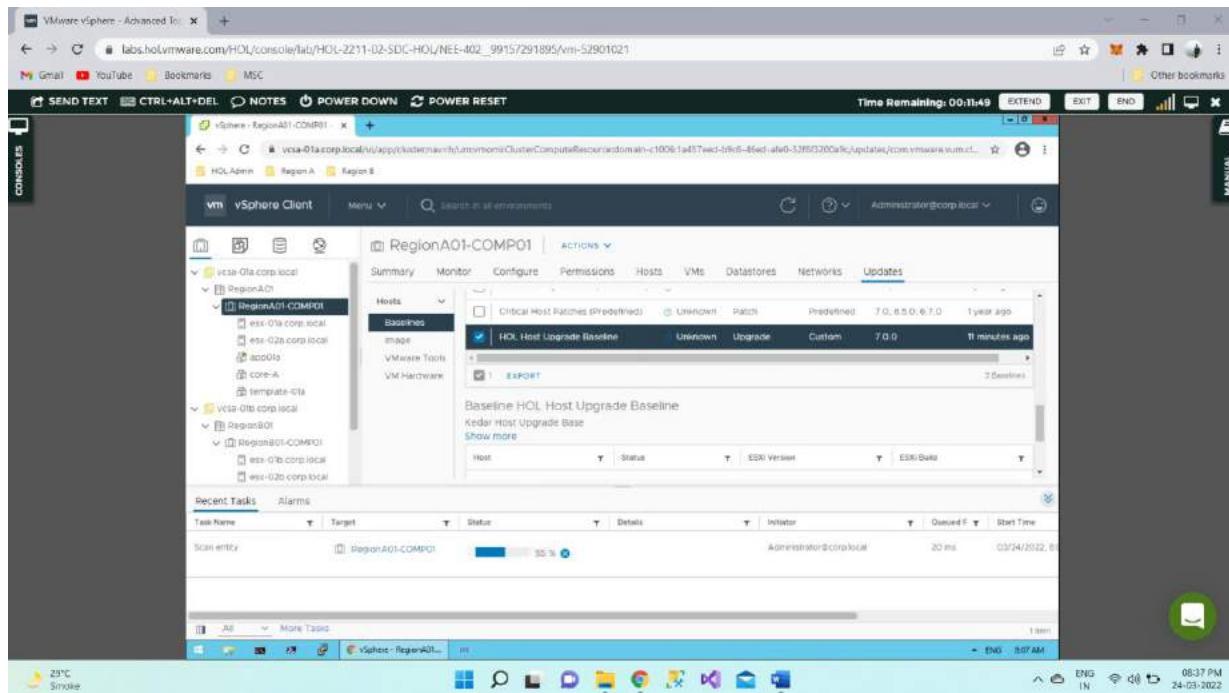
**Step 23:** Select **HOL Host Upgrade Baseline** option under attached baselines tab.

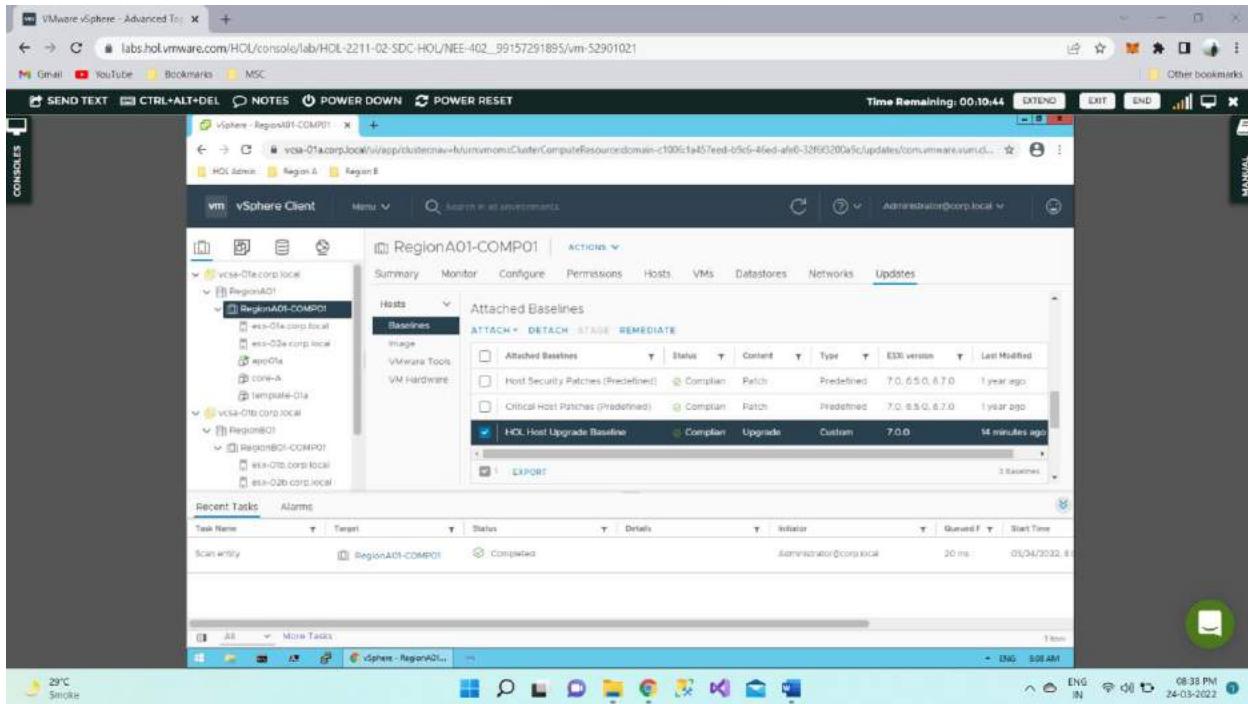


**Step 24:** Scroll down in current window and select **CHECK COMPLIANCE** option.

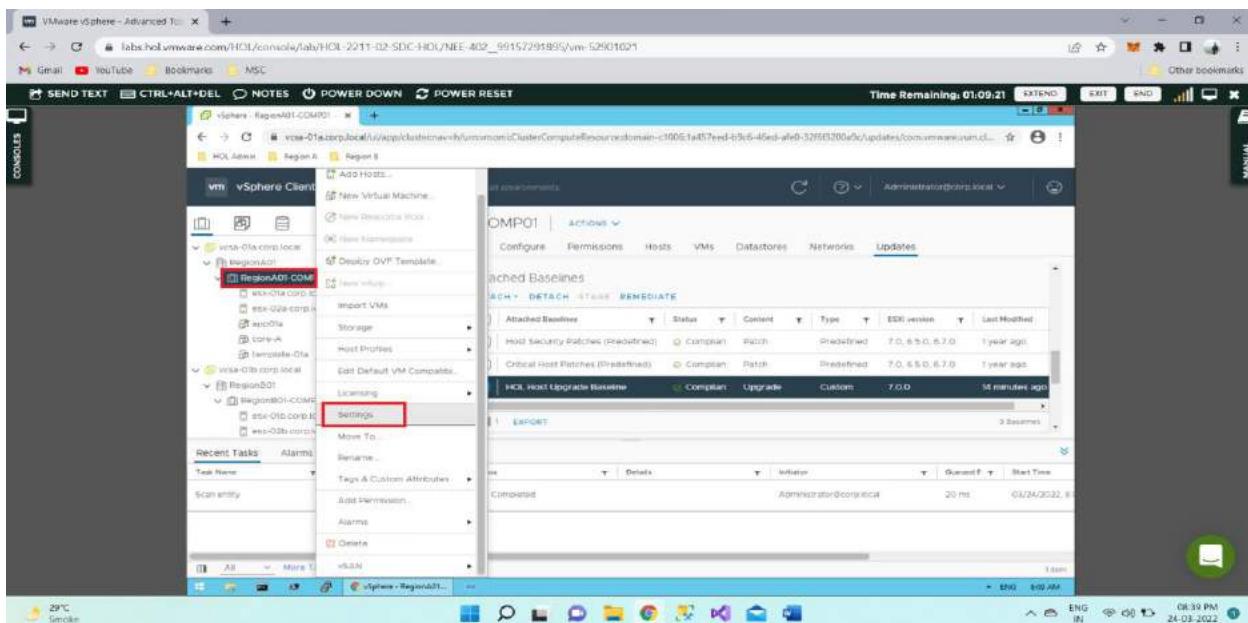


**Step 25:** Show the status in Recent Tasks window.

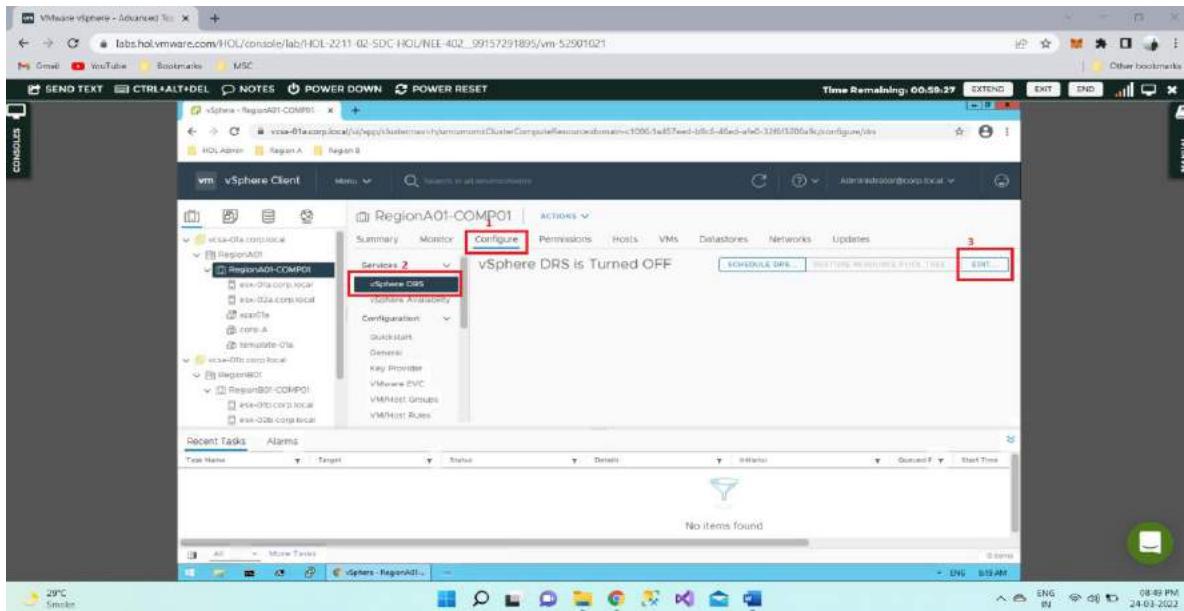




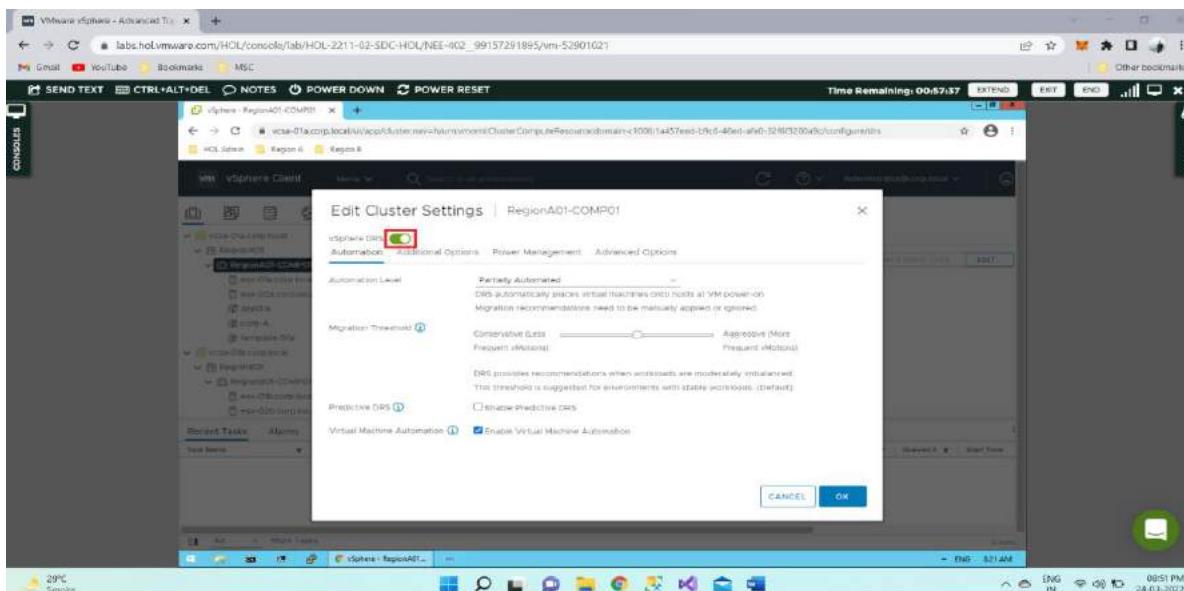
**Step 26:** Click on **RegionAO1-COM01** and select **Settings...**

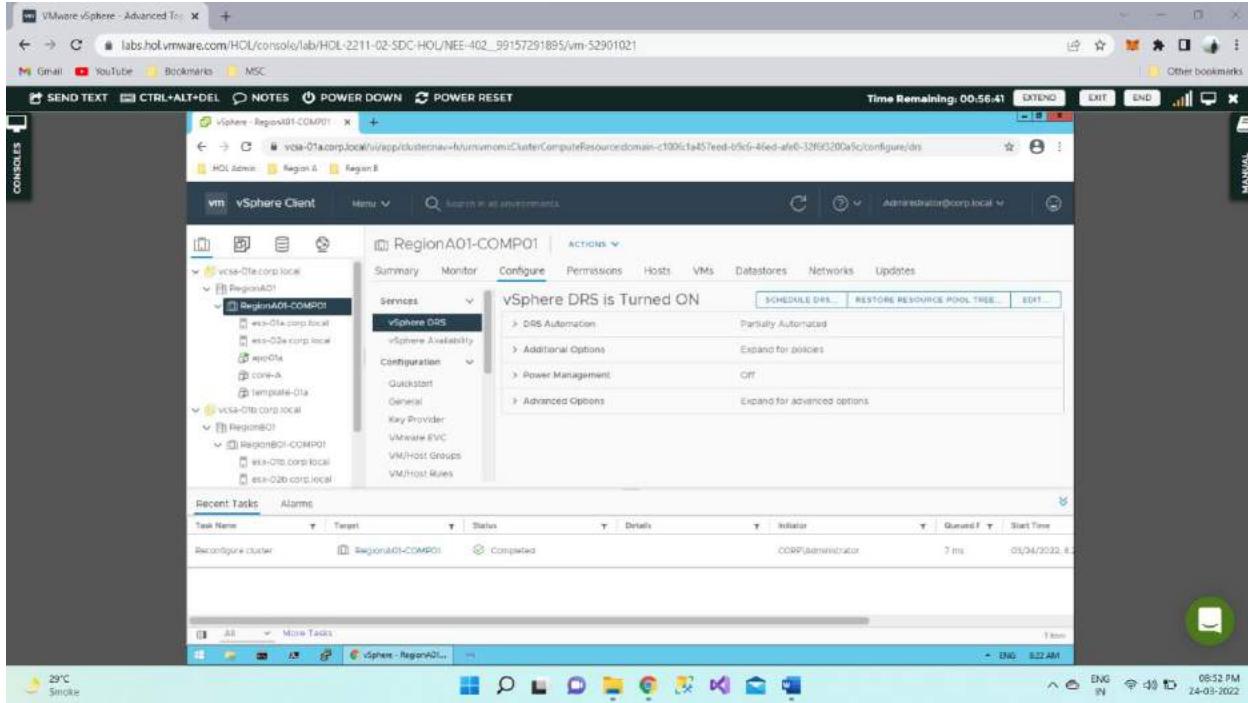


**Step 27:** Click on **Configure** tab and select **vSphere DRS** and Click on **Edit** button.

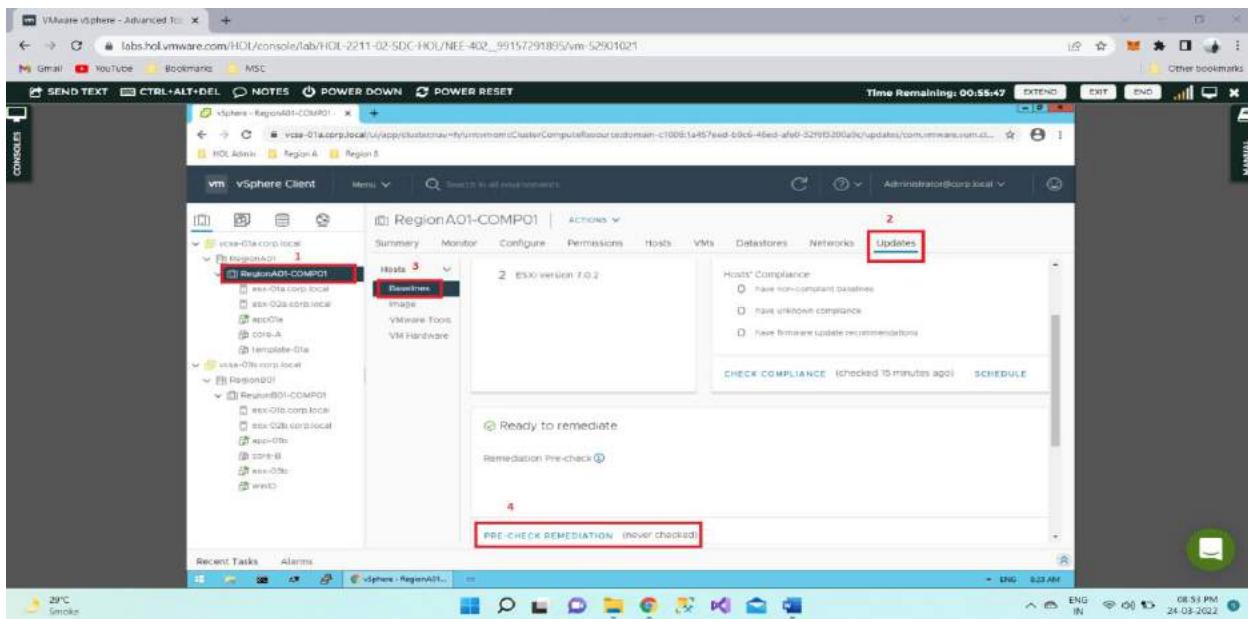


**Step 28:** Enable **vSphere DRS** toggle and click on **OK** button.

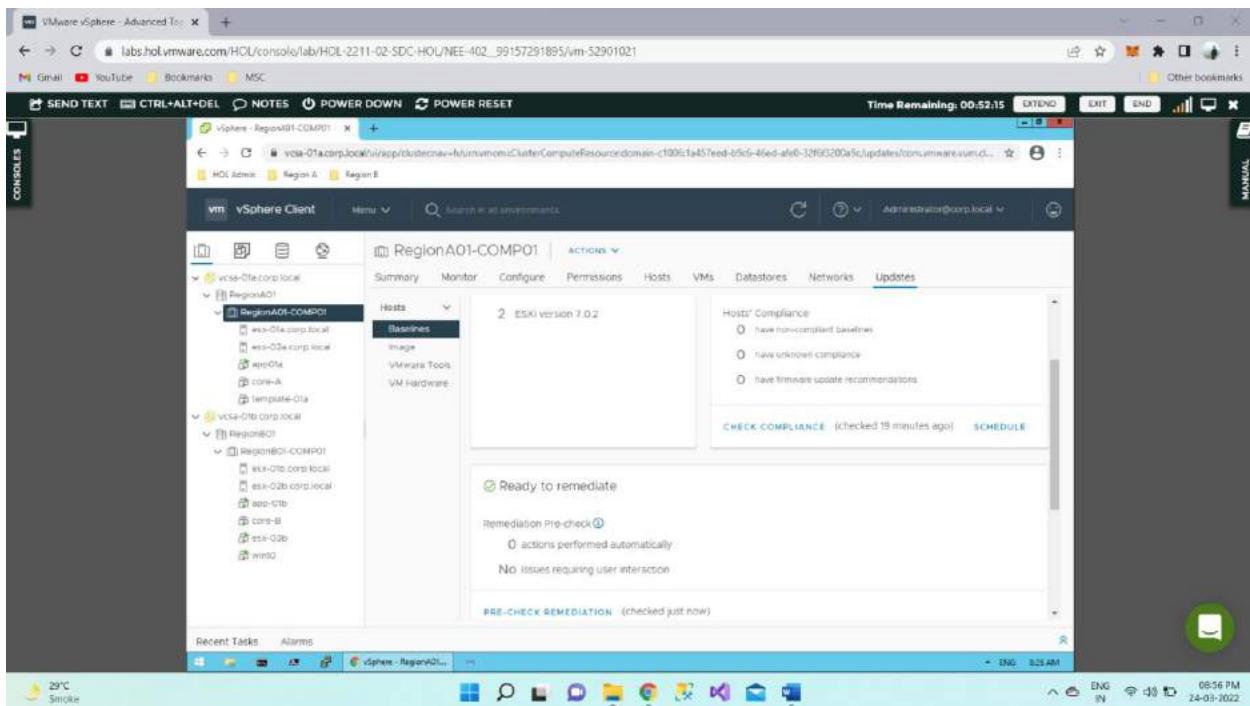
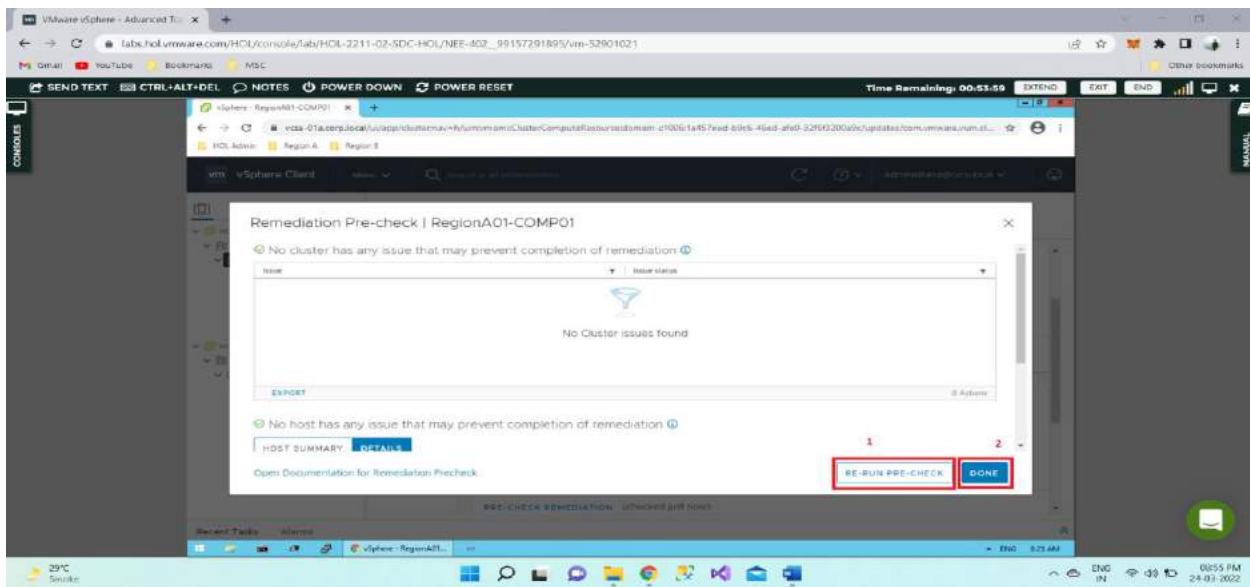




**Step 30:** Click on **RegionAO1-COM01** -> **Update** tab -> then select **Baselines** and click **PRE-CHECK REMEDIATION**.



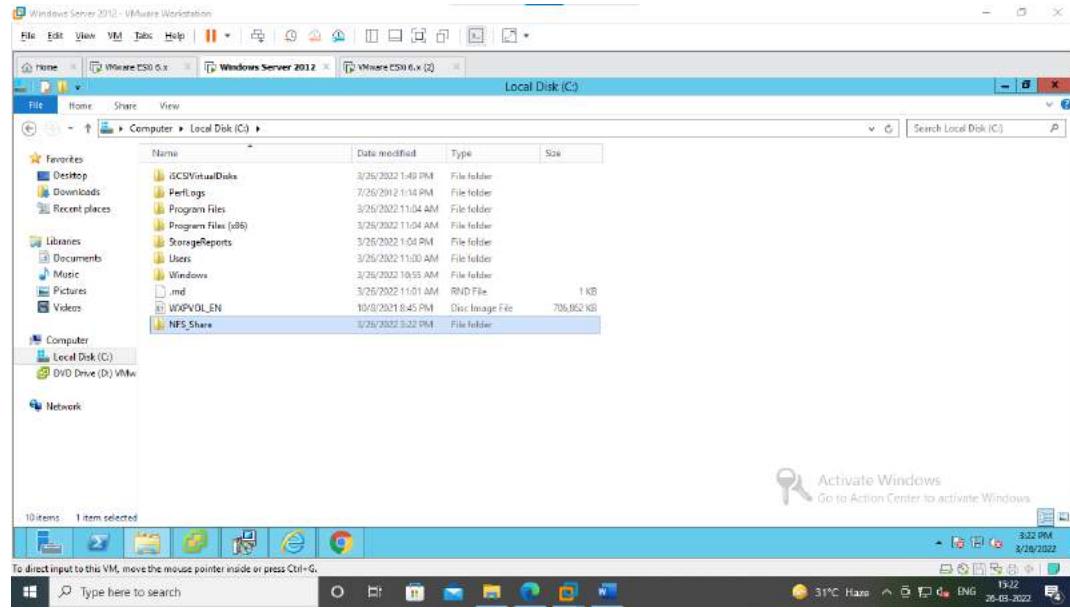
**Step 31:** Click on **RE-RUN PRE-CHECK** button first and then click on **DONE** button.



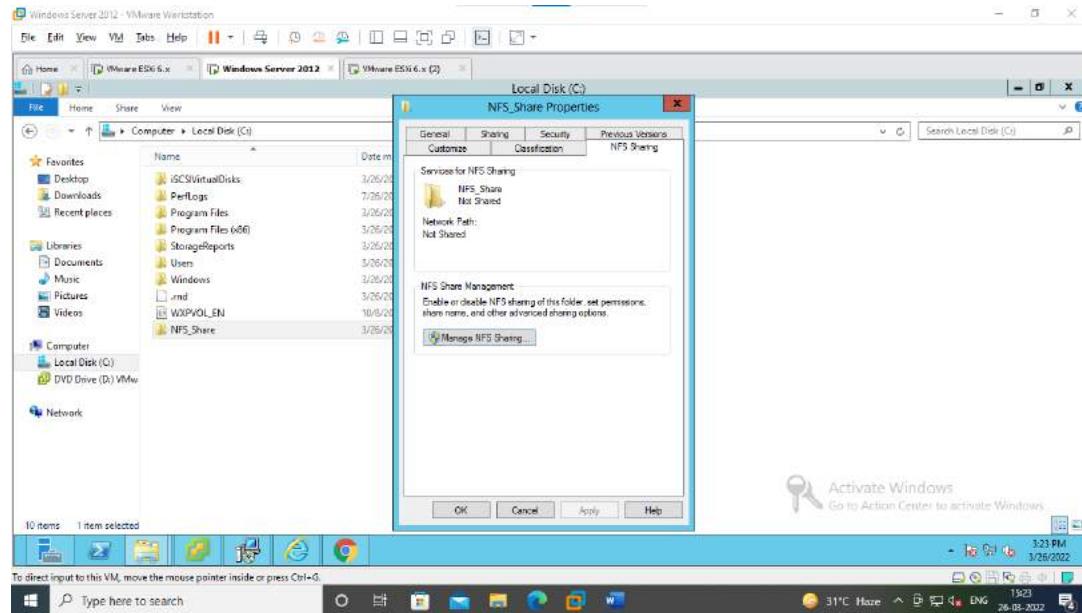
## Practical 6: Implement the NFS with the vCenter Server.

This practical depends on the **Practical No: 4 (A)**

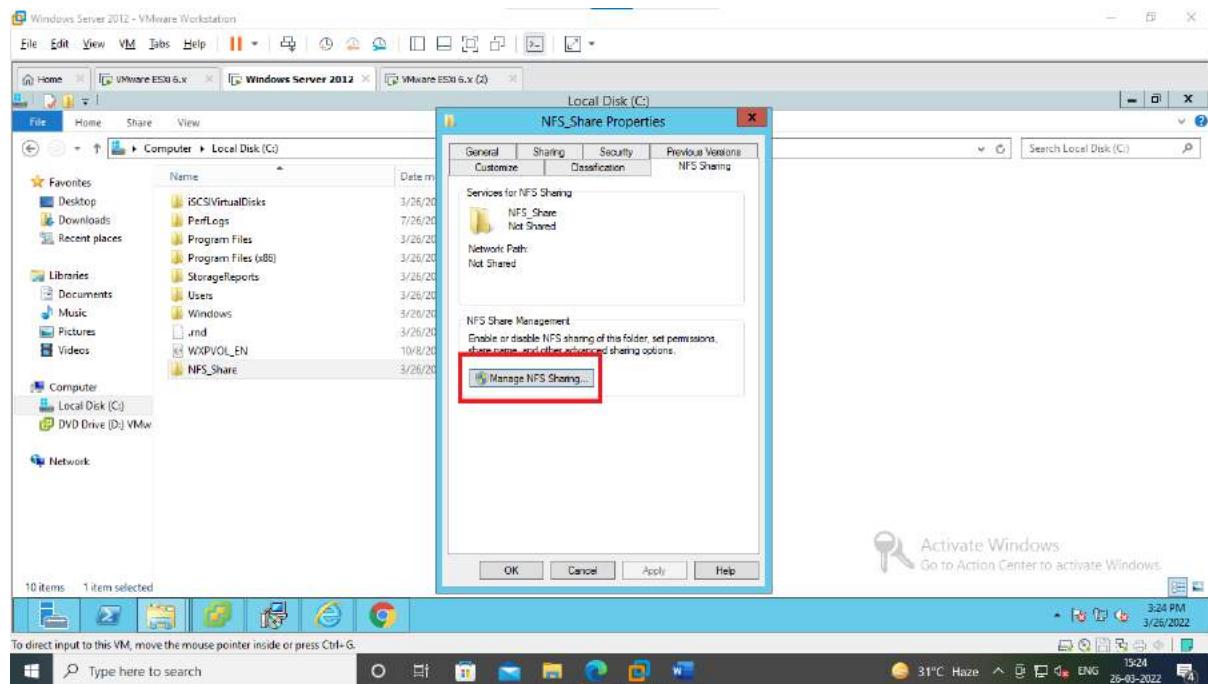
**Step 1:** First go to the Disk C then Create a new folder (i.e., **NFS\_Share**)



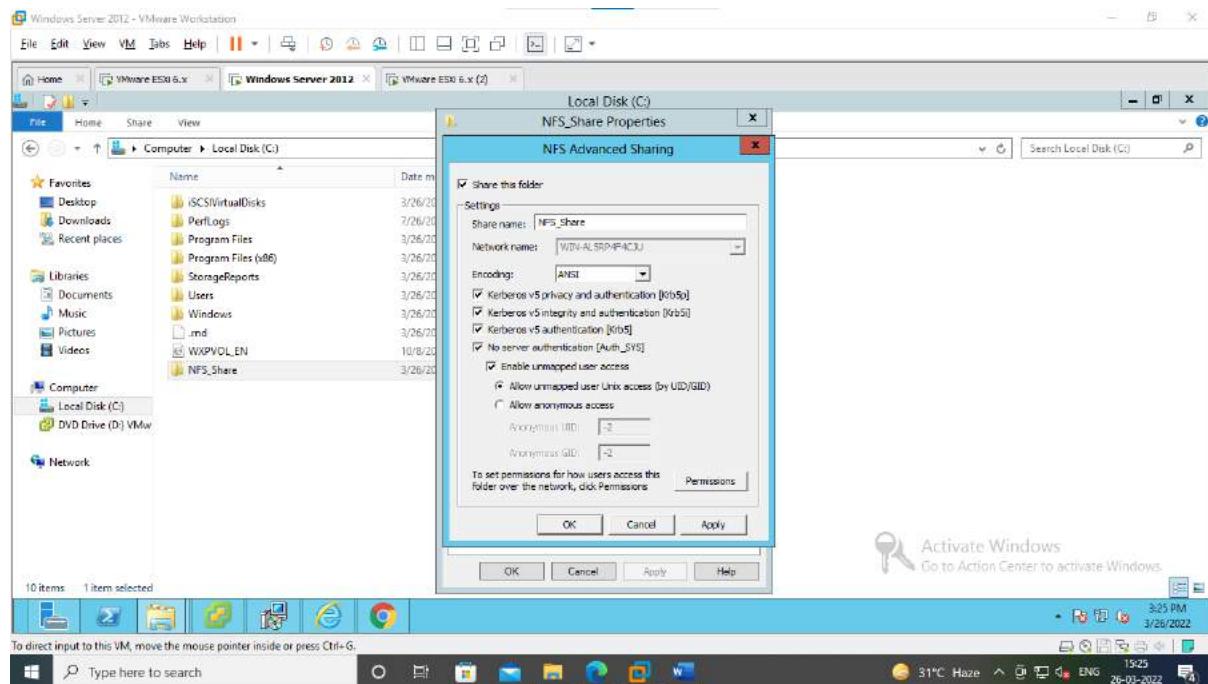
**Step 2:** Go to the folder **Properties** and after that click on the **NFS Sharing tab**.



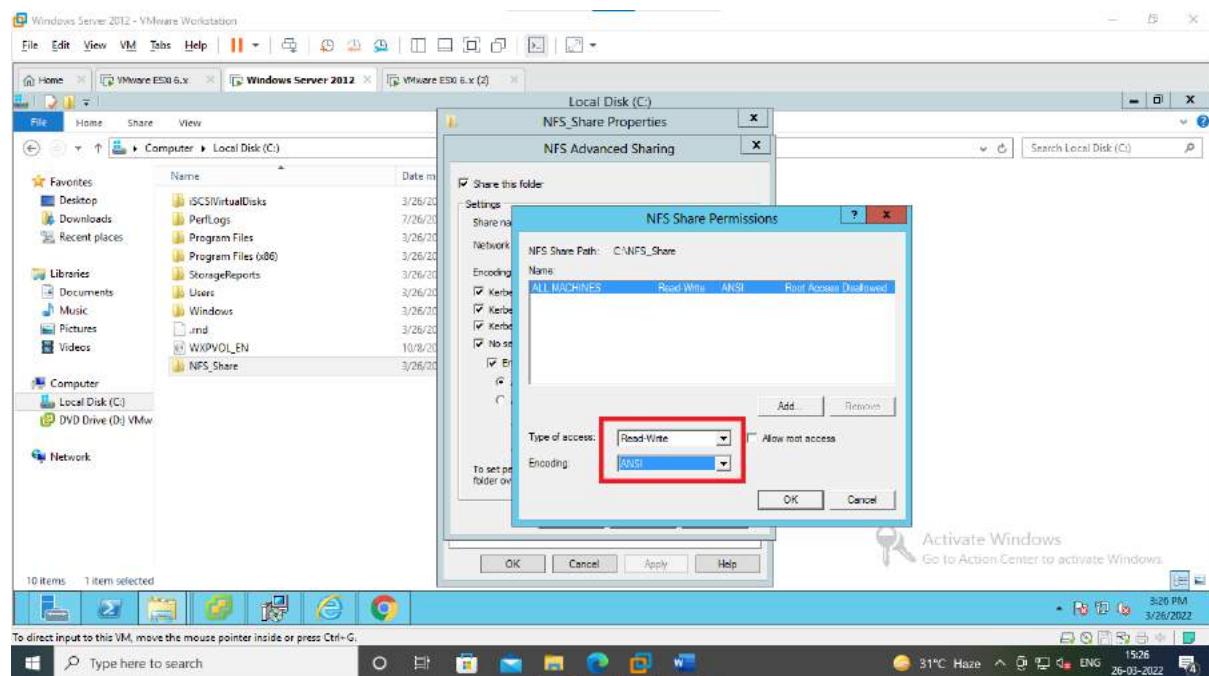
**Step 3: Click on the Manage NFS Sharing... button.**



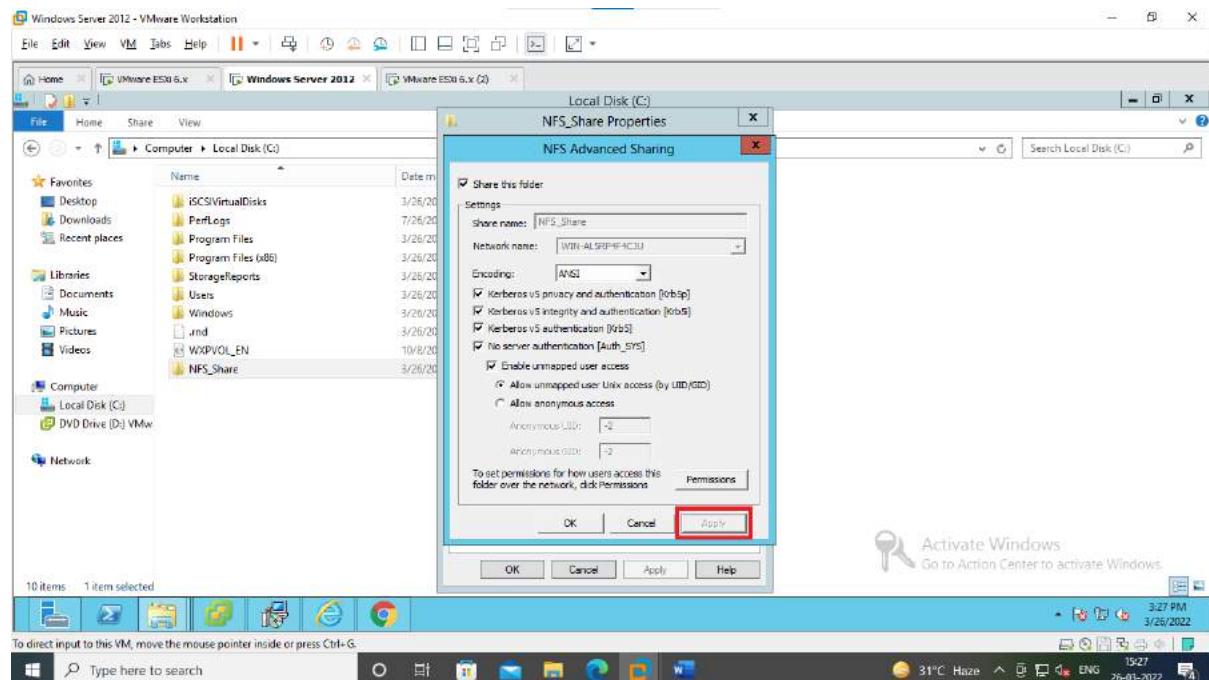
**Step 4: Click on the Share this folder option.**



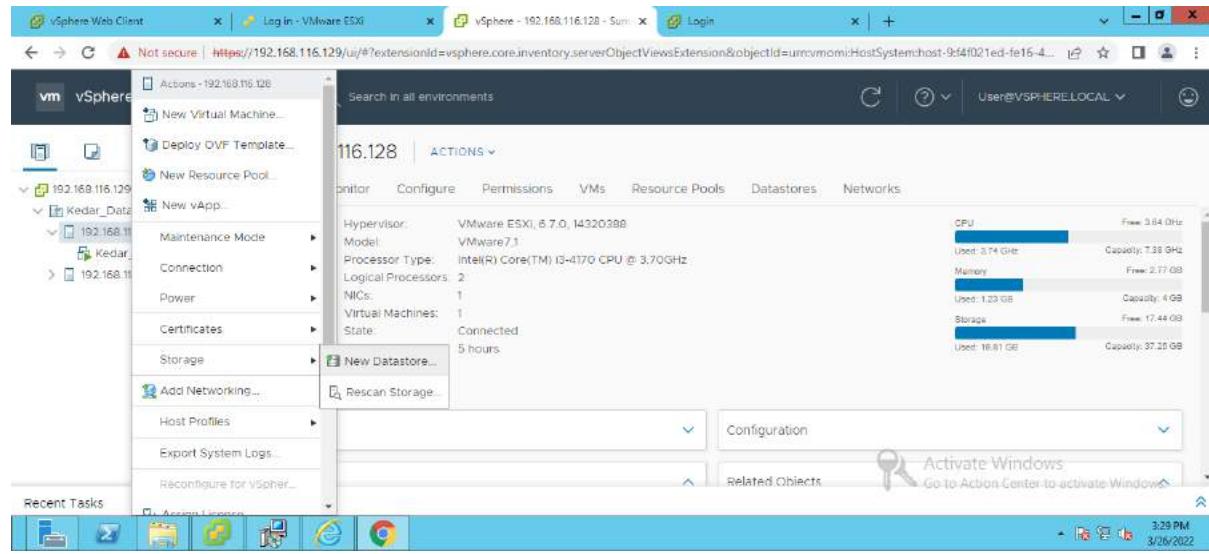
**Step 5:** Select Type of access **Read-Write** and Encoding **ANSI** and then click on **OK** button.



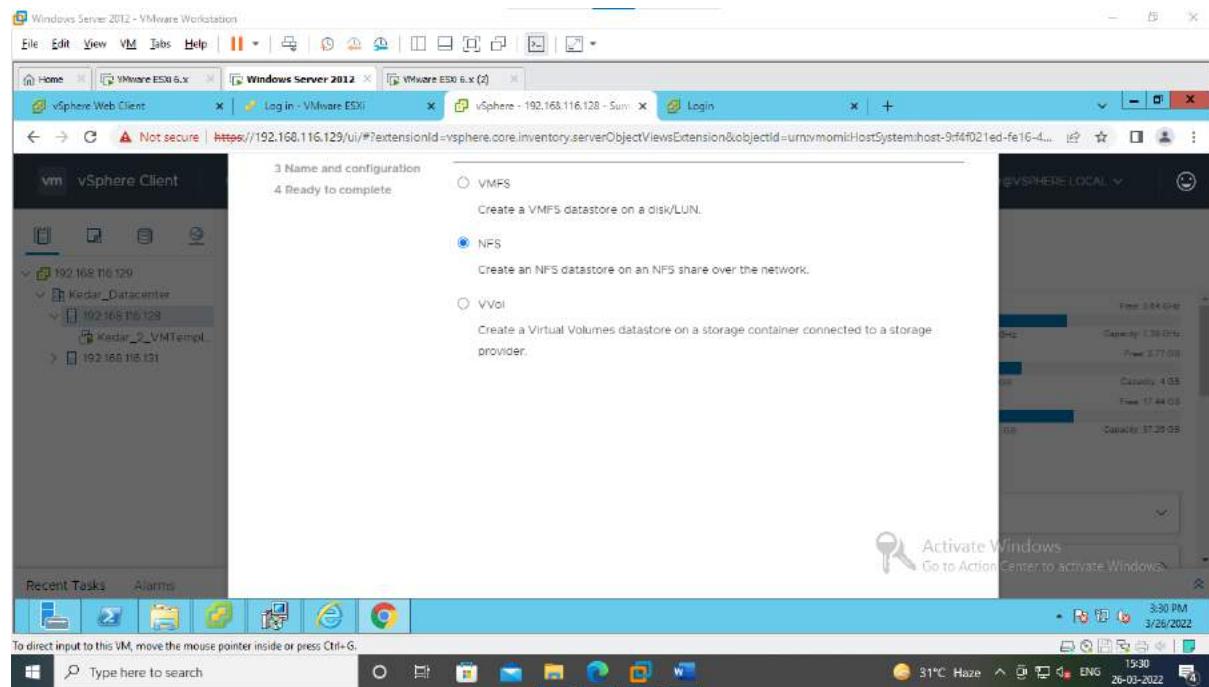
**Step 6:** Click on the **Apply** button.



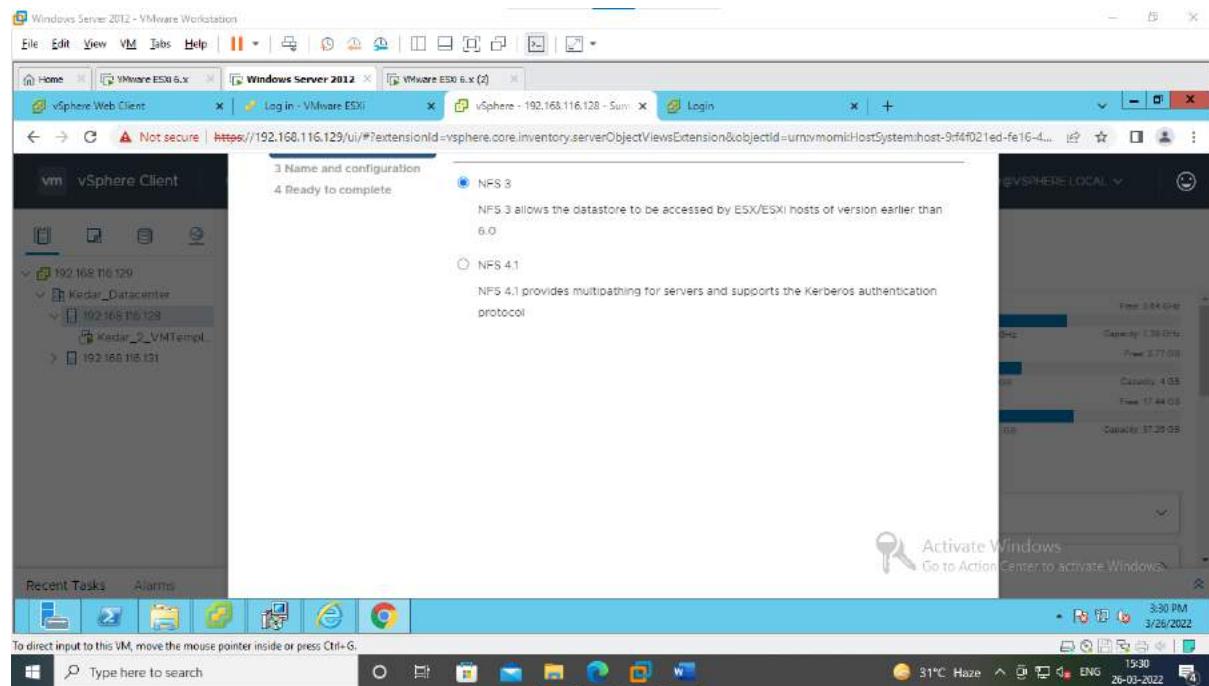
**Step 7:** Right click on the Host and Go to the Storage. Click on the New Datastore option.



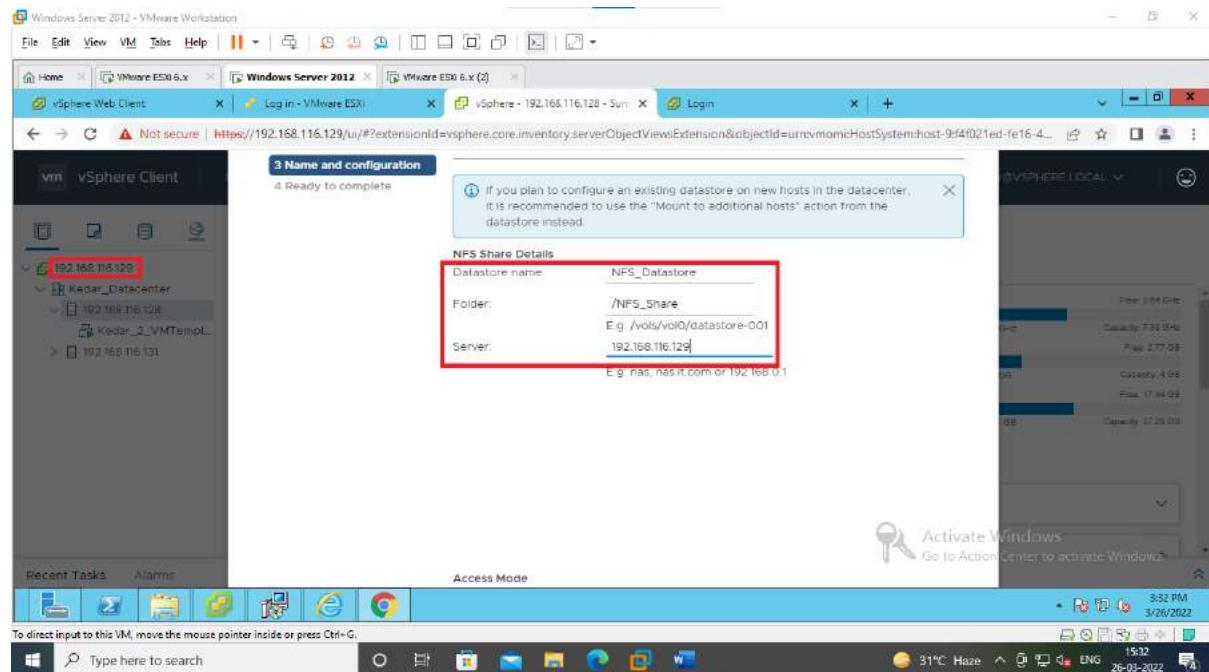
**Step 8:** Choose NFS option and click on the Next button.



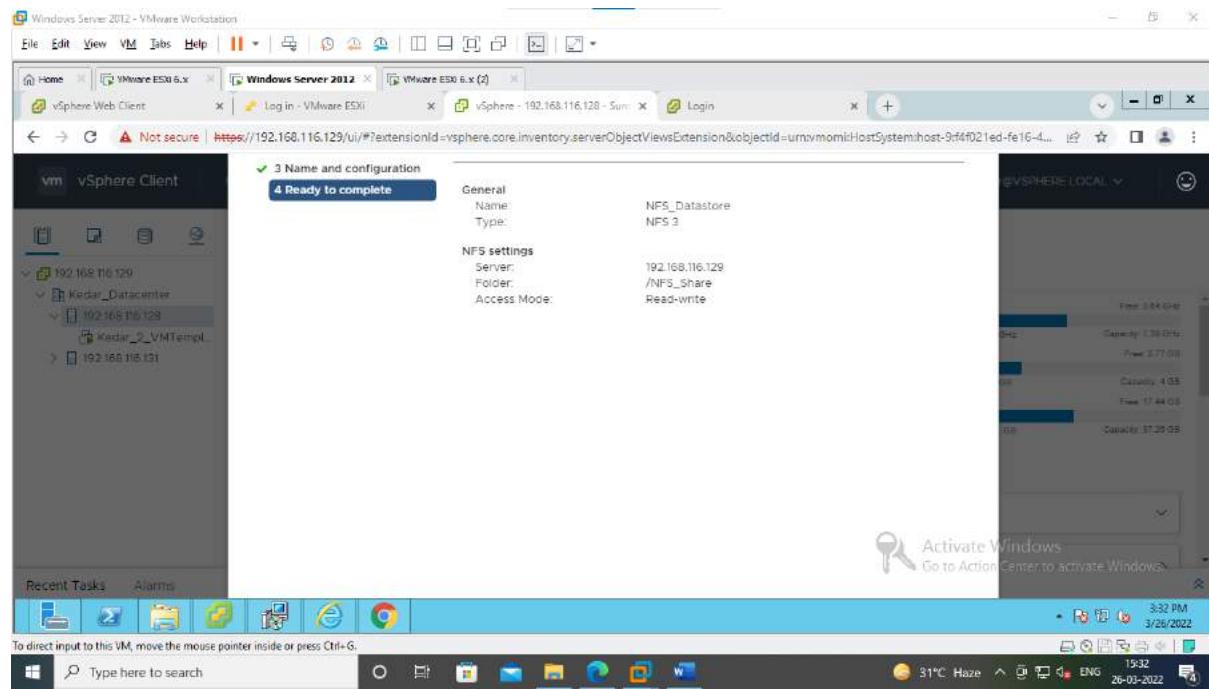
**Step 9:** Select the **NFS version** -> **NFS 3** and click on the **Next** button.



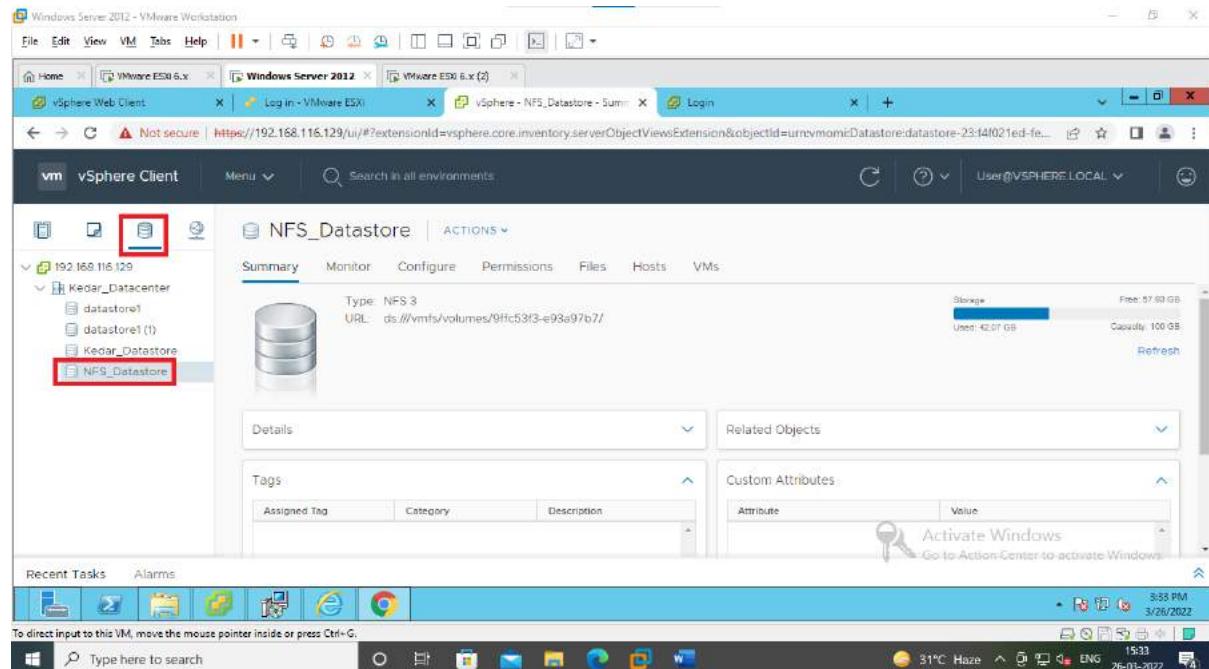
**Step 10:** Enter the **Datastore Name**, **Server** as IP address and **Folder** (Created folder into Disk C) and click on the **Next** button.



### Step 11: Click on the Finish button.



Datastore created successfully.



## Practical 7: Implement and manage the network of VMware ESXi server.

### A. Create vSphere Standard switch.

**Step 1:** Open below link in browser.

<https://labs.hol.vmware.com/HOL/catalogs/catalog/1936>

The screenshot shows a web browser displaying the VMware Hands-on Labs catalog. The URL in the address bar is <https://labs.hol.vmware.com/HOL/catalogs/catalog/1936>. The page is titled "Welcome, Kedar Jadhav Jadhav". On the left, there's a sidebar with categories like "Enrollments", "Labs" (with 184 items), "Transcript", and "Powered by VMware Learning Platform". The main content area features a "NEW LABS!" section with a thumbnail for "Using VMware Cloud Director and VMware Cloud Foundation on VxRail (HOL-2260-01-ISM)". Below it, there are two more lab entries: "Virtualization 101 (HOL-2210-01-SDC)" and another "Virtualization 101" entry. Each lab card includes an "ENROLL" button and other options like "INVITE A FRIEND" and "Available Now". To the right, there's an "ANNOUNCEMENTS" box with a message about the site being moved to <https://pathfinder.vmware.com/v3/explore/hol>, and a "What is VMware Hands-on Labs" section with a video thumbnail.

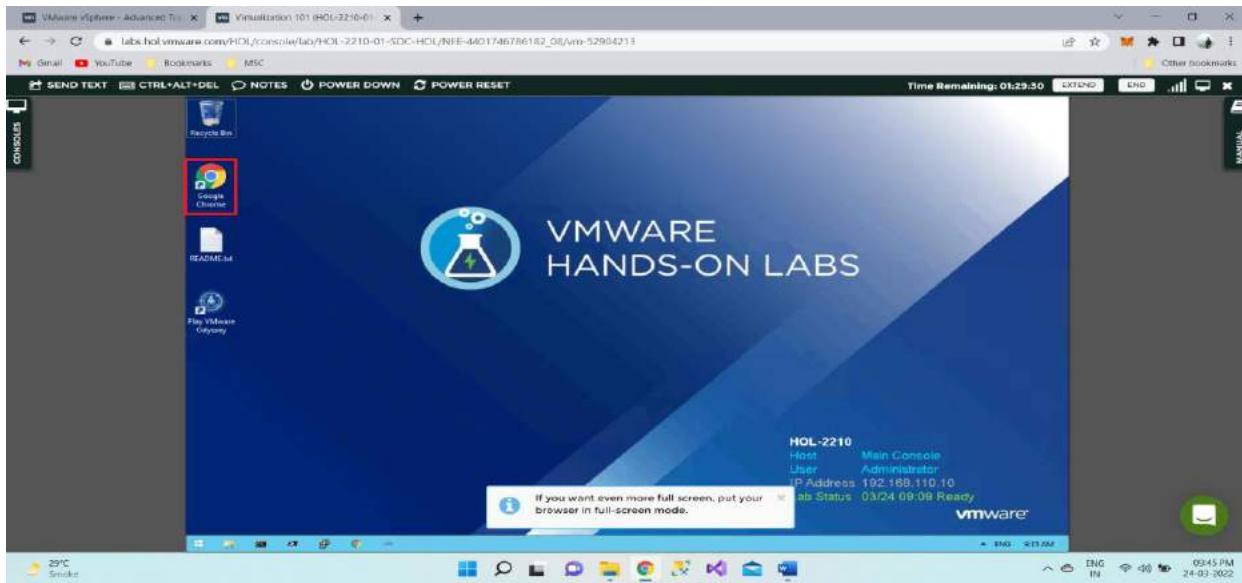
**Step 2:** Select Virtualization 101 (HOL-2210-01-SDC) option and click on **ENROLL** button.

The screenshot shows the VMware Hands-on Labs catalog page. On the left sidebar, there are various lab categories like 'New Labs!', 'Lightning Labs', 'App Modernization', etc. In the main content area, there's a section titled 'NEW LABS!' featuring a 'Virtualization 101 (HOL-2210-01-SDC)' lab. This lab is described as 'Using VMware Cloud Director and VMware Cloud Foundation on VxRail (HOL-2260-01-ISM)'. It has a 'NEW' badge and an 'ENROLL' button. Below it, another 'Virtualization 101 (HOL-2210-01-SDC)' lab is listed with a similar description and an 'ENROLL' button. The right side of the page includes announcements and other lab details.

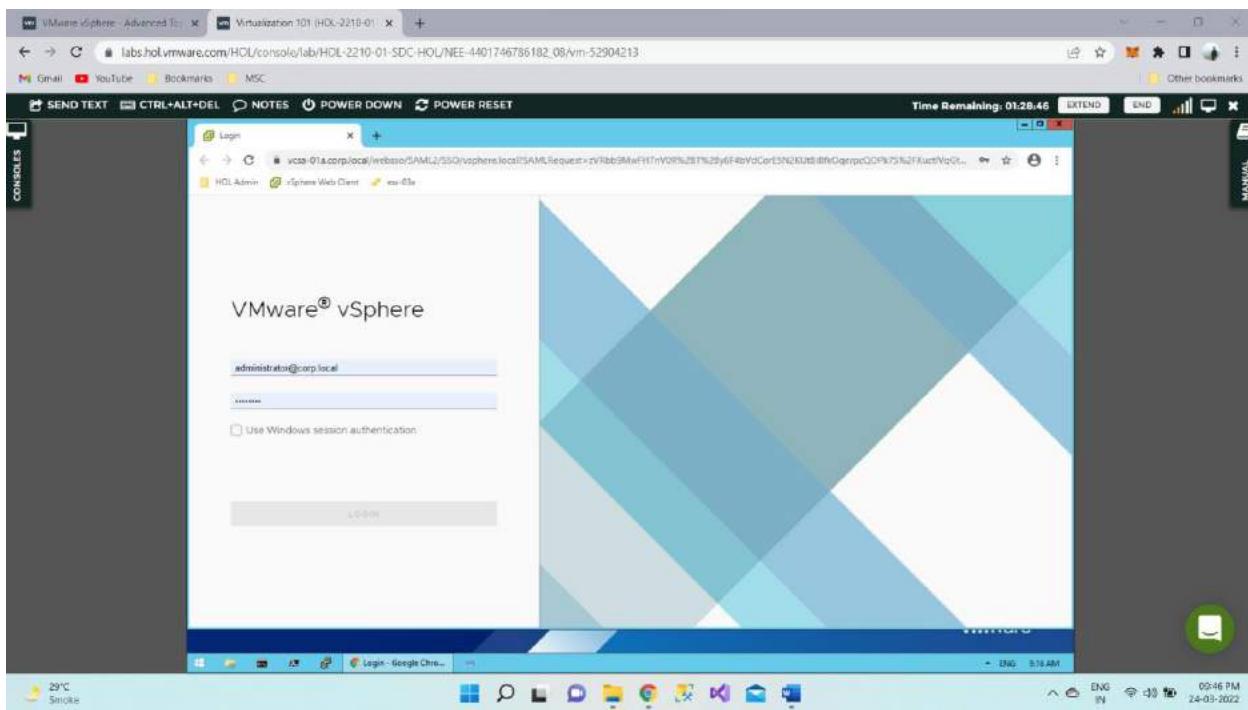
**Step 3:** Click on **START THIS LAB** button.

This screenshot shows the same catalog page as the previous one, but the 'Virtualization 101 (HOL-2210-01-SDC)' lab is now selected. The 'START THIS LAB' button is highlighted with a red box. The progress bar indicates 'TIME REMAINING: 1 hour 30 minutes'. Below this, another lab, 'VMware vSphere - Advanced Topics (HOL-2211-02-SDC)', is listed with its own progress bar and 'RESUME THIS LAB' button. The right side of the page remains the same with announcements and other content.

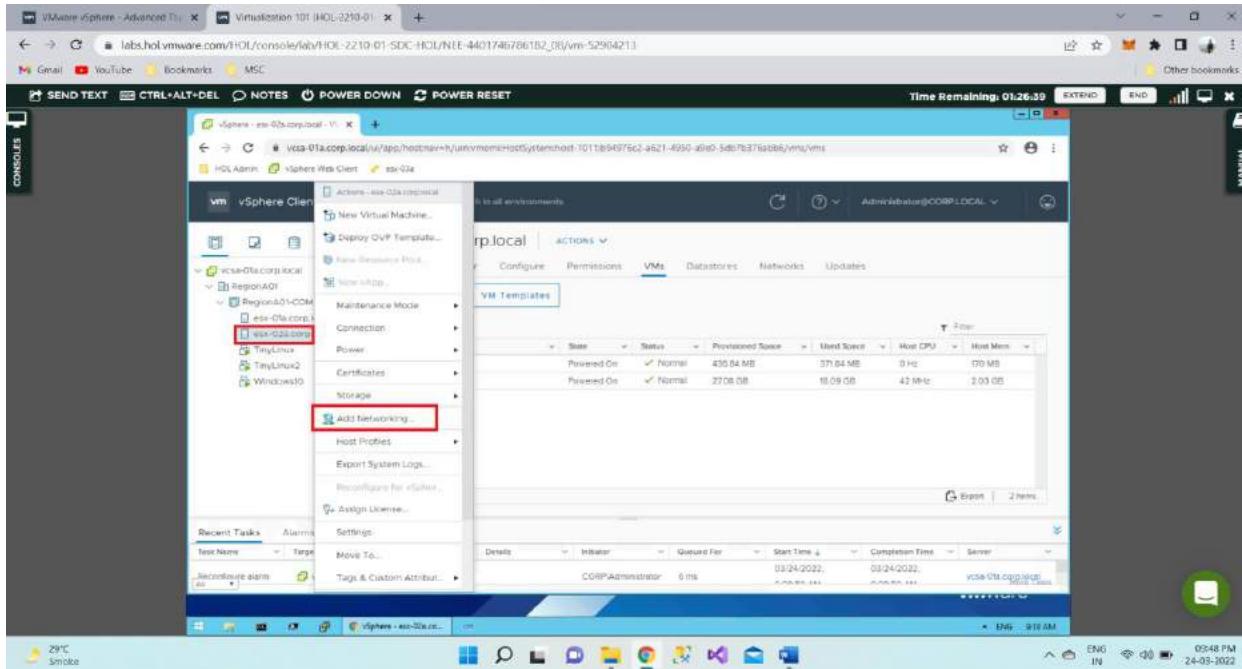
**Step 4:** Open Google chrome browser.



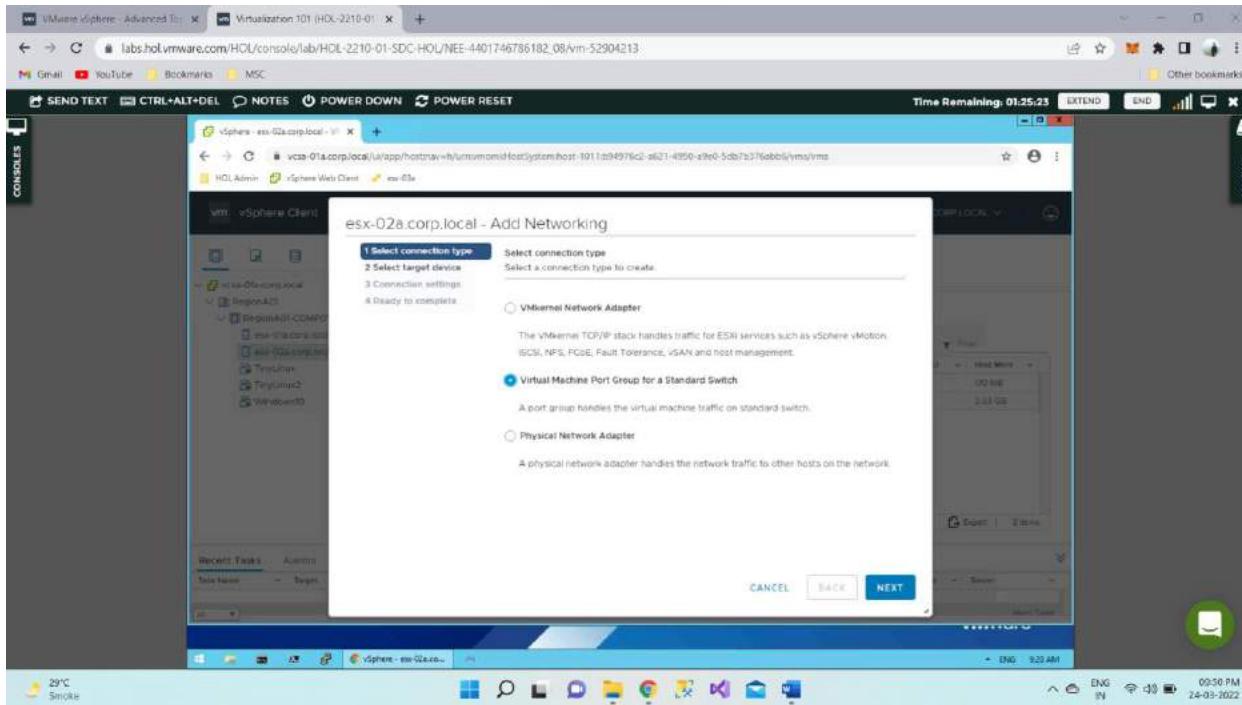
**Step 5:** Enter Login button.



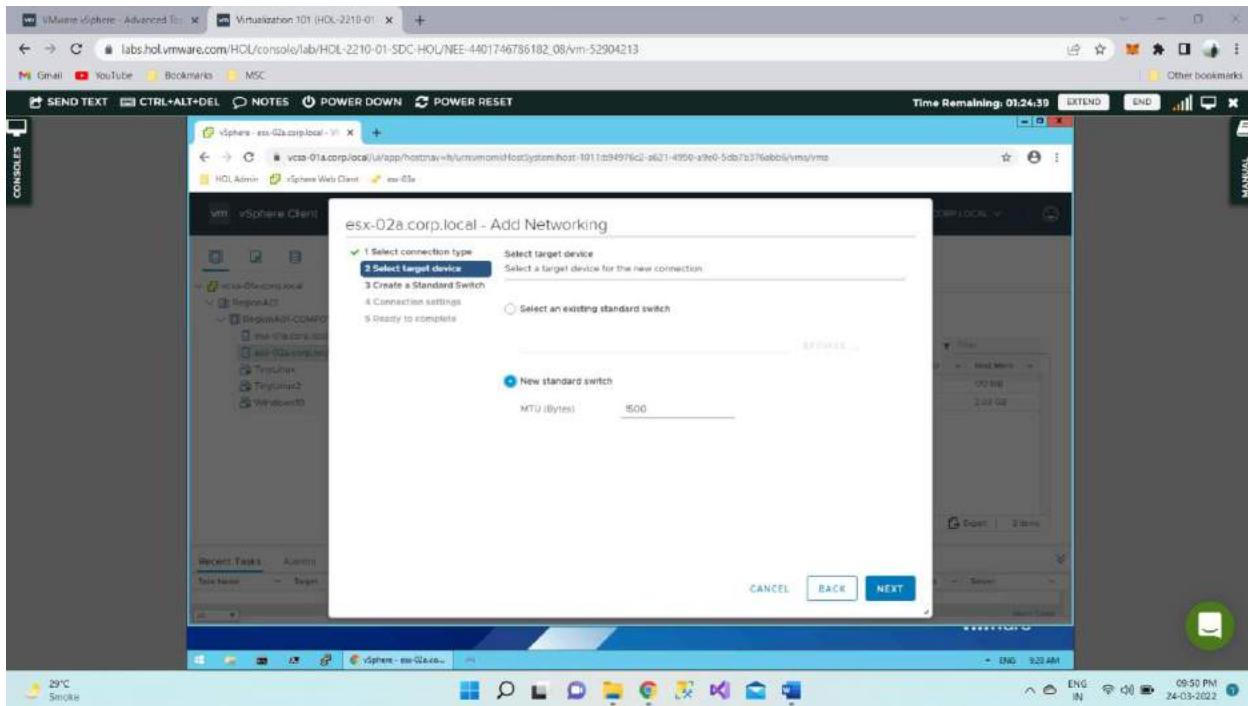
**Step 6:** Under **vcsa-01a.corp.local**, expand **RegionA01** and then **RegionA01-COMP01**. Next, right-click on **esx-02a.corp.local** in the Navigator and then select **Add Networking...** option.



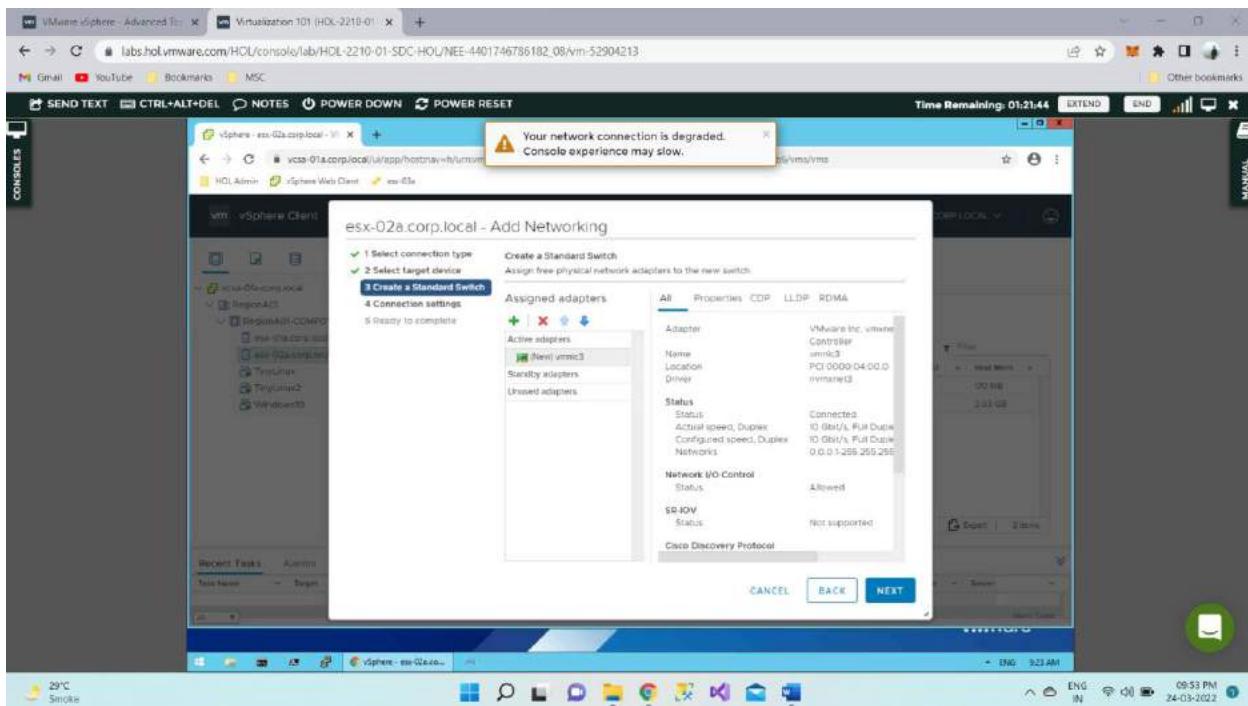
**Step 7:** Select **Virtual Machine Port Group for a Standard Switch** & Click **NEXT**.

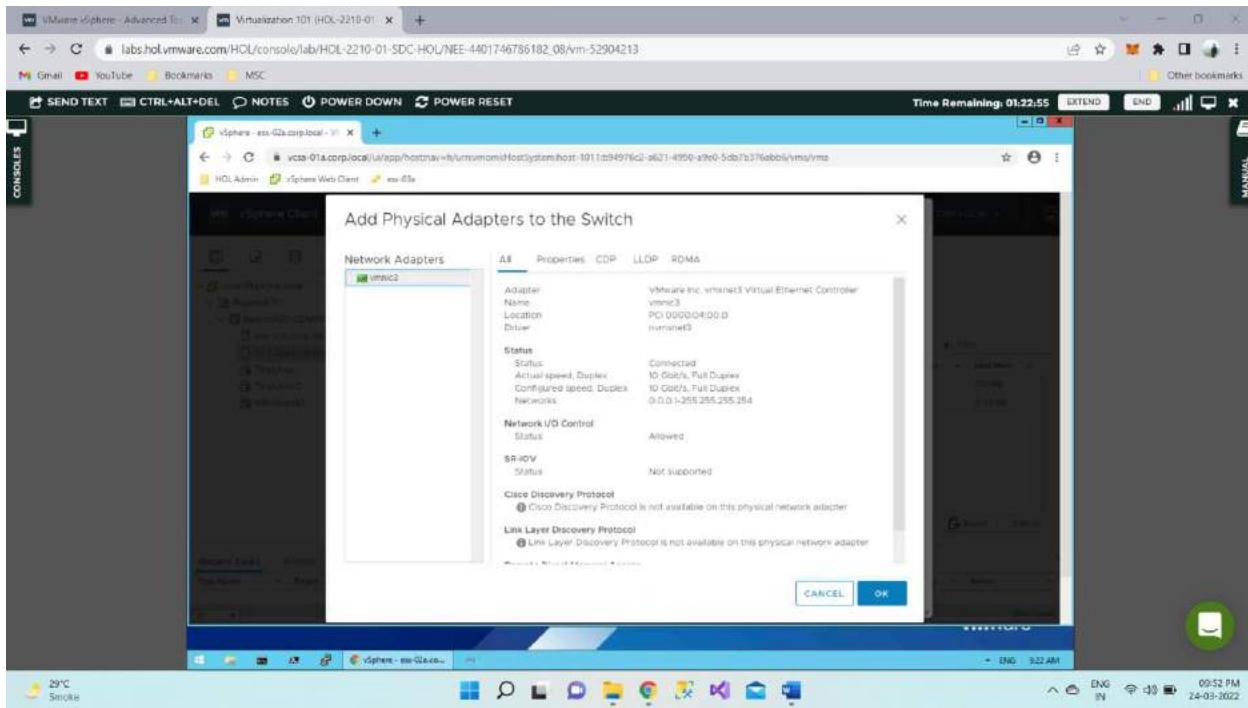
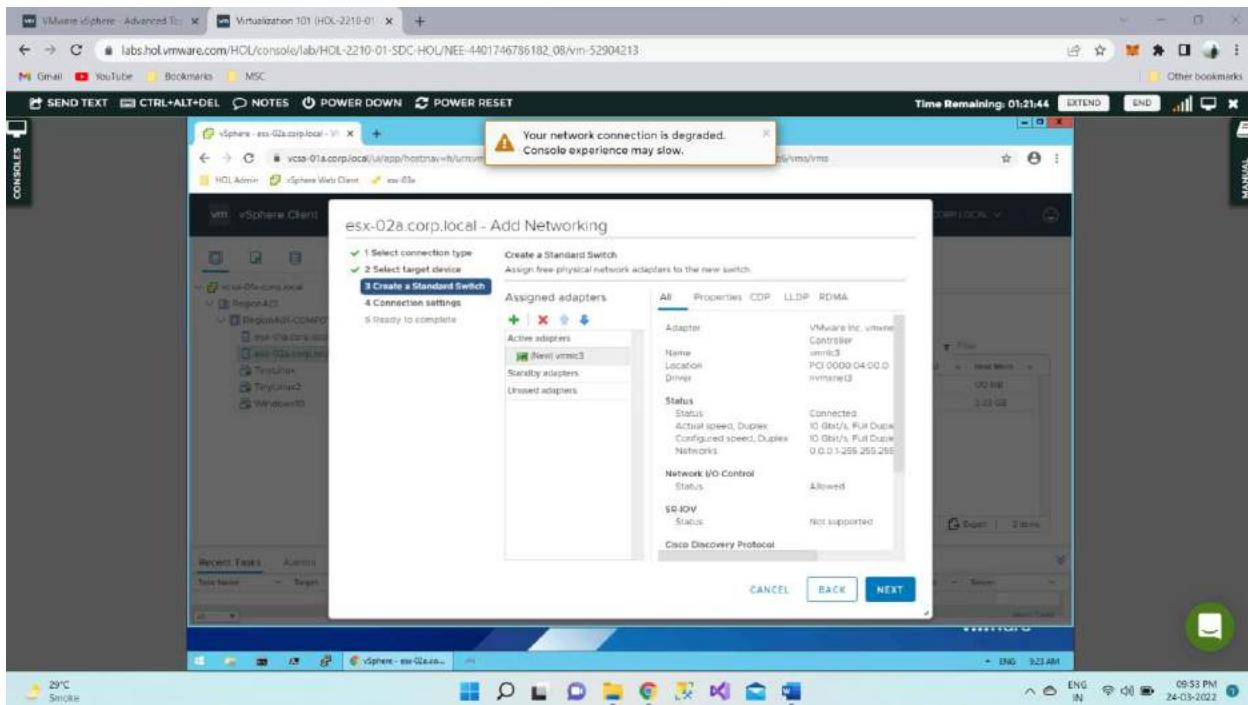


**Step 8: Select New standard switch option & Click NEXT.**

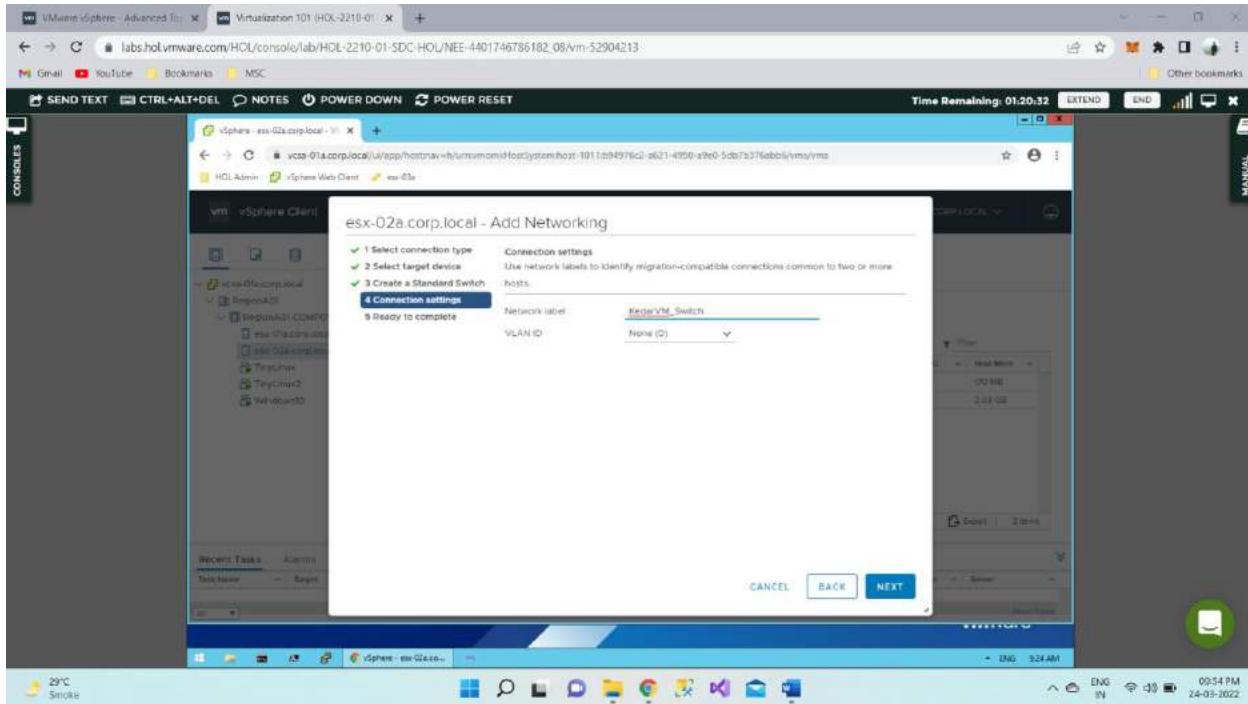


**Step 9: Click on + and then select (New) vmnic3 and Click NEXT.**

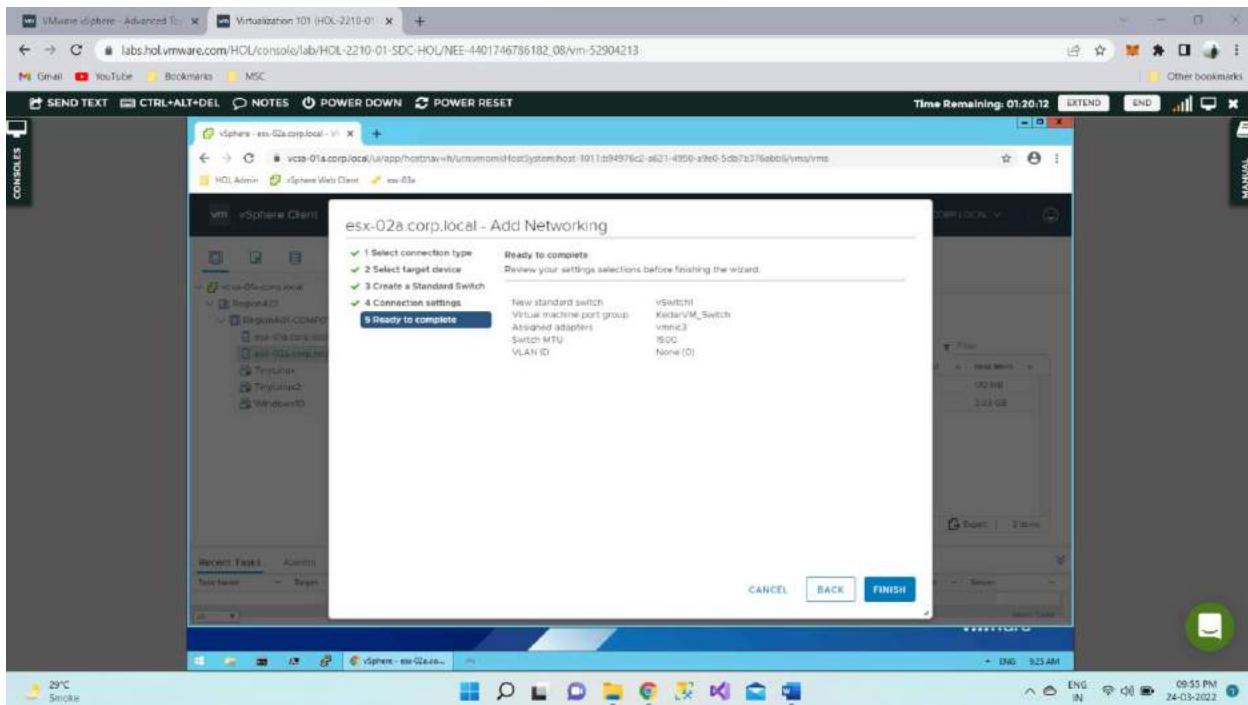


**Step 10: Click on OK.****Step 11: Click on NEXT.**

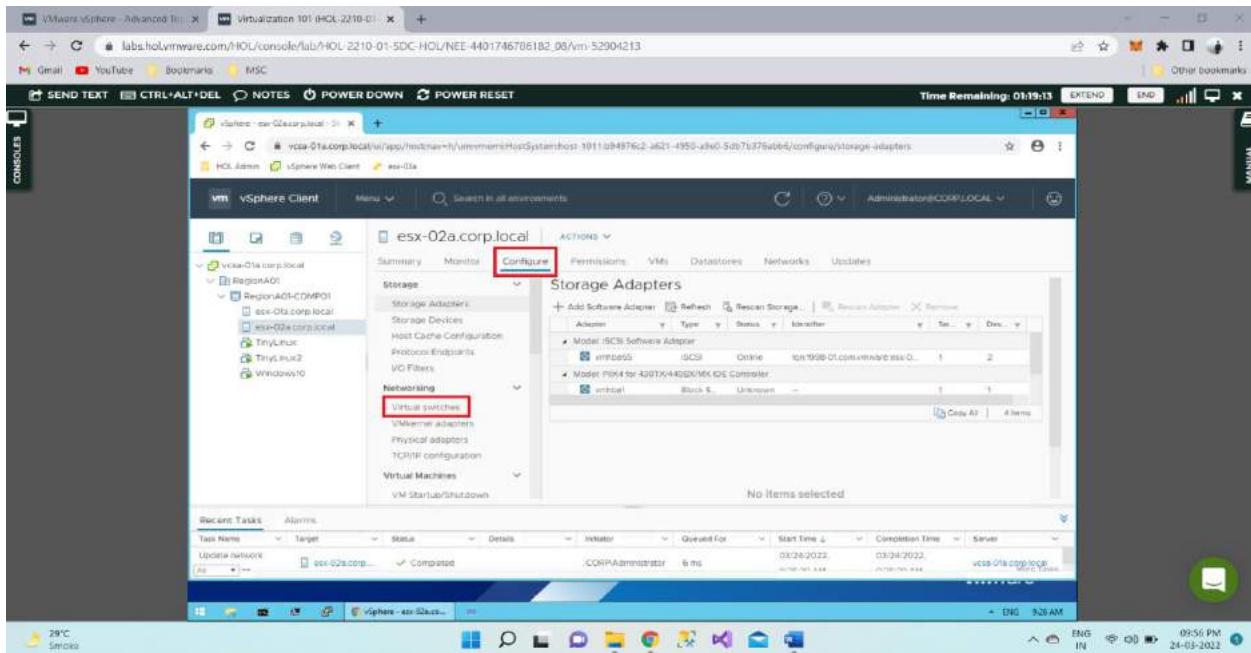
**Step 12:** Enter name of **Network Label** and make the **VLAN ID** is default. i.e., **None (0)**



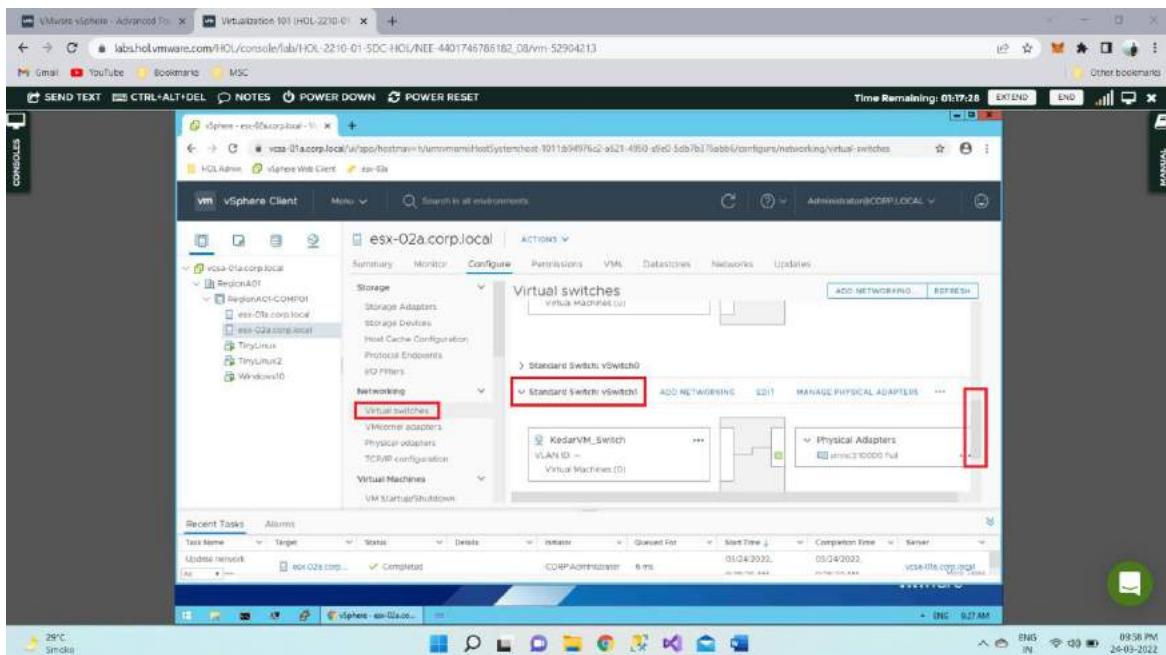
**Step 13:** Click on **FINISH** button.



## Step 14: Click **Configure** and then click on **Virtual Switches**



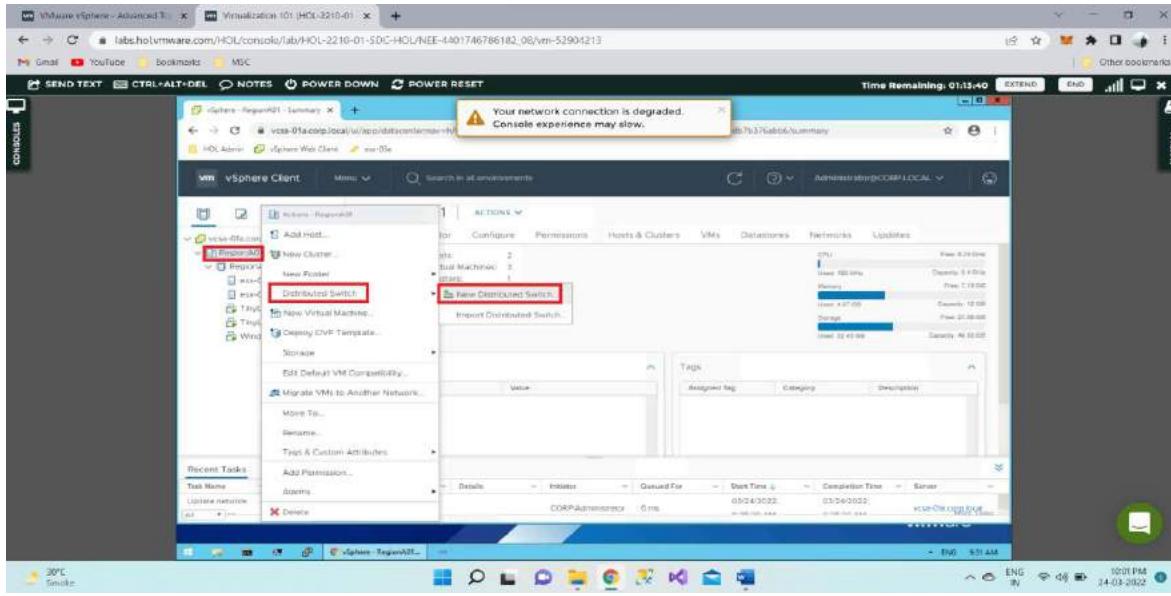
Scroll down until you see Standard Switch: vSwitch1. If needed, expand the section.



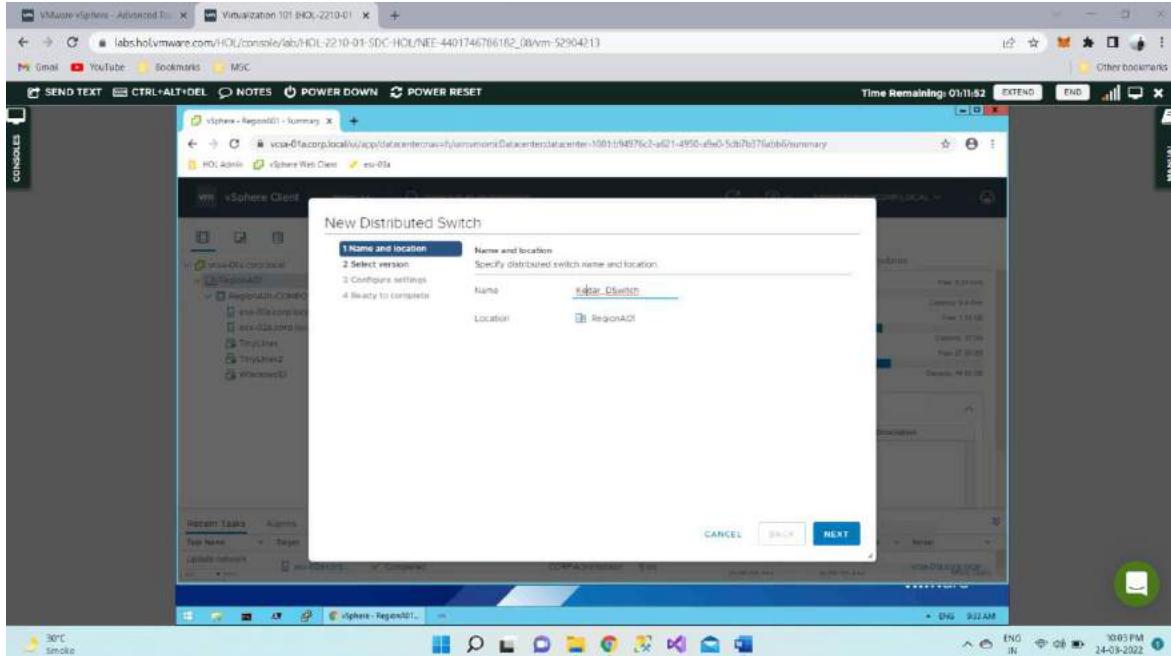
You should see the above diagram showing a virtual port group (VM Network 2) that is on vSwitch1 and it is using vmnic3 as an uplink.

## B. Create vSphere Distributed switch

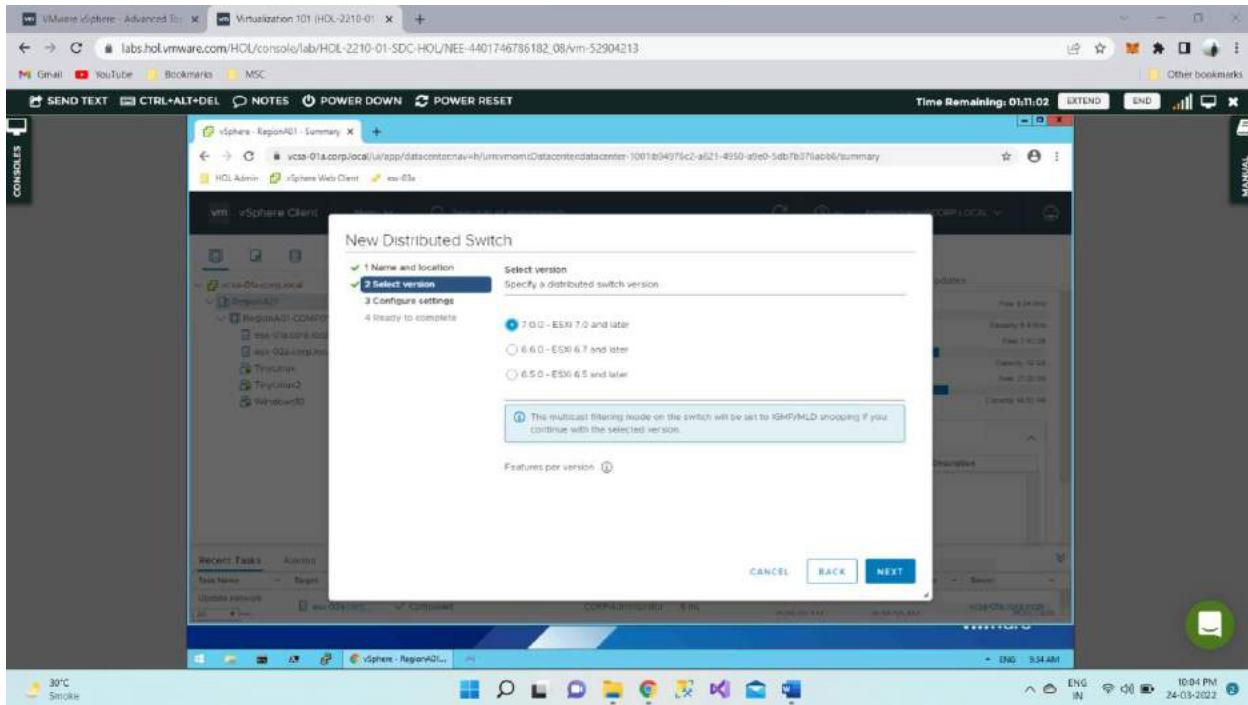
**Step 1:** In the vSphere Web Client, click on RegionA01. And the navigator, right-click the RegionA01. Select **Distributed Switch** andthen **New Distributed Switch**, this will open the New Distributed Switch wizard.



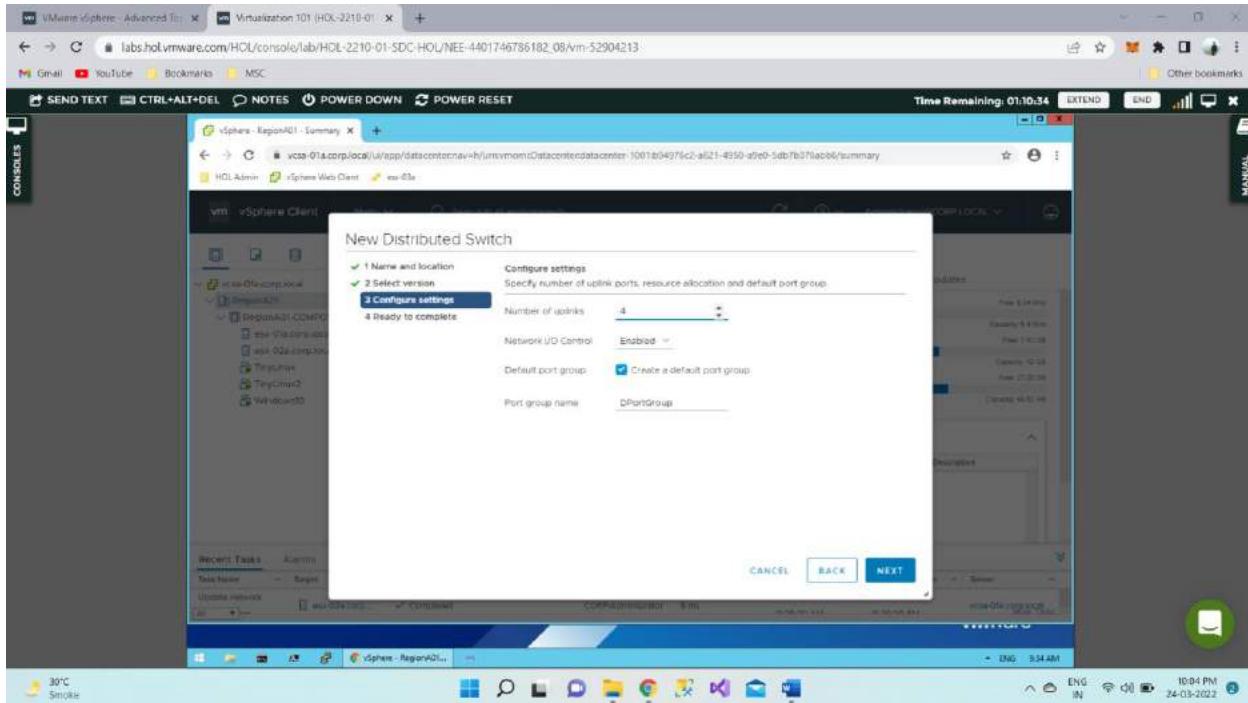
**Step 2:** Enter Name of Distributed switch in the Name field & Click on **Next**.



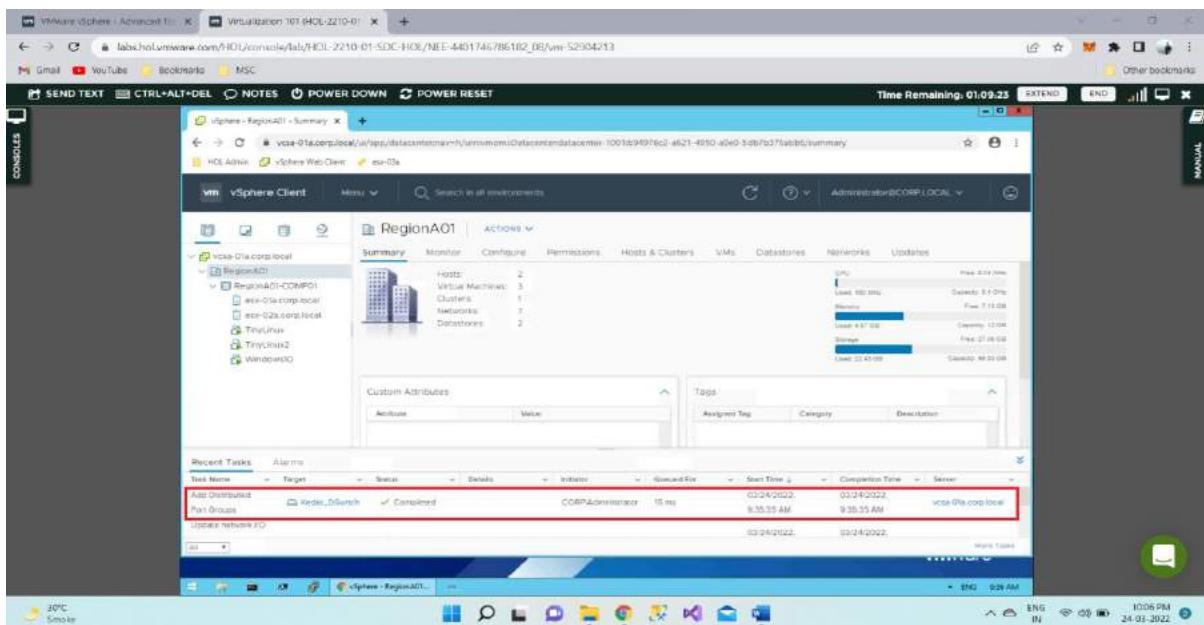
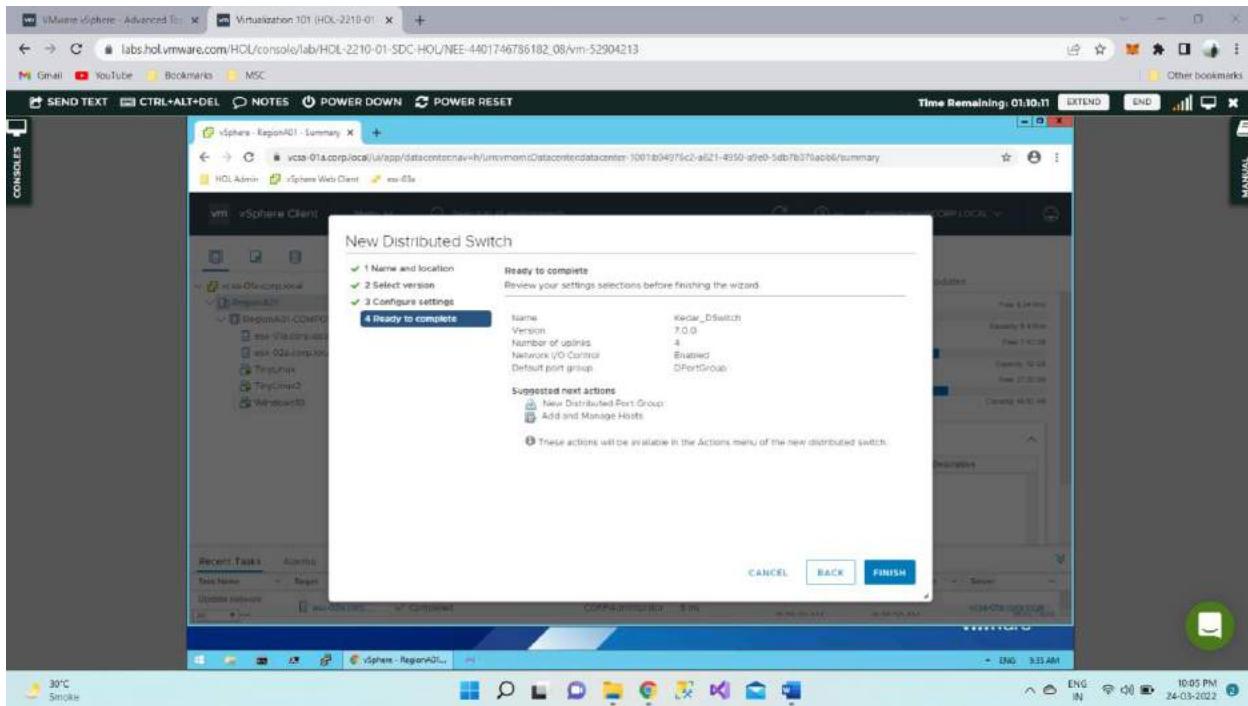
**Step 3:** Leave the default setting of **7.0.0 - ESXi 7.0 and later** and later and click on **Next**

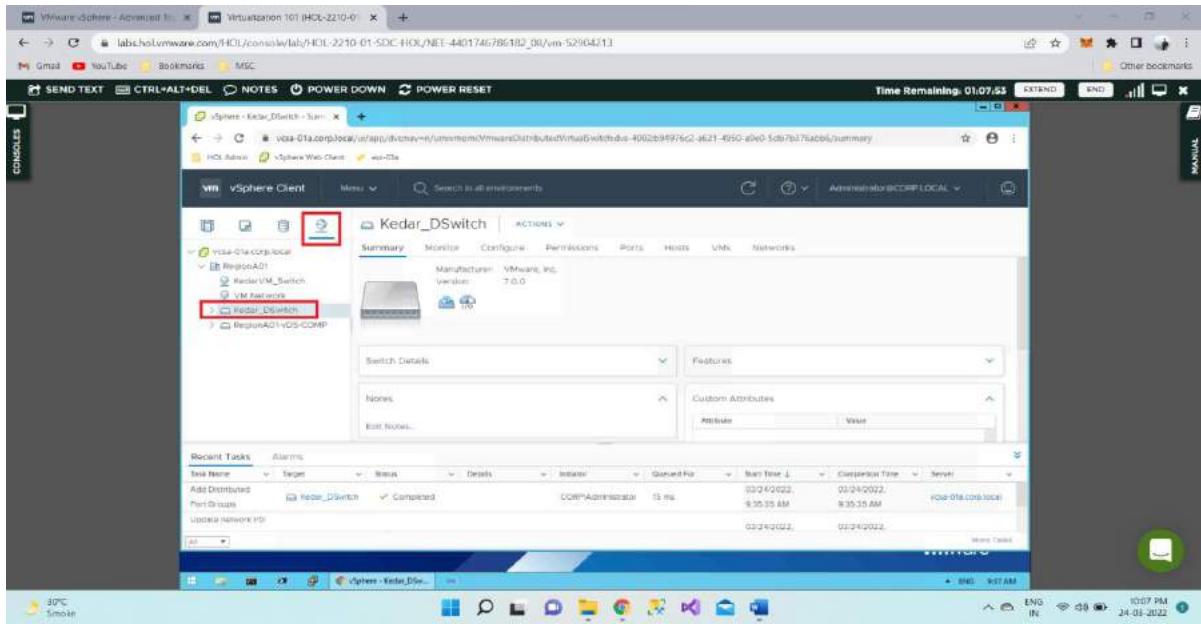


**Step 4:** Leave the default setting and click on **Next**



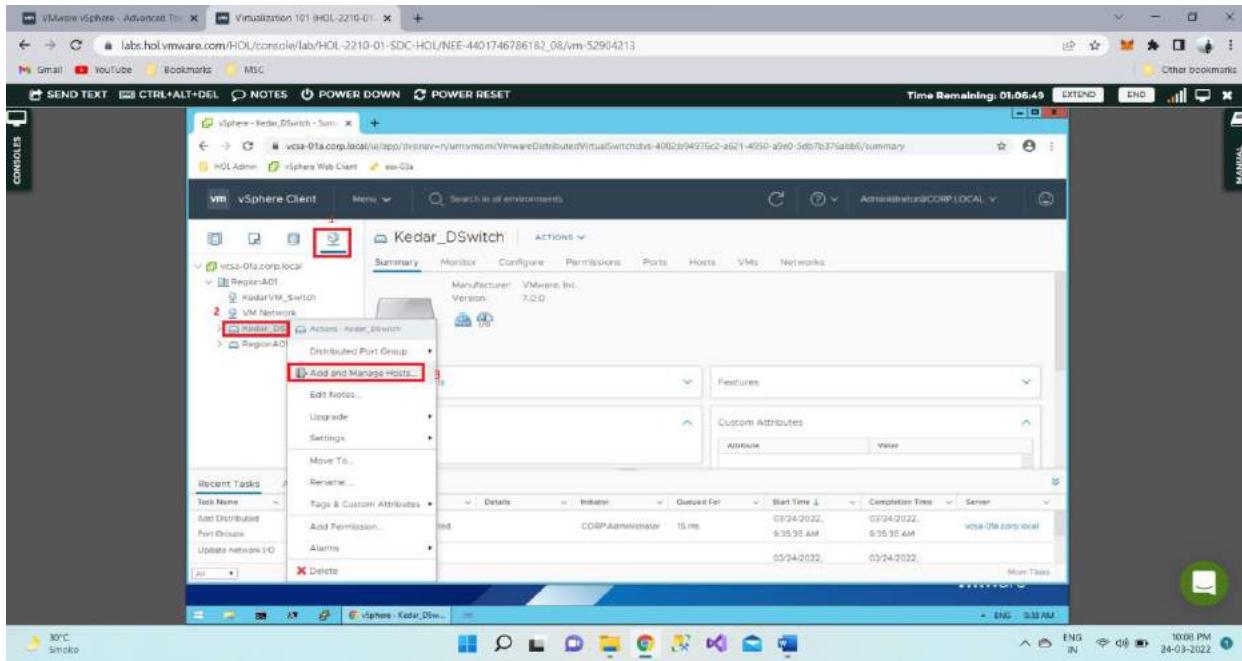
## Step 5: Click on Finish.



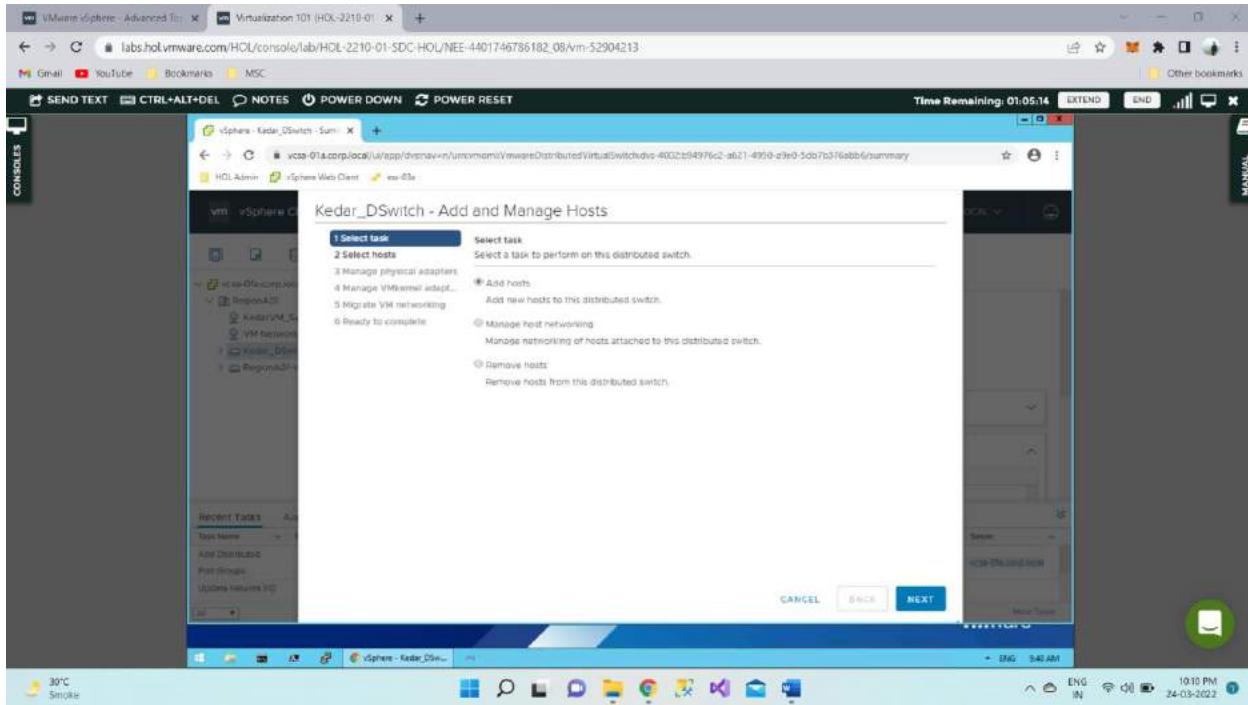


- Add Hosts to a new distributed switch.

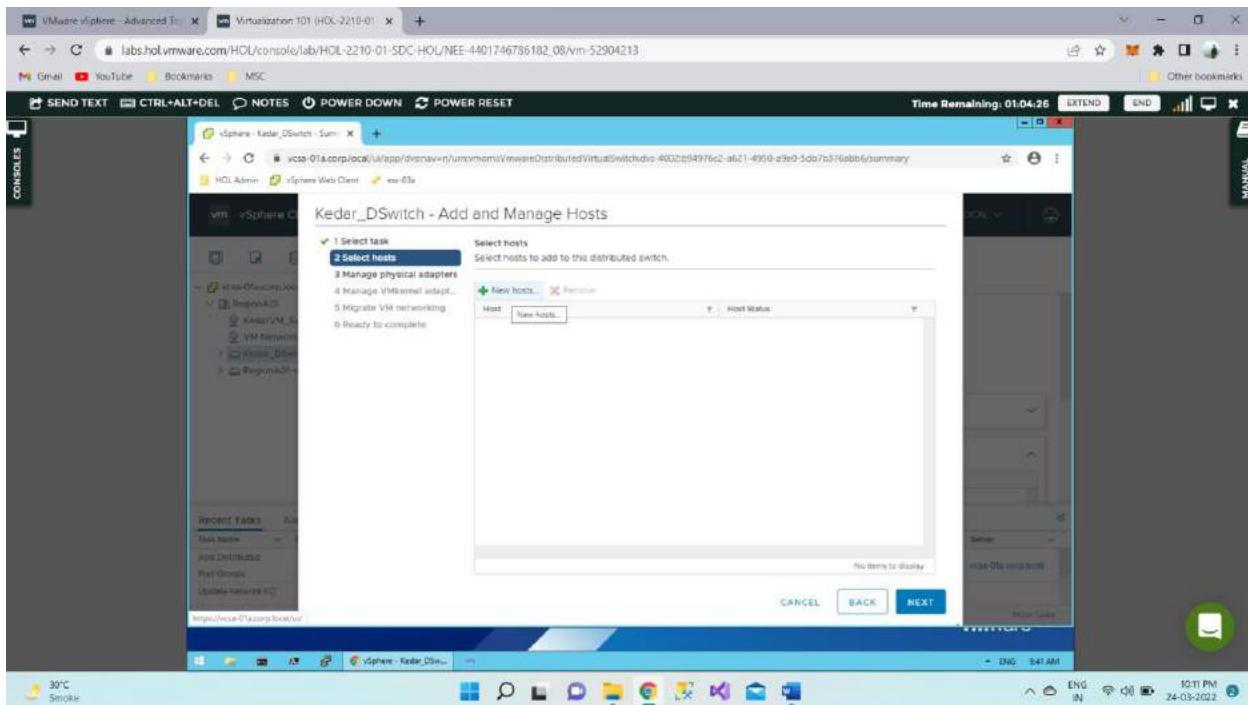
**Step 6:** Right click on the newly created distributed switch and Select **Add and Manage Hosts**

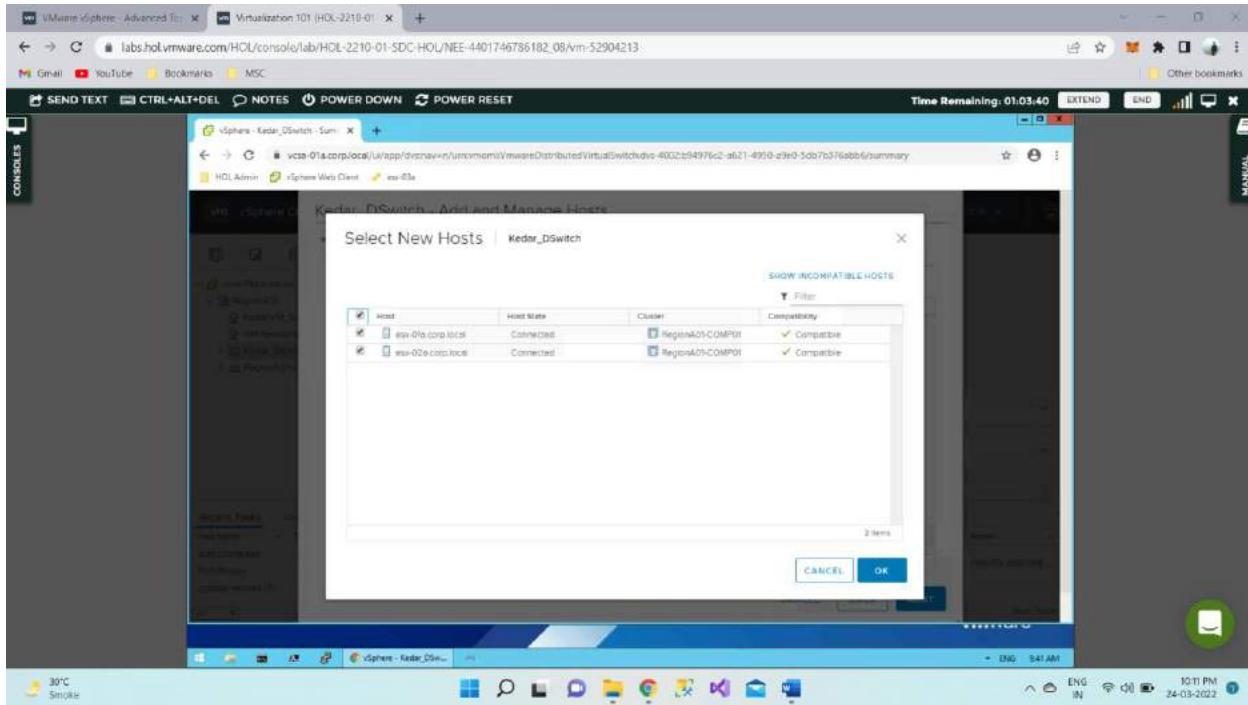
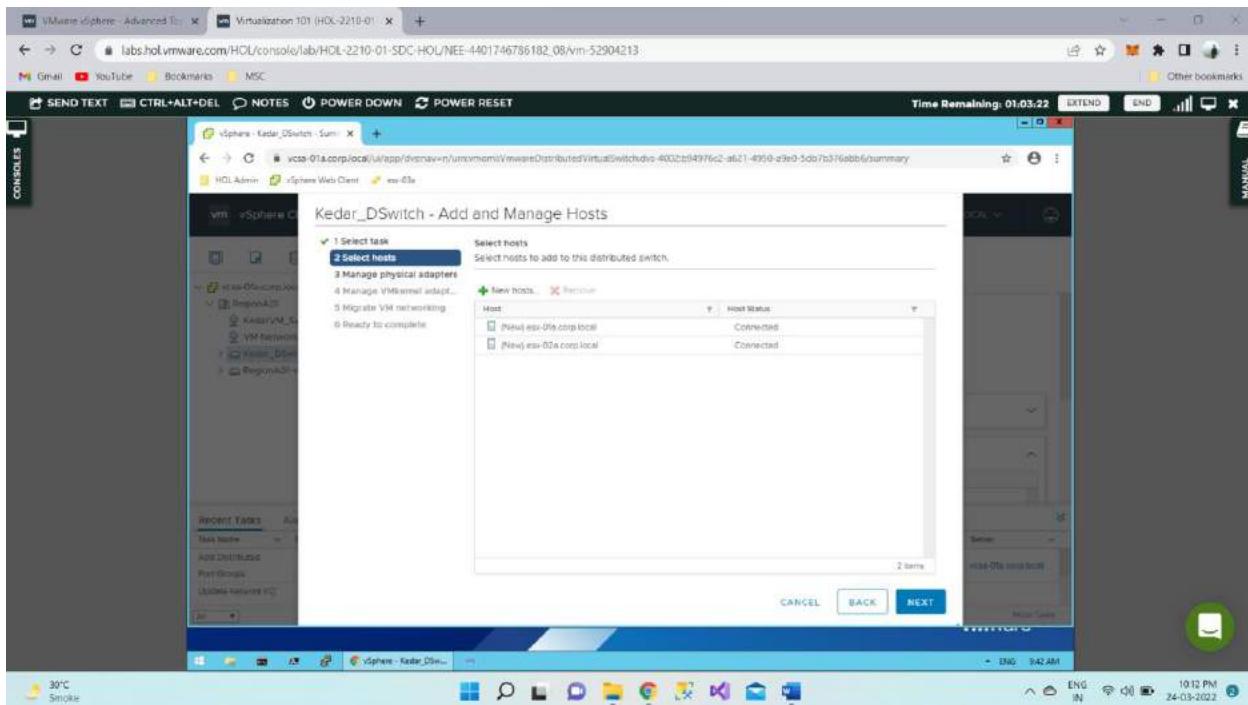


**Step 7:** Task page, select **Add hosts** and click **Next**.



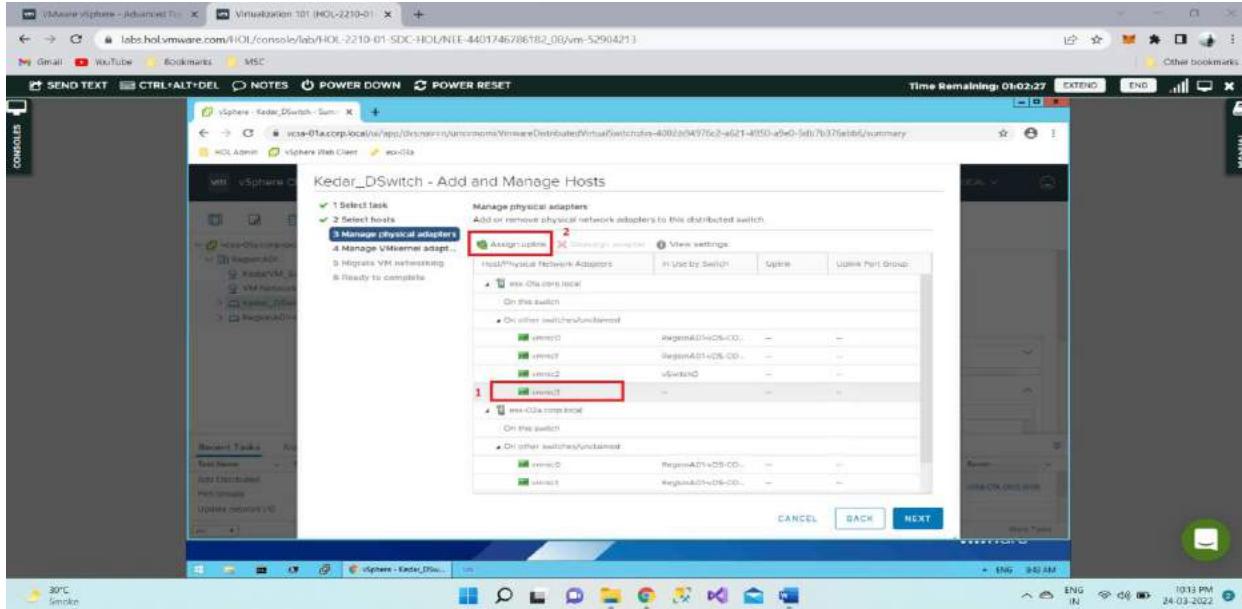
**Step 8(A):** On host page, select on **+ New hosts...**



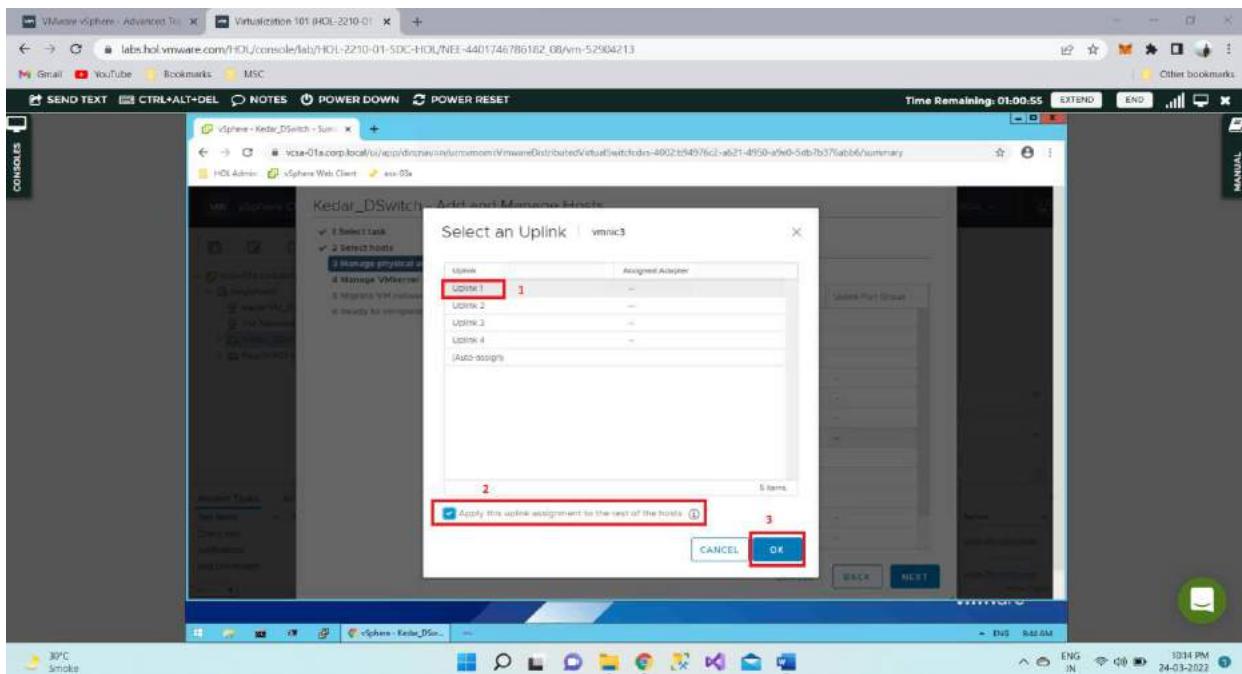
**Step 8(B): Select All host from List and click on OK.****Step 9: Click on Next.**

**Step 10:** On the Manage physical network adapter's page, we want to configure which physical NICs will be used on the distributed switch.

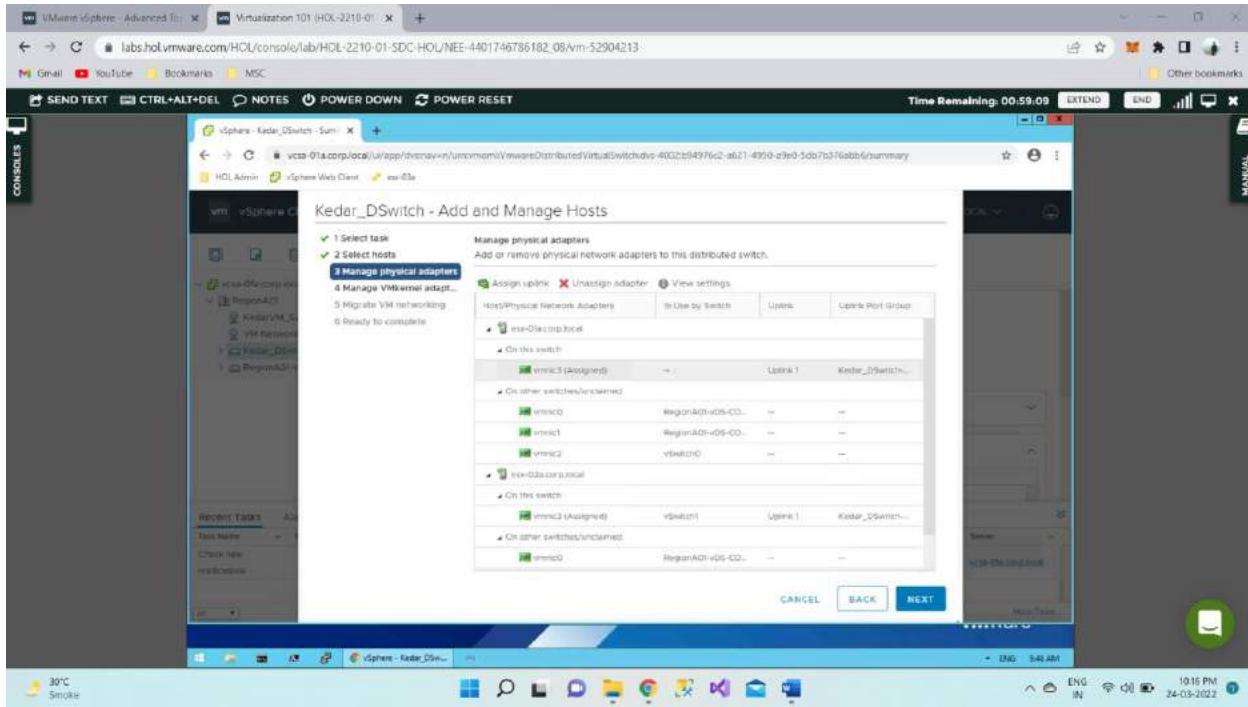
From the on another switches/unclaimed list, **highlight vmnic3** and click **Assign uplink** then click on **Next**.



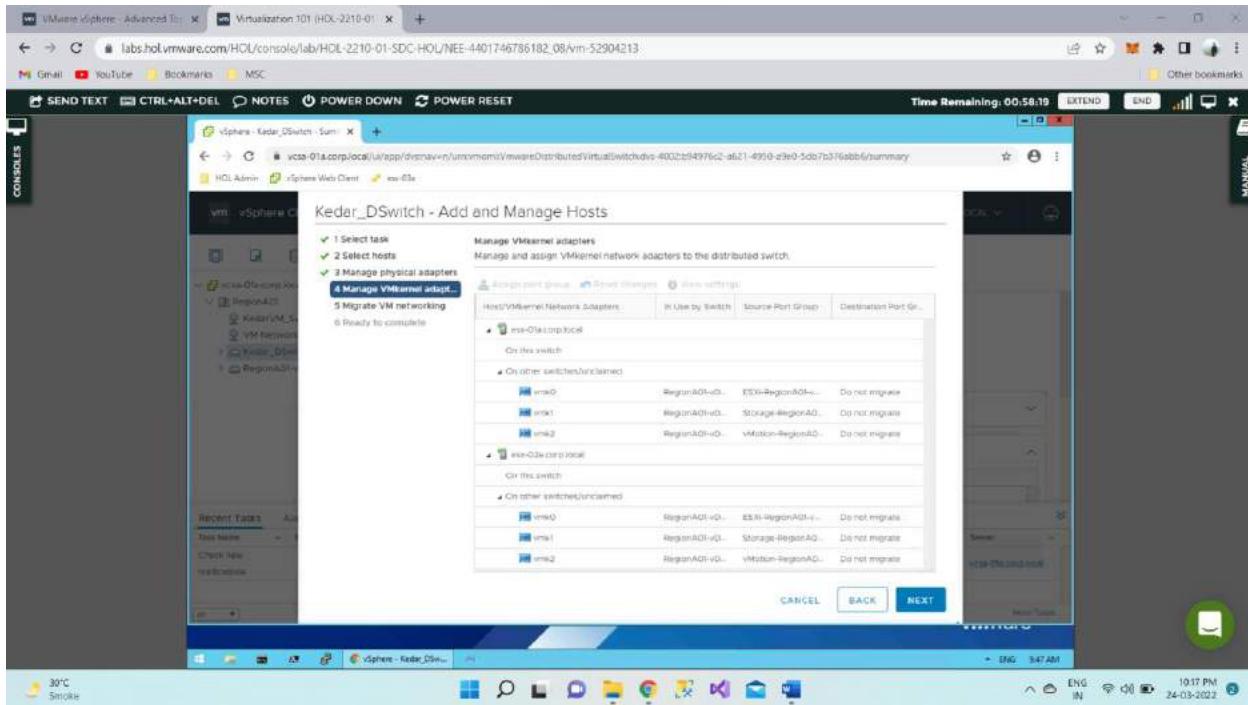
**Step 11:** From the Select an Uplink page, select **Uplink 1**. Check the box next to **Apply this uplink assignment to the rest of the hosts** and click on **OK**.



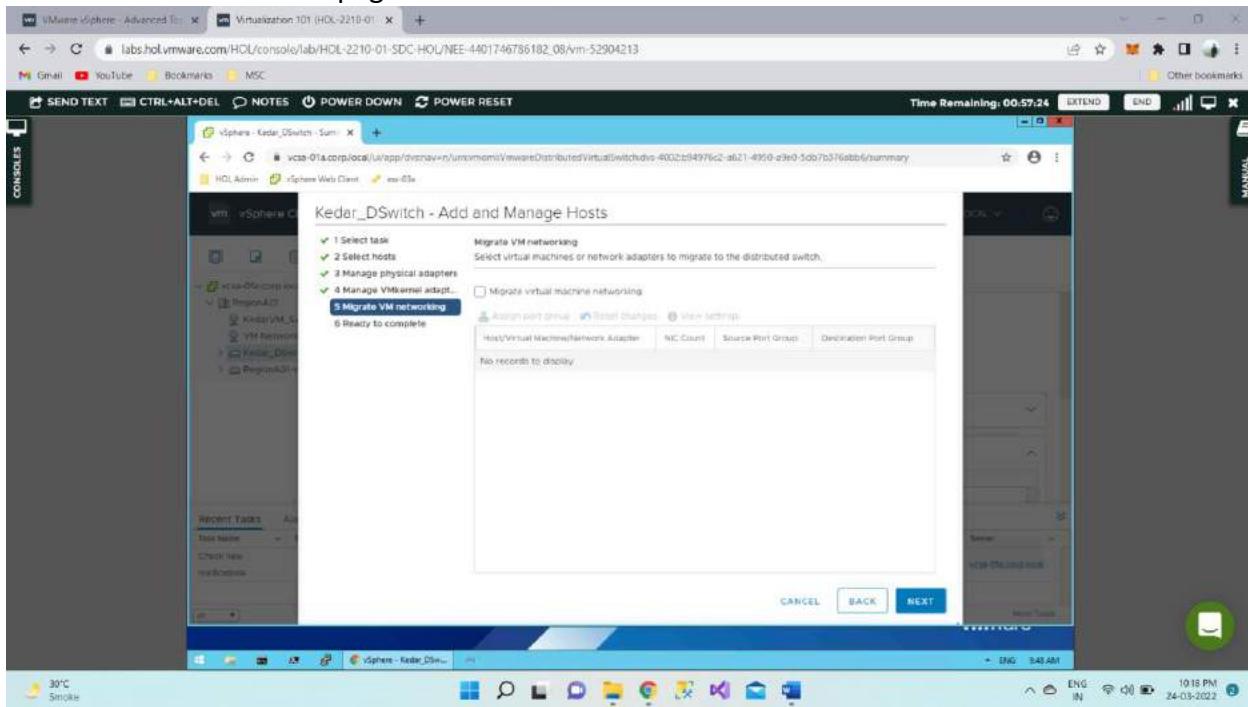
**Step 12:** Review vmnic and uplink settings for the hosts you are adding and click **Next**.



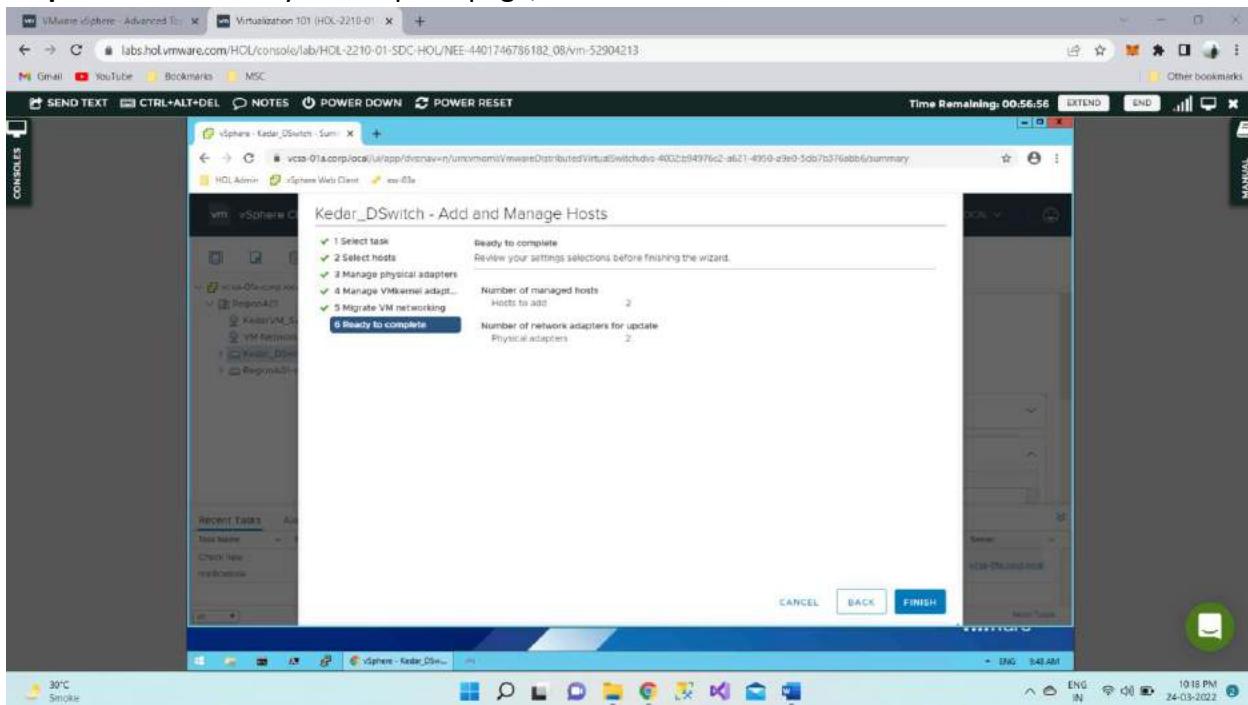
**Step 13:** Since we will not be using this distributed switch for any VMKernel functions, click **Next**.



**Step 14:** 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**.



**Step 15:** On the Ready to complete page, click **Finish**



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

Networking -> Hosts -> Name

The screenshot shows the vSphere Client interface with the 'HOSTS' tab selected. The host list displays two entries:

Name	Status	Cluster	Consumed CPU %	Consumed Mem %
esx-01a.corp.local	Connected	Normal	RegionA01-CD...	2.2%
esx-02a.corp.local	Connected	Normal	RegionA01-CD...	5.8%

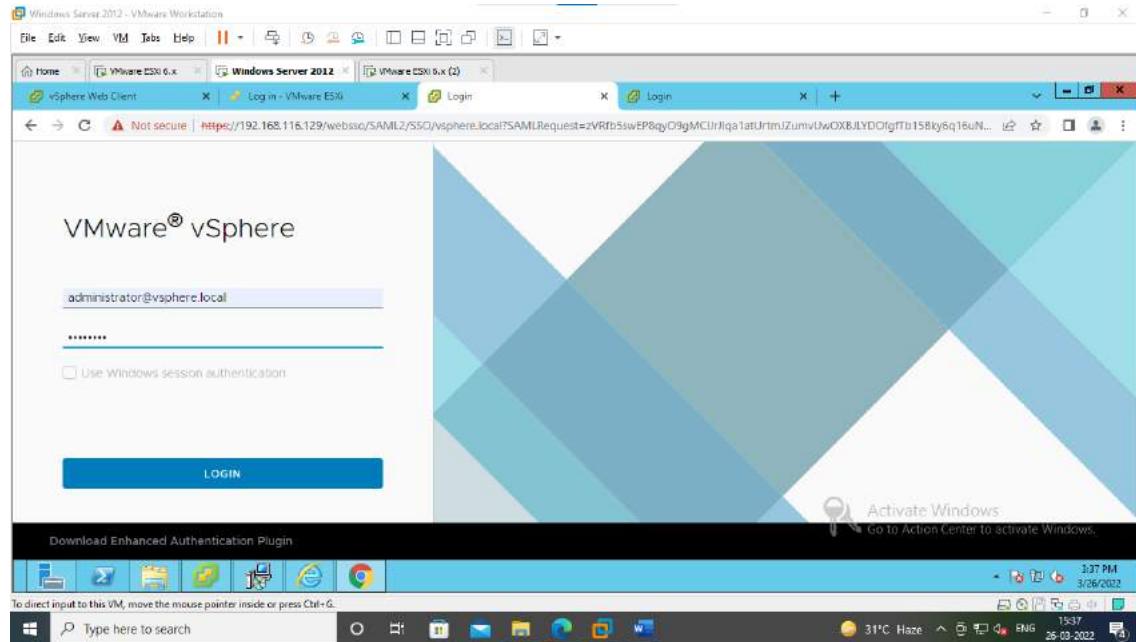
The screenshot shows the vSphere Client interface with the 'esx-02a.corp.local' host selected. The 'Configure' tab is active. In the 'Virtual switches' section, two distributed switches are listed:

- ESXi-RegionA01-vDS-COMP (VLAN 0) - VMkernel Ports (1), Virtual Machines (0)
- Storage-RegionA01-vDS-COMP (VLAN 0) - Uplink (4 NIC Adapters)

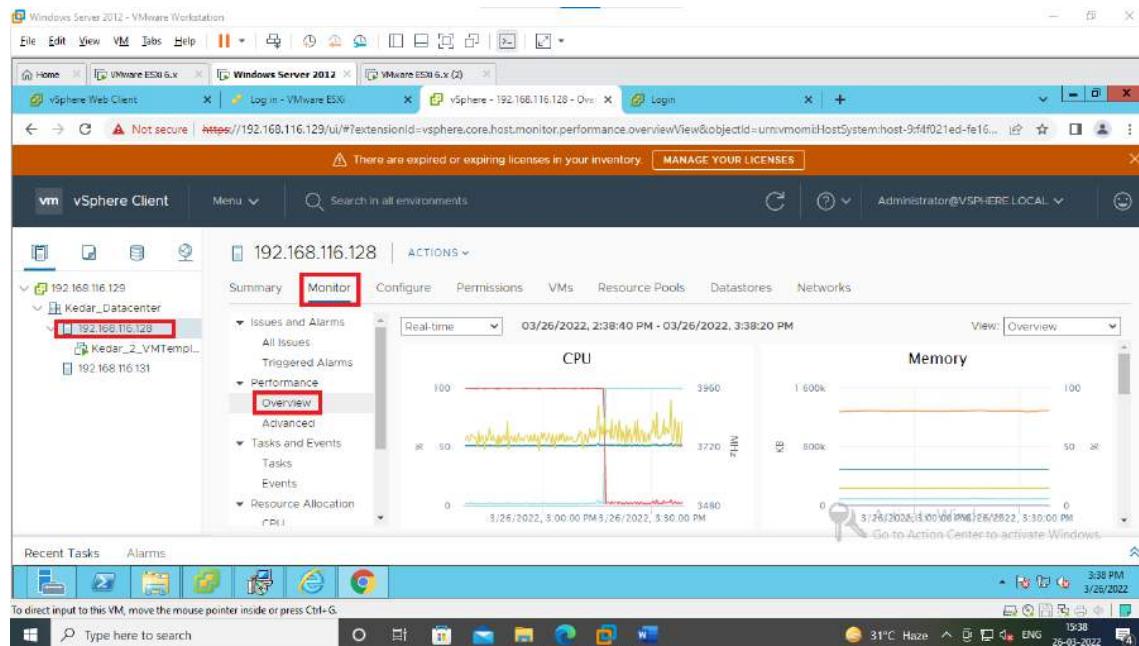
## Practical 8: Perform vSphere Monitoring and Performance

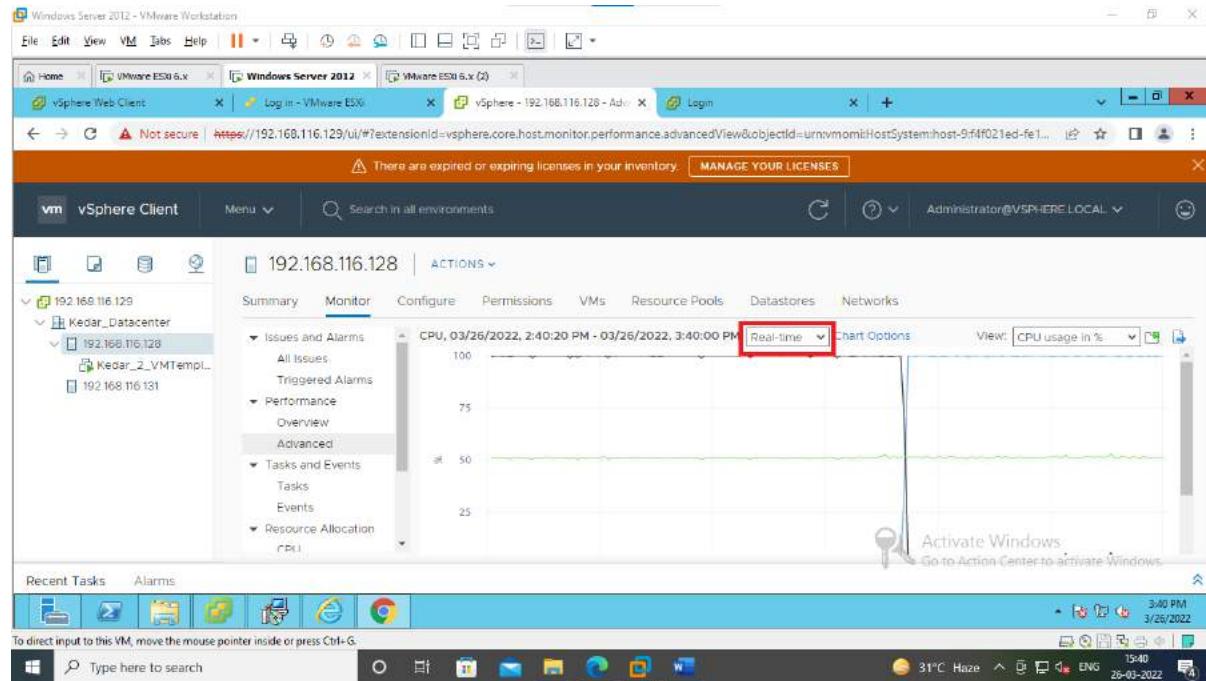
### A. Monitoring Inventory Objects with different Performance Charts.

**Step 1:** Login the VMWare vSphere.

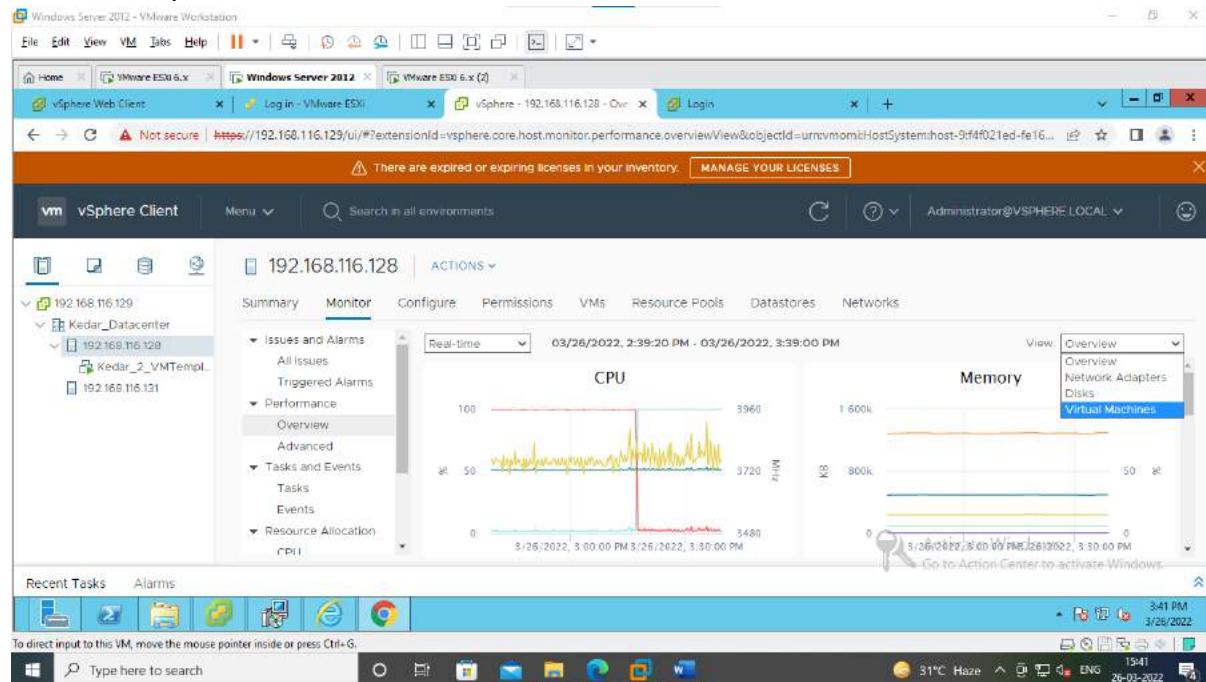


**Step 2:** Select **Host IP address** then Click the **Monitor** tab and then click **Overview** under the Performance section.





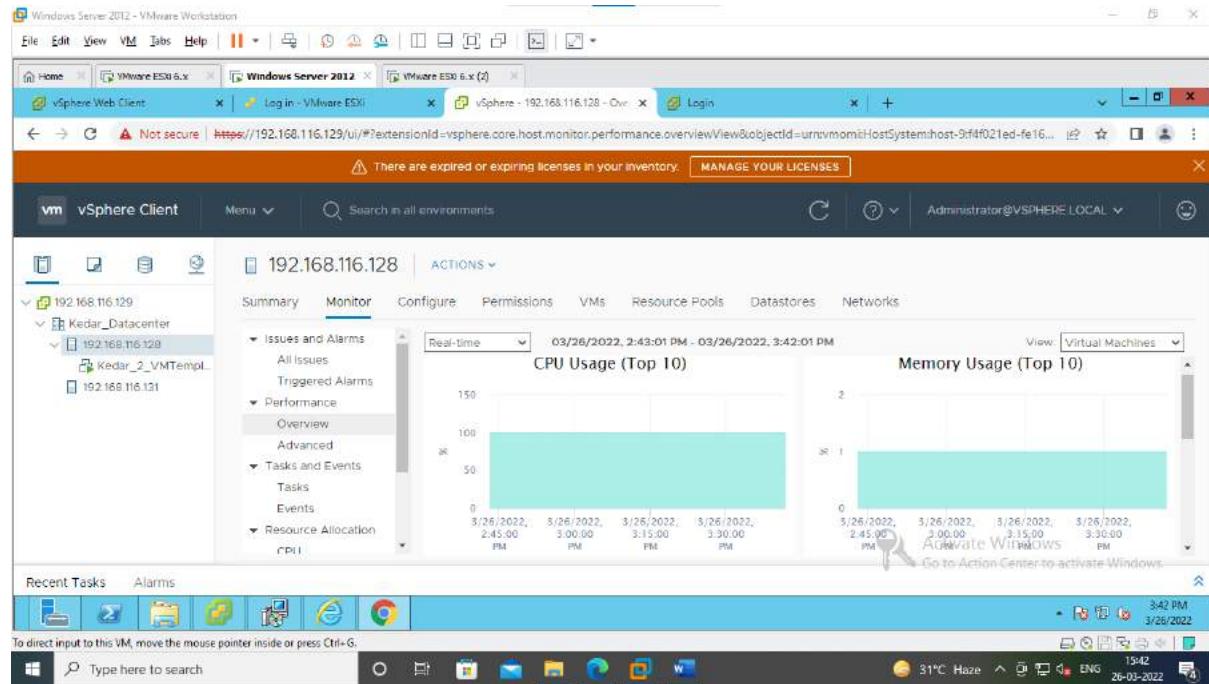
Ensure Real-time has been selected from the Time Range drop-down menu. Here we can see in real-time the CPU usage in percent for **HOST IP address**. By default, the chart will refresh every 20 seconds.



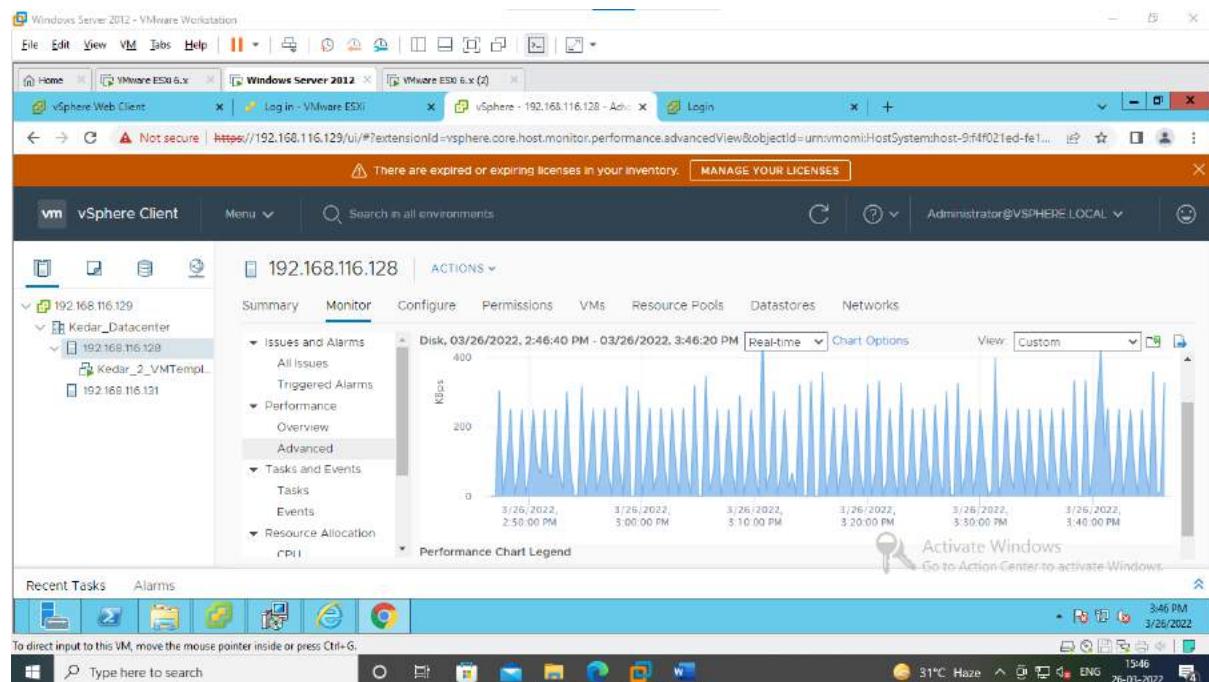
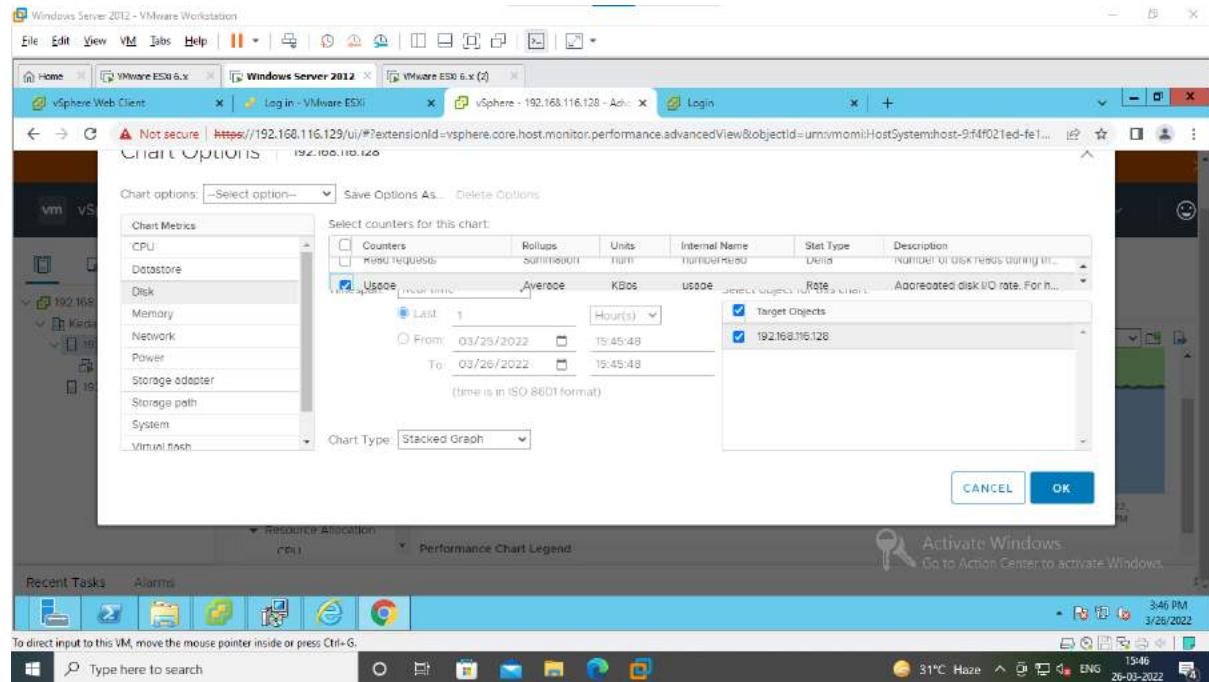
Now click the View drop-down box and select **Virtual Machines**.

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.



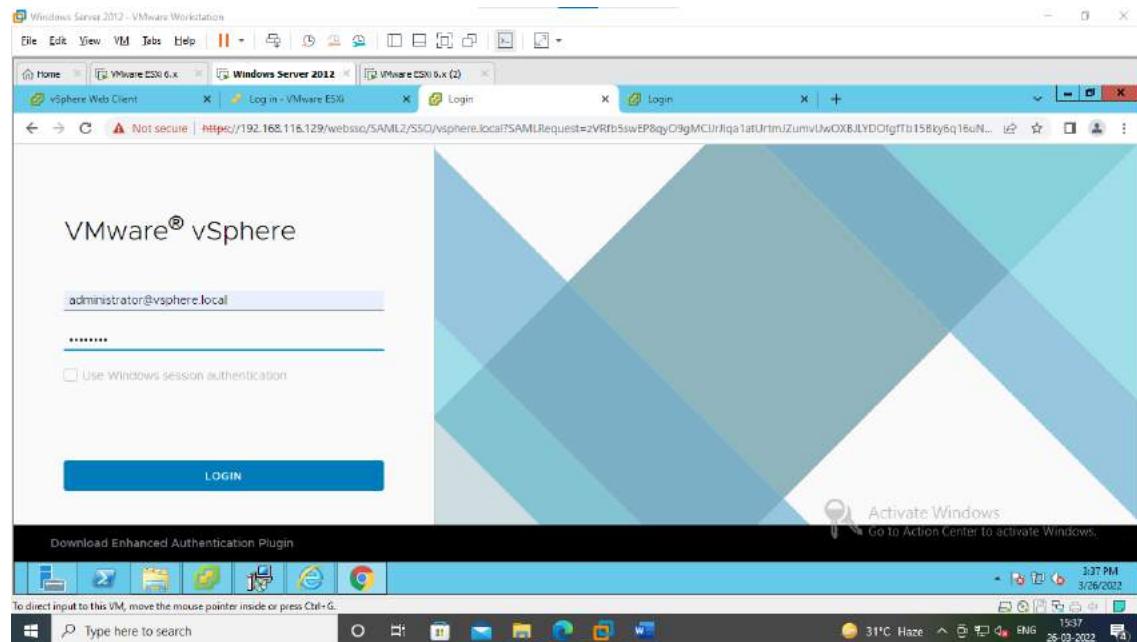
Click the Chart Options link. This will bring up options to **customize the chart**. From the Chart Type drop-down menu, select **Stacked Graph** per VM. Under the Select objects for this chart box, **verify all the virtual machines are selected**. Click the **OK** button to see the newly customized chart.



## B. Monitoring Guest Operating System Performance and view performance statistics for windows Guest Operating system

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

**Step 1:** Login the VMWare vSphere.



**Step 2:** Select the virtual machine we have created.

